

6751 1.1 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025

priority

institutes

3. The Status of Irrigation Research in Nigeria

Nigeria

E. U. Nwa
Department of Agricultural Engineering
University of Ilorin, Ilorin

3.1 INTRODUCTION

One of the goals of the irrigation sub-sector in Nigeria is to accelerate the achievement by the nation of self-sufficiency in food. To achieve this goal a large amount of capital was invested in irrigation between 1973 and 1984. Unfortunately the contribution of irrigation to food production has not been very impressive because the development of irrigation in the country has not been very effective.

A great number of problems face the irrigation sub-sector. These range from inconsistency in government policy to inadequate funding and inadequacies in system management. Clearly one of the problems inhibiting a rapid and an effective irrigation development in Nigeria is that research support for irrigation is very weak. Irrigation development can hardly be efficient without an effective research support.

It is intended in this paper to present a picture of the current situation of irrigation research in Nigeria and to suggest a strategy that could be used to strengthen research support for irrigation in the country.

3.2 CURRENT RESEARCH INSTITUTIONS AND RESEARCH ACTIVITIES

3.2.1 Irrigated Crops Research

Currently the best organized research programmes in support of irrigation are in the area of irrigated crops improvement. The irrigated crops include wheat, rice, maize, sugar cane, barley, cowpea and vegetables among others. A number of Research Institutes have the mandate to undertake research to improve these and other irrigated crops. These institutes include the Institute for Agricultural Research (IAR), Samaru, Zaria; National Cereals Research Institute (NCRI), Badeggi, Niger State; Lake Chad Research Institute (LCRI), Maiduguri; and the National Horticultural Research Institute (NIHORT), Ibadan (Nwa, 1983). The International Institute of Tropical Agriculture (IITA), Ibadan, has a programme based in Kano to develop cowpeas for irrigation. Perhaps the only groups working on sugar cane is the small "Sugar Research Institute" based in the University of Ilorin and NCRI.

In addition to the Research Institutes, there are three Universities of Agriculture and at least 23 Faculties of Agriculture in the country's universities, some of whose members do carry out research to improve irrigated crops. However, most of the university based research depend on individual staff interest and on his ability to secure research funds. This is to say that most of the research is not based on "a mandate" backed up with research funds.

3.2.2 Other Irrigation Research

The other aspects of irrigation research are less organized than irrigated crops research (Nwa, 1983). It appears that only three Research Institutes have the mandate to undertake other aspects of irrigation research. These are IAR, LCRI and NCRI.

The Institute for Agricultural Research organizes its irrigation research programme under three sub-programmes (IAR, 1992) namely, Water Resources Development and Management, Irrigated Cropping Systems, and Environmental Implications of Irrigation. The Lake Chad Research Institute has also carried out some irrigation research in addition to irrigated crops research, but being a younger Institute, its irrigation programme may not be as wide as that of IAR.

Other irrigation research are being undertaken, but these are by individuals and small groups scattered all over the various universities and centres in the country. The University of Ilorin, for example, is studying small scale, farmer managed, non-formal irrigation systems in its vicinity; and the University of Nigeria, Nsukka is examining water resources development for small scale irrigation in its zone, just to name two.

The socio-economic issues relating to irrigation are being studied at Bayero University; Centre for Social and Economic Research, ABU, Zaria; National Institute of Social and Economic Research (NISER), Ibadan, among many other places.

The environmental aspects of irrigation involves:

- public health
- fisheries
- aquatic weeds
- considerations for wildlife
- downstream hydrology
- agricultural pest management
- increased use of fertilizer
- impacts on groundwater
- drainage costs, and
- social costs

The Institute of Ecology of Obafemi Awolowo University, Ile-Ife, has been carrying out studies on the health aspects of irrigation. For example, they studied the vector-borne disease problems of small scale water resource development projects in Nigeria and they have developed guidelines for rapid assesment of these problems in irrigation projects. The Nguru wetland project is also another attempt to study the

environmental impact of irrigation with particular reference to wildlife. Some other aspects of the environmental impact of irrigation are being studied by other groups.

Using remote sensing techniques, the IITA is leading a programme to classify inland valleys in West Africa. This could be a prelude to the study of the irrigation of these valley bottom lands which are more prevalent in southern Nigerian just as the fadamas are prevalent in the north.

