Bibliographical Control In The Field Of Agriculture In Nigeria - A Study Of Demand And Availability

Georgiana Kiente Nwagha

Follow this and additional works at: https://ir.lib.uwo.ca/digitizedtheses

Recommended Citation
Nwagha, Georgiana Kiente, "Bibliographical Control In The Field Of Agriculture In Nigeria - A Study Of Demand And Availability" (1983). Digitized Theses. 1266.
https://ir.lib.uwo.ca/digitizedtheses/1266

This Dissertation is brought to you for free and open access by the Digitized Special Collections at Scholarship@Western. It has been accepted for inclusion in Digitized Theses by an authorized administrator of Scholarship@Western. For more information, please contact tadam@uwo.ca, wlswadmin@uwo.ca.
NOTICE

The quality of this microfiche is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us a poor photocopy.

Previously copyrighted materials (journal articles, published tests, etc.) are not filmed.

Reproduction in full or in part of this film is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30. Please read the authorization forms which accompany this thesis.

THIS DISSERTATION HAS BEEN MICROFILMED EXACTLY AS RECEIVED

AVIS

La qualité de cette microfiche dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de mauvaise qualité.

Les documents qui font déjà l'objet d'un droit d'auteur (articles de revue, examens publiés, etc.) ne sont pas microfilmés.

La reproduction, même partielle, de ce microfilm est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30. Veuillez prendre connaissance des formules d'autorisation qui accompagnent cette thèse.

LA THÈSE A ÉTÉ MICROFILMÉE TELLE QUE NOUS L'AVONS REÇUE
BIBLIOGRAPHICAL CONTROL IN THE FIELD OF AGRICULTURE IN NIGERIA
- A STUDY OF DEMAND AND AVAILABILITY

Prepared by:
Georgiana Kiente Ngeri Nwagha

SCHOOL OF LIBRARY AND INFORMATION SCIENCE

Submitted in Partial Fulfillment of the requirements for the degree of Doctor of Philosophy

Faculty of Graduate Studies
The University of Western Ontario
London, Canada

April, 1983

© Georgiana K. N. Nwagha 1983
ABSTRACT

A survey of eighteen Nigerian agricultural research institute libraries and the researchers using these libraries was undertaken to determine the effectiveness of the document delivery system in use. The original hypothesis—that fifty percent of demands for scientific documents made by agricultural research scientists in Nigeria are not satisfied—was found to be untenable. Survey data showed that in a majority of libraries, research scientists suppressed some of their demands. These suppressed demands frequently involved publications not stocked in the libraries. The high satisfaction ratios recorded by three quarters of the libraries did not reflect the true availability situation and was therefore not valid for purposes of testing the hypothesis.

Barriers to the availability of scientific publications to research scientists were identified. They include financial and infrastructural barriers such as inadequate funding, stringent foreign exchange regulations, poor communication systems and inadequate photocopying and translation facilities. However, in spite of these common barriers, the survey data indicated a marked difference among the libraries in the availability levels of publications to researchers. This difference was associated with the presence or absence of a professional reference librarian at the libraries.
Two initial assumptions were then converted into null hypotheses: that no relationship exists between the rank or qualification of the reference staff and (1) the location which materials were obtained to satisfy demands made by scientists or (2) the type of questions asked by research scientists. Tests of these hypotheses showed a strong relationship between professionalism and location of materials as well as type of questions. It appears therefore that the deployment of non-professional reference personnel in research libraries is one of the key barriers to the availability of publications to research scientists in Nigeria.
ACKNOWLEDGEMENTS

I would like to thank everyone at the School of Library and Information Science, the University of Western Ontario for their support during this research. In particular, I wish to express my sincere gratitude to the members of my advisory committee, especially Dr. W.J. Cameron, my principal advisor, who willingly gave of his time to direct my research efforts, and Dr. Elaine Svenonius my first principal advisor, who helped me to focus on my topic. I also thank Dr. Janet Fyfe and Dr. Wilson Aiyepetu, my supervisors who painstakingly read through my drafts and gave suggestions for improvements. I am grateful to Mr. Jason Farradane for his many encouraging words and proof reading of my work. A special thanks to my husband, Herbert and my children for their support and understanding throughout my studies. I also thank the Federal Government of Nigeria for awarding me a Scholarship and making it possible for me to study in Canada, and all those friends who gave me moral and financial support.
# TABLE OF CONTENTS

.CERTIFICATE OF EXAMINATION ........................................... ii

ABSTRACT ................................................................. iii

ACKNOWLEDGEMENTS ....................................................... v

TABLE OF CONTENTS ........................................................ vi

LIST OF TABLES ................................................................ viii

