INSTITUTE OF AGRICULTURAL RESEARCH AND TRAINING (I. A. R. & T.): DEMAND DRIVEN, FARMER-TARGETED RESEARCH FOR ENHANCED FOOD SECURITY

1. BACKGROUND INFORMATION

The pioneer School of Agriculture in Nigeria (now Federal College of Agriculture) was established on Moor Plantation, Ibadan in 1921. That school, now known as Federal College of Agriculture, Akure, the Federal College of Animal Health and Production Technology (formerly School of Health and Animal Husbandry) as well as the Research Division of the Western Region Ministry of Agriculture and Natural Resources were reconstituted in 1969 into the Institute of Agricultural Research and Training (IAR&T) as an integral part of the then University of Ife (now Obafemi Awolowo University), Ile-Ife. The Institute was established by a charter signed by the then Vice-Chancellor of the University of Ife (now Obafemi Awolowo University) and the Governor of the former Western Region of Nigeria, with well defined statutes.

As a multi-commodity research institute, the ultimate goal of the Institute is to help the nation achieve self-sufficiency in food and industrial raw material production within a very short time. The multiplier effect of this is to improve the nutritional status and economic base of low income farmers in the South-West zone in particular and Nigeria in general. It is pertinent to mention that the institute research focus is on sustainable farming systems and land management that conserve land, water, plant/animal genetic resources in an environmentally friendly, non degrading, technologically appropriate, economically feasible and socially acceptable farming system. The target is therefore the resource poor farmers growing a wide range of agricultural commodities. With a multidisciplinary approach, the strategy embarked upon is to develop technologies, which will enhance agricultural productivity of the farmers with low level inputs to derive maximum benefits from their small holdings.

OBJECTIVES

The Institute, in order to meet its mandate and the demands of its clientele, has functioned as a Research, Training and Services Centre for the improvement of agricultural productivity and farm efficiency through research into the existing soils, water, crops and livestock resources in the broad agro-ecological zones of

south-western Nigeria.

The institute has carried out its research, services and training activities in the context of the following four broad objectives:-

i. To serve as a national centre for the integrated improvement of the genetic potential, yield and nutritional or utilization quality of major food and agro-industrial (raw materials) crops, livestock and other important commodities adapted to the broad agro-ecological zones of south-western Nigeria.
ii. To investigate, develop, evaluate, validate and promote farming systems that would increase and maximize overall agricultural production and productivity in relation to inputs.
iii. To provide adequate, relevant and functional junior, intermediate and high level manpower training for national agricultural development.
iv. To collaborate with other universities, national, regional and international institutions in the validation and practical application of improved agricultural technologies.

2. MANDATES OF THE INSTITUTE

Thus, I.A.R.&.T is one of the four national agricultural research institutes affiliated to universities in Nigeria. It has been, since its inception, rendering services to Nigerian farmers through its integrated programmes in applied research, extension and middle-level manpower training. When the federal government reviewed the activities of the National Agricultural Research Institutes (NARIs) in 1987, IAR&T, as one of the five (5) Zonal Research Institutes, was given the following mandates:-

(a) National mandate for soils and water management
(b) National mandate for genetic improvement of kenaf and jute
(c) National mandate for improvement of maize, and joint coordination for the Nationally Coordinated Research Programme (NCRP) on maize for the forest and humid savanna agro-ecologies.
(d) Mandate for farming systems of south-western agricultural zone, covering eight states of Lagos, Ogun, Oyo, Osun, Ondo, Ekiti, Edo and Delta.
(e) National joint coordination for livestock research with research focus on large and small ruminants, trypano-tolerant indigenous cattle breeds, sheep and goats.
(f) National joint coordination for soybean in the humid agro-ecology.

By this statutory role, the institute has continued to develop ecologically adaptable, socially acceptable, economically adoptable proven technologies for over five million farm families in the southwestern Nigeria. The ADP System in each State serves as the organ of transfer of new technologies to our teeming farmers. It is by extension of this mandate that IAR&T was designated the Zonal Coordinating Research Institute responsible for establishing close research extension linkages and provision of research back-up services for the ADPs in the south west zone of the country.

3. ORGANISATION OF THE INSTITUTE

THE GOVERNING BOARD

The administrative structure of the Institute, as spelt out in the charter, provides for a Governing Board. The Governing Board is responsible for general policy formulation and for overall authority for the institute's activities. Amongst others, it is responsible for approval of research and service projects, consideration of the institute's budget for presentation to the university council and the supervising ministry, and ratification of proposals for physical development.