In 1991 the International Irrigation Management Institute (IIMI) established its office in Kano and started research into irrigation management problems using the Kano River project as a pilot centre (Pradhan, 1992). Four major areas are the focus of this collaborative action research, namely:

- institutional aspects
- mode of management
- operation and maintenance procedure, and
- resource mobilization.

In this section of this paper, an indication has been given of some of the on-going irrigation research activities in Nigeria. As stated previously, some work are being done at various locations. Perhaps one of the outcomes of this Seminar would be to find a way to document all the various research activities and results for easy reference.

3.3. POTENTIAL IRRIGATION RESEARCH INSTITUTIONS

As indicated in section 3.2, many individuals are carrying out irrigation research at various places. Most of this work are being undertaken out of the personal interest of the researchers and not from demand by third parties to solve specific problems. This is one of the reasons the results are not being applied as much as they should be. This is also one of the reasons why many individuals and institutions with potential do not take part in irrigation research. This situation could be reversed easily by specifying what problems need to be solved and by providing funds to solve priority problems.

Today (March 1993) there are 24 Federal and 12 State universities, excluding the military universty,in Nigeria. Several of these universities have departments of agricultural, civil, water resources and environmental engineering; geography; geology; applied geophysics; meteorology; agronomy and water management in addition to the department of management sciences.

Table 3.1 gives the numbers of departments of some of the courses available in the Nigerian universities. In addition there are expertise in ecology and in environmental and community health at several centres. These are some of the departments and groups with the potential to undertake irrigation research. If these institutions and groups are organized and funded, there is no doubt that much more effective irrigation research could be undertaken.

Table 3.1 Numbers of departments of various courses available in Nigerian universities (March, 1993)

Courses	Number of departments
1. Agricultural Engineering	14
2. Civil Engineering	22
3. Water Resources and Environmental Engineering	1
4. Geography	25
5. Geology	15
6. Applied Geophysics	3
7. Meteorology	3
8. Agricultural Meteorology and Water Management	1
9. Agronomy	3
10. Soil Science	Several but as part of Agriculture

Source: JAMB (1992)

3.4. PROPOSED FRAMEWORK FOR IRRIGATION RESEARCH

It is proposed here that the irrigation research potential of the existing institutions be utilized to support existing and planned irrigation projects in the country. Already Nigeria has been divided into 11 catchment areas (river basins). It is proposed that all the institutions be divided into 11 groups and that one group should take care of one river basin. All the problems of the RBDA projects, those of the ADPs of the states in the basin, and all the problems of the private sector projects in the same basin are expected to be solved by the respective research group. One of the institutions in the group is to coordinate the work of the group.

Table 3.2 gives the river basins and their States and the proposed institutional groups and the coordinating institutions. It is suggested also that this scheme be started on a pilot basis using one basin in the north and another one in the south. The lessons learnt from the pilot project would be used to modify the scheme if necessary before implementing it all over the country. Based on the level of development of the existing projects in the basins, it is recommended that Anambra-Imo and Hadejia-Jama'are river basins be used for the pilot study. The details of the implementation procedure should be worked out before starting the project.

Table 3.2. Organization of institutions to support irrigation research

River Basin	States	Institutions	Coordinating Institution
1. Anambra-Imo	Abia Anambra Enugu Imo	UNN FUTO NAU UMUDIKE ABSU ESUTECH IMSU	UNN
2. Benin-Owena	Edo Ondo	BENIN FUTA EDSU OSUA	BENIN
3. Chad Basin	Borno Yobe	MAIDUGURI BAUCHI YOLA LCRI	MAIDUGURI
4. Cross River	Akwa Ibom Cross River	UYO CALABAR	UYO
5. Hadejia-Jama'are	Bauchi Jigawa Kano	IAR ABU BAUCHI BAYERO KANO ICRISAT IIMI IITA	IAR
6. Lower Benue	Benue Plateau	MAKURDI JOS UNN BESU	MAKURDI
7. Niger Delta	Delta Rivers	DELSU RSUST PHC	RSUST
8. Niger River	FCT Kaduna Kogi Kwara Niger	ILORIN ABU ABUJA MINNA NCRI NWRI	ILORIN

Table 3.2. contd

River Basin	States	Institutions	Coordinating Institution
9. Ogun-Oshun	Lagos	ABEOKUTA	ABEOKUTA
	Ogun	IBADAN	
	Osun	LAGOS	
	Oyo	OAU	
		LAUTECH	
		LASU	
		OGUN	
		IAR & T	
10. Sokoto-Rima	Katsina	UDU	UDU
	Kebbi	ABU	
	Sokoto	IAR	
		ILORIN	
		NCRI	
11. Upper Benue	Adamawa	YOLA	YOLA
	Taraba	BAUCHI	
		JOS	
		MAIDUGURI	
		LCRI	