LIST OF FIGURES ................................................................ ix

LIST OF APPENDICES .......................................................... x

LIST OF ABBREVIATIONS ..................................................... xi

CHAPTER I  BACKGROUND AND STATEMENT OF OBJECTIVES

1. Importance of Scientific and Technical Information for Developing Countries ... 1

2. Universal Bibliographic Control ............... 4

3. Universal Availability of Publications ......................... 7

4. Objectives of the Study ............................... 13

5. Definitions .................................................... 15

CHAPTER II  AGRICULTURE AND THE NIGERIAN ECONOMY

1. The Economy of Nigeria ............................... 17

2. The Role of Information in Agricultural Research ........................................... 19

3. The Need to Determine the Model of Information Network Suitable for Nigeria ............... 24

CHAPTER III  RELATED RESEARCH

1. Introduction ....................................................... 35

2. Document Delivery Test .............................. 35

3. Satisfaction of Potential Demands ............... 37

4. Effects of Delay in Supplying Publications ........................................... 38

5. Formal Library training and Reference Efficiency .............................. 42

6. Relationships Between Quantifiable Reference Service Variables and Reference Performance ........................................... 44

7. Performance of Professionals and Non-Professionals in the Reference Interview ........................................... 45

CHAPTER IV  METHODOLOGY

1. Introduction ....................................................... 49

2. Data-Collection Instruments .............................. 53

3. Survey Population ....................................................... 57

4. Response to the Questionnaires ........................................... 59

vi
CHAPTER V   DATA ANALYSIS
1. Library Survey .................................. 65
2. Opinion Survey .................................. 71
3. Barriers to the Availability of
   Scientific Publications .......................... 77
4. Literature of Interest to Agricultural
   Scientists ...................................... 83
5. Hypotheses Testing .............................. 86

CHAPTER VI   THE DEPLOYMENT OF PROFESSIONAL LIBRARIANS
AND ITS EFFECTS ON THE AVAILABILITY OF
SCIENTIFIC PUBLICATIONS
1. Introduction .................................... 97
2. Purpose of Interview Questions .............. 101
3. Analysis of Data Obtained From the
   Interviews .................................... 104

CHAPTER VII  SUMMARY OF FINDINGS AND SUGGESTIONS FOR
FURTHER RESEARCH
1. Summary of Findings ............................ 122
2. Suggestions for Further Research .......... 133

BIBLIOGRAPHY ........................................ 138
APPENDICES .......................................... 143
CURRICULUM VITAE ................................ 170
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Proportion of Satisfied Demands</td>
<td>67</td>
</tr>
<tr>
<td>2</td>
<td>Satisfaction Time</td>
<td>67</td>
</tr>
<tr>
<td>3</td>
<td>Source From Which Materials Were Obtained to Satisfy Demands</td>
<td>69</td>
</tr>
<tr>
<td>4</td>
<td>Information-Seeking Behaviour of Agricultural Research Scientists</td>
<td>74</td>
</tr>
<tr>
<td>5</td>
<td>Reported Sources for Obtaining Translations</td>
<td>75</td>
</tr>
<tr>
<td>6</td>
<td>Cross Tabulation of Rank of Recording Officer by Source of Document</td>
<td>92</td>
</tr>
<tr>
<td>7</td>
<td>Cross Tabulation of Rank of Recording Officer by Type of Question Asked</td>
<td>94</td>
</tr>
<tr>
<td>8</td>
<td>Reasons for the Suppression of Demands for Documents Not Held in Institute Library</td>
<td>107</td>
</tr>
<tr>
<td>9</td>
<td>Suggestions for Improved Access to Documents</td>
<td>121</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>1</td>
<td>Models for Inter-Library Lending</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>Histogram of Satisfaction Time</td>
<td>68</td>
</tr>
<tr>
<td>3</td>
<td>Reasons for Failure to Satisfy Demands</td>
<td>72</td>
</tr>
<tr>
<td>4</td>
<td>Researchers' Expressed Need to Consult the Literature</td>
<td>72</td>
</tr>
<tr>
<td>5</td>
<td>Reasons for Dissatisfaction with Inter-Library Loan Service</td>
<td>74</td>
</tr>
<tr>
<td>6</td>
<td>Reported Reasons for Dissatisfaction with Translations</td>
<td>76</td>
</tr>
<tr>
<td>7</td>
<td>Extent to Which Time Lag Affects Work of Research Scientists</td>
<td>76</td>
</tr>
<tr>
<td>8</td>
<td>Major Additional Services Required from Institute Libraries</td>
<td>78</td>
</tr>
<tr>
<td>9</td>
<td>Suggestions for Improved Access to Documents Needed</td>
<td>79</td>
</tr>
<tr>
<td>10</td>
<td>Means of Communication with Source Library for Inter-Library Loan</td>
<td>84</td>
</tr>
</tbody>
</table>
# LIST OF APPENDICES

