

8. Research and Extension in Irrigation Technology Development in Nigeria

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8.1. INTRODUCTION

The importance of irrigation in agriculture has long been appreciated in the Northern States. The contribution of irrigation as a complementary means of food and fibre production cannot be over emphasized. Also irrigation provides employment to a great number of rural people during the traditionally idle period of the long dry season. The importance of irrigation is enhanced due to the potentiality of growing economically important cash crops such as vegetables and wheat during the dry season. Hence, irrigated agriculture is a critical component that can ensure Nigeria's food self-sufficiency.

In the early period, the various governments of Nigeria, through the ministries of agriculture, constructed small earthen dams for irrigation development. In the 1970's, the Federal Government established River Basin Development Authorities (RBDAs). The National Fadama Development Project (NFDP) to be executed by the State Agriculture Development Projects (ADPs) is the latest attempt by the government to realize the nation's goal in irrigation development.

Against this background, this paper presents the role of research and extension in irrigation technology development, and also presents a priority setting technique based on the attributes of the technology package to be adopted. Recommendations on how to improve irrigation development projects through revised research and extension strategies are made.

8.2 ROLE OF RESEARCH AND EXTENSION IN IRRIGATION TECHNOLOGY DEVELOPMENT.

If irrigation were only water storage, lifting, conveyance and distribution, then water supply companies and corporations (like the state public utility boards) should be the right organs to do so. The fact that many irrigation development projects in Nigeria start with huge water supply systems makes many people, including politicians, to place wrong emphasis on the water supply component of irrigation development, neglecting what happens to the water when it gets to the field (Agodzo, 1991). This often leads to difficulties in management of such projects sometimes due to rivalries among certain groups of professionals and usually results in poor performance of

irrigation systems. It is important to evolve effective irrigation research and extension processes for the development of appropriate technologies for irrigation farmers. There is a consensus that appropriate irrigation technologies that can be managed by the farmers are those which have certain attributes. These technologies are to be:

- simple and economically viable,
- technically sound,
- socially acceptable and consistent with the natural environment; and should have
- relative advantage over existing practices.

Irrigation research and technologies in themselves are useless in the Nigerian context if the developed technologies are not extended to farmers for adoption and use. However, the rural farmers must understand them in order to adopt and successfully use them. For this to happen, there is the need for effective teaching and education of the farmers by the extension units of the irrigation development schemes. Farmer-managed irrigation extension education in Nigeria should be the systematic methods of creating, transmitting and applying scientific knowledge to bring about positive change in the irrigation behaviour of farmers. This helps them to live a better life through learning better ways of water resource management for optimum food production. Irrigation extension education should not be concerned only with teaching and securing farmers adoption of a particular improved practice. It should bring change in total outlook of the farmers and encourage them to initiate activities for improving their farms to ensure higher productivity. Irrigation extension programmes can not only "take research results to farmers" and impart "knowledge and skill" but it can also influence the farmers to change their traditions and values associated with rainfed agriculture. Through irrigation, risk and uncertainties can be minimized from the minds of the farmers.

8.3. RECOMMENDED RESEARCH ACTIVITIES

In some parts of the country, water resources development in river basin have already overstretched the existing water resources. It is therefore necessary to simulate such systems on monthly, seasonal and annual time intervals in order to identify appropriate levels of utilization. This also helps to formulate water resources management options. Such options should include;

- setting limits to the annual rate of water resources impoundment,
- limiting the capacity of canal systems for water delivery,
- limiting irrigation canals and land levelling to reduce losses; and
- setting limits like pumping capacities designed to maintain the level of water table etc.

In other parts of the country, the problems are peculiar to the individual projects. The problems include drying up of the water sources; poor engineering designs, construction and supervision. In such cases, research should be geared towards:

- verifying agreement or otherwise between the design and actual regime and water balance of reservoirs, and
- improving methods of computation and forecasting of the water regime and balance of the reservoirs capable of ensuring rational use of the head-works or the downstream areas.

The problems of the water and salt balance of irrigated land is of great concern. Due to unsuitable irrigation practice, unfavourable changes of salt balance and nutrients frequently occur. The consequence of this problem is that despite the completion of new irrigation schemes, the total irrigated area may not increase significantly because of salinization and other operational problems of the existing schemes. A reason for the salinization of the schemes lies in an insufficient study of the water and salt balance of the soils in the initial hydraulic designs while another is due to an insufficient study of the same balance under the influence of irrigation. There is, therefore, the need for efforts to be geared towards solving this problem (Soribe, 1992).

A number of states are already participating in the NFDP which is about to take off. Reports from some of the participating states have already indicated areas of potential problems that the project have to address for a successful tenure. In this regard, special attention should be paid to:

- base line data collection and information on the soils prior to the project take off. Continuous soil and water analyses throughout the life of the project should be carried out,
- shallow ground water studies that will determine among other things, the storability and transmissibility of aquifers, water table fluctuations, and safe yield of the aquifers,
- development of alternative water lifting devices to be used in the fadamas, and
- promotion of improved soil and water management techniques in the irrigated fadamas.

8.4 SUMMARY AND CONCLUSION

This paper attempted to place irrigated agriculture in the proper context of the country's struggle for self-sufficiency in food production. The paper recognized the efforts of both the Federal Government and the World Bank in introducing the NFDP to some states and recommended proper research to make the project sustainable.

The paper finally observed the important role of extension in the irrigation sub-sector and recommended the strengthening of the extension components of all

the irrigation projects. For the irrigation sub-sector to achieve the desired success, the beneficiaries (farmers) should be involved right from the planning stage of most research activities.

8.5. REFERENCES

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