Note: See the appendix for the abbreviations

3.5. CONCLUSIONS AND RECOMMENDATIONS

In this paper the current research institutions and research activities in Nigeria were examined. The two major conclusions of this paper are that:

1. The infrastructure for irrigated crops improvement research are much better than those for the other aspects of irrigation research, and,
2. Research support for irrigation could be improved by exploiting the tremendous potential for irrigation research which exists in the Nigerian universities and other institutions.

In order to strengthen research support for irrigation the following recommendations are made:

1. A mechanism should be developed to document all the on- going research activities and the research results and other published information on Nigerian irrigation; these should be made easily accessible to researchers and other interested parties.,

2. The framework for research proposed in this paper should be adopted to support irrigation, and
3. A pilot project using Anambra-Imo and Hadejia-Jama'are river basins should be instituted to test the framework proposed in this paper.

3.6. REFERENCES

IAR. 1992. Report on Irrigation Research programme. Cropping Scheme Meeting, IAR, ABU, Zaria.

JAMB. 1992. Guidelines for Admission to First Degree Courses in Nigerian Universities, 1993/94 Session. JAMB, Lagos.

Nwa, E. U. 1983. Role of irrigation research in agricultural development in Nigeria. *Water World* 5(3): 17-20.

Pradhan, P. 1992. IIMI Research programme in Nigeria. Paper presented at the 1st National Water Resources Forum, National Water Resources Institute, Kaduna.

APPENDIX

Institutional and Other Abbreviations

ABEOKUTA	- Federal University of Agriculture, Abeokuta
ABU	- Ahmadu Bello University, Zaria
ABUJA	- University of Abuja
ABSU	- Abia State University, Uturu
ADP	- Agricultural Development Project
BAUCHI	- Abubakar Tafawa Balewa University, Bauchi
BAYERO	- Bayero University, Kano
BENIN	- University of Benin, Benin City
BESU	- Benue State University, Makurdi
CALABAR	- University of Calabar, Calabar
DELSU	- Delta State University, Abraka
EDSU	- Edo State University, Ekpoma
ESUTECH	- Enugu State University of Technology, Enugu
FCT	- Federal Capital Territory
FUTA	- Federal University of Technology, Akure
FUTO	- Federal University of Technology, Owerri
IAR	- Institute for Agricultural Research, Samaru

IAR & T	- Institute for Agricultural Research and Training, Ibadan
IBADAN	- University of Ibadan, Ibadan
ICRISAT	- International Crops Research Institute for Semi-Arid Tropics
IIMI	- International Irrigation Management Institute
IITA	- International Institute of Tropical Agriculture
ILORIN	- University of Ilorin, Ilorin
IMSU	- Imo State University, Owerri
JAMB	- Joint Admissions and Matriculation Board
JOS	- University of Jos, Jos
KANO	- Kano State University, Bagauda, Kano
LAGOS	- University of Lagos, Lagos
LAUTECH	- Ladoke Akintola University of Technology, Ogbomosho
LASU	- Lagos State University, Ojo, Lagos
LCRI	- Lake Chad Research Institute, Maiduguri
MAIDUGURI	- University of Maiduguri, Maiduguri
MAKURDI	- Federal University of Agriculture, Makurdi
MINNA	- Federal University of Technology, Minna
NAU	- Nnamdi Azikiwe University, Akwa
NCRI	- National Cereals Research Institute, Badeggi
NIHORT	- National Horticultural Research Institute, Ibadan
NISER	- National Institute for Social and Economic Research, Ibadan
NWRI	- National Water Resources Institute, Kaduna
OAU	- Obafemi Awolowo University, Ile-Ife
OGUN	- Ogun State University, Ago-Iwoye
OSUA	- Ondo State University, Ado-Ekiti
PHC	- University of Port-Harcourt, Port-Harcourt
RBDA	- River Basin Development Authority
RSUST	- Rivers State University of Science and Technology, Port-Harcourt
UDU	- Usmanu Danfodiyo University, Sokoto
UMUDIKE	- Federal University of Agriculture, Umudike
UNN	- University of Nigeria, Nsukka
UYO	- University of Uyo, Uyo
YOLA	- Federal University of Technology, Yola