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix I</td>
<td>Some Attributes of the Research Institutes Surveyed</td>
<td>143</td>
</tr>
<tr>
<td>Appendix II</td>
<td>Record of Demands Made in Research Libraries</td>
<td>145</td>
</tr>
<tr>
<td>Appendix III</td>
<td>Questionnaire for the Opinion Survey of Agricultural Research Scientists</td>
<td>147</td>
</tr>
<tr>
<td>Appendix IV</td>
<td>Coded Library Survey Questionnaire</td>
<td>150</td>
</tr>
<tr>
<td>Appendix V</td>
<td>Coded Opinion Survey Questionnaire</td>
<td>152</td>
</tr>
<tr>
<td>Appendix VI</td>
<td>Letter to Research Library Personnel</td>
<td>155</td>
</tr>
<tr>
<td>Appendix VII</td>
<td>Letter to Agricultural Research Scientists</td>
<td>156</td>
</tr>
<tr>
<td>Appendix VIII</td>
<td>Letter of Request to Administrative Heads of Agricultural Research Institutes for a Comprehensive List of Research Staff</td>
<td>157</td>
</tr>
<tr>
<td>Appendix IX</td>
<td>Interview Questions for Librarians</td>
<td>158</td>
</tr>
<tr>
<td>Appendix X</td>
<td>Interview Questions for Research Scientists</td>
<td>160</td>
</tr>
<tr>
<td>Appendix XI</td>
<td>Brief History of Agricultural Research Institutes Surveyed</td>
<td>162</td>
</tr>
</tbody>
</table>
# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRICOLA</td>
<td>Agricultural On-Line Access. Formerly CAIN (Cataloguing and Indexing Systems of the National Agricultural Library)</td>
</tr>
<tr>
<td>AGLINET</td>
<td>Agricultural Libraries Information Network</td>
</tr>
<tr>
<td>AGRIS</td>
<td>Agricultural Information System</td>
</tr>
<tr>
<td>ALA</td>
<td>Associate of the Library Association</td>
</tr>
<tr>
<td>BLLD</td>
<td>British Library Lending Division</td>
</tr>
<tr>
<td>CAB</td>
<td>Commonwealth Agricultural Bureaux</td>
</tr>
<tr>
<td>CAN/SDI</td>
<td>Canadian Selective Dissemination of Information</td>
</tr>
<tr>
<td>COSTED</td>
<td>Committee on Science and Technology in Developing Countries</td>
</tr>
<tr>
<td>DEVSIS</td>
<td>Development Sciences Information System</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
</tr>
<tr>
<td>FLA</td>
<td>Fellow of the Library Association</td>
</tr>
<tr>
<td>IFLA</td>
<td>International Federation of Library Associations</td>
</tr>
<tr>
<td>MEDLARS</td>
<td>Medical Literature Analysis and Retrieval System</td>
</tr>
<tr>
<td>MEDLINE</td>
<td>MEDLARS-On-Line Service provided by National Library of Medicine</td>
</tr>
<tr>
<td>MLS</td>
<td>Master of Library Science</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical package for the Social Sciences</td>
</tr>
<tr>
<td>UAP</td>
<td>Universal Availability of Publications</td>
</tr>
<tr>
<td>UBC</td>
<td>Universal Bibliographic Control</td>
</tr>
<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
</tr>
</tbody>
</table>
CHAPTER I

BACKGROUND OF THE STUDY

1. IMPORTANCE OF SCIENTIFIC AND TECHNICAL INFORMATION FOR DEVELOPING COUNTRIES

Despite the rapid advances being made in science and technology in the world today, most inhabitants of the Third World countries still remain under conditions of extreme poverty. They live in crowded, unhygienic conditions, and are plagued with problems of malnutrition and ill-health. Young children daily go permanently blind owing to lack of sufficient vitamin intake, and wide-spread disease and deformity among large masses of people is a common sight. Summing up the situation, S. Radhakrishna, said that "the problem of developing countries now is one of mass poverty, illiteracy, ill-health, frequently returning floods, droughts and famine conditions and rapidly dwindling natural resources" (43).

