AN EVALUATION OF NIGERIAN AGRICULTURAL RESEARCH POLICY: THE CASE OF INSTITUTE FOR AGRICULTURAL RESEARCH, SAMARU, ZARIA 1978-1988

BY

KOLAWOLE EMMANUEL OBAITAN

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ZARIA.

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CERTIFICATION

This thesis has been certified and approved by the undersigned:

First Supervisor

Second Supervisor

Head of Department

External Examiner

DECLARATION

I, OBAITAN, Kolawole Emmanuel, hereby declare that this thesis is written by only me and that it was not copied from any past research or thesis.

I also declare that all the articles used in this thesis are appropriately acknowledged.

Sign.....

DEDICATION

This thesis is dedicated to the Almighty God and my children, Marion and Anthony.

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ABSTRACT

This study is an evaluation of the performance of the Institute for Agricultural Research, Samaru, Zaria, within the context of Nigerias' agricultural research policy. The evaluation was undertaken by using some selected objectives of the institute which include the improvement of the farming practices of the farmers within its periphery, the provision and efficient use of agricultural extension services and teaching at all levels of the University i.e. Ahmadu Bello University.

For the study, both primary and secondary data were obtained. The farmers and the agricultural extension workers provided the primary data while the secondary data was obtained from I.A.R. officials and documents. Percentages and tables were used as method of analysis.

Results of the study showed that, overall, the I.A.R. is improving the farming systems of the farmers, although not in a spectacular manner. Despite this, however, the material well-being of the farmers has not increased in consonance therewith.

The study also found that the agricultural extension workers have generally carried out their functions of advising and assisting the farmers in their farming activities. However, the farmers do not receive adequate visits from the extension officials, particularly at

the crucial period of post planting of crops.

Finally, the study found that, contrary to the expectation of teaching at all levels of the University, the I.A.R. staff concentrate their teaching role at the post graduate levels only. Part of the explanation for this is the heavy demand on them by research since the institute is a researching and not a teaching one.

In order to accelerate the performance of research institutes, there is the need for all such institutes to carry out the functions of both research and training. It is also necessary to reduce the number of crops each institute researches on and the duplication of functions by agricultural establishments should be avoided.

Finally, further research is necessary into the relationship between agricultural development and such variables such as income, land tenure and level of education.

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CHAPTER ONE

INTRODUCTION

1.1 Statement of the Problem

It is generally agreed and widely reported that Nigerian agriculture is in crisis.

Since 1970 and especially since 1975, urban food prices have risen rapidly more than other prices, and much more than minimum wages in either government or industrial employment.

The volume of food imports had increased particularly during the second republic. These increases were pronounced in wheat, rice, fish, meat, sugar and so on. The volume of Nigeria's agricultural exports had fallen and particularly exports of groundnuts and palm oil had collapsed.[1]

These changes had coincided with the expansion of Nigeria's exports of mineral oil since 1970 and the dramatic boost to oil prices in 1974. The third national development plan (1975-80) allocated vast sums to investment in agricultural projects, along with everything else.[2]

There also appeared to be widespread agreement on the source of the crisis. It is argued that peasants cultivated fragmented small holdings with backward production techniques; storage and transport costs were

high; higher incomes in urban employment drew young men out of the villages and raised the wages which farmers pay to replace them. Consequently production has been falling, or rising less slowly than the increase in population.[3]

Attempts at solutions were made, all of which were incorporated into the national plan. The first was to bypass peasant producers entirely. Several state governments established plantations for food and export crops. Foreign corporations were invited to invest in plantations and in processing crops such as sugarcane into sugar. The government made huge loans available for commercial farming and livestock, and required the banks to do the same. The government decided to underwrite bank loans to prospective farmers.

The second was to invest vast sums in irrigation projects to grow wheat and rice for urban markets.

The third, (embodied in the integrated rural development projects funded by the world bank and in the National Accelerated Food Production Programme) was to provide packages of high yeilding seeds, fertilizer and other chemicals to increase production of food crops, notably maize, rice, beans, guinea corn, etc. In addition, the government had replaced the state marketing boards with boards for different commodities, including staple

foods. The idea was that they would guarantee a minimum price for crops and also build up strategic reserves.

Agricultural research institutes were established in addition to the formulation of other agricultural programmes to see to the improvement in agriculture. The overall objective, as it were, was to increase agricultural productivity.

Many institutes of agriculture have been established in the universities and charged with the responsibility of improving agriculture. The Institute of Agricultural Research (I.A.R.) Samaru is administered by both the Federal Government and the Ahmadu Bello University.

The aim of agricultural research is to improve agriculture by making findings and expert advice available to institutions concerned with training in agriculture and to both small scale and large scale farmers. Yet agriculture has not significantly contributed to the country's GNP, despite the huge financial investment.

Apart from finance, the government has made inputs - teachers, subsidized sale of fertilizers, insecticides, herbicides, seed multiplication - all these through the I.A.R. to the local farmers. The I.A.R. provides advisory services, extension work, information and counselling, experimentation, demonstration, research into various aspects of food crops, seminars, conferences, publications,

radio programmes and so on. All these are part of the functions and objectives of the I.A.R.

The Institute was established to conduct research into the development of farming systems which involve crops of the savanna zones and maintenance or improvement of the soil resources, especially into the production of sorghum, millet, maize, wheat, barley, soyabeans, etc.

In particular, it is to conduct research into the improvement of agronomic and husbandry practices; the mechanisation and improvement of the methods of cultivating, harvesting, processing and storage of the specified crops; the improvement of the utilization of by-products; the ecology of pest diseases and weeds of the specified crops and improved methods of their control; the technical, social and economic integration of the cultivation of the crops into farming systems in different ecological zones and their impact on the economy and irrigated agriculture.

It is also to co-operate with other bodies in the dissemination of knowledge of agricultural matters and of the results of research conducted by it.

In addition, it is to arrange for such conferences of government officers and other persons and for such courses and lectures as may be considered to further the above roles and lastly to participate in the teaching function of the University at all levels.

Looking at the major policy roles above, which the I.A.R. is expected to play, one wonders if the public, particularly the intended beneficieries, (the farmers) are aware of such roles and how much benefit they derive from them. More important, there is a justified inquisitiveness to know to what extent and with what effectiveness these roles have been and are being executed. It is in the light of this that this study is contemplated.

1.2 Aim of the Study

This study is intended to evaluate the implementation of the I.A.R. research policy within the framework of Nigeria's agricultural research policy.

The I.A.R. is one of so many institutes concerned with agricultural research. The basic purpose of setting them up is to use their findings for the overall improvement of agriculture. In the case of the I.A.R., it is to provide advisory services, extension work, conduct experiments and related activities in order to improve the quality of farm crops particularly within the periphery of its location.

An investigation therefore into its performance is to see how these objectives have been achieved as reflected in the activities of the farmers. Also this study tries to examine what variables, administrative or financial, and what other factors have made for the achievement or

non-achievement of the agricultural research policy objectives. Central to these objectives are conducting research into the crops of the savannah region, such as sorghum, millet, wheat, groundnuts, cotton and so on and the application of modern agricultural technologies as related to farming system and practices. Those objectives relevant to this study are stated in section 3.4 of this study.

1.3 Significance of the Study

This study is timely because of the currency of the problem of agricultural development. Nigeria was caught in a cobwebb characteristic of developing countries where, whenever there is a boom, the placement of priorities becomes a problem. With the oil boom, agriculture was deemphasized and the situation was worsened by the actors of the second republic whose pastime was squandermania and unjudicious importation of food. The inflation completes the vicious circle that makes agricultural development problem very current in Nigeria. This situation therefore calls for the need to evaluate government policies if improved performance is to be enhanced.

1.4 Scope and Limitation of the Study

This study concerns itself with agricultural policies relating to agricultural research. The nature of this study and the lack of time and other relevant resources such as finance and manpower has made it impossible to widen the scope to cover the 24 agricultural research institutes in Nigeria. Therefore, the spacical focus of the study is the I.A.R. at Samaru and its branches at Kano and Sokoto States.

1.5 Hypotheses Tested

1. That the I.A.R. research work has not significantly improved agriculture in the areas it is established to serve in order to ensure:
   (a) improved farming system
   (b) higher yields of crops
   (c) higher output
   (d) better storage of crops, and
   (e) increased income of farmers
2. That the performance of the I.A.R. agricultural extension workers has not made appreciable impact on the farming practices of the farmers.
3. That the I.A.R. researchers have not made enough input to teaching activities of the University at all levels of the faculty of Agriculture.

1:6 Methodology

1.6.1 The Setting

Originally, the I.A.R. at Samaru had five out-stations at Mokwa in Niger State, Yandev in Benue State, Bakura in Sokoto State and Kadawa and Minjibir, both in Kano State. The first and second stations have been closed down for almost a decade now. The focus of this study are the farmers in the functioning out-stations at Minjibir, Bakura and Kadawa.

1.6.2 The Sample

The three out-stations are located in villages with a total population of 4,134 taxable males or farmers made up of 1846 for Minjibir, 1322 for Bakura and 966 for Kadawa. Sample calculation for each village was based on these figures. Two hundred and eighteen was chosen as the sample used and subdivided among the three villages according to the following calculation:

i. Minjibir Sample size.

$$100\ \frac{1846}{4134}\ \%\ \text{of the total sample}$$

$$= 45\ \text{app.}$$

ii. Bakura sample size.

$$100\ \frac{1322}{4134}\ \%\ \text{of total sample} = 32\ \text{app.}$$

iii. Kadawa sample size.

$$100\ \frac{966}{4134}\ \%\ \text{of total sample} = 23$$

Thus Minjibir has 45% of 218 = 98 farmers as sample,
Bakura has 32% of 218 = 70 farmers as sample
Kadawa has 23% of 218 = 50 farmers as sample.

1.6.3 Data Collection

Before developing the interviewing schedule, detailed discussions were held with officials of the I.A.R. The purpose was to get acquainted with research administration and the organisation of the agricultural extension unit of the institute.

The data for this study were collected through two sets of questionaires. There was one for the farmers and another for the agricultural extension workers. Also, an analysis of official reports, files and documents was undertaken to obtain information on the teaching function of the I.A.R. and on other relevant issues to the farmers and extension workers.

Since the performance of the institute is the subject of this study's evaluation, the goals of the I.A.R. were identified for this purpose, in line with Edward Suchmans[4] approach. The contents of the questionaire for both the farmers and extension workers were constructed to reflect the selected goals for evaluation.

1.6.4 Pretesting

The questionaires were pretested in Bomo village, very far removed from the sample area, by volunteers in the presence of this researcher. In the process, some questions were found to be unclear and were modified. In the process of the finalisation of the questionaires, these shortcomings were removed.

1.6.5 Method of Analysis

The data were reported in the form of simple cross tabulations and percentages of responses to the major issues in the study objectives.

Definition of Terms

It is necessary to define a few terms that have occurred frequently in this research.

Policy

This is a general plan of action by government or a standing decision characterised by behavioral consistency and repetitiveness on the part of those who make it.[5] In this research, agricultural policy refers to a body of laws instruments and commitments by government of Nigeria with the overall objective of providing agricultural growth and development.

Agriculture

The science or practice of cultivating the soil and rearing animals.[6] Used in this research, it is the preparation of plant and animal products for man's use and disposal of these by marketing.

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Agricultural Extension

Provision of medium of transmitting information and the execution of activities related to agricultural programmes. In this study the media for this refers to both an institution like the A.E.R.L.S. and officials such as agricultural extension workers.

Cropping

The process of cultivating plants, especially grains.

Varieties

Different species of seeds for purposes of planting.

Savannah

Grassy plain with few or no trees in tropical and subtropical regions. It is in this type of region that are grown the crops which the I.A.R. researches on.

Plan Period

One of the periodical intervals at which a country's economic development programme has been mapped out.

Goal

Object of effort or ambition. In this study the term is interchanged frequently with another word, namely, objective.

Demonstration

Showing through practical action how an activity is performed. In this context, it is the practical performance of a farm practice, e.g. the application of fertilizer, by an agricultural extension worker.

Faculty

In this study the term refers to a department of University teaching.

Outline of the Thesis

In this study, Chapter One deals with the introduction, stating clearly the problem, aim of study, significance of study, scope and limitation of study, hypotheses tested, methodology and definition of terms frequently used in the research.

The second chapter is devoted to literature review. The first part discussed the theoretical framework for analysis, using the systems theory and its applicability to the I.A.R. and its beneficiaries. The chapter also discussed the criteria for performance measurement such as efficiency, equity, adequacy, effort and effectiveness and then revewed some related studies.

In chapter three, research policy objectives in the national development plans and the historical background were examined. This was followed with the discussions of the allocation of resources to agricultural research and the I.A.R. general research policy.

Chapter four is devoted to the analysis of data and presentation of result. Chapter five is mainly the conclusion and recommendations.

FOOT NOTES

1. T. Rorrest, "Agricultural Policies in Nigeria, 1900 - 1978" in J. Heyer, P. Roberts and G. Williams (Eds) Rural Development in Tropical Africa. (London, MacMillan Press Ltd. 1981) P.17

2. Ministry of Economic Development, Third National Development Plan 1975 - 1980 (Central Planning office, Lagos, 1975) Pp.78 - 93.

3. J. Ono - Fadaka, Ideologies and Strategies of Rural Development: A critique (Benin City, Ethiope Publishers, 1977) P. 81.

4. Edward A. Suchman, Evaluative Research: Principles and Practice in Public Service and Social Action Programmes (New York, Russel Sage Foundation,) P.57

5. S.O. Olayide "Agricultural Policy of the Military Era 1966-1979", in F. Kayode (ed) The Nigerian Economy under the Military, (Kano Proceedings of the 1980 Annual Conference of the Nigerian Economic Society, 1982). P.159.

6. Daniel N. Lapedes (ed) McGraw Hill Encychopaedia of Science and Technology (New York, McGraw Hill Inc., Vol. 1971) P. 142.

CHAPTER TWO

LITERATURE REVIEW

This chapter posits a conceptual framework for this study and also critically looks at some related studies and the extent to which they have influenced this study.

2.1 Theoretical Framework

The theoretical basis for this study is the systems theory. Put simply, a system is a combination of parts which constitute a complex entity.[1] Usually, and significantly, apart from being constituents or parts, systems are characteristically composed of a hierachy of sub-systems. In other words, the parts which form the major systems may themselves be systems and their parts may be sub-systems.

The concept does not, in Martins description "provide a set rule or formular for solving all problems but it is a useful device for viewing many phenomena".[2] The concept has two assumptions, one of which is that a system can be understood and should be designed to accomplish its purpose and the second is that it emphasises the relationship between the parts.

When the system theory is adapted to an organisation it is perceived as a social system "whose survival depends on its capacity to maintain its relative constancy of its processes and relationships within and outside the system".[3] This depends, however,

on whether the system is "open" or "closed" Grifiths says that "an open system is related to and exchanges matters with its environment whereas a closed one is not".[4]

A social system, because of its openess, has a self-regulating tendency towards constant balance in its response to internal and external pressures. So in order to maintain its state of balance, it must have adequate feedback processes in which a portion of its output is fed back as input, otherwise the survival of the system is at stake. This is why Katz and Kahn[5] say that all open systems share common characteristics, the most important of which are inputs through put and output.

