

modern system of farming and expectedly our experience is limited. In spite of this limitation, we are striving hard to improve the irrigation practices in Nigeria through organised research studies. I am happy this forum will also afford us opportunities to learn, from veteran professionals, of improved irrigation practices in other countries.

I thank you for giving me the invitation to be with you today.

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## 2.11 INTRODUCTION

With the teeming population, insufficient food production and poor state of the economy, this discussion is very timely indeed.

Irrigation in Nigeria covers, at present, about 0.9 million hectares (including double cropping) or 2.8% of the total cultivable area, most of which is planted with rice and produces about 8.2% of the total annual crops. The total irrigation potential is estimated at 2-2.5 million hectares capable of producing 25-40% of the total current annual crop production. This, therefore emphasizes the need for continued irrigated agricultural practice.

Food production has increased with the establishment and involvement of some organizations such as the River Basin Development Authorities (RBDAs), Agricultural Development Projects (ADPs) etc through the initiation of small to large scale irrigation projects spread across the country coupled with researches and extension services carried out by various Colleges and Institutes of Agriculture, Polytechnics and Universities.

It is of utmost importance particularly at this time of serious economic constraints to identify some specific irrigation research priority areas to be tackled since all the irrigation problems cannot be solved at the same time.

## **2.12 IMPORTANT AREAS FOR IRRIGATION RESEARCH**

### **2.12.1 Irrigation Scheduling**

1. Modeling and Measurement of Irrigation scheduling parameters.
2. Evaluation of  $E_T$  models in different ecological zones of Nigeria.
3. Crop yield response to irrigation water management.

The usual purpose of irrigation is to supply the water requirements of plants, therefore, successful irrigation scheduling requires a thorough understanding of the principles governing water flow through the soil, plant water uptake from the soil and water loss to the atmosphere.

### **2.12.2. Equipment and Instrumentation**

The design and fabrication of simple hydrometric equipment and other instruments needed to measure soil and water parameters will reduce the high cost needed to import these equipment for research purposes.

### **2.12.3 Evaluation of Methods of Irrigation Water Application**

The main considerations in selecting an irrigation system are the suitability of the system to the site, its costs, availability of water and labour and the expected returns on investment. Systematic studies will lead to sound decisions in the choice of irrigation methods.

### **2.12.4 Environmental Impact Assessment of Irrigation and Drainage Projects**

The employment of irrigation, especially medium/large scale, sometimes involve the construction of reservoirs, dams, conveyance and distributary canals, ditches etc. However, these activities often lead to some undesirable health and environmental hazards, if not properly managed.

Among the health hazards are water related diseases such as bilharzia, river blindness, elephantiasis, malaria, guinea worm etc., while some of the environmental hazards are water-logging, salinization, aquatic and agricultural weeds, pests, sedimentation, water pollution etc. Some of the social problems include resettlements, compensation and change of lifestyles. Because of the importance of

environmental conservation, it is a necessity in irrigation projects that the environmental impact assessment be carried out before and after the establishment of the project.

The Federal Ministry of Agriculture, Water Resources and Rural Development recently demonstrated its belief in environmental impact assessment by incorporating it in the terms of reference of four World Bank assisted irrigation projects executed by the ministry. To date, the Ministry has been involved directly in the assessment of environmental impact of some irrigation and drainage projects. These are:

- a) The assessment of irrigation schemes in North-West Nigeria. This assessment was carried out in collaboration with Hydraulic Research Ltd, Wallingford, UK and Institute of Ecology, Obafemi Awolowo University, Ile-Ife, Nigeria.
- b) Environmental Impact Assessment of National Fadama Development Project (NFDPP) for Northern States. This assessment was carried out under the auspices of the Federal Agricultural Co-ordinating Unit (FACU), Ibadan, Nigeria.
- c) Environmental Impact Assessment of four major irrigation projects. These are Jere Bowl (Alau Dam), Lower Anambra, Kano River and Dadin Kowa Irrigation projects.

#### **2.12.5 Feasibility of renewable energy as alternative power source to conventional fossil fuel.**

Energy is required in irrigation to pump certain quantity of water to meet crop demand. A list of available energy sources is large. This includes fossil, direct solar, wind, nuclear, geothermal etc. However in Nigeria, virtually only one source which is fossil is exploited as farm power source, there is need to explore other power sources.

#### **2.13 CONCLUSION**

Needless to mention, there are many areas of research interests which need development. With the involvement of all the organizations involved in irrigation, there is no doubt that research will bring the expected improvement in irrigated agriculture in the country.