From its inception in 1969 to 1974, the composition of the board was largely a western state affair with membership drawn extensively from the then University of Ife (now Obafemi Awolowo University) and the Western State Public Service, with the Vice-chancellor as the chairman. Membership of the Governing Board was made up largely of the Permanent Secretaries in the States in the Institute's area of mandate, distinguished professional agriculturists, as well as the University Council and Senate Representatives with the Vice-Chancellor as Chairman. Within the last decade or so, however, the Federal Government has appointed more members as well as a representative of the Hon. Minister of Agriculture and Water Resources

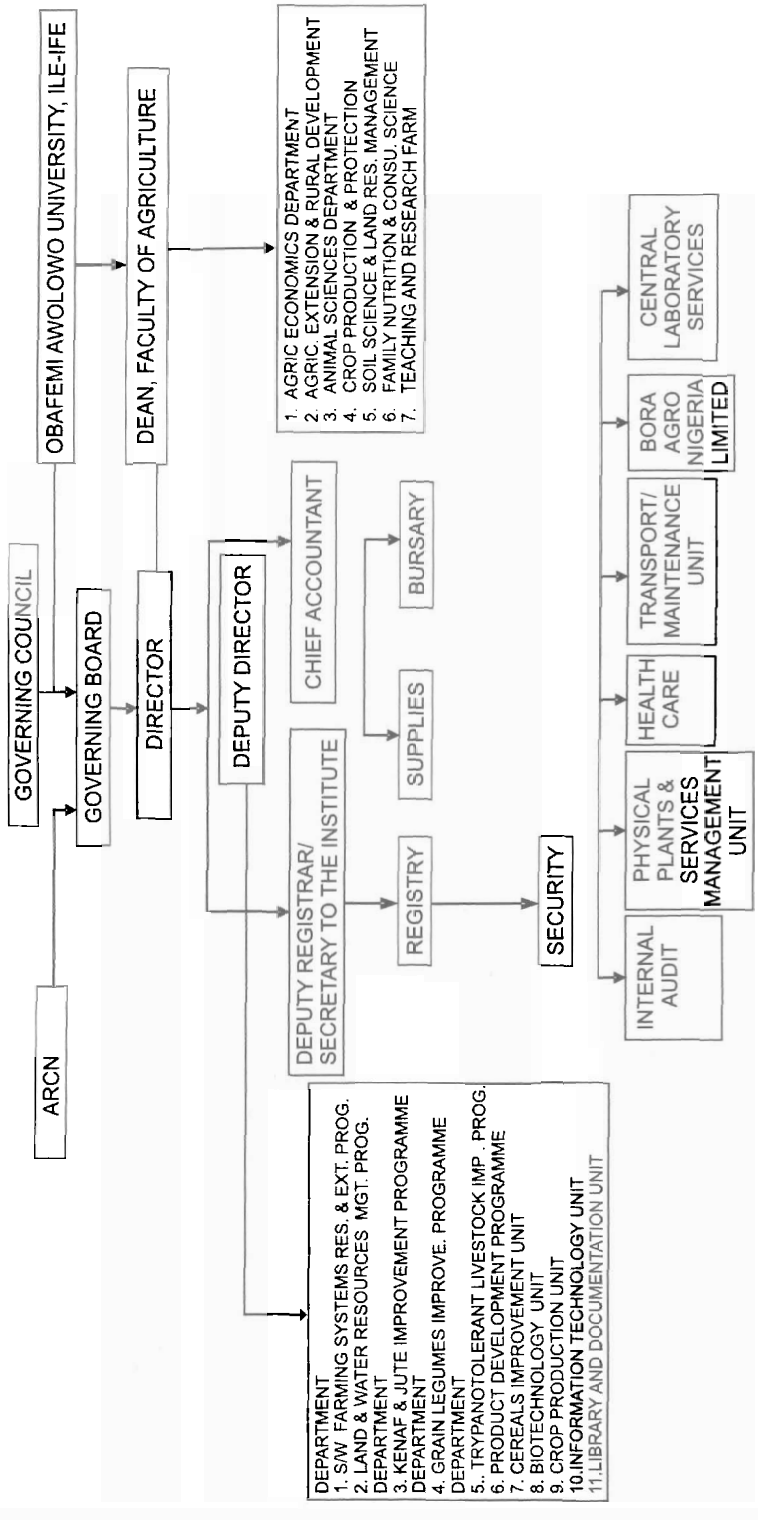
3.1 ADMINISTRATIVE STRUCTURE OF THE INSTITUTE

While the Governing Board lays down general policy guidelines, the Institute is headed by a

Director, who is responsible to the senate and council through the Vice-Chancellor for the day-to-day administration of the institute. The director was assisted formerly by three assistant directors in the coordination of the activities in Research, Training and Services.