This theory is a suitable framework within which to look at the I.A.R. and its beneficiaries, namely, the farmers within its locality. The I.A.R. as an organization, is established to improve agriculture in the locality of its establishment and in order to be able to execute this central objective, it is crucial that it has at its disposal basic inputs. For meaningful research to be undertaken, adequate funding is a pre-requisite. The right manpower should be recruited, maintained and developed and other facilities such as equipment and infrastructure are no less important. These input have to undergo certain processes such as the utilization of funds, conducting experiments

in laboratries, breeding of plants, the development of varieties of seeds. All these activities which are processes of altering the inputs constitutes the through put. The findings of research, the fertilizers, seed multiplication, the developed varieties of seeds, expert advice are all output of the I.A.R. which in turn become input for the farms although the farmers themselves contribute other inputs such as the land labour and capital and so on.

The resultant output such as higher and better crops yield, improved farming systems and therefore better living standards of the farmers would be a function of certain factors such as the quality of the input - that is how suitable the institutes output is, the degree of adoptability of the innovations by the farmers and interactions between the farmers and the extension workers. In other words, the improved standard of agriculture in the locality indicates the effectiveness of the performance of the I.A.R. In this regard, the extent to which the institute has performed or not is what this study has attempted to evaluate.

Measurement of performance of an organization presupposes a knowledge of its operating goals. As pointed out by Brewer and Deheon[6], goals are a complex problem which should be understood and accommodated if an evaluation should be done. Goals also serve as the

criteria of programme success and for this reason Rutman[7] advised that "they must be clearly specified for the purpose of developing measures".[8] Programmes are generally expected to meet certain needs or to solve particular problems and if goals are not adequately specified, there would be no basis for holding programmes accountable. How, for example can the various River Basin Authorities or the Agricultural Development Programmes account for their performance if they have to operate within unspecific or ambiguous goals?

The goal approach has however been attacked on various grounds. Katz and Kahn while noting that "the primary mission of an organisation as perceived by its leaders furnishes a highly informative set of clues" go on to point out that "nevertheless the stated purpose of an organisation as given by its bye-laws or in the reports of its leaders can be misleading. Such statements of objectives may distort or even omit some essential aspects of the functioning of the organisation.[9]

The goal approach is often adopted by researchers because they assume that it safeguards them against their own subjective biases. Even then Etzioni quarrels with this assumption on the grounds that it "has some methodological shortcomings and that it is not as objective as it seems to be".[10] He argued further that the assessment of organisational effectiveness in terms

of attainment should be rejected on theoretical considerations because goals "as sets of meanings depicting target states are cultural entities while organisations as systems of coordinated activities of more than one actor are social systems".

What these criticisms mean in effect is that firstly, goals as ideal states do not offer the possibility of realistic assessment and secondly, goals arise outside the organisation as a social system, in which case cannot be arbitrarily attributed as properties of the organisation itself. These arguments seem to this researcher to undermine the rationale behind the use of goals as yardstick for assessing organisational effectiveness. This should not be necessarily so and on this the views of Campbell et. al are relevant that "goal setting as opposed to a stark directive to do one's best may have a lot to do with transforming a great deal of wheel spinning into efficient work, not because the individual would be more 'motivated' but because he would have a much clearer idea of where to direct his effort".[11] And contributing also to the same view, Charnle and Sayles say that "given two individuals with an equal desire to expend effort, the individual with the greater specific knowledge concerning the nature of organisations goals and their priorities should perform at a higher level.[12] This is also applicable to institutions or organisations. In this study therefore,

the performance of I.A.R. is undertaken using its goals as criteria of evaluation. These goals are clearly stated in section 3.4 of this study.

2.2 Criteria For Performance Measurement

In a profit-oriented organisation, performance can be measured by profits in a clear-cut manner. Such an organisation can develop what Dieter Elz calls "a highly decentralized decision-making structures based on the central idea of profit".[13]

But in the absence of such a clear-cut measure of performance, such as profits, a research institution, for example, would tend to have a highly centralised decision-making structures. In the case of I.A.R., policy decisions are centralised at the federal level leaving decisions on policy details at the level of the Board of Governors. The fact that such an establishment does not operate under competitive market conditions, there is a lack of pressure for change either in the manner policies are implemented or reaction to research investigations.

Eventhough profit is a concrete measure of performance, especially in a commercial establishment, as said earlier, there can be different means of performance measurement as supported by Brewer and Deheon that:

> Many different measures are required to assess system performance and to evaluate policy impacts. Considering the number and diversity of possible outcomes and effects for even the simplest programme, one nearly always must use multiple criteria to evaluate. The sheer complexity of most interventions means that a single measure of effectiveness probably will not suffice; it also demands considerably more basic data than usually available to conduct a responsible evaluation.[14]

In the light of the above, the criteria often employed as measures of a systems performance are efficiency, equity, adequacy, effort and effectiveness.[15]

2.2.1 Efficiency

This criterion, as Brewer and Deheon see it, is the "ratio between inputs and outputs" and they believe that inputs are resources which are "transferred through activities to produce outputs".[16] But in the analysis of public programmes and policies, Poiser looks at the concept as "the relationship between the total costs and total benefits of a public programme or project such that resources are allocated so as to maximise citizens satisfaction derived from the use of these resources."[17] This is more or less a benefit - cost analysis since it is an attempt to measure in monetary terms, costs incurred by and benefits derived from the programme.

Pointing out that efficiency involves comparing the amount of policy output produced to the amount of effort required to produce the output, Coplin warns against

using it as a single criterion to measure policy performance. The danger, he says, is that "there is a tendency to assume that whenever a policy is operating efficiently, it is meeting the discerned objectives."[18] He argues further, and rightly too, that a policy can be performing efficiently but not effectively, especially where there is an effort to 'economise.' The implication of this for a public institution is clear; economising may lead to reduced budgets, which in turn could mean a reduced capacity. If for instance, the I.A.R. has a budget allocation of ₦.5 million and spends much less of this amount, it would in all likelihood, not get as much allocation in the subsequent year. Another danger is that changes in policies, particularly as a result of political instability which is a common incident in third world countries, mean the introduction of new programmes and goals which do create problems for efficiency. For an example, the 'green revolution' was a calamity just as its predecessor 'Operation Feed the Nation' was a failure. For these reasons, efficiency in public programmes is often not a realistic criterion.

2.2.2 Equity

As a criterion, equity implies the equal treatment of people in similar circumstances. It relates most directly to what Poister calls "appropriateness consideration".[19] So in considering equity, the analyst

should examine the distribution of the benefits derived from, and the costs imposed by the programme or policy. Therefore, the concept refers to a "fair" distribution of costs and benefits as defined by the public policy for a particular context. In other words, a fair distribution of benefits might be determined in terms of some measure of need for the service or the charging of equal fees for equal service or the absence of geographical location or coverage. So to measure how fairly a service is distributed among target groups, and to measure needs which are met, one must consider whether and how much a needed service the individuals in each recipient group get. Equity does not mean that equivalent amount of each service are necessarily provided to each individual, since individual needs and abilities to benefit from services differ. This follows that equity involves two types of measurable criteria; the percentage of a target group needing service and actually receives it, and the variance among groups in the quantity of services received. In Nigerian agricultural sector, a service which is a widespread test case of equity is fertilizer. The distribution of this important agricultural input to farmers lacks equity in terms of need, geographical spread and even in the manner it is sold out. The farmers who need it most don't get it directly but through greedy public officials or 'general contractors' who hoard it in order to sell at prohibitive price. Also, the 'criteria'

of flooding certain parts of the country more than other parts look more political than economic.

2.2.3 Adequacy

Sometimes the objectives of a programme are established to eliminate a problem but constraints such as finance or administrative incompetence may make the objectives unatainable and so the problems remain unsolved. The objectives, despite the constraints may be partially obtained and perhaps the problems partially solved. Within this context, therefore, the criterion of adequacy refers to the degree to which the attainment of a programmes objectives will elminiate the problem. A particular programme strategy might be very good but the level of funding might be totally inadequate in relation to the magnitude of the need for the programme.

Adequacy can also be a measure of the amount of effort in relation to the degree of impact of programme objective. Or as Suchman puts it, it is "a measure of the amount of effort or impact of the stated objective".[20] Suchman, like many others, has failed to suggest the criteria for measuring the 'effort', which therefore subjects such a procedure to a subjective rather than objective exercise. What this researcher considers concrete, and indeed relevant to this study is looking at the concept in terms of funding. Many research undertakings are incomplete, or where otherwise, have

not made desired impact because of inadequate funding.

In considering adequacy, it is important to see it in terms of a public policy. There should be a concern about the question whether the attainment of an individual programme objective will also result in accomplishing some larger objective. For instance a programme may be designed to evacuate toxic wastes found anywhere in Nigeria. This may be effective in terms of eliminating one source of pollution, and yet inadequate relative to a greater objective in preventing environmental pollution in the country.

A policy should meet the need and desire of the target groups. A farming locality may express the need for more effective field demonstration of a research finding, say cropping a new variety of seeds. But the actual behaviour of the field demonstration may be considered offensive by the local residents, thus making the policy programme unresponsive in the eyes of the intended recipients of the benefits of the programme.

2.2.4 Effort

Logically, a programme effort is a programme input. So measures of programme effort aims at providing information on the nature of the effort expended in the programme, which, presumably, is related to the achievement of desired programme outcomes.

Effort can be misleading since it verifies only

expended effort and not the extent to which objectives are being met or have been met. However, it is useful to assess the resources needed to improve policy effectiveness and efficiency.

2.2.5 Effectiveness

A programme's performance in the light of specified objectives is what effectiveness is all about. If one is measuring effectiveness, one should look at the question whether the programme is producing the desired kinds of results and compare actual accomplishments with standards of what is expected of the programme. In the same sense, Dehon and Garry say "it is a ratio measure relating observed output to the planned output over some time period".[21] The criterion refers to actual or visible consequences of the programme and involves the identification and measurement of physical or behavioural changes which can be attributed to the programme in relation to the intended objectives.

Sometimes effectiveness may be interpreted as goal-achievement and this raises the question as to the degree of such achievement or 'effectiveness'. This is why Coplin says that effectiveness is the most complex criteria which involves verifying. He claimed that:

> firstly, the degree to which formal and informal substantive and procedural policy objectives are affecting, either adversely or benefitially, a target and speel-over groups; secondly, the speed with which objectives are being implemented and thirdly, the affected groups perception of how satisfactorily objectives are being met.22

The complexity of effectiveness as performance criteria manifests particularly in agricultural research because, in this area there are usually enormous difficulties in obtaining data to make a quantitative assessment. For an example, only few research institutes, such as NIFOR, keep any consistent time-series data on seeds produced and distributed. Sometimes too, research results may not make the desired impact because there is no effective system of passing on research results to farmers. In this aspect, the I.A.R. however, uses the AEPLS as a medium through which farmers obtain research findings.

2.3 A Review of Related Studies

In this section of this chapter, a critical survey of some related studies which have influenced this study is undertaken. In trying to evaluate how far the objectives of the Focus and concentrate Programme[23] in Ghana had been achieved, Atsu also tried to identify the constraints in achieving the objectives. The programme was designed to concentrate advisory services and soil fertility practices along with sufficient credit for the procurement of imputs on a limited geographical area with considerable potential for increased agricultural production. The objective of the study was to evaluate the programme in the Kpandu and Ho agricultural districts of the Volta Region of Ghana. The study was directed largely at the aspects of the programme which could be meaningfully evaluated such as

the impact on farm practices and the provision and utilization of farm credit.

The necessary data for the study were gathered through a field survey which involved interviews with the farmers. The farmers records of operations and transactions at Focus and Concentrate Programme office were used, and wherever records were not available, the interviewers relied on the farmer's memory and their dbility to estimate. This medium was also utilized by this researcher because those farmers who had no records had to depend on memory and estimation in stating for example the kilograms of millet they harvested in a few years back as compared with the weitht of that they had at the time of the study. However, in this regard, this study also took advantage of the records some of the farmers had with the I.A.R. Atsu largely based his research data on the recollection of farmers which is an approach subject to a major demerit in that research data based largely on the recollection of farmers may be faced with a wide margin of error. The reliability of such data could only be enhanced where the enquiry refers to operations in the immediate past year.

The two agricultural districts Atsu chose, for the survey, namely, Kpandu and Ho were close to other agricultural districts which were outside the population for the survey. That situation raised a question, which interests this researcher, as to whether the extension

worker's activities had any demonstration effects on other farms that were proximate to those under survey. It is a question which in itself is a sufficient problem for further research.

This issue was one of the objectives of Vercruijsse and Boyd[24] who in 1970 carried out a study in Sierra Leone on the impact of the Tore Agricultural Institute on the farmers in the area. They compared twelve farms within the locality of the institute and another twelve outside it over such variables as farm inputs, yields, market orientation, farm income and readiness to use innovations. Data were gathered from both groups through oral interviews and questions which emphasised issues like fertilizers, farming systems and yields. The general impression given in that study was that the farmers within the locality had higher positive scores than their counterparts in terms of use of modern inputs such as tractors, fertilizers, new seeds and that they had higher yields and were generally bigger farmers. The difference in yields as indicated in the data analysis was about 15 per cent which did not significantly justify the inputs at the disposal of the farms within the location of the institute. Such inputs include fertilizers, improved seeds, expert advice and extension workers. The role of extension workers is a vital factor in evaluating the performance of an agricultural programme. In this regard, the

selection and quality of extension workers is important. For this study this researcher ensured that those selected not only understand the local language but also know their customs and way of life. This is a factor that was not emphasized in the Tora study. Some of the extension workers had to rely on literate natives to interprete their messages. The reason for this choice of extension men was not explained.

The extension role factor was more emphasized when in 1972 Van Logehem[25] did another study which involved 440 farmers from five different villages. Unlike the Tora study, Van attempted to assess the degree to which the objectives of the institute had been met by examining the role of extension workers, among other variables. He collected data from the farmers through interview guide and from extension officials through questionnaires. Surprisingly, his findings showed that interactions of the extension officials did not make much impact. There were explanations for this, some of which guided this study. Many of the farmer's responses to questions about extension workers showed that they received few visits from them and some of the farmers had direct contact with the institute.

This situation was unlike what happened in the study conducted by Williams and Alao[26] where the analysis of the data obtained from both farmers and research agents showed a higher degree of interactions.

The study was an evaluation of Rice and Maize Project which the then Western State of Nigeria mounted with USAID[27] in 1970/71 planting season. The researchers felt that the objectives of the project would not be attained without appropriate attention to extension agents. They collected data at two levels; first at the level of agents who were specifically assigned by the Ministry of Agriculture to work with selected farmers and secondly, at the level of selected farmers participating in the project. The farmers involved were spread throughout the agricultural circles in the State, namely Abeokuta, Ibadan/Oyo, Ondo/Akure and Ekiti which was the population from which a random selection of individual farmers was obtained. Some of the findings of the study there was insufficient supply of seeds to meet farmer's demand, fertilizer was not available to farmers when required and that recommended disease-of-pest-control measures were too expensive. These issues guided this researcher in enquiries and discussions with the I.A.R. officials. Either in approach or in findings the study and the earlier ones did not indicate the degree of adoption of innovations. In view of the fact that information in this area is equally important in assessing how successfully such a programme has performed, this researcher has incorporated the relevant questions for the farmers. If farmers are averse to adopting innovations, then the whole basis for establishing agricultural research organisation is questionable.

Ascroft et al[26] and Brain, D. Silva et al[29] in in separate studies gave this issue relevant attention. In their theoretical consideration, Ascroft and his group regarded the degree to which innovations have been adopted in a social system as a measure of its development and they believed that development "can be boosted by accelerating the flow of productivity - increasing innovations to members of the social system". So their purpose was to study the degree of adoption of productivity - increasing innovation by Tetu farmers in Kenya. D' Silva's group tried to ascertain the extent to which the farmers in the Funtua Agricultural Development Project area (now in Katsina State of Nigeria) had adopted the technological packages, namely, fertilizers, improved seeds, chemicals, and farm equipment like Ox-ploughs, sprayers and tractors.