Modern advances in science and technology have not significantly affected this state of affairs in developing countries, and this, unfortunately, cannot be attributed to a lack of scientific knowledge, or even of scientific infrastructures. Many of the developing countries now have a sound scientific personnel and basic infrastructure. India, for example, has excelled in the field of electronics and computers and even has the capacity to produce fuel elements for atomic reactors (43).
Nigeria has over 40,000 scientists, engineers and technicians (54), many of whom are engaged in research and experimental development in the country. She also has a steel mill at Ajaokuta as well as a number of manufacturing and industrial plants. Despite these seeming advancements, per capita income of Nigeria, like that of many other developing countries, is still low at $333.00 (52). What is more, conditions of appalling poverty still exist side by side with such technological achievements. Thus the ability to adapt scientific knowledge to meet human requirements and needs in the developing countries seems to be lacking.

Consequently, Radhakrishna (43) argues that progress in developing countries will depend to a large extent on application of science for solving their problems. He further argues that the application of science, usually referred to as transfer of technology, should be based on local materials and local competence. Information regarding the availability of relevant technologies and their possible socio-economic impact is of great importance for solving the immediate problem of providing for basic, human needs in developing countries.

Realization of the relationship between application of science and development led to the constitution of COSTED (43) in 1966. COSTED is a special scientific committee of the International
Council of Scientific Unions on Science and Technology in Developing Countries. It is a non-governmental body financed by UNESCO. Its primary task is to promote the use of science and technology for solving problems of developing countries.

COSTED attributes the gap between science as it is practised in the research institutes and low standards of human life styles in developing countries in part to ineffective science information dissemination. Consequently, COSTED has as one of its aims popularization of scientific information both in urban areas and more particularly among the large rural population.

In many developing countries, the significance of scientific information as a factor in development is not appreciated because information is not disseminated to the rural areas in an appropriate form. For example, despite information available on the causes of intestinal diseases, rural dwellers in many developing countries are still ignorant of simple precautionary methods; similarly, they do not realize the relationship between nutrition and some types of blindness. Information on new scientific developments such as cheap and durable construction materials, effective methods of destroying agricultural pests, and other matters which could have an impact on the quality of life does not get conveyed to the people who would benefit by it. The great importance of access
to scientific and technical information was tragically exemplified in one of the Ujamaa villages of Tanzania when, in 1976, the village lost half of its dairy cows (13). It was later discovered that this loss could have been avoided by spraying the animals with some anti-pest chemicals but the villagers did not know the remedy until it was too late. Similar agricultural disasters such as the loss of hundreds of poultry due to some animal disease are still experienced in some third world countries.

A change in the information policy in developing countries is needed if scientific information in relation to development is to be a vital resource that contributes to the socio-economic development of a nation. In fact, more dynamic, innovative and effective methods of information dissemination are called for as well as a continuous evaluation of the effectiveness of existing national information systems.

2. **UNIVERSAL BIBLIOGRAPHIC CONTROL**

The importance of the concept of Universal Bibliographic Control (UBC), which originated with the International Federation of Library Associations (IFLA), is now taken for granted by most librarians and information scientists. UBC was first initiated as a programme for national and international action.
It was the theme of IFLA's General Council in Grenoble in 1973 and the IFLA International Office for UBC was established in the following year.

The purpose of UBC is "to make universally and promptly available, in a form which is internationally acceptable, basic bibliographic data on all publications issued in all countries" (2). To achieve this purpose, information on any publication should be produced as completely and correctly as possible at the earliest possible date, preferably in its country of origin.

The programme of UBC calls for a world-wide system for the control and exchange of bibliographic information. This is possible only if component national parts are integrated at the international level. The influence of UBC and other concepts, like the UNESCO-sponsored National Information System (NATIS)¹, has resulted in more and improved national and subject bibliographies, even in developing countries. The National Library of Nigeria now publishes a number of bibliographies,

---

¹ At the end of 1976, during UNESCO general conference in Nairobi, it was decided to merge two of UNESCO's hitherto separate information programmes, UNISIST and NATIS under the title of GIP, (General Information Programme).
including the Nigerian National Bibliography. Several listings of scientific journals are also compiled by different scientific institutions and academic libraries, and a Union List of Scientific and Technical Periodicals in Nigerian Libraries was produced at the International Institute of Tropical Agriculture.

In the developed countries like Britain, Canada and the United States, efforts at bibliographic control have advanced to the establishment of computer-based information systems and networks providing on-line bibliographical data on a wide variety of subjects. Examples of such systems are AGRICOLA, CAB, COMPENDEX, and MEDLINE, to mention only a few. In addition to these, there are programmes for selective dissemination of information, such as CAN/SDI. CAN/SDI is a computerized current awareness service which alerts subscribers in Canada to the existence of recent papers covering their specific fields of interest as published in the world's scientific and technical literature.