With a revised structure in 1994, the Director is now being assisted by a Deputy Director instead of the erstwhile three Assistant Directors. (Organogram of the Institute, Table 1).

ORGANOGRAM OF THE INSTITUTE



Apart from the academic aspects of the institute, administrative support is also provided by theSecretary to the institute, who covers the registry functions, whilst the financial operations division is headed by the Chief Accountant. The Secretary to the institute assists the director in ensuring that the business of the institute is conducted in accordance with the prevailing university rules, regulations and procedure. The Secretary is professionally responsible to the registrar and functionally responsible to the Director. The office of the secretary to the institute provides the required administrative support to the Institute over a wide range of registry functions such as: Personnel, Academic, Student Affairs, Budgeting and Planning, Committee work and General Administrative duties.

3.2 INSTITUTE COMMITTEE SYSTEM OF ADMINISTRATION

In accordance with the democratic tradition of decision-making process in the university, the director is assisted in the administration of the institute by various committees, which can be classified into two broad categories – Counterpart Statutory Committees and Institute Internal Committees.

The Counterpart Committees are those which are counterparts to those on the home campus – (the Obafemi Awolowo University). In other words, they perform statutory functions as similar bodies in the university. These committees are:-

Institute Review Panel ((Equivalent of Faculty Review Panel)
Institute Selection Panel (Equivalent of Faculty Selection Panel)
Junior Staff Committee (For Junior Staff matters)
Institute Administrative Committee (Equivalent of the Petty Contracts Panel at Ife)
Institute Board of Survey (Equivalent of the University Board of Survey).

The Institute Internal Committees assist the Director in the development and execution of programmes in research, training and services and other important areas of institute's activities. Top on the list is the Institute Administrative Committee made up of the Director, the Deputy Director, a Research Professor, the Secretary to the Institute and the Chief Accountant as well as Provosts of the two Federal Colleges based in Ibadan (the Federal College of Agriculture and Federal College of Animal Health and Production Technology). Together, they constitute the Institute Management Committee and advise the Director on all facets of the institute's operations. Other main Committees are on Research, Publications, Services, Seminar, Livestock, Budget, Land Allocation, Housing Allocation Farm and Station Management, Security, Public Relations, and of recent Parks and Gardens among others.

4. RESEARCH PROGRAMMES AND SERVICES UNITS

To efficiently carry out these responsibilities, the institute established six research programmes, two research units and four services units.

4.1. Land and Water Resources Management Programme

4.1.1 Mission Statement

- To improve land and water resources management for food, livelihood and wealth creation

4.1.2 Theme

- **Land** Water Resources Management in a changing world: New drive for Sustainable Agricultural Development

4.1.3 Sub-themes

i. Land degradation, soil survey and modeling systems
ii. Soil quality
iii. Integrated Nutrient Management and production systems

4.1.4 Long term objective

To develop and promote the adoption of research for development based technologies for optimizing soil, water and nutrient management in well-defined farming systems and agro-ecological zones, which support intensification of agricultural production systems as well as preservation of the natural resource base for food production and security programmes.

4.1.5 Short term objectives

- To classify, characterize and map Nigerian soils for agricultural production and land use planning
- To provide appropriate management practices, recommendations and advisory services to farmers, institutions and industries in soil survey/land evaluation, soil testing and laboratory analysis.
- To develop efficient and effective engineering technologies to solve irrigation, land clearing and tillage problems.

4.2 Farming Systems Research and Extension Programme

4.2.1 Mission

To provide increased access to improved technology towards, self-sufficiency in food and fibre production, enhanced income and poverty alleviation among farmers in southwest Nigeria

4.2.2 Theme: Farming system Research for Sustainable Agricultural Development.

4.2.3 Sub Themes:

- o Sustainable farming systems for food security and wealth creation among resource poor farmers.
- o Impacting the lives of farmers in our adopted villages with special focus on youth and women through sustainable development and empowerment programme
- o Effective Coordination of Research-Extension-Farmers-Input-Linkage System in southwest Agro-ecological zone.
- o Assessing the impact of I.A.R. & T. intervention programmes on our focal point in Southwest Agro-ecological zone.