The Tetu study first classified the farmers according to their degree of progressiveness[30] and attempted to establish the differences between more and less progressive farmers in terms of a number of relevant characteristics such as farm sizes, extention contact and social participation. The researchers administered questionaires on 380 farmers randomly selected from a sampling frame which was a list of registered farmers they obtained from the headquarters of Tetu Division. In the opinion of this researcher, the classification of farmers according to how early they adopted innovation as a first step is like "putting the cart before the horse"

This researcher has a relevant question as to when the farmer first adopted an innovation and the type of innovation. The idea of classification followed the responses of the farmers.

The Funtua study used a twenty-nine page questionnaire of 113 questions administered to 350 farmers in Malumfashi and Funtua Local Government areas. Much of the strategies employed by this researcher in the field were as a result of the problems encountered by the Funtua study. Many questionaires were not returned and this was not unconnected with the fact that the questionaire was too bulky. Not many farmers would have the patience and time to attend to 113 questions. During the rainy season, respondents could not be contacted during the day and so the field workers were constrained to hold interviews in the afternoons or in the evenings and could not reach outlying hamlets. This researcher solicited the excellent cooperation of village heads who provided guides and assisted in contacting the respondents for interviews and assured the completion of the field work.

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FOOT NOTES

1. R. Martins, Teach Yourself Public Administration (London, The English Universities Press 1949) P. 32.

2. Ibid. P. 37

3. Ibid. P. 41

4. J.A.G. Griffith (ed) From Policy To Administration, Essays In Honour of William A. Robson (London, George Allen & Unwin Ltd 1976) P. 59.

5. Daniel Katz and Robert Kahn, The Social Psychology of Organisations (New York: John Wiley and Sons 1966) P.149.

6. Garry D. Brewer and Peter Deheon, The Foundations of Policy Analysis (Homewood Illinois: The Dorsey Press, 1983) P. 331.

7. L. Rutman, Evaluation Research methods: A Basic Guide (London, Sage Publications, Beverly Hills 1977) P. 20.

8. Ibid, P. 21

9. Daniel Katz and Robert Kahn Op. cit P.152.

10. A. W. Etzioni, "Two Approaches to Organisational Analysis: A critique and a suggestion" in Administrative Quarterly Vol.5 1960 PP 257 - 275.

11. J.P. Campbell, M.D. Dunnette, F.E. Lawler and K.E. Weick, Managerial Behaviour Performance and Effectiveness (New York, McGraw Hill Book Company, 1970) P. 377.

12. E.D. Chapple and L.R. Sayles, The Measurement of Management, New York, (McMillan Company, 1961) P. 13.

13. Elz Dieter (ed), The Planning and Management of Agricultural Research A World Bank and ISNAR Symposuim , Washington (The World Bank, U.S.A. 1961) P.114.

14. Garry D. Brewer and Peter Deheon, Op. cit P.341

15. Ibid P. 347

16. Ibid. P. 349.

17. T. H. Poister, Public Programme Analysis: Applied Research Methods, (Baltimore, University Park Press, 1978) P. 11.

18. E.O. Coplin, Management Efficiency (Delaware, Caxton Publishers, 1977) P. 14.

19. T. H. Pioster, Op.cit l. 17.

20. Edward A. Suchman, Evaluative Research, Principles and Practice in Public Service and Social Action Programmes (New York, Russel Sage Foundation, 1967) Pp. 63 - 64.

21. Garry and Deheer, Op. cit P.351.

22. E.O. Coplin, Op. cit P. 17.

23. S. Y. Atsu, The Focus and Concentrate Programme in the Kpandu and Ho Districts, (Legon, Technical Publications, Institute of Statistical Social and Economic Research, 1974) P. 4.

24. J. Vercruijsse and J. Boyd, Effects of the Tora Agricultural Institute on Farm Practices and Attitudes of Tora Locality, (Freetown, A Central Bureau of Research Organisation, 1970). P.8.

25. V.S. Van Logchem, The Tora Experiment, Unicersity (University Press Ltd, Okan, Serraleon 1972) P.41.

26. S.K. Taiwo Williams and J. Ade Olao, Evaluation of the Rice/Maize Project of the USAID/Ministry of Agriculture and Natural Resources Western State of Nigeria, (Ife, Department of Extension Education and Rural Sociology, Faculty of Agriculture University of Ife 1972) Pp. 18 - 21.

27. United States Agricultural Industrial Development.

28. Joseph Ascroft, Niels Roling, Joseph Kariuki and Fred Chege, Extension and the Forgotten Farmer (Nairobi, For Development Studies, University of Nairobi, 1973) P. 57.

29. Brian C. D'Silva, M.R. Raza N.O. Ejiga and I.O. Bogunjoko, A Socio-Economic and Extension Survey of the Funtua Agricultural Development Project in Nigeria.
(Samaru, Zaria, Department of Ageicultural Economics and Rural Sociology, I.A.R., A.B.U., 1981) Pp.13-15.

30. Progressiveness was defined within the context of the study as the degree to which an individual was relatively earlier to adopt new ideas than other members of his local system.

CHAPTER THREE

NIGERIA'S AGRICULTURAL RESEARCH POLICY

Nigeria, before independence was able to grow not only all its food needs, but produced surpluses of other agricultural raw materials such as cocoa, coffee, groundnuts, cotton, palm produce etc. for export to other countries. In other words, agriculture then not only provided the Nigerian population with all its food needs but it also provided the much needed foreign exchange with which the country financed its capital development.

Twenty years after independence, Nigeria can no longer provide enough food for its fast - growing population, some section of which is disproportionately very effluent, and neither could the present agricultural system cope with the increasing demands of the agricultural raw materials to keep the country's oil mills, textiles and other agro-based industries operating at full capacity, let alone have surplus for export. In fact the role of export agriculture in providing resources for government had always been one of the important questions in agricultural policy in Nigeria.

This change, since independence, in both domestic and export agriculture called for suitable agricultural policy, particularly in the area of research. Given the present role agriculture is expected to play in the Nigerian economy since the decline of oil, there is the

need to examine such a policy.

This chapter, among other things, examines Nigeria's earlier experience in the area of agricultural research policy, the agricultural research policy objectives as stated in the various development plans, the allocation of resources to agricultural research, and the general research policy of the I.A.R.

3.1 Research Policy Objectives in the National Development Plans.

Prior to political independence, the emphasis on Nigeria's agricultural products was on cash crops such as cocoa, groundnuts, cotton, rubber and so forth. It was the policy of the colonial masters that these products were exported to Britain as vital raw materials for the home industries. The lack of emphasis on food crops was noted by the post independence government of the country. This was why the first National Development Plan document (1962 - 68)[1] spelt out the emphasis on domestic food crops such as cassava, yams, maize, rice and so on. Towards this end, a great effort was required to expand and make available, through research institutes, the knowledge needed on fertilizers, pesticides, improved seeds and improved farm practices which would work under Nigerian conditions.

In particular, a major effort was to be made to expand rice production and the production of other domestic foodstuffs of high nutritious value such as potatoes and legumes.

Special emphasis was also placed on soil fertility and fertilizer studies which was to be closely coordinated with the activities of the then Regional governments. The idea was that the findings were expected to provide the basis for a major fertilizer programme which, itself, would form the foundation for expanded fertilizer production. Some work in that field was then being organised in Nigeria by the Food and Agricultural Organisation of the United Nations.

This policy trend was continued in the second National Development Plan (1970 - 74)[2] excepting that, in the field of agricultural research, some urgent reforms were called for. These were to involve the role of the federal research centres in relation to agricultural faculties in the universities and the state Ministries of Agriculture and Natural Reseources. Also, a feasible working relationship between agricultural teaching and other elements of agricultural improvements, such as research and extension services, was to be established. Students of agriculture were to be encouragedto do some of their field work in research stations of the ministries to make them conversant with operational problems of local agricultural development.

Some specialists in government research institutes were to be attached to faculties of agriculture in the universities to the mutual benefit of both the government and the universities in the promotion of meaningful

research among all agencies in order to effect "a set of priorities consistent with the national objectives of agricultural policy".[3] Particularly, the Universities were expected to carry out research activities which were to be geared to the real and urgent needs facing the development of aagriculture in all its facets. For the purpose of coordinating research, a National Agricultural Council was to be established.

It can be seen that emphasis, during the second plan period, was on reforms of agricultural research, particularly in the area of organisation and administration. But during the Third Plan period (1975 - 80)[4], most of the envisaged agricultural research programmes were related to food crops and agricultural implements as indicated in the plan document:

> In the crop production Sector, there is the need to intensify research to improve the existing varieties of industrial as well as staple food crops. At present, there is little application of improved tools or implements to Nigerian agriculture. During the plan period, research will be conducted into the development of cheap and simple tools, and small motor-powered and animal-drawn implements.5

Most of the agricultural projects earmarked for the plan period were research on food crops such as rice, maize, beans and root crops. The objective for the research for rice and beans improvement was "to intensify research to produce high yielding, nutritive and disease-resistant varieties suitable for different areas in the country".[6] With regards to maize, the objective was "to raise maize yields from the present 5,000kg. to 6,000kg. and

to upgrade the nutritive values of the crop".[7]

The attention to root crops was essentially to survey all the growing areas of the Federation and the survey "will embrace the soil type, cultural practices, pest and disease control, storage and product utilization of the country's root crops."[8]

Of all the National Development Plan periods, the one which ought to contain policies that should reinforce comprehensive agricultural research on food crops is the Fourth Plan period (1981 - 85) because the previous few years withnessed a disastrous mismanagement of food resources in Nigeria. Due to misplaced priorities, the production of food crops was neglected and so there was unguarded resort to massive importation of food. There was therefore the need for sound agricultural research policies, particularly on food crops in order to attain self-reliance in terms of quality and quantity of food items. But unfortunately, the Guidelines for the Fourth National Development Plan document (1981 - 85) gave no clear-cut policies in terms of what crops should be the focus of research let alone spelling out priorities in this area. Rather, the document stated policies which were not new and which, as a matter of fact, had featured in some of the previous plan documents. For an example, the Guidelines stated, among other things, that:

> Although agricultural research has been an established area of government activity, there is need to widen this research effort so as to make it more relevant to the immediate problems of the sector. Effort will be made to secure better results from government agricultural research activities during the fourth plan by emphasizing the following:
>
> i) efficient allocation of resources among agricultural research establishments;
>
> ii) expansion of existing research stations into viable units;
>
> iii) relevance of agricultural research activity to the pressing needs and problems of society;
>
> iv) optimal integration of agricultural research and extension to ensure effective dissemination of those results
>
> v) training programme to develop a stable core of agricultural research staff.

In view of the 'general nature of this policy statement, one could logically conclude that those who sacked the second Republic actors would lean heavily on the provision of the 1975-80 plan period with regards to policies for food crop research.

3.2 Historical Background

The interest of government in agricultural research dates back to 1893 when a botanical station was established in Lagos. A model farm was started at Moor Plantation, Ibadan in 1899 mainly to propagate rubber trees and for general agriculture.[9] The British Empire Cotton Growing Corporation (BECGC) started research at the

farm in 1905 but after five years it was abandoned because it was found to be unsuitable for cotton production. Moor Plantation became the headquarters of the Department of Agriculture in 1910 and experimental work at the plantation increased in the early 1920s while a chemistry laboratory was built there in 1926.

At present there are about 24 agricultural research institutes covering crops, livestock, fisheries and forestry.[10]

Over the years, the institutes have gone through various changes. For an example, the National Cereals Research Institute (NCRI) established in 1975 succeeded the Federal Department of Agricultural Research (FDAR). The National Root Crops Research Institute (FDAR) established in Umudike in 1975 to conduct research into root crops and tubers, started as a provincial experimental farm in 1923. The present Institute for Agricultural Research (I.A.R.) started as a regional research station at Samaru in 1922 when it served as the headquarters of the Department of Agriculture of the Northern Provinces. But actual research at Samaru began with the appointment of a batanist in 1924 and of a chemist in 1927.

3.2.1 Instrument of Establishment

The Nigerian Research Institute Act of 1964 established four research institutes: Cocoa Research

Institute of Nigeria (CRIN), Nigerian Institute for Palm Research (NIFOR), Forestry Research Institute of Nigeria (FRIN), and Nigerian Institute for Trypanosomiasis Research (NITR).

Subsequently, certain changes were made through decrees. In 1971, a decree established the Agricultural Research Council of Nigeria (ARCN) and made it responsible for coordinating all agricultural research. The Agricultural Research Institutes Decree of 1973 empowered the Commissioner of Agriculture and Rural Development, in consultation with the ARCN and the Nigerian Council for Science and Technology to establish institutes to conduct research and training in any field of agriculture, Veterinary Science, Fisheries, Forestry and Water resources. The decree empowered the Federal Government to take over any existing state research stations. This marked an important departure because the 1963 Constitution said that "regions and states as well as the Federal Government" could engage in agricultural research. In reality, the Federal departments had concentrated on basic agricultural research, whereas regional research departments had emphasized the application of the results of basic research since the time of the 1954 Constitution.[11]

The 1975 Research Institute's (Establishment) Order established 14 research institutes: three for food crops

(NCRI, NRCRI and NIHORT), four for tree crops (CRIN, RRIN, NIFOR and FRIN), four for livestock (NVRI, NAPRI, NITR and LRIN, and three for fisheries (LCRI, KLRI, and NIOMR). (See Appendix E).

In 1977, the National Science and Technology Development Agency Decree set up an executive Agency (NSTDA) to coordinate all research in Nigerian agricultural and non-agricultural. It, in effect, repealed the decree establishing the ARCN.

3.2.2 Defects

A general weakness of the early research institutes was that the ordinances and decrees which established them did not provide specific guidelines. As a result of this, research was not always consistent with national objectives. This led to poor phases or sequences of programmes. For instance, new plant varieties were sometimes imported and tested before determining the characteristics of the local varieties.

The research Institute (Establishment) Order of 1975 made some attempt to specify the functions of the institutes. It directed the crop research institutes to engage in breeding, "agronomic and entomological" research and crop utilization. It was a general statement which had some drawbacks. First, the order failed to set prorities for the institutes. When the same functions are listed for all institutes, it implies that all crops

are at the same level of development, which is not so. In rice research, for an example, improved crop processing and utilization is said to have priority over plant breeding, whereas in cow pea research, the contrary is the case. Unless priorities are set, many research institutes may continue to list irrelevant projects.

Secondly, the order failed to recognise that a major objective of agricultural research is to help to raise the living standards of rural people. Without this recognition, there would be the danger of concentrating too much on pure commodity research. In that case, the rural majority will be left in poverty if they cannot apply it.

Thirdly, the functions assigned to the institutes were largely production-oriented. There was no specific reference to research on the problems of marketing increased output.

Fourthly, the order listed mechanization of farming operations as a major objective, though research into alternative new technologies that are consistent with the country's factor endowments would have been better.

Fifthly, except for mechanization, non of the crop institutes was charged to do any input research. Only NAPRI had specific directives to study inputs for pastures,

rangeland and so on. So the order provided no specific guidelines at all. The broad mandate, "conduct research into all aspects of the production and products" does not provide an adequate guide for setting priorities.

3.3 Allocation of Resources to Agricultural Research

National economic objectives should be reflected by allocations of research resources to crops, livestock, fisheries and forestry. The budget allocations by the Federal Government in the four national development plans shows that there were no clear guidelines.