The ultimate aim in Canada and many other countries, however, is "to have a national information system which can be accessed by anyone in the country, regardless of their subject needs and interests" (7). In Australia, steps have been taken by the National Library of Australia council to develop a library-
based information system (ALBIS) covering all fields of knowledge and serving the community at all levels of need on a voluntary and cost-effective basis (33). At the international level, such national information systems are being encouraged by IFLA to achieve a practical level of international standardization so that records and information can be shared without difficulty.

3. **UNIVERSAL AVAILABILITY OF PUBLICATIONS**

The primary aim of librarians and information scientists is to serve users by providing them with access to recorded information. To accomplish this aim, there are two requirements: first, to aid users in discovering which records may be of interest and second, to make it possible for a user to have access to these records.

Universal Bibliographic Control, whose primary aim is to aid users in the discovery of what records exist that may be of interest, is therefore not enough in itself. In fact, it has been argued (56) that it is of no use to provide a fuller and faster supply of references if the documents to which they referred could not be obtained. To satisfy users, the publications themselves must also be accessible to anyone wherever they may be. Otherwise to record and distribute the references
world-wide could even lead to serious frustration, since information about publications would tend to generate and encourage use. Thus to derive the full benefits of the efforts towards Universal Bibliographic Control, a programme of Universal Availability of Publications (UAP) would be essential.

According to M. Line (27), the concept of UAP originated with Donald Urquhart, the former Director of the British Library Lending Division, and was in fact stimulated by UBC. UAP aims to make materials, either in the original or in the form of copies, available to users everywhere, regardless of the place of publication or the actual location of the material. Thus, Universal Bibliographic Control, must be accompanied by a programme of Universal Availability of Publications (30). UAP has now been recognized as an objective of equal importance to UBC, and as such has been included in both UNESCO's and IFLA's medium-term programmes (20).

D.J. Urquhart (56) sees the concept of UAP as an attempt to take a new look at a very old target of librarianship -- that of supplying the user with what he wants. The main difference, however, is that the source of supply is not restricted to one location. As M.B. Line rightly pointed out (30), UAP is a very wide ranging concept, affecting legal deposit, and other methods of acquisition, the coordination of libraries by such
means as union catalogues, the organization of library systems to offer ready availability, inter-library lending and photocopying, the exchange of publications, and the role of national libraries or national centres.

The present exponential growth of printed material and an even faster growth of demand for information from an increasingly educated population, means that not even the most highly developed country can hope to satisfy all the information needs of its own population. This inability to possess all required documents in one place is accentuated by increasing cost of acquiring printed materials. Thus, "that any library could provide all the resources for research required by its readers is now generally recognized by scholars and librarians, albeit reluctantly, as an unattainable aspiration" (8). As a result, resource-sharing among libraries is increasingly being accepted as the only realistic means of maximizing availability of materials and services needed for scholarly research. Accordingly, the full value of information systems like The International Information System for the Agricultural Sciences and Technology (AGRIS), can be realized only through cooperative resource-sharing programmes like AGLINET. AGLINET is a Union List of Serials Published by the David Lubin Memorial Library of FAO. It contains over six thousand titles of serials falling mostly in agriculture, forestry, fisheries,
food and other closely related fields regularly indexed by AGRIS input centres. Place of publication, frequency, ISSN (International Standard Serial Number), and holding library codes are given after each serial title. The main purpose of the Union List is to assist libraries in the AGLINET network, and other users of AGRIS products by directing them to the nearest and surest points of access to desired serial materials.

Countries of the Third World would obviously benefit most from UAP since the majority of materials needed by scholars and stocked by libraries in these countries are, in fact, published in other countries. However, just as each country is expected to make a contribution to UBC by accepting the responsibility for making available the bibliographic record of its own publications, so each country must also contribute to ensure the realization of UAP. Accordingly, at the international level, IFLA has accepted the principle that each country should be responsible for making available on loan to other countries copies of any of its native publications. And to facilitate inter-lending between countries, IFLA has urged that each country should have a centre which will be able to communicate with similar centres in other countries. Such national centres for inter-lending will also screen out-going requests to ensure that items requested abroad are not locally available.
Universal availability depends to a large extent on national availability. Unless each country has an adequate lending and photocopying system for its own publications to serve its own population, UAP is unattainable. Thus UAP is not only related to UBC but it is also essential ultimately to the NATIS Concept. The working document of the Inter-Government Conference on the planning of National Documentation, Library and Archives Infrastructures, held at Paris in 1974 specifically mentions need for "planning for the maximum availability and use of the countries' information resources, which involves activity ensuring the provision of information services to all kinds of users" (19).