4.3 KENAF AND JUTE IMPROVEMENT PROGRAMME

4.3.1 Theme: Development of improved fibre crops and the by-products to meet national needs.

4.3.2 The Industrial Crops Improvement Programme (ICIP) is responsible for the conduct of experiments on Kenaf, Jute, Sesame and Sunflower. Of all these crops, the institute has the national mandate for genetic improvement of Kenaf and Jute in Nigeria. The programme is also interested in the introduction of other oil plants like Jatropha for future biodiesel projects.

4.3.3 THE BROAD OBJECTIVES OF THE PROGRAMME

1. To improve the genetic potential for higher yield and better quality in industrial crops especially Kenaf, Jute and Roselle.
2. To develop appropriate and improved technology for the production of the programme's mandate crops either as sole or as intercrops, and
3. To develop integrated disease/pest management techniques for the mandated industrial crops.
4. To improve kenaf fibre for the

production of textile yarn.

4.4 Grain Legumes Improvement Programme

4.4.1 Theme: Development of appropriate and sustainable technologies for increased production and utilization of food legumes to meet national demands

4.4.2 Sub-themes

- Development and utilization of improved legumes
- Development of Crop protection practices against pests and disease using botanicals.

4.4.3 Long term objective

Increased food security through high yielding legumes

4.5.4 Short-term objectives

- Improving seed quality by appropriate plating date in the southern guinea savanna ecology
- Achieving adequate pest control through effective crop protection technologies

4.5 TRYPANOTOLERANT LIVESTOCK IMPROVEMENT PROGRAMME

4.5.1 THEME: IMPROVED LIVESTOCK PRODUCTIVITY

The focus would be categorized into improved livestock breeding, nutritional and health management.

4.5.2.1SUB-THEME I: IMPROVED ANIMAL BREEDING MANAGEMENT

This will be addressed through multiplication and genetic improvement of local chickens, Nigerian indigenous pig, local chicken, Muturu and Ndama cattle.

4.5.2.2SUB-THEME II: IMPROVED ANIMAL FEEDING MANAGEMENT

This will be addressed through

(a) development of low cost but efficient feed resources for livestock through utilization of available, cheap, agro-industrial by-products as a replacement for the high cost and scarce conventional feedstuffs in macro and micro-livestock

(b) determination of macro-mineral requirements for micro-livestock

(c) identification and utilization of more available leguminous plants as feed resources for ruminant livestock

4.5.2.3SUB-THEME III: IMPROVED ANIMAL HEALTH MANAGEMENT

This will be addressed through development of low input and cost effective health packages using ethno-veterinary and indigenous technologies.

4.5.3 RESEARCH OBJECTIVES

- To identify and evaluate improved breeds of livestock such as cattle, sheep, goats, pigs, rabbits, snails, cane-rat and poultry adapted to South-west agro-ecologies
- To develop appropriate low cost and efficient feed resources
- To develop appropriate management/husbandry system
- To develop appropriate low input and cost effective health package, including ethno-veterinary and indigenous technologies.

4.6 PRODUCT DEVELOPMENT PROGRAMME

4.6.1 MISSION STATEMENT

Increasing national food security and

healthy living through improved processing and utilization of agricultural products.

4.6.2 SUB THEMES:

1. Improving harvest and storage of agricultural products through mechanization, storage facilities, pest and disease management to enhance product quality.
2. Improving farmers livelihood through improved post harvest techniques.
3. Enhancing food security through emerging value-added processing and utilization technologies.
4. Dissemination and assessment of improved post harvest technologies.

4.6.3 SHORT TERM OBJECTIVES

- To reduce post-harvest losses of crop produce using improved technologies
- To assess physical, nutritional, biochemical and microbial properties of agricultural produce
- To develop value-added agricultural products using enhanced indigenous food processing technologies
- To develop and introduce appropriate processing and utilization technologies for small and medium scale processors.
- To create diverse means for income generation.

4.6.4 LONG TERM OBJECTIVES

- To ensure food safety through unique food systems quality control approach
- Improving livelihood at local and national level
- Enhance healthy living
- Impact on farm price of value added products
- Support national initiatives for a rapid formulation of food and nutrition policy for Nigeria.
- Enhancing foreign exchange for national economic growth
- National Stored Product Research Institute
- Bells University, Otta
- Small scale food processors

4.7 CEREALS IMPROVEMENT PROGRAMME

4.7.1 Theme: Developing improved cereals crops for sustainable productivity

4.7.2 Sub Themes

i. Sustainable maize production for higher yields and nutritional quality
ii. Varietal development for adaptation to constraint environments.
iii. Integrated Crop Pests Management of maize and Sorghum bicolor
iv. Breeding for locally acceptable maize traits qualities through back crossing and introgression of desirable gene.