Allocations to crop, livestock, fishery and forestry research rose sharply between the 1962/68 and the 1981-85 plan periods. The 1960s were largely characterised by extensive agriculture. Rotational bush fallowing provided much of the incremental production needed at reasonable prices. However, continuous cultivation seriously, in some places, depleted soil nutrients to the extent that farm production in the 1970s and 1980s had declined. In addition, various policies over the years had reduced the availability of farm labour. They include urban bias in the provision of infrastructural facilities, the effects of universal free primary education, urban minimum wages and so forth. All these factors drew workers to the cities, thereby leaving aging farm labour force that cannot meet the challenges of extensive agriculture.

The need to obtain most of the increase in crop production from higher yields demands that the allocation to crop research in the total federal government expenditure in the crops subsector should have risen. Instead, it dropped sharply.

The federal government had no major role for agriculture up to a few years after independence and so there were no noteworthy agricultural sector objectives. Agricultural research policy could not be clearly made out of a national agricultural policy.

In the 1962-68 National Development Plan, areas of emphasis in agricultural research were food crops, tree crops and research on fertilizers, pesticides, improved seeds, improved farm practices and soil fertility. These areas were chosen according to the needs of the moment.

The 1970-74 plan contained a wide set of national economic objectives which provided a basis for objectives for agricultural sector. But the share of research allocations for crops in total federal government expenditures fell slightly. It appeared the planners did not use shares of subsectors and sectors in the national economy as criteria for allocating research resources. In the 1962-68 plan, crop production averaged nearly 50 per cent of the the G.D.P., but the crop research allocation during the plan was only 1.6 per cent of the

total federal public budget. Thus in terms of the importance of crops in the national economy, federal allocation for crop research in the 1962-68 plan were grossly inadequate. Allocations to crop research in the 1970-74 plan was also not consistent with the relative importance of the crops sector.

In 1962-68 allocation for research on crops, livestock, fishery and forestry was 23 per cent of all federal expenditures on these subsectors. But these fell to only 5.7 per cent in the 1975-80 plan, and still down to 5.5 per cent in that of the 1981-85 plan.

This decline is not consistent with the contributions of agriculture, livestock, and fishery to the economy and does not also bur well for the emphasis on small scale farming. There was a declining growth rate of agriculture towards the late 1960s and through the early 1970s, which was a period when increased allocations were needed to counter this decline.

The situation in livestock and fishery research was also not encouraging. Increasing income and population had boosted demand for livestock products. But livestock research allocation fell from the 21.1 per cent in the 1962-68 plan period to 9.2 per cent in the 1975-80 plan period. The share of fishery research in the federal expenditure on fishery fell from 59.3 per cent in the 1962-68 plan period to 18.8 per cent in the 1975-80 plan.

On the other hand, the share of forestry research rose to 12.5 per cent.

When judged on the basis of its important role in the national economy and in nutrition and food policy, [11] crop research should receive top priority among the subsectors.[12] In the years before comprehensive development planning, livestock, fishery and forestry research were emphasized more than was necessary in terms of their contribution to G.D.P. With the 1962-68 plan, crop research was accorded relative priority. It rose to 63.1 per cent of the total research during the 1970-74 plan.

The emphasis on livestock and fishery research reflected the attention given to solving the protein deficiency problem. The estimate of per capita calories intake of Nigerian population was 2,250 calories per day in the early fifties, and the protein availability per capita during that period was estimated at 50 grams per day, made up of 45 grams of vegetable protein and 5 of animal protein." These estimates led to special stress on veterinary research, expanded fisheries production and the gradual substitution of cereal crops for roots and tubers in the south of the country. Eventhough fishery and livestock are not sectorally as important as crops, relatively high research allocations were justified by the need to correct nutritional deficiencies.

Nigeria's history shows a lack of a national food or nutrition policy, which explains the lack of vigorous national policy on food research. The greater the awareness of the political leadership of the nutrition problem, the greater the proportion of revenues devoted to food crop research. The 1962-68 plan made no distinction between food crops and export crops in providing for research. But the 1970-74 plan, which contained eloquent statement on both the food problem and agricultural sector objectives, specifically provided for food crop research and this was emphasized further in the 1975-80 plan.

The Federal Government agricultural research allocations were not made on a commodity basis. The relative emphasis on crops, livestock, forests and fishery was inferred from the statutory responsibilities assigned to each research institute concerned. For an example, the I.A.R. which is concerned mainly with food crops research received a total allocation of ₦9.5 million in 1976/77 which was 17.89 per cent of total allocation to all research institutes. In 1977/78, its share was ₦14.102 million which was 17.05 per cent of total allocations to all the research institutes.

Federal government annual allocations to food crops research averaged ₦27.4 million between 1976/77 and 1977/78 which was 41.1 per cent of total annual allocations to all agricultural research. Allocations

to fishery research averaged ₦7.2 million between 1976/77 and 1977/78, an average of 10. per cent of the total. Those to tree crop research averaged ₦17,933.824 per year during the period, an average of 27.7 per cent.

Put together, cereals, seeds and nuts, cow peas and sugar contributed an average of 72.8 per cent of the country's domestic supply of calories from 1972 to 1974. They also supplied 76.1 per cent of the domestic protein available during the period. The dominance of these crops as sources of calories and protein justified their share of government budget allocations.

Although seeds and nuts contributed more than 23 per cent of total (domestic) protein available from 1972 to 1974, they were not covered in the Research Institute Establishment order 1975.[13] It was only later when NSTDA exercised funding control over I.A.R. that the Federal Government financed research on these crops.

3.4 I.A.R. General Research Policy

The Federal Government's Policy could be seen as guidelines for all the research institutes in the country. Even where the federal policy specifically mentions the functions of a particular research institute, given the suitability of its geographical

location for such functions, such policy could still be taken as guideline. It is the duty of the institute to work out the details for operationalization within the circumstances prevailing there.

Thus statute 15 of A.B.U. law of 1972 which was approved by the board of governors, the council and Head of State sets out the functions of the I.A.R. in relation to the then six northern states as follows:

1) To conduct research into matters pertaining to agriculture, with special reference to agriculture in the states, and to administer matters relating thereto.

2) To cooperate with other bodies in the dissemination through out the states of knowledge of agricultural matters and of the results of research conducted by the institute.

3) To provide agricultural extension services to the states.

4) To arrange for such conferences of government officers and other persons and for such courses and lectures as may be considered to further the above functions and

5) To participate in teaching functions of the university at all levels.[14]

These functions somehow reflect the history and origin of the Institute in the Research Division of the Ministry of Agriculture of the former Northern Region of

Nigeria, the area of which was then composed of the six northern states or the present eleven states. Broadly, this is the area of the distinctive annual crops of the "Savannah" region, where the I.A.R. has concentrated research on Savannah crops.

Thus, the Institute had the bulk of the responsibility for research work on sorghum, millet, wheat, groundnuts and cotton. Research on national crops like rice, maize and sugar had been controlled by the then Federal Department of Agricultural Research, although a certain amount of research work on maize has been carried out at I.A.R. in breeding varieties adapted to the northern ecological zones.

The responsibility for concentrating on varieties of seeds suitable to the savannah zones was re-emphasized in a new statute produced for the I.A.R. in 1976, which stated that its role was:

> To conduct research into the development of farming systems which involve crops of the Savannah zones and result in the maintenance or improvement of the soil resources and especially into the production and products of sorghum, millet maize, wheat and borley, cow pea and soya beans (in cooperation with other institutes) grundnuts, sesame and other oil seeds of economic importance; cotton and other vegetable fibres of economic importance; tree and horticultural crops; and shall in particular conduct research into:
>
> i) The mechanization and improvement of the methods of cultivating, harvesting, processing and storage of the specified crops,

ii) The ecology of pests diseases and weeds of the specified crops and improved methods of their control,

iii) irrigated agriculture, and

iv) any other problems related to the specified crops.15

The Extension Research liaison Services of I.A.R., which is the present Agricultural Extension Research and Liaison Services (AERLS) had operated on a wider crop base because it had to offer extension, material and advice on all crops within the states bounderies. The AERLS has since 1975 become an autonomous Institution. Even then, it is still the channel through which the research findings of I.A.R. are made available to the farmers.

Item five (5) of the functions of I.A.R. reflects its position within the University structure. It is the policy of the board of governors that the research work of I.A.R. must be closely related both to the needs of extension and development of agriculture in the states and to the teaching of Agriculture at both graduate and undergraduate levels. The Board made it clear and most emphatically, that I.A.R. shall carry out directed research firmly oriented towards the practical problems of the agricultural industry. Further more, it said that any time spent by institute staff in teaching shall be "minimal" and within the special field of the research worker.

Essentially, however, the I.A.R. research programme is aimed towards the small farmer situation, although much of the work is equally applicable to large farms.

A major policy of the institute is guarding against the difficulty of communicating news of improved techniques to the huge number of farmers and of distributing the inputs of seed, fertilizers and chemicals necessary for crops improvement to farmers. This necessity is emphasized by the fact that most of these farmers have very little capital and are so vulnerable to any failure that theyare very reluctant to take any risks with their small resources. These circumstances impose severe constraints on the kind of recommendations that can be made and therefore on the selection of research projects to give rise to those recommendations. These limitations do not apply to large scale plantations where the operators have large scale plantations where the operators have large amounts of capital and are prepared to take greater risks. Many crops have been selected or bred to suit the northern zones and are already available for large scale operations and the techniques developed in equivalent parts of the world could be confidently used.

The Board of Governors of the I.A.R. recognises the urgent need for increased food production to overcome immediate shortfalls. It also lays long term

stress on improving those crops which can compete on world markets and continue to bring in external earnings to the country, cash income to the farmer and provide raw materials for local industry, especially rural industries.

FOOTNOTES

1. Federal Ministry of Economic Development, Federational of Nigeria National Development Plan, 1962-68 (Lagos Central Planning Office 1962) P.vi.

2. Federal Ministry of Information, Second National Development Plan 1970-74 (Federal Government Printing Division 1970) P.11

3. Ibid. Page 13.

4. Federal Ministry of Economic Development and Reconstruction, Third National Development Plan, 1975-80 Vol.I. (Lagos Central Planning Office) P.15.

5. Ibid. P. 15

6. Ibid. P. 16

7. Ibid. P. 18

8. Ibid. P. 21

9. R. E. Everson and Kislev Yoav, Agricultural Research Research and Productivity, New Haven, Yale University Press 1975. P. 31.

10. See Appendix D.

11. The International Bank for Reconstruction and Development recommended in its 1955 Report on Nigeria that all basic research on livestock, crops, fisheries and forestry should be done by the federal government while the regions should concentrate on applied research or experimental application of research findings.

12. F. S. Idachaba, Food Policy for Nigeria Towards a Framework of Analysis (Ibadan Caxton Press, Agricultural Research Bulletin Vol.1 No.1 1980) P. 5.

13. Federal Office of Statistics Research Institute Establishment Order 1975 (Lagos Trade Division 1975) P. 23.

14. Institute for Agriculture Research, General Research Policy (IAR, A.B.U., 1972 P. 1.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION OF RESULTS

Largely, the success of any policy is judged by results and results, quite often are tantamount to the achievement of policy goals. The achievement of the goals of agricultural research policy should be assessed, not so much at the level of the executors of the policy but at the level of those for whom the policy is designed. In giving this study that background, the performance of the I.A.R. can only be efficient to the extent that the farmers who should benefit from research findings have improved their farming practices and their standard of living. It is only then too that the I.A.R. can be satisfied that its research policy goals have been achieved.

It is the farmer's evidence, more than any other, that can give a clear picture of what this research establishment is doing. In this regard, this researcher solicited the farmers' cooperation in responding to a package of relevant questions and added to this was useful information obtained from extension workers and some officials of the institute.

Out of the 218 questionnaires distributed in the three villages selected for this study, 197 were returned of which 88 were received from Minjibir, 63 from Bakura and 46 from Kadawa. The comporatively little attrition

suffered in the return of the questionaires was due to the commendable assistance this researcher received from volunteers acquired in each of the three villages and they were people who were very conversant with the localities. The quality of the responses was high for two reasons. First, the volunteers became ego-involved in the exercise to the extent where gathering accurate information became more important than getting the job done quickly. Secondly, they took time and pain to explain questions to the respondents, particularly the illiterate ones.

Questionaires were administered on 19 of the 21 extension workers[1] assigned to the three villages at one of the bi-monthly general meetings of extension workers held at Samaru and all were received duely filled-out. Interviews and discussions were held with officials of the I.A.R. in addition to Secondery data obtained from documents and records.

4.1 Organisation of the Chapter

In the previous chapter, the objectives of the I.A.R. were stated according to the Ahmadu Bello University statues of 1972 and 1976. The nature of this study negates the possibility of evaluating all the objectives of the I.A.R., and so some were selected for that purpose and they include:

(a) Improvements of farming systems such as supply of improved seed varieties, encouraging yearly cultivation of research crops, advice on and storage of crops which will ensure higher crops yield output and higher income,

(b) the provision and effective use of extension services and,

(c) participating in teaching functions of the University at all levels.

Section 4.2 evaluates the improvement of farming system, section 4.3 evaluates the activities of the extension workers while section 4.4 evaluates the teaching functions of the I.A.R.

4.2 Analysis of Improvement of Farming Systems

This study started with the hypothesis that the research activities, which hinge on farming systems, have not significantly improved the agricultural activities of the farmers. As stated in Section 4.1, such activities include the supply of improved varieties of seeds, encouragement of annual cropping of research crops and specialised advice on crops and storage. If these were done, there would be assurance of higher crops yield, output and increased income of the farmers. This hypothesis is now tested below.

4.2.1 Supply of Improved Varieties of Seeds

In testing this hypothesis, the respondents were asked to indicate the sources of their supply of seeds which they plant yearly. The results are presented in Table 4.1. The Table shows that 82 respondents or 41 per cent do obtain their supply of seeds from the I.A.R. followed by 73 or 37 per cent who get theirs from the National Seed Service. Twenty-seven respondents or 13.7

per cent are supplied by Agricultural Developments Project while only 12 or 6 per cent purchase their seeds from the market.

Table 4.1.

Sources of Seeds Supply to the Farmers

N. = 197

Source	No.	Percent
Institute of Agricultural Research	82	41.6
National Seed Service	73	37
Agricultural Development Project	27	13.7
Market	12	6.4
Others	3	1.5

Source: Survey by the researcher.

From Table 4.1., it can be seen that most of the farmers rely more on the I.A.R. and the National Seed service as sources of supply of seeds for planting. Since the National Seed Service relies on the I.A.R. for the provision of developed variety of seeds before their multiplication, it can be logically concluded that the I.A.R. is responsible for the developed variety of seeds that about 7[illegible] per cent of the farmers plant. It also shows that the farmers rely less on other sources such as the Agricultural Development Projects and especially the market.

4.2.2. Types and Frequency of Crops Cultivated

One of the roles of the I.A.R. is to conduct research into the development of farming systems which involve crops of the savannah zones. Accordingly, the respondents were asked to indicate the types of crops they cultivate and how frequently they do so, whether yearly, occasionally or not at all. Table 4.2 shows the frequency with which each crop is cultivated by respondents according to their villages. This study lays more emphasis on crops cultivated yearly because consecutive yearly cultivation of a crop makes for easier assessment of performance before and after a respondant's contact with the I.A.R.

From the Table, six crops, namely maize, sorghum groundnuts, rice, beans and millet are grown yearly. All respondant (100%) cultivate maize yearly. A total of 87.7 per cent approximately broken down to 40.6 per cent for Minjibir, about 26 for Bakura and 21 for Kadawa cultivates sorghum yearly. For groundnuts, 68.3 per cent made up by 39.5 for Minjibir, about 11 for Bakura and 18.2 by Kadawa grow the crop yearly. Rice is grown by 64.8 per cent broken down to about 22 for Minjibir, 30 for Bakura and about 13 for Kadawa. As for beans about 53.1 per cent cultivate it, consisting of about 17.7 for Minjibir, about 25 for Bakura and about 11 for Kadawa. The lowest per centage about 28 is recorded for millet of which about 13 goes to Minjibir, 8 to Bakura and 7 to Kadawa.