A country where the internal lending system works well is also one which will best meet requests from abroad. This has been exemplified by countries like Britain, where highly developed library systems provide a wide range of services designed to meet the needs of different categories of users. In Britain, the comprehensive national collection at the British Library Lending Division, supplemented by resources of other Libraries, meets over two million (32) requests for documents yearly both from within the country and abroad. The example of Britain has clearly demonstrated that to realize the goal of Universal Availability of Publications, the prior problem of how to ensure national availability must first be faced and overcome.
Optimum utilization of library resources available within the country should be first encouraged before one should begin to use sources beyond national frontiers.

The concept of Universal Availability of Publications implies both availability of all the world's publications to users in a given country and availability of publications of that country to all the world (43). One of the basic principles endorsed by IFLA in 1973, and by a meeting of National Librarians in 1976, is that each country should be responsible for making its own publications available by loan or photocopy to other countries. Thus UAP is dependent to a large extent on the degree to which various countries, especially Third World countries, will be prepared to respond to the basic demands of the programme.

National participation in the UAP programme, especially for developing countries, will necessarily have to evolve from existing practices and systems within each country. Thus, for Nigeria to participate effectively in UAP she first has to ensure availability of publications to all who need them within her boundaries; it is necessary that a document delivery system exists that ensures that research workers in particular, and other persons needing information can obtain any relevant publication they need for the progress of their work. Without this, there can be no genuine commitment on the part of Nigeria
to UAP and she will be paying only lip service to this worthy concept. For it has been demonstrated earlier with the example of the BLLD, that a country with a system to ensure internal availability of publications is also one that is likely to contribute most to UAP.

4. **OBJECTIVES OF THE STUDY**

The objective of this study is to evaluate the effectiveness of the document delivery system for making journals and other scientific documents available to agricultural research workers in Nigeria. Effectiveness will be defined in terms of the degree to which the existing systems achieves its objectives, that is, its success rate or the proportion of demands made to the system that are satisfied within a given period of time.

It was therefore proposed to test the hypothesis that 50 percent of the demands for scientific documents made by agricultural research workers in Nigeria are not satisfied. S.M. Lawani, in his study which will be discussed later, stated that 50 percent of tropical agricultural journals in Nigerian Libraries were available at, or held in, at most three different libraries. A document-delivery system implies the sharing of resources in different locations. Consequently, an attempt will be made to determine how available the other 50.
percent of the titles, that are held in less than three
different libraries, are to research workers all over Nigeria.
In particular, the following questions were to be addressed:

- What is the average time taken to satisfy demands for
  scientific documents by Nigerian agricultural research
  workers?

- Are translation services in the country adequate to meet
  the demands of agricultural research workers?

- What are the main barriers to the availability of
  scientific documents to agriculturists in Nigeria?

- Are agricultural research scientists in Nigeria satisfied
  with the degree of availability of documents, and with the
  operation of the document delivery system?

The operation of a document delivery system requires a user to
approach a library with a demand. The library staff who comes
in contact with the user has to understand the demand and
ensure that it coincides with the actual document needs of the
patron. The library staff then has to make various decisions
involved in searching for and locating the required document.
Finally, he or she has to arrange to obtain it for the patron by operating the document delivery system. The library staff in charge of reference and inter-library loans is thus a key factor in the effective operation of a document delivery system. Consequently, in the second part of this study, the effect of the reference staff in the agricultural research institute libraries on the availability of scientific publications to agriculturists will be discussed.

5. DEFINITIONS

Agriculture -
The term is used in this study in its broadest sense to include crop and animal husbandry, forestry, fisheries, wildlife and range management, and all other areas in which the Food and Agriculture Organization of the United Nations has a programme of activities.

Agricultural Research Scientists -
University graduates in academic research institutes who are actively engaged in research activities in the field of agriculture.

Availability -
Restricted to the physical accessibility of publications.
Demands -
Defined as requests for publications - monographs, full articles or abstracts - made to a library or information centre. Demands are satisfied when the user receives the requested publication. Requests for unpublished materials are not considered in this investigation.

Professional Librarian -
A library worker with a qualification in librarianship such as ALA, FLA or MLS (see list of abbreviations) who is performing his or her duties in a professional manner.