4.7.3 Long terms objectives

i. Development of quality protein hybrid maize varieties for diverse Agro-ecologies of Nigeria.
ii. Breeding for improved maize varieties resistant to stem borer.
iii. Development of acid tolerant maize varieties.
iv. Upgrading desirable local maize cultivars for downy mildew resistance.

4.8 BIOTECHNOLOGY UNIT

4.8.1 Main Theme: To enhance technology generation by shortening the time needed for variety development through conventional breeding techniques.

4.8.2 Sub themes

I. Crop improvement through tissue culture techniques

ii. Plant and animal breeding through marker assisted selection.

4.8.3 Objectives

a. To develop simple protocols for rapid screening of our mandate crops for resistance to major prevalent diseases in south west of Nigeria.
b. To develop molecular assays for rapid screening of our mandate crops for resistance to major diseases and stresses.
c. To develop new crop varieties and animal breeds through marker assisted selection.
d. Use of molecular markers for effective identification and conservation of the germplasm of our major crops.

4.9 INFORMATION TECHNOLOGY UNIT (ITU)

4.9.1 Theme: Provision of information technology services for effective agricultural productivity.

4.9.2 Sub theme(s)

I. Provision of Information Technology Services for Effective and Efficient Research System.
II. Utilization of Standard/Appropriate Statistical packages in the assessment of agricultural productivity.

4.9.3 Long Term objective

To project the image of the Institute to the global world through ICT.

4.9.4 Short term objectives

I. Creation of data base application for various programmes, units and sections of the Institute.
II. Provision of statistical services
III. Provision of computer maintenance services to all sections of the Institute.
IV. Provision of internet services and day to day administration of the institute's network.

4.10 LIBRARY AND DOCUMENTATION UNIT

4.10.1 Introduction: The library and documentation Unit complements the research activities of the institute by providing current literature and database relevant to the information needs of the research scientists. It is the knowledge base of the research carried out in the institute.

4.10.2 Theme : Information Retrieval & Dissemination

4.10.3 Sub Theme: Development of an electronic library- database of agricultural information.

4.10.4 Objectives:- The mission of the library is to develop a comprehensive collection by acquiring books, Journals and non-print materials like CD-ROMS and other agricultural databases relevant to the research mandates of the institute. A computerized library system/e-library will be put in place by acquiring and developing appropriate software application programme for library operations that have been hitherto carried out manually. A local network will be established within the library and with scientists in the Institute. This will enhance efficiency of library services, and provide global accessibility of information for research.

4.10.5 Our Strategic Objectives :

- To develop a comprehensive collection of books journals and non-print materials (electronic resources) in the field of agriculture and other subjects related to the research

mandates of the institute
- To develop a computerized library system and in-house database.
- To establish networks within the country and globally.
- Capacity building of library personnel in ICT and professional matters.

4.11 PUBLICATIONS UNIT

The establishment of this Unit in March 2009 was borne out of the need to give greater emphasis to information dissemination as a crucial vehicle to revolutionize agricultural development in the country.

4.11.1 Mission: To disseminate information on technologies generated in the institute so as to bring closer to the end users the latest methods of crop and livestock productions and marketing.

4.11.2 Goal: To provide a link between researchers and end users of technologies generated in the Institute.

4.11.3 Long-term objective:

1. **To accumulate data on technologies** generated in the Institute
2. To disseminate such data to the end users

4.11.4 Short-term objective

1. To oversee the editing, production and distribution of the Institute international journal – The Moor Journal of Agricultural Research.
2. To produce bulletins, annual reports, research and farmers guides and distribute to the end-users.
3. To educate farmers on modern methods of food production.

4.12. Central Laboratory Services

The laboratory is as old as the institute especially with respect to soil and plant analysis as far back to the Ministry of Agriculture with National mandate for Soil Survey in the Old Western States:

The unit is made up of the following laboratories:

- Soil Chemistry Laboratory
- Plant/Fertilizer Laboratory
- Biochemistry Laboratory
- Livestock Laboratory
- Microbiology Laboratory
- Pathology Laboratory
- Soil Physics Laboratory
- Entomology Laboratory

Functional equipments available in the laboratories include Atomic Absorption Spectrophotometer (AAS), HPLC (High Performance Liquid Chromatography among others.