TABLE 4.2

CROPS CULTIVATION BY FREQUENCY AND VILLAGE BY NUMBER AND PERCENTAGE

Crop	N 88 Frequency in Minjibir			Percentage of Yearly Crop	N 63 Frequency in Bakura			Percentage of Yearly Crop	N 46 Frequency in Kadawa			Percentage of Yearly Crop	TOTAL	
	Yearly	Occ.	None		Yearly	Occ.	None		Yearly	Occ.	None		Number	Percent
Sorghum	80	5	3	40.6	51	8	4	25.8	42	3	1	21.3	197	[illegible]
Rice	43	[illegible]	5	21.8	60	-	3	30.4	25	18	3	12.6	197	64.8
Millet	[illegible]	51	12	12.6	17	40	6	8.6	14	30	2	7.1	197	21.7
Soya Beans	3	30	[illegible]	1.5	-	39	24	0	2	29	15	1	197	2.5
Groundnuts	78	-	[illegible]	[illegible]	[illegible]	2	40	10.6	36	4	6	18.2	197	68.3
Wheat	-	13	75	0	-	9	54	0	-	[illegible]	38	0	197	0
Maize	88	-	-	44.6	64	-	-	[illegible]	47	-	-	23.8	197	100
Cowpea	11	28	49	5.5	-	17	46	0	3	13	30	1.5	197	7
Beans	[illegible]	43	10	17.7	49	[illegible]	-	[illegible]	21	14	11	[illegible]	[illegible]	53.1

Note - Occ. = Occasionally.

Source: Survey by the Researcher

4.2.3 Advice on Crops

Table 4.3 shows the percentage of degree of advice sought by the respondents on each crop. There is a correlation between the degree of advice and crops grown yearly. They all recorded a higher percentage of advice than other crops which are either occasionally grown or not at all. That not withstanding, apart from groundnuts and beans which claim more than 70 per cent each, the others had scores less than 50 per cent each. Of these, millet had the lowest percentage of about 29.

TABLE 4.3

DEGREE OF ADVICE SOUGHT BY CROP.

N = 197

Crop	Much		Little		None	
	No.	Percent	No.	Percent	No.	Percent
Sorghum	73	39.5	67	34	52	26.3
Rice	82	41.6	64	32.4	51	25.8
Millet	57	28.9	101	51.2	39	19.7
Soya beans	28	14.2	13	6.5	156	79.1
Groundnuts	144	73	34	17.2	19	9.6
Wheat	0	0	30	15.2	169	84.7
Maize	80	40.6	66	33.5	51	25.8
Cowpea	15	7.4	11	5.5	171	86.8
Beans	152	77.1	27	13.7	18	9.1

Source: Survey by the Researcher.

The Objectives of farmers obtaining advice on crops was not, particularly with regard to beans and groundnuts. Good measure of advice was also sought on sorghum, rice, maize and millet. The table shows that little or no advice is sought on wheat, soyabeans and cowpea, which correlates an earlier observation in section 4.2.2. that they are rarely cultivated by the farmers.

4.2.4 Advice on Storage of Crops

The respondents were requested to indicate how often they received advice from the I.A.R. officials on the best method of storing their crops. About 22 per cent or 43 respondent claim that they very often received advice while 73 per cent or about 144 respondents said they occasionally received advice. Five per cent or 10 of them receive no advice at all.

TABLE 4.4

Frequency of Advice Given to Farmers on Crops Storage.

Frequency of Advice	No.	Percent
Very Often	43	22
Occasionally	144	73
None	10	5

Source: Survey by the Researcher.

In the face of the data above, this important function has been satisfactorily executed. The Nigerian farmer is faced with the perennial problem of grains storage. Losses through improper storage methods have depleted the farmers' income and contributed immesurately to the spiralling cost of food. However, a lot of farmers still resort to the traditional methods of grains storage. This they do some times in the face of expert advice either due to the rigid ties of tradition or inability to afford the cost of modern approach to the problem.

4.2.5 Quantity of Crops Harvested Before and After Contact with I.A.R.

The farmers were asked to indicate how much quantity of crops they harvested within a selected period before and after their contact with the I.A.R. For this purpose, a five year period before and after was selected and the crops used were those consecutively cropped yearly during the two periods.

Discussions with the farmers revealed that they use 'tiyan'[2] and bags of grains rather than kilograms as measures of weight and so the researcher decided to use the bag as a unit as shown in Tables 4.4 to 4.8. All the data used in averages and the three villages were first treated separately before giving an overall picture of the three put together in Table 4.8.

Table 4.5 shows that sorghum grains harvested by Minjibir farmers increased by about 65 bags or 6,500 Kgs at the end of five years of contact with the I.A.R. Rice increased by seven bags or 700 Kgs; millet increased by 51 bags while beans had an increase of 46 bags but groundnuts harvested decreased by 30 bags or 3,000 Kgs at the end of the period.

In Bakura, Table 4.6 indicates that increases were recorded in all the crops. The highest increase was in sorghum (43 bags) followed by millet which had 18 bags. Both maize and beans had increase of 10 bags each while the lowest recorded was for rice which was seven bags.

TABLE 4.5

AVERAGE BAGS PRODUCED BY YEAR BY CROP IN MINJIBIR

N = 88

Crop	Five Years Before						Five Years After						Difference	Increase or Decrease
	1978	1979	1980	1981	1982	Total	1983	1984	1985	1986	1987/88	Total		
Sorghum	29.5	31	27	34.5	37	159	35.5	41	43	51	53	223.5	64.5	Increase
Rice	11	17	13	15	14	70	12	15	14	17	19	77	7	Increase
Millet	9	8	11	13	9	50	13	10	14	14	13	53	3	Increase
Groundnuts	21	23	25	23	27	119	19	21	19	17	13	89	30	Decrease
Maize	31	45	33	46	49	204	42	44	50	57	59	255	51	Increase
Beans	7	11	9	13	15	55	21	19	17	23	21	101	46	Increase

Source: Derived from AERLS Annual Reports 1978 - 1985 and I.A.R. Agric. Ext. Unit Reports 1986 - 1988.

TABLE 4.6

AVERAGE BAGS PRODUCED BY YEAR BY CROP IN BAKURA

N = 63

Crop	Five Years Before						Five Years After					Total	Difference	Increase or Decrease
	1978	1979	1980	1981	1982	Total	1983	1984	1985	1986	1987/88			
Sorghum	31	22	25	31	33	142	31	29	41	41	43	185	43	Increase
Rice	11	15	12	14	15	67	12	13	14	17	18	74	7	Increase
Millet	6	7	9	8	10	40	9	11	11	13	14	58	18	Increase
Groundnuts	20	19	21	23	25	108	21	23	22	23	29	118	10	Increase
Maize	31	34	37	39	49	190	33	35	37	39	5050	198	2	Increase
Beans	10	11	13	13	15	62	13	15	15	17	19	72	10	Increase

Source: Derived from AERLS Annual Reports 1978 - 1985 and I.A.R. Agric. Ext. Unit Reports 1986 - 1988.

Two crops in Kadawa, groundnuts and beans suffered decreases as reflected in Table 4.6. They had 20 and 2 bags respectively. Highest increases were in Sorghum (about 60 bags) and maize, 45 bags. Rice increased by 24 bags.

The overall picture for the three villages are shown in Table 4.7. The table shows that at the end of the five years before contact with the I.A.R., the three villages harvested a total average of 455 bags of sorghum as against 622 bags at the end of the five years after contact, which means an increase of 167 bags. Similarly, maize recorded 601 bags as against 699 an increase of 98 bags. For beans, the difference in production for the two period was 54 bags increase while rice and millet had increases of 38 and 35 bags respectively.

TABLE 4.7

AVERAGE BAGS PRODUCED BY YEAR BY CROP IN KADAWA

N = 46

Crop	Five Years Before						Five Years After						Diff Prod	Increase/Decrease
	1978	1979	1980	1981	1982	Total	1983	1984	1985	1986	1987/88	Total		
Sorghum	28	32	27	37	30	154	31.5	40	42	49	51	213.5	59.5	Increase
Rice	9	16	11	13	14	63	15	13	19	21	19	87	24	Increase
Millet	7	5	9	11	7	39	13	9	12	13	15	53	14	Increase
Groundnuts	20	21	19	23	22	105	17	19	21	16	12	85	20	Decrease
Maize	32	41	31	51	52	207	41	43	51	59	58	252	45	Increase
Beans	9	12	20	13	15	69	19	19	10	9	10	67	2	

Source: Derived from AERLS Annual Reports 1978-85 and I.A.R. Agric. Ext. Unit Reports 1986 - 1988.

TABLE 4.8

AVERAGE BAGS PRODUCED IN TWO PERIODS BY CROP IN THREE VILLAGES

N = 197

Crop	Period Before 1978 - 1982				Period After 1983 - 1987/88				Difference	Increase	
	Minjibir	Bakura	Kadawa	Total	Minjibir	Bakura	Kadawa	Total			
Sorghum	159	142	154	455	223.5	185	213.5	622	167	Increase	36.7
Rice	70	67	63	200	77	74	87	238	38	Increase	19
Millet	50	40	39	129	53	58	53	164	35	Increase	27
Groundnuts	110	122	105	332	89	118	85	292	40	Decrease	12
Maize	204	190	207	601	255	192	252	699	98	Increase	16
Beans	55	62	69	186	101	72	67	240	54	Increase	29

Source: Derived from Tables 4.5, 4.6 and 4.7.

One can logically conclude that the desired objective of increased production of grains has been satisfied, eventhough the percentage increases in respect of each crop as shown in Table 4.7 is not too encouraging. Of note is groundnut which suffered an overall decrease of 40 bags. Apparently this is a disturbing picture considering the fact that this crop had been a major cash crop in the former Northern region. However, discussions with some of the farmers and I.A.R. Officials revealed that the recesses in its production in recent years are due mainly to the frequent droughts.

4.2.6 Cultivation of I.A.R. Improved Varieties of Seeds

This researcher wanted to know whether the farmers noticed any difference between the products of I.A.R. improved varieties of seeds and those they had probably obtained from other sources. So they were therefore asked to indicate if they harvest more or less grains whenever they obtain the seeds from the I.A.R.

Table 4.9 shows that a good percentage of the percentage of the respondents 66, per cent or 131 of them observed increased harvests whenever they plant seeds they obtain from the I.A.R. while 43 of them or about 22 per cent do not and the rest 11.6 percent have no idea.

TABLE 4.9

MORE OR LESS HARVESTS OF GRAINS BY I.A.R SOURCE OF SEEDS SUPPLY

N = 197

Higher or Lower Harvests of Grains of I.A.R. Source of Seeds Supply	No.	Percent
Higher	131	66.4
Lower	43	21.8
No Idea	23	11.6

Source: Survey by Researcher

The table reflects the picture of section 4.2.5 which shows that the I.A.R. has obtained the objective of ensuring that improved seeds have resulted in increased output of the farmers crops.

4.2.7 Income and Wealth

It is often empirically difficult to estimate overall welfare of a people. It is also difficult to ascertain from people their financial status, most especially local people who in all probability, would be highly suspicious of the basis for such enquiry.

However, important components like material welfare can be fairly estimated. Income estimation which is accepted as a good indicator of material welfare has not been possible in this study due to its nature and duration. However, wealth indicators or material possessions were used here in an attempt to indicate some measure of economic impact of the I.A.R. The material possessions used here are indicated in Table 4.10. The respondents were asked to indicate whether they bought whatever items they possess either before or after their contact with the I.A.R.

For the purposes of this study, it is the spread of the materials possession among all the respondents that is more relevant than the numerical strength of an individuals acquisitions. Therefore the data in Table 4.10 indicates that less respondents acquired the following items after contact with the I.A.R; wristwatches, iron beds, matresses, bicycles, mobylette, motocycle, car, horses, cattle, house and tractor. Infact no respondent bought tractor after contact. It means that only three items, namely radio, television and wooden bed had more acquisitors after contact.

TABLE 4.10

WEALTH STATUS OF INDIVIDUAL RESPONDENTS

N = 197

Things Owned	No.	Percentage of Ownership	Percentage that bought Before and After			
			Before		After	
			No.	%	No.	%
Wrist watch	107	54.2	57.	29	50	25.2
Wooden Bed	99	50.3	40	.2	59	30.1
Iron Bed	146	74.2	100	51	46	23.2
Matress	173	87.6	97	49.2	76	38.4
Radio	108	54.6	50	25.2	58	29.4
Television	9	4.5	3	1.5	3	6
Bicycle	140	70.9	99	50.2	41	20.7
Mobylette	8	4.2	6	3.1	2	1.1
Motocycle	26	13.1	20	10	6	3.1
Car	3	1.5	2	1.2	1	.3
Horse	10	4.9	7	3.3	3	1.6
Cattle	46	23.5	42	21.2	4	2.3
Tractor	1	.3	1	.3	0	0
House	119	60.6	116	59	3	1.6

Source: Survey by Researcher.

The table further shows that of the 54.2 per cent that own wrist watches, less (25.2 per cent) acquired them after contact with the I.A.R. and of the 70.9 per cent who bought bicycles, less than half (20.7 per cent) acquired theirs after contact. It is only in the case of radio that of the percentage owners (54.6) more than half per cent (29.4) bought theirs after contact.

The material welfare of the farmers has not had appreciable improvement as reflected by Table 4.10, since contact with I.A.R. Overall, eleven of the items possessed by the respondents, or about 79 per cent, were acquired before contact with the I.A.R., as against three or 21 per cent which were acquired after contact. Discussion with several farmers revealed that they take special pride in owning bicycles, radios and wrist watches because they are items they can move around with, even to the farm. But less of these items were bought after contact with the I.A.R., with the exception of radio whose ownership increased by only 4.2 per cent.

The conclusion on the first hypothesis is that all the variables have been proved wrong, to varying degrees, with the exception of the one relating to increased income of the farmers. The relevant data shows that with the first variable, about 74 per cent of the farmers get their supply of improved seeds from the I.A.R. and 67 per cent of them cultivate I.A.R. research crops yearly, that is in connection with the second variable.

Data on the third and forth variables show, respectively that a minimum of 74 per cent of advice was sought on all the crops, with the exception of three, and that about 95 per cent of the farmers were advised on crops storage. The data for the fifth shows that out put increased for all crops, except ground nuts, while for the sixth variable the data shows that 88 per cent of the farmers do cultivate I.A.R. improved varieties of seeds. The last variable was proved right to the extent that 79 per cent of the farmers' material possessions were acquired before their contact with the I.A.R.

4.3. Analysis of Performance of Agricultural Extension Workers

Before 1975, the medium of contact between the I.A.R and the farmers was the Agricultural Extension and Research Liaison Services A.E.R.L.S which was a section of the institute. In 1975 the A.E.R.L.S became autonomous such that it was given a new role which covers the twenty one states of Nigeria. The I.A.R. therefore established an Agricultural Extension Services Unit as a substitute.

This unit is responsible for the appointment and training of extension workers for the states under the mandate[3] of the I.A.R. As a result of reorganisation, the I.A.R. now has a mandate for Kaduna, Kano, Katsina, Bauchi and Sokoto states.

This study chose the villages around the outstations of the I.A.R. as a focus. The villages are Minjibir, Bakura and Kadawa to which were allocated a total of twenty one extension workers by the institute.