Scientific Documents or Publications -
All published materials requested by research scientists for their work. Earle and Vickery (14) have shown in their study that a majority of these documents are journal articles.

Barriers to Availability -
Circumstances that prevent a user from gaining physical access to a publication of whose existence he or she has become aware.

Satisfaction Time -
The time taken to satisfy a demand measured from when a user makes a demand at the library to when he or she actually receives the requested publication.
CHAPTER II

AGRICULTURE AND THE NIGERIAN ECONOMY

1. THE ECONOMY OF NIGERIA

Agriculture has always been the most important single activity in the Nigerian economy. Even though petroleum now accounts for over 90 percent (21) of exports and foreign-exchange earnings, agriculture remains the mainstay of the country's economy. About 70 percent of the total labour force is engaged in it, producing yam, cassava, plantains, rice, beans, sugar-cane and citrus fruits for food. Nigeria also produces such agricultural products as cocoa, oil palm and kernel, groundnut, rubber, cotton and timber as raw materials for local industries and for export. However, the amount of foreign exchange earned by these products has declined in recent years.

Unfortunately, as the population of the country increased rapidly, the agricultural output of Nigeria dropped mainly because the oil boom lured farmers away from their farms in the rural areas to the cities. The result is that from being a world-leading exporter two decades ago of some of the agricultural products mentioned earlier, Nigeria is now obliged to import some of these crops. In fact, in the past three years, the country even had to resort to the importation of large quantities of food like rice, maize, and meat to supplement its products. In 1979, for instance, Nigeria imported about 515,000 tons of rice and over 100,000 tons of maize (11).
Agriculture provides one of the essentials of life: food. Hence in many countries, governments are inclined to pay special attention to agriculture, and support and encouragement of agricultural research by governments is often seen as a protectionist measure to ensure that human nutrition shall not depend on foreign countries.

Nigeria is no exception to this tendency. The agricultural policy (11) of both the Federal and State governments is to increase agricultural output substantially as a weapon against malnutrition and as a means of improving the standard of living of every Nigerian. In the first half of 1980 alone, 18.3 million (about $36 million) was spent in providing farmers with fertilizers, pesticides, and other agricultural inputs at heavily subsidized prices (11). In addition, tractor hire services and land development schemes are being expanded at government expense as an additional contribution to agricultural production.

The agricultural policy of the present Federal Government in Nigeria is embodied in the Green Revolution launched in January 1980 (11) to arrest the alarmingly declining trend in the country's agricultural production. A National Council on Green Revolution was established in April, 1980, to coordinate the activities of all ministries and organizations involved in
agricultural production, processing, marketing and research. The Council is also charged with the responsibility of finding new ways that will facilitate the application of science to agricultural production in Nigeria, in order that the country may achieve self-sufficiency in agricultural production in the quickest possible time (35).

2. THE ROLE OF INFORMATION IN AGRICULTURAL RESEARCH

The advancement of science depends to a large extent on accumulation of past findings, and every scientist builds on the knowledge of other scientists. Scientists therefore spend a great deal of their time communicating, and rightly so, because the penalties of not communicating could be serious. They include duplication of work, waste of money and portrayal of ignorance of relevant facts. Scientific information is, however, not only useful for the advancement of research, but also necessary for sound policy and planning decisions in many walks of life. Scientific information, therefore, needs to be communicated in a suitable form to several kinds of users, including research scientists and decision makers in government and industry.

In order to produce enough food to feed the world's ever-increasing population, it is essential to incorporate into
agriculture the latest and best technical advances available, and to have a programme of intensive and far-reaching agricultural research. This places a high priority on a free flow of information. A current awareness list of agricultural information, such as AGRINDEX produced by AGRIS "level one", thus has the potential to aid the acceleration of agricultural production.

AGRIS is a mission-oriented system for providing access to information about food production. The system, which began operating in 1975, was created by the Food and Agriculture Organization (FAO) of the United Nations cooperating with various governments and institutions, to generate a data base which would provide references to current literature relevant to research and development in food and agriculture. AGRIS is a cooperative system in which each member-country contributes data relating to its current national documents, and receives the enormous input of the whole, that is, the world-wide record of agricultural literature (46).

The input received at AGRIS coordinating centre of the FAO from contributing centres is merged into a magnetic tape data base from which is derived AGRINDEX, a printed and categorized bibliography. AGRINDEX thus makes it possible for agricultural research scientists in one country to benefit from research
findings generated in other countries. Such interchange of research information make current awareness services like AGRINDEX of potentially great importance in the transfer of modern agricultural technology and in spreading innovations between developed and developing countries.