The researcher's hypothesis is that the performance of the extension workers has not made good impact on the farmer's farming practices. This hypothesis is now tested below.

4.3.1 Assistance To Farmer's in Farm Practices

The extension workers were asked whether they do render assistance to the farmers in certain important farm practices listed in Table 4.1.

Eighty nine per cent of the extension workers claimed that they do demonstrate the application of fertilizer but about 74 per cent admitted that they do not assist the farmers in the selection of suitable farmland, while only about 36.8 per cent assist in the supply and distribution of planting materials.

In the selection of variety of seeds for planting, 79 per cent of them claimed they do assist while about 58 per cent help in seed-bed preperation. Quite a high number of them about 95 per cent advise the farmers on how to weed their crops and all of them 100 per cent, usually advise the farmers on disease and pest control measures but very few, 26 per cent, give the farmers information and advice on loan and credit facilities.

TABLE 4.11

AGRICULTURAL EXTENSION WORKERS BY ASSISTANCE TO FARMERS IN FARM PRACTICES

NO. 19

Farm Practices		No.	Percent
1. Demonstrating Fertilizer Application			
	Yes	17	10.5
	No	2	10.5
2. Thinning and spacing practices.	Yes	11	57.8
	No	8	42
3. Supply and Distribution of Planting Materials	Yes	7	36.8
	No	12	63.1
4. Selection of suitable Land	Yes	5	26.3
	No	14	73.6
5. Seed Bed Preparation	Yes	11	57.8
	No	8	42.1
6. Selection of Variety of seed for planting	Yes	15	78.9
	No	4	21
7. When and how to weed crops. crops	Yes	18	94.7
	No	1	5.2
8. Advice on Disease and Pest Control Measures	Yes	19	100
	No	0	0
9. Information and Advice on Loan and credit facilities	Yes	5	26.3
	N	14	73.6

Table 4.11 (Cont'd)

Farm Practices		No	Percent
10. Storage of Crops			
	Yes	14	73.6
	No	5	26.3
11. Giving Farmers Assistance When they need it	Yes	19	100
	No	0	0
12. Others	Yes	12	63.1
	No		

Source: Survey of the Researcher.

All the extension workers claimed that they do assist the farmers whenever the farmers need the assistance.

Responses of the extension workers, according to Table 4.11, shows that most of them have performed well, particularly with regard to advice on disease and pest control measures, selection of good varieties of seeds, demonstration of fertilizer applications and giving farmers assistance when they need it. In fact the data show that all the extension workers do assist the farmers whenever they need it. This is important because no matter how useful an advice is, it becomes useless if its arrival is ill-timed.

4.3.2 Visits to Farmers

The interaction between the extension workers and the farmers can be logically predicated on frequency of visits the farmers pay the latter. Accordingly, the extension workers were asked to indicate the number of times they meet the farmers before and after planting of crops.

Table 4.12 shows that before crops planting no extension worker visits more than six times. Only about 11 per cent visit five or six times while as high as 84 per cent visit three or four times but only 5 per cent visit once or twice.

After crops planting, about 53 per cent visit three or four times while about 32 per cent visit five or six times but only about 16 per cent visit once or twice.

TABLE 4.12

AGRICULTURAL EXTENSION WORKERS BY VISIT TO FARMERS

N = 19

Visits	No	Percent
I Before Crops Planting		
1 - 2 Times	1	5.2
3 - 4 "	16	84.2
5 - 6 "	12	10.5
7 - 8 "	0	0
9 - 10 "	0	0
10 and above "	0	0

Table 4.12 Cont'd

Visits	No	Percent
II. After Crops Planting		
1 - 2 Times	3	15.7
3 - 4 "	10	52.6
5 - 6 "	6	31.5
7 - 8 "	0	0
9 - 10 "	0	0
10 and above "	0	0

Source: Derived from survey of the researcher.

Table 4.12 shows that a total of 18 extension officials or about 95 per cent visit the farmers between 3 and 6 times before planting of crops as against 16 or 84 per cent who do so after planting, but for the wrong number of times. This role has not been satisfactorily performed particularly in view of the fact that according to officials, a cropped land needs greater attention as soon as the seeds have been planted. It would have been satisfactory if at least, more than 50 per cent visit the farmers for at least ten times especially after planting crops.

However, the lack of more frequent visits to the farmers is partly due to some of the problems most of the extension officials complain of. For an example the data in Appendix A 10 show that 84 per cent lack transport facilities while 63 per cent complain of roads not being motorable when they need to visit the farmers.

The conclusion on the second hypothesis is that whereas the first multiple - structured variable was proved wrong, the second was not. Data obtained on the first variable showed that 9 or 75 per cent of the farm practices listed under it were executed by higher percentages of the extension workers in most of the practices. For an example, all of the extension workers assist the farmers in pest control measures and in giving advice when needed. However, data on the second variable indicates that no extension worker visited the farmers for the required or advisable number of times after crops have been planted.

4.4 Analysis of the Teaching Role of the I.A.R.

According to the 1976 statute of the I.A.R., one of its roles is "to participate in the teaching functions of the University at all levels". The teaching functions of the institute have been confined to the faculty of Agriculture, Samaru, and so all teaching programmes at all levels should jointly be carried out by both the faculty and institute staff.

Records and relevant documents were examined and personel interviews were held, where necessary, to find out to what extent the I.A.R. staff have been involved in teaching courses in both undergraduate and post graduate programmes and the supervision of theses for the bachelor and post graduates degrees.

The exercise was aimed at testing the hypothesis that the I.A.R. staff have not sufficiently carried out the function of teaching at all levels of the University. The hypothesis is tested below.

4.4.1 Coursework for Post graduate and Undergraduate Degrees

There are seven departments that constitute the faculty of agriculture, namely, Agricultural Economics, Agricultural Engineering, Agronomy, Crop Protection, Plant Science, Soil Science and Animal Science. The seventh department, Animal Science, is outside the activities of the I.A.R., since it deals mainly on research into crops. Both the I.A.R. and the faculty of agriculture staff are therefore represented in the other six departments.

Table 4.13 shows that of the 131 staff members in six departments in the 1978/79 session, only 34 per cent of the institute staff taught courses at Ph.D level and 37 per cent taught at Master's level while only about 5 per cent taught courses at undergraduate level. The same trend goes through all the sessions and all the levels even to the last session, namely, 1987/88. The table also shows that no members of the Institute staff taught at undergraduate level in the 1979/80, 1982/83, 1983/84 and 1986/87 sessions respectively. Even in the other sessions where they did teach courses at that level, only an insignificant per centage did so at each session compared with the high percentages for the faculty staff.

TABLE 4.13

PERCENTAGE PARTICIPATION OF I.A.P. AND FACULTY STAFF IN COURSE WORK FOR DEGREES BY SESSIONS.

Session	Institute and Faculty Staff No.	Ph.D. Degree Course Work		Masters' Degree Course Work.		Bachelors' Degree Course Work	
		Institute Staff Percent	Faculty Staff Percent	Institute Staff Percent	Faculty Staff Percent	Institute Staff Percent	Faculty Staff Percent
1978–1979	131	34.3	65.6	37.4	62.5	4.6	95.4
1979–1980	127	33.	66.9	33.[illegible]	66.[illegible]	0	100
1980–1981	128	32.8	67.1	31.2	68.7	[illegible].5	94.5
1981–1982	115	33	66.9	26.9	73	1.8	98.2
1982–1983	109	33	66.9	33.9	66.	0	100
1983–1984	106	33	66.9	29.2	70.7	[illegible]	100
1984–1985	103	33	66.9	30.1	[illegible].9	2.9	97.1
1985–1986	101	32.[illegible]	67.3	30.6	69.3	4	96
1986–1987	97	32.[illegible]	67	34.	65.9	0	100
1987–1988	93	33	66.6	36.5	63.4	6.5	93.5

Source: Derived from Staff Records in Directors Office and Subject Time Tables in the Deans Office.

4.4.2 Theses Supervision at Post Graduate and Undergraduate levels

As can be seen in Table 4.14, all the Ph.D theses for the 1978/79, 1981/82, 1984/85, 1985/86 and 1987/88 sessions were supervised by the I.A.R. and more of the Ph.D. studies carried out in the other sessions were also supervised by the institute.

The same trend goes with theses at masters degree level where, as indicated in Table 4.14, the I.A.R. supervised more of the thesis for consecutive sessions from 1978/79 to 1983/84. The picture changed from the 1984/85 session when the faculty supervised more theses all through the session up to the 1987/88 session.

With regard to Bachelors' degree theses, well over 90 per cent and in some sessions all the theses were supervised by the faculty. Apart from the 1987/88 session when about eleven per cent of the theses were supervised by the I.A.R., the institute did not supervise up to five per cent in any of the other sessions. Infact as shown in Table 4.16 in the 1979/80, 1980/81, 1981/82, 1983/84 and 1986/87 sessions, all the theses were supervised by the faculty.

All the data for the coursework and theses supervision for the three degrees in the faculty of agriculture present a clear picture that the I.A.R. staff concentrate on teaching and theses supervision at the post graduate levels only.

TABLE 4.14

PERCENTAGE PH.D. THESES SUPERVISION
BY INSTITUTE AND FACULTY BY SESSION

Session	Theses No.	Institute Staff Percent	Faculty Staff
1978-1979	1	100	-
1979-1980	3	66.	33.3
1980-1981	-	-	-
1981-1982	2	100	-
1982-1983	5	80	20
1983-1984	5	60	40
1984-1985	1	100	-
1985-1986	2	100	-
1986-1987	4	75	25
1987-1988	1	100	-

Source: Derived from Theses Unit of African Section of Kashim Ibrahim Library, A.B.U.

TABLE 4.15

PERCENTAGE MASTERS' THESES SUPERVISION BY INSTITUTE AND FACULTY BY SESSION.

Session	Theses No.	Institute Staff Percent	Faculty Staff Percent
1978-1979	10	70	30
1979-1980	11	54.5	45.5
1980-1981	24	54.1	45.8
1981-1982	27	77.7	22.2
1982-1983	24	54.2	45.8
1983-1984	26	76.9	23.1
1984-1985	31	48.3	51.6
1985-1986	22	22.7	77.3
1986-1987	35	45.7	54.3
1987-1988	33	45.5	54.5

Source: Derived from Theses Unit of Africana Section of Kashim Ibrahim Library, A.B.U.

TABLE 4.16

PERCENTAGE BACHELORS' THESES SUPERVISION BY INSTITUTE AND FACULTY BY SESSION.

Session	Theses No.	Institute Staff Percent	Faculty Staff Percent
1978-1979	201	1.8	98.2
1979-1980	252	-	100
1980-1981	263	-	100
1981-1982	278		100
1982-1983	291	4	96
1983-1984	305	-	100
1984-1985	317	4.3	95.7
1985-1986	329	2.3	97.7
1986-1987	365	-	100
1987-1988	369	10.6	89.4

Source: Derived from I.A.R. Library.

In the face of the data presented in the four relevant tables, it would appear that this researchers hypothesis has been proved right. This is however not so, and in making this conclusion cognisance was taken of several factors as would be seen below. It is recognised that the faculty staff also have to conduct researches in order to meet the requirements for promotion. Table 4.13 shows that the highest percentage of I.A.R. staff involved in teaching Ph.D course work within the ten academic sessions is 34 as against 65 which is even the lowest for the faculty staff. The trend continues as 37 per cent, highest, for I.A.R. staff compared with 63 per cent lowest for the faculty with regard to Master's programme. For the undergraduate programme, the highest percentage participation for I.A.R staff is approximately 7 compared with the faculty's staff of approximately 94 as the lowest.

In the supervision of theses, it is clear from Table 4.14 that almost all the Ph.D theses were supervised by I.A.R. staff within the period. This trend also goes up to half way the period in the case of Masters theses as Table 4.15 shows. Table 4.16 however shows that almost all the undergraduate theses were supervised by the faculty staff, quite apart from their higher participation in the supervision of Masters theses within the second half of the ten academic sessions. It is logical to conclude that even in theses supervision, the

faculty staff had more to do on the bases of the arguements that first, Ph.D theses are comparatively fewer than the others and secondly, in the opinion of this researcher, more is involved in the preparation and delivery of lectures than the supervision of theses.

However, discussions and interviews held with some members of staff of both at the institute and faculty revealed two important factors that are relevant to the picture presented by the data. The first is that an I.A.R. staff has about four to six programmes a year that he has to research on. The field work, including data collection takes about three-quarters of the academic year, leaving about one-quarter for teaching and theses supervision. The second is that most of the research topics chosen by the post graduate students are related to the institutes research programmes and so, logically, they have to be supervised by the institute staff unless in cases where the faculty staff are farmiliar with the areas. Most of the topics chosen for undergraduates studies are faculty related, although not unfarmiliar to the institute staff who, due to their tight research and teaching schedules, cannot be much involved. Besides, the 1976 I.A.R. statute says that any time spent by the institute staff in teaching shall be minimal. It is clear to everyone that the I.A.R. is a researching and not a teaching institute. Its

minimal or non-involvement in under-graduate work is explained by the fact that the research work of the institute meets appropriately post graduate level rather than that of undergraduate level. In view of all these factors, the third hypothesis has been proved wrong.

4.5 The Systems Theory and the I.A.R. Field Operations

As indicated in Chapter two, the "systems theory" is the theoretical basis for this study. The major concern in this concluding portion of chapter four is to relate the systems theory to the data on I.A.R. field operations. The systems theory basically concern itself with "problems of relationships, of structure and of inter-dependence rather than with the constant attributes of objects".

The I.A.R. is an open system and like all open systems, it "inputs some form of energy from the external environment. The I.A.R. draws its financial and non financial energy from its environment. It obtains funding from the government and with this financial resources or financial energy it acquires its needs. These include the right mix of high-level manpower, equipment and the necessary infrastructures for research. The through - put processes generale the ideas and material inputs it disseminates to the various farmers and farm systems within its environment. This interaction with farms and farmers dramatizes the "relationships" and "interdependence"

often associated with "open systems".

Table 4.1 contains data which underscores the fact that no socio-economic structure is self-sufficient or self-contained. This is a fundamental tenet of the system theory. The systems theory also posits that individual systems within a given environment must constantly draw "renewed supplies of energy from other institutions or people or the material environment". Again, Table 4 dramatizes this tenet of the systems theory. From the table, it is evident that farmers and their farming systems relied on the I.A.R. and the National Seed Service as sources of supply of seeds. Here the output of the I.A.R. constitute a major input into farm systems within the northern states. This farm systems constantly draw "renewed supplies of energy" from the I.A.R. in the form of seeds and expert advice (See Table 4.4) The National Seed Service draws from the output of the I.A.R. in the form of improved seeds. This in itself is a source of "renewed energy" which gives support and meaning to the activities of the National Seed Service. Some kind of systems balance is maintained through this complex interactions.

From the field data on I.A.R. operations in the northern states, there is no doubt that the I.A.R. as a research institute has made contributions to agricultural development in Nigeria. However, it lacks an institutional or organizational framework for monitoring

the concerns of farmers and some of the inadequacies of its operations. This is required as an important and critical "feedback" loop into the I.A.R. as an open system. Based on this feedback it can rethink its operational mandates and strategies in order to maintain a high level of achievement in the field. To bring this feedback loop into existence, an evaluation unit to monitor the impact of I.A.R. research dissemination in the field is crucially needed. If this unit is created in the I.A.R., the dissatisfaction of farmers relative to the visits paid to them by extension workers could be monitored and ameliorated through action at the I.A.R. headquarters, See Table 4.12.

In "open systems", dynamics inputs can also be informational in character. These kinds of inputs "furnishes signals to the structure (the I.A.R.) about the environment" and about the way it operates in relation to that environment. The simplest category of "information inputs" found in every "open system", like the I.A.R. is negative feedback. And this ought to, and should be fedback to I.A.R. headquarters. This researcher's review of the literature on systems theory reveals that information feedback of a negative kind "enables the system to correct deviations from course". Stated differently, the feedback of negative information from farmers will enable the I.A.R., as an "open system", to correct for its malfunctioning or to institute changes

in the field (i.e farm environment) and thus achieve and maintain over a long time a "steady state of homeostatasis", which in practice translates into a dynamic rather than a static balance. Clearly this study reveals that this vital feedback loop is missing in the entire I.A.R. field research operations.

4.6 The I.A.R. Field Operations and Exogenous Inputs

As pointed out in section 4.5 above, the systems theory is characterized with the problems of relationships within the system and interdependence with other systems within its envornment. It was also stated that the I.A.R generates ideas and other material inputs to the various farmers and farming systems within its environment. In concluding this chapter it is also necessary to posit that the I.A.R. cannot supply all the inputs required by the farms and the farmers. Therefore, the I.A.R. cannot as a single institution be made accountable for all the failings of the farms and the farmers, just as it may not claim all credit for the positive feedback from the farms and farmers. The farmers and their farms are within an environment where exists other systems whose inputs, which are external to the I.A.R., are also required. These other systems include government ministries, Agricultural Development Programmes (ADPs) farmers' cooperative societies and even traditional associations such as age-groups and so on. This

observations is important because an institution may be efficient and yet ineffective in terms of results, especially where the failings of other factors (systems) do not compliment its efforts.

FOOT NOTES

1. Two of the extension workers were absent at the bi-monthly general meeting.

2. A 'tiya' is a local measure of weight. Forty 'tiyas' are equivalent to a standard bag of grains which weighs 100 Kilograms.

3. As a result of a 1987 reorganisation, all the Agricultural research institutions in the country now operate in states which are zoned to each of the institutes.

4. This figure is broken down to 41.6 per cent for I.A.R. and 37 per cent for the National Seed Service (See Table 4.1) The National Seed Service gets its seeds from the I.A.R., and so logically the I.A.R. accounts for the 79 per cent.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

Nigerian agriculture has been facing steady declines in development. In addition to other agricultural programmes, research institutes were set up to see to the improvement in agriculture.

This study evaluated the performance of the Institute for Agricultural Research (I.A.R.) at Samaru, Zaria, in order to see to what extent agricultural research policy goals have been met. In order to be able to evaluate the institute successfully, the objectives of improving farming systems, provision of good varieties of seeds, increased production of grains and higher income of the farmers were used. Also used were the objectives of effective use of agricultural extension agents and the teaching role of the I.A.R. staff. All these were used as the bases for the hypotheses to be tested.

The study used the questionaire method to obtain information from the farmers and the agricultural extension workers to determine to what extent the objectives of the institute have been attained. Personal interviews, discussions and documents were used to ascertain information about the teaching function of I.A.R. staff.

In applying the scientific method of investigation, the techniques of random sampling was adopted to select

The establishment of agricultural research institutes is a good policy of promoting agricultural development. In addition to this, the federal government should study the various ways of encouraging more Nigerians to go into farming. This will ensure more food at lower prices. Recently the federal government set up a committee to look into the causes of brain-drain. This researcher believes that an investigation into agricultural labour-drain is more urgent.

Areas for Further Research

In the course of this study certain gaps became open in some areas that call for further investigations.

There is the need to find out what proportions of the farmer's income is creditable to the impact of an agricultural research institute. The credibility of such a study may be higher if income indicators are used rather than only material possessions which this study used due to certain limitations.

The ownership or otherwise of farmland can determine the extent of or consistency in farming practices. It is necessary therefore to investigate land tenure factor in agricultural production in Nigeria.

Finally, illitracy has a delimiting influence on several economic activities, including agricultural industry. Therefore a study in the level of education and response to agricultural innovations is very worthwile.

REFERENCES

1. Atsu, S.Y., The Focus and Concentrate Programme in the Kpandu And Ho Districts (Legon, Technical Publications, Institute of statistical, Social and Economic Research, 1974).

2. Ascroft A. Roling, N. Karuiki J., and Chege, F. Extension And The Forgotten Farmer (Nairobi, Institute for Development Studies, University of Nairobi, 1973).

3. Brewer, G.D. and Deheon, P. Foundations of Policy Analysis (Home wood, Ilinois; The Dorsey Press, 1983)

4. Bauer, P.T. and Yamey B.S. Economics of Under-developed countries (Chicago, University of Chicago Press 1957).

5. Britton, D.D. and Hill, G., Size and Efficiency in Farming (Greshan Unwin Brothers Ltd., Gresham Press 1968).

6. Campbell, J.P.; Dunnette, M.D., Lawler, E.E. and Weick, K.E. Managerial Behaviour Performance and Effectivness (New York, McGraw-Hill Book Company, 1970).

7. Chapple E.D. and Sayles L.R., The Measurement of Management (New York, The MacMillan Company 1961).

8. Coplin, E.O. Management Efficiency (Delaware, Caxton Publishers 1977).

9. Carver, T.N., Elements of Rural Economics (Boston, University Press 1964).

10. Cole, J. The Poor of the Earth (London, MacMillan Press Ltd. 1976)

11. Cohrane, W.W., The World Food Problem: A Guardedly Optimistic View (New York Crowell Publishers Ltd 1969).

12. Cooper G.C. Agricultural Research in Tropical Africa (Dar Es Salleam, Nairobi East African Literature Bureau 1970).

13. Croyndon R.T. "Proceedings of the Legislature Council" (Speech need on 14th May 1924 in Kenya in the floor of the House of Representatives).

14. Casey A.H. "The Development and Evaluation of an Instrument for the Performance Review of County Extension Agents" (Ph.D. Dissertation Oklahoma State University 1961).

15. Dieter, E. (ed) The Planning And Management of Agricultural Research: A World Bank and ISNAR Symposium (Washington D.C. U.S.A., The World Bank 1961).

16. D'silva B.C., Raza M.R., Ejiga N.O. and Bogunjoko I.O. A Socio-Economic and Extension Survey of the Funtua Agricultural Development Project in Nigeria (Samaru, Zaria, Department of Agricultural Economics and Rural Sociology 1981).

17. Etzioni, A.W. "Two Approaches to Organisational Analysis: A Critique and Suggestion" in Administrative Quarterly (Vol. 5 1960).

18. Evenson, R.E. and Yoav, K. Agricultural Research and Productivity (New Haven, Yale University Press 1975).

19. Ernle, L. English Farming, Past and Present (London Heinemann Educational Books Ltd and Frank Cass & Co. Ltd., 1961).

20. Ebong, I.J. "The Role of Agriculture in Economic Development" in Proceedings of the National Agricultural Seminar (Ibadan, Nigeria, July 26 - August 5, 1971).

21. Ekpere, J.A. A Comparative Study of Job Performance Under Two Approaches to Agricultural Extension Organisation (Madison, Land Tenure Centre University of Winsconsin 1974).

22. Forrest, T. "Agricultural Policies in Nigeria 1900 - 1978" in J. Heyer, P. Roberts and G. Williams (eds) Rural Development in Tropical Africa (London, (London, MacMillan Press Ltd, 1981).

23. Federal Ministry of Economic Development, Federation of Nigeria National Development Plan 1962-1968. (Lagos Central Planning Office, 1962).

24. Federal Ministry of Economic Development, Second National Development Plan, 1970 - 74 (Lagos. Central Planning Office, 1970).

25. Federal Ministry of Economic Development, Second National Development Plan 1970-74. Progress Report (Lagos, Central Pla nning Office, 1970).

26. Federal Ministry of Economic Development, Third National Development Plan 1975 - 1980. (Lagos. Central Planning Office, 1975).

27. Federal Ministry of Economic Development Third National Development Plan 1975-1980: First Progress Report. (Lagos. Central Planning Office, 1975).

28. Federal Ministry of Economic Development Third National Development Plan 1975-1980. Project Summary (Lagos Central Planning Office, 1975).

29. Federal Ministry of Economic Development, Guidelines for the Fourth National Development Plan 1981 - 1985 (Lagos. National Planning Office 1981).

30. Federal Office of Statistics Research Institute Establishment order 1975 (Lagos. Trade Division 1957).

31. Food and Agricultural Organisation, Agricultural Development in Nigeria 1965 - 1980 (Rome. United Nations Organisation 1964).

32. Griffith J.A.G. (ed) From Policy to Administration: Essays in Honour of William A. Robson (London. George Allen and Unwin Ltd. 1976).

33. UNDP/FAC National Agricultural Report of an Evaluation Study of Selected Countries (Rome United Nations Organisation 1984).

34. Heady, E.O. Agricultural Policy Under Economic Development (Iowa, Iowa State University Press Iowa U.S.A. 1962).

35. Hardin, C. M. The Politics of Agriculture (Glenco. The Free Press Illinois 1952).

36. Helleiner, G.K. "Typology in Development Theory: The Land Surplus Economy (Nigeria)" in Food Research Institute Studies: Stanford University (Vol. 6. 1966).

37. Idachaba, F.S. Food Policy for Nigeria: Towards a Framework of Analysis (Ibadan Caxton Press, Agricultural Research Bulletin Vol. 1 No. 1980.

38. Institute for Agricultural Research I.A.R. General Research Policy (Samaru, Zaria Ahmadu Bello University 1972).

39. Johnson, B. Agricultural Development and Economic Transformation (Stanford University Press Ltd. 1960).

40. Jesness O.B. (ed) Readings in Agricultural Policy (Philadelphie Toronto. The Blackiston Company 1950).

41. Jorgensen, J.J., "Multinational Corporations and the Indegenisation of the Kenyan Economy" (A paper presented at IDEP Conference on "Multinational Corporations in Africa" in September 25 - Oct. 3rd 1974 at Nairobi, Kenya.

42. Katz D. and Kahn R., The Social Psychology of Organisations (New York. John Wiley & Sons 1966).

43. Logehem S.V., The Tora Experiment (Freetown, University Press Ltd., Okan 1972).

44. Lapedes D.N., (ed) McGraw Hill Encyclopaedia of Science and Technology (New York. McGraw Hill Inc. Vol. 1 1971).

45. Mutsaers H.J.W., Fisher N.M., Vogel W.O. and Palada M.C. A Field Guide for On-Farm Research (New York. Frobin Publishers Ltd, 1968).

46. Martins M. Teach Yourself Public Administration (London. The English University Press 1949).

47. Mellor, J.W. Economics of Agricultural Development (Ithaca and London. Cornell University Press 1971).

48. Mbithi P.M. Issues in Rural Development (Nairobi Institute for Development Studies, University of Nairobi 1972).

49. Mosher P., Creating a Progressive Rural Structure: To Serve Modern Agriculture (New York. Agricultural Development Inc. 1969).

50. Nze, F.C. "Agricultural Development Policy in Nigeria (1975 - 1980): Goals, Objectives, and Performance" in Philipine Journal of Public Administration (Vol. xxvi January, 1982).

51. Omo-Fadaka, Ideologies and Strategies of Rural Development: A Critique (Benin City. Ethiope Publishers 1977).

52. Olayide S.O. "Agricultural Policy of the Military Era 1966 - 1979" in F. Kayode (ed) The Nigerian Economy Under the Military (Kano Proceedings of the 1980 Annual Conference of the Nigerian Economic Society 1982).

53. Olatunbosun, D. Nigeria's Neglected Rural Majority (Ibadan. Oxford University Press 1975).

54. Obeng A. "Rural Development For What?" (A paper presented at the Workshop on "Rural Environment in South Africa" at Gaboronne, Botswana 12th-24th July 1978.

55. Olatunbosun D. and Olayide S.O. "Social - Economic Implications of Nigeria's Second National Development Plan 1970-1974" in The Quarterly Journal of Administration. (Vol. 5 No.3 April, 1974).

56. Olatunbosun D., "Rural Development in Africa - An Integrated Approach" in Olatunbosun D. (Ed) Rural Development In Africa - Proceedings of an International Conference (Ibadan Oxford University Press 1977)

57. Poister, T. H. Public Programmes Analysis: Applied Research Methods (Baltimore. University Park Press 1978).

58. Rutman L. Evaluation Research Methods: A Basic Guide (London. Sage Publications, Beverly Hills 1977)

59. Raper A.F. Rural Development In Action (Ithaca and London. Cornell University Press 1970).

60. Rahim S.A. "The Comilla Programme In East Pakistan in Clifton R.W. (Ed) Subsistence Agriculture and Economic Development (London. Frank Cass & Co. Ltd., 1970.)

61. Rodney, W. How Europe Under-developed Africa (Dar-es-salaam Publishing House 1972).

62. Suchman, A.E. Evaluative Research: Principles and Practice in Public Service and Social Action Programmes (New York. Russel Sage Foundation, 1967).

63. Smith T.C. The Agrarian Origin of Japan (Stanford. Stanford University Press California 1959).

64. Shiverly B.E., "The Study and Development of Two Merit Rating Devices for use by Supervisors to Rate cooperations Extension workers" (Master Thesis, Purdue University, Lafayette, Indiana 1958).

65. Schaffer B.B. "The Dead locak in Development Administration" in Leys C. (ed) Politics and Change in Developing Countries: Studies Theory and Practice of Development. (Cambridge, Cambridge University Press. 1969).

66. Troyer, D.R. "An Analysis of the Paired Comparison Rating Technique for Promotions Transfers and salary Increases of Agricultural Extension Workers in Indiana" (Masters Thesis, University of Wisconsin Madison 1960).

67. Vercruijsse J. and Boyd J., Effects of the Tora Agricultural Institute on Farm Practices and Attitudes of Tora Locality (Freetown. Central Bureau of Research Organisation, Sierra Leone 1970).

68. Williams S.T. and Alao J.A. Evaluation of the Rice/ Maize Project of the USAID/Ministry of Agriculture and Natural Resources, Western State, Nigeria (Ife. Department of Extension Education and Rural Sociology, Faculty of Agriculture University of Ife 1972).

69. Williams, S.K.T. "Rural Poversity to Rural Prosperity: A Strategy for Development In Nigeria" (Ibadan. Inaugural Lecture Series 115 University of Ibadan July 2nd 1973).

APPENDIX A

PERSONAL AND BACKGROUND CHARACTERISTICS OF THE FARMERS

A 1.

Age of Respondents

N = 197

Age	Number	Per cent
20 years and below	7	3.5
21 - 30 years	7	3.5
31 - 40 years	50	25.3
41 - 50 years	60	30.4
50 and above	73	37.0
	197	100.0

A 2.

Level of Education

N = 197

	Number	Per cent
Did not attend school	105	53.2
Primary School incomplete	50	25.3
Primary School completed	30	15.2
Vocational Training School	2	1.0
Adult Education Classes	5	2.5
Secondary School	5	2.5
	197	100.0

Source: Derived from researchers' survey.

A 3.

Length of Farming Experience by Village

N = 197

Period	Village			Total	Percent
	Minjibir 88	Bakura 63	Kadawa 46		
Less than 5 years	1	1	5	7	3.5
5 - 10 yrs	3	10	2	15	7.6
11 - 15 yrs	8	9	3	20	10.1
16 - 20 yrs	20	10	2	32	16.2
Over 20 yrs	52	34	30	116	58.8
No Response	5	0	2	7	3.5
	89	64	47	197	100

Source: Derived from Survey of the Researcher.

APPENDIX A (Cont'd)

A 4.

PERCENTAGE SIZE DISTRIBUTION OF FARMS BY VILLAGE
N = 197

Size Group (Hectres)	Minjibir		Bakura		Kadawa		Total	
	No. of Farms	% of Farms	No. of Farms	% of Farms	No. of Farms	% of Farms	No. of Farms	% of Farms
	20	10.1	19	9.6	13	6.5	52	26.3
2 5	47	23.8	31	15.7	30	15.2	108	54.8
5 10	10	5	10	5	3	1.5	23	11.6
10 20	9	4.5	3	1.5	0	0	12	6
20 and over	2	1	0	0	0	0	2	1
	88		63		46		200	100

2 - 3 acres = 1 Hectre

Source: Derived from Researchers survey.

APPENDIX A Cont'd

A 5.

PERCENTAGE BY MEDIUM OF COMMUNICATION

N = 197

Medium	No.	Percent
English Language (Fluent)	9	4.5
English Language (Smattering)	41	21
Hausa	147	74.5

Source: Derived from Survey of the Researcher

A 6.

PERCENTAGE BY FREQUENCY OF VISITS

N = 197

Frequency	No.	Percent
Very Often	56	28.5
Occasionally	137	69.5
None	4	2

Source: Survey by the Researcher.

APPENDIX A CONT'D

A 7.

PERCENTAGE BY FARMING OPERATIONS ASSISTED IN

N = 197

Operation	No.	Percent
Ploughing of Land	3	1.5
Seed Treatment before planting	64	32.5
Planting Method	99	50.5
The Use of Fertilizers	166	84.5
Knowledge of Minimum weeding requirements	90	45.5
Harvesting Method	92	46.5
Storage Methods	101	51.5
Practical Demonstrations		

Source: Derived from Survey of the Researcher.

A 8.

AGRICULTURAL EXTENSION WORKERS BY PERSONAL AND BACKGROUND CHARACTERISTICS

N = 19

Characteristics	No.	Percent
1. Age		
21 - 25 Years	1	1.2
26 - 30 "	3	15.7
31 - 35 "	14	73.6
36 - 40 "	1	1.5
Over 40 Years		
2. Education		
I. Formal Training		
Primary School		
West African School Cerfiticate / General Certificate in Education	17	89.4
School of Agriculture Diploma	1	5.2
Other	15	78.9

Δ 8.Cont'd

Characteristics	No.	Percent
2. In-Service Training		
Yes	15	78.9
No	4	21
3. Present Job Title		
Field Demonstrator/Overseer	5	26.3
Agricultural Assistant	13	68.4
Agricultural Supretendent	1	5.2
4. Previous Occupation		
None	14	73.6
Teaching	1	5.2
Clerical Work	4	21
Daily Paid Labourer		
5. Tenure		
I. Years in Agricultural Extension		
2 - 5 Years	1	5.2
6 - 10 "	18	94.7
11 - 15 "		
Over 15 Years		
II. Years in Present Position		
2 years or less	0	0
3 - 5 years	0	0
6 - 9 years	1	5.2
Over 9 years	18	94.7

A 8. Cont'd

Characteristics	No.	Percent
III. Years in Present Location		
2 years or less	0	0
3 - 4 years	0	0
Over 4 years	19	100
6. Rural/Urban Background		
I. On a farm	0	0
In a Village	0	0
In a small town	17	89.4
In a city	2	10.5
II. Location of School Attended		
Urban Area	12	63.1
Rural Area	7	36.8
7. Fluency in Languages		
English	19	100
Hausa	19	100
Arabic	0	0

Source: Derived from survey of the researcher.

APPENDIX A

A 9.

AGRICULTURAL EXTENSION WORKERS BY OWNERSHIP OF TRANSPORTATION

N = 19

Transportation	No.	Percent
1. Motor Vehicle	1	5.2
2. Motor Cycle	4	21
3. Bicycle	10	56.6
4. Canoe	0	0
5. Horse	0	0
6. Donkey	0	0
7. None	54	21

Source: Derived from Survey of the Researcher

A 10.

NUMBER AND PERCENTAGE OF DIFFICULTIES MENTIONED BY AGENTS.

N = 19

Difficulties Mentioned	No.	Percent
1. Lack of transport facilities and limited mileage claims	16	84.2
2. Non-payment of mileage claims	10	52.6
3. Supply of Fertilizer and other planting materials not arriving in good time	14	73.6
4. No encouragement of incentive to staff doing good work	3	15.7
5. Shortage of staff	7	36.7
6. Roads not motorable when one needs to visit farmers	12	63.1
7. Cost of essential packages like fertilizer, seeds, fungicides etc too high for the farmers.	15	78.9

Source: Derived from survey of the Researcher.

APPENDEX B

THE QUESTIONAIRE , INTERVIEW, QUESTIONS FOR FARMERS

PERSONAL AND SOCIO-ECONOMIC CHARACTERISTICS

1. Village Town Hamlet District Local Govt. Area

2. Approximate Age:

(a) Under 20 years ____

(b) 20 - 30 " ____

(c) 31 - 40 " ____

(d) 41 - 50 " ____

(e) 50+ ____

3. Number of wives ____

Number of Children: Male ____

Female ____

Ages of Children: ____

	Male	Female
Age of the eldest		
Age of the youngest		

4. Occupation.

(a) Indicate whether you are full-time or part-time farmer.

Full-Time ____

Part-Time ____

(b) If part-time, what other occupation do you have? Please state briefly

____

____

5. Education

Which of the following applies to you?

(a) Did not attend school ____

(b) Primary School incomplete ____

(c) Primary school completed ____

(d) Vocational training school ____

(e) Adult Education classes ____

(f) Secondary grammar school ____

6. How can you read and write the following languages?

(a)

	Very Well	Adequately	Little	Not at all
(a) Arabic				
(b) Hausa				
(c) English				

7. Do you belong to: ____ Yes ____ No

(a) Young Farmer's Club ____ Yes ____ No

(b) Cooperative Society ____ Yes ____ No

(c) Farmers Council ____ Yes ____ No

(d) Others, Please specify _____

_____

8. For how many years have you been fully or partly engaged in farming?

	Fully	Partly
Less than 5 years	____	____
5 - 10 years	____	____
11 - 15 "	____	____
16 - 20 "	____	____
Over 20 years	____	____

9. How large is your farm? Please tick off whichever applies.

   Less than 5 hictres

   5 - 10 hectres

   11 - 15 hectres

   16 - 20 hectres

   Over 20 hectres

10. Does the land on which you farm belong to you or on lease?

    ____ Mine ____ On lease

11. Have you benefited from any form of loan?

    (a) ____ Yes ____ No

    (b) If yes, indicate the source of the loan

    Bank ____

    Other organization ____

    A Friend ____

12. How often do you cultivate the following crops?

	Yearly	Occasionally	Not at all
Guinea Corn			
Millet			
Soya beans			
Groundnuts			
Sorghum			
Wheat			
Maize			
Barlly			
Cowpea			
Rice			

13. Are you aware of the Institute for Agricultural Research at Samaru, Zaria?

Very much	Not much	No

(b) If you are aware, how did you become aware?

Through radio ____
Through Television ____
Through Newspapers ____
By visiting the place ____
Through officials coming to our locality ____
Through a friend ____
Any other means, please indicate:

_____

_____

14. In the cultivation of any of the crops above do you obtain assistance from the I.A.R.?

(a) ____ Yes ____ No

(b) What nature of assistance?

Advice ____
Improved seeds ____
Field demonstration ____
None ____

(c) If advice, what nature of advice?

Method of planting ____
Time to plant ____

Choice of fertilizer ____

How to harvest ____

Any other - Indicate please_____

_____

(d) On which of the crops do you seek advice? Please tick off.

Guinea corn
Millet
Soya beans
Groundnuts
Sorghum
Wheat
Maize
Barley
Cowpea
Rice

15. When was your first contact with I.A.R.? State the year.

_____

(b) State or estimate the number of bags or weight of the crop you harvested five years before and five years after that date.

	BEFORE			AFTER		
	1st yr Bags Kilos	2nd yr Bags Kilos	3rd yr Bags/ Kilos	1st yr Bags Kilos	2nd yr Bags Kilos	3rd yr Bags/ Kilos
Guinea corn						
Millet						
Soya beans						
Groundnuts						
Sorghum						
Wheat						
Maize						
Barley						
Cowpea						
Rice						

16. In terms of output, indicate whether it was higher or lower

	Before		After	
	Higher	Lower	Higher	Lower
Guinea corn				
Millet				
Soya beans				
Groundnuts				
Sorghum				
Wheat				
Maize				
Barley				
Cowpea				
Rice				

(b) Do you harvest more or less grains whenever you plant seeds you get from I.A.R.?

Higher ____

Lower ____

No Idea ____

17. When you harvest your crops how much of it do you store or sell or consume?

	Much	Little	None
Storage			
Sales			
Consumption			

18. How do you store your crops?

Traditional way ____

Modern way ____

(b) If modern way, who gave you the idea?

I.A.R.	____
State Ministry of Agriculture	____
A Friend	____

(c) How much crops do you lose yearly due due to problems of storage? Just tick off.

Much	____
Little	____
None	____

19. Which of the following items did you acquire before or after you came in contact with the I.A.R.?

	Before	After
Wristwatch	____	____
Wooden Bed	____	____
Iron Bed	____	____
Matress	____	____
Radio	____	____
Television	____	____
Bicycle	____	____
Mobylette	____	____
Motocycle	____	____
Car	____	____
Horse	____	____
Cattle	____	____
Tractor	____	____
House	____	____

20. Do you use fertilizers in your farming practice?

(a) ___ Yes ___ No

(b) From what source do you get it?

i) I.A.R. ___

ii) State Ministry of Agriculture ___

iii) Open market ___

(c) Do you get it when you need it?

___ Yes ___ No

21. From what source do you obtain the seeds you plant?

I.A.R. ___

National Seed Service ___.

Open Market ___

Others, (indicate please_____

_____

22. Do you use any modern farm equipment?

(a) ___ Yes ___ No

(b) What types? Please indicate _____

_____

(c) When did you start the use of such equipment? State the year.

_____

(d) How did you get the idea?

I.A.R. ___

Ministry of Agriculture ___

Other ___

23. How often do officials of the I.A.R. (Extension Workers) visit your farm?

Very often ____
Occasionally ____
Not at all ____

24. What is the meduim of communication between you and the officials?

English ____
Hausa ____
Others (indicate)_____

_____

(b) In yearly visits to your farms, is it the same persons or different persons?

Same ____
Different ____

25. In which of the following operations do the extension workers assist you?

(a) Ploughing of land ____
(b) Seed treatment before planting ____
(c) Planting method ____
(d) The use of fertilizers. The best time, the suitable type and the dose ____
(e) Knowledge of minimum weeding requirements ____
(f) Harvesting method ____
(g) Storage methods ____
(h) Practical demonstration ____

APPENDIX C

THE QUESTIONAIRE
INTERVIEW QUESTIONS FOR EXTENSION WORKERS

PERSONAL CHARACTERISTICS

1. Age range.

   21 - 25 years ____
   26 - 30 years ____
   31 - 35 years ____
   36 - 40 years ____
   Over 40 years ____

2. Educational Attainment

   (a) Formal Training

   Primary school ____
   West African School Certificate ____
   General Certificate of Education ____
   School of Agriculture Certificate ____
   School of Agriculture Diploma ____
   Other (Specify) _____

   _____

   (b) Have you undertaken any in-service training?

   ____ Yes ____ No

3. What is your present job title?

   Field Demonstrator/Overseer ____
   Agricultural Assistant ____
   Agricultural Superintendent ____

4. What was your previous occupation?

None ____
Teaching ____
Clerical Work ____
Daily Paid Worker ____

5. For how many years have you been in Agricultural Extension?

2 - 5 years ____
6 - 10 years ____
11 - 15 years ____
Over 15 years ____

6. What has been your rural or urban background?

Living on a farm ____
Living in a village ____
Living in a small town ____
Living in a city ____

7. How fluent are you in the following languages?

	Very much	Little	None
English			
Hausa			
Arabic			

8. Do you render the following assistance to the farmers?

(a) Demonstrating how to apply fertilizers

____ Yes ____ No

(b) Cultural activities like thinning, spacing etc.

___ Yes ___ No

(c) Supply and distribution of planting materials

___ Yes ___ No

(d) Helping to select suitable land.

___ Yes ___ No

(e) Seed Bed preparation

___ Yes ___ No

(f) Variety of seed to use

___ Yes ___ No

(g) When and how to weed Crops

___ Yes ___ No

(h) Disease and pest control measures

___ Yes ___ No

(i) Loan and credit facilities

___ Yes ___ No

(j) Storage of Crops

___ Yes ___ No

9. Do the farmers obtain the assistance when they need it?

___ Yes ___ No

(b) If not please explain briefly why

_____

_____

_____

10. What means of transport do you have?

Motor vehicle	____
Motor cycle	____
Bicycle	____
Canoe	____
Horse	____
Donkey	____
None	____

11. How many visits or meetings are you able to pay the farmer to listen to their problems?

	Many	Few	None
Prior to Planting			
After Planting			

12. What general problems do you face in your extension work both in the field and the office?

_____

_____

13. Can you make suggestions and recommendations?

APPENDIX D

NIGERIAN AGRICULTURAL RESEARCH INSTITUTES

There are 24 research institutes in Nigeria but the following are related to food and agriculture:

1. Institute for Agricultural Research (I.A.R.), Samaru, Zaria, Kaduna State.
2. Cocoa Research Institute of Nigeria (CRIN), Onigambari, Ibadan, Oyo State.
3. National Cereals Research Institute, NCRI, Badaggi, Bida, Niger State.
4. National Horticultural Research Institute, (NHRI) Idi-Ishin, Ibadan, Oyo State.
5. National Root Crops Research Institute (NRCRI), Umudike, Umuchie, Imo State.
6. Nigerian Stored Products Research Institute (NSPRI) Yaba, Lagos, Lagos State.
7. Institute for Agricultural Research and Training (IAR&T), Moor Plantation, Ibadan, Oyo State.
8. Rubber Research Institute of Nigeria (RRIN) Iyanomo, Benin City, Bendel State.
9. Nigerian Institute for Palm Oil Research (NIFOR) Benin City, Bendel State.
10. National Animal Production Research Institute (NAPRI) Shika, Zaria, Kaduna State.
11. *Federal Institute for Industrial Research (FIIRO) Oshodi, Lagos, Lagos State.
12. **Agricultural Extension and Liaison Services (AERLS) Samaru, Zaria, Kaduna State.

* Now conducts research into some food items as industrial base e.g. garri.

** Now serves all the agricultural research institutes in the country.

APPENDIX F

ABBREVIATIONS OF RESEARCH INSTITUTES SET UP BY THE 1975 RESEARCH INSTITUTES ESTABLISHMENT ORDER

1.	NCRI	National Cereals Research Institute
2.	NRCRI	National Root Crops Research Institute.
3.	NIHORT	National Institute for Horticultural Research.
4.	CRIN	Cocoa Research Institute of Nigeria
5.	RRIN	Rubber Research Institute of Nigeria
6.	NIFOR	Nigerian Institute for Palm Oil Research
7.	FRIN	Forestry Research Institute of Nigeria.
8.	NVRI	National Veterinary Research Institute.
9.	NAHRI	National Animal Production Research Institute.
10.	NITR	Nigerian Institute for Trypanosomiasis Research.
11.	LRIN	Leather Research Institute of Nigeria
12.	LCRI	Lake Chad Research Institute
13.	KLRI	Kainji Lake Research Institute
14.	NIOMR	Nigerian Institute for Oceanography and Marine Research.

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