Since 1899 when the Moor Plantation, Ibadan, was established as a model farm, agricultural research in Nigeria has steadily developed. The first research institute to be established by the Federal Government was the National Cereals Research Institute, founded in 1910 and situated at the Moor Plantation, Ibadan (58). At this Institute, which was formerly under the name of Federal Department of Agricultural Research, research is carried out into the production and products of rice, maize and grain legumes of economic importance for improving the genetic potential of the crops. Two other agricultural research institutions followed in 1924. These are the National Veterinary Research Institute at Vom, where intensive research is carried out into all aspects of animal diseases, nutrition and production, and the Institute for Agricultural Research at Ahmadu Bello University, Zaria. In the latter institute, research is carried out into improvement of production of sorghum, millet, wheat, groundnuts, cotton, cowpeas and other vegetables as well as maintenance of soil fertility.
From 1924, the number of agricultural research institutes established by the Federal Government steadily increased. Today, agricultural research is carried out in seventeen institutes (Appendix I) established and financed by the Federal Government of Nigeria as well as in the facilities of agriculture of the Universities at Nsukka, Ibadan, Port Harcourt, Ife, and Zaria. At the International Institute of Tropical Agriculture, which was established at Ibadan in 1968, an international team of scientists carries out research on various aspects of tropical agriculture including farming systems, grain legume improvement, cereal improvement and root and tuber improvement. All these research institutes and faculties of agriculture have their own libraries and/or documentation centres, whose objectives include the provision of current information to research workers.

In 1971, the Agricultural Research Council of Nigeria, ARCN, was established by a decree promulgated by the ruling Military Government. Like similar councils for Medicine, Industry and Natural Science, the ARCN was set up to advise the Federal Government through the Nigerian Council for Science and Technology. The library and documentation centre of the ARCN was charged with publishing research results, providing abstracting and indexing services, and serving as a national referral centre.
In 1977, the Federal Government established the National Science and Technology Development Agency (NSTDA), and the ARCN became its Department of Agricultural Sciences Research. Government gave NSTDA executive responsibility for promoting and developing science and technology, and initiating policies in research and development activities. The dissemination of scientific information, regarded as vital for coordinating research activities of scientists, was accomplished by establishing a family of four journals, namely:

- The Nigerian Journal of Agricultural Sciences
- The Nigerian Journal of Engineering and Technology
- The Nigerian Journal of Medical Sciences
- The Nigerian Journal of Natural Sciences

By sponsoring these journals, and insisting on high standards, NSTDA hoped to stimulate interest in research relevant to the country, and ensure that articles about Nigerian problems would be made readily accessible to a majority of Nigerian scientists. Such articles in the past were scattered in a multiplicity of international journals, thus making their retrieval difficult. In general, the NSTDA, in developing its science information programme, had accorded premier priority to the dissemination of agricultural research findings, in accordance with Government's recognition of the vital role that
information could play in expanding the nation's agricultural production, both in the short term and in the long term. In 1979, the new civilian Government of Nigeria established the Federal Ministry of Science and Technology. This Ministry has now taken over the control of all the Agricultural Research Institutes formerly under the NSTDA.

3. THE NEED TO DETERMINE THE MODEL OF DOCUMENT DELIVERY SYSTEM SUITABLE FOR NIGERIA

A variety of terms such as consortium, systems, cooperatives and networks, have come into use for the more formal versions of what used to be described simply as library cooperation. Besides, new technology now available for library purposes has added a wealth of possibilities and opportunities so vast that networks and networking are no longer just synonyms for resource-sharing and cooperation. They now go further "to conjure up a picture of computerized systems linked by telecommunication devices to serve users in widely separated locations on an immediate response basis" (22).

Jack Burkett (9) categorizes three different kinds of networks according to the type of services they provide. These have been reorganized into two distinctive categories for the purpose of this study. The first type is the network
organization for the supply of documents by means of inter-library loans. The second type of network is that which channels bibliographical information by linking a number of user populations. Such bibliographical information is often generated by national bibliographical centres and frequently stored in a computer-controlled data base. The AGRIS network, aimed at the rapid compilation of a comprehensive data base of references to new agricultural literature and receiving input from over seventy national and international centres, is an example of this second type of network.

However, several existing networks incorporate features of both types of networks identified. The Ohio College Library Centre (OCLC), a computer based library network, provides a good example of a hybrid type of network. OCLC was incorporated in 1967 for the purpose of establishing, maintaining and operating a regional electronic bibliographic network. Located in Columbus, Ohio, and formed initially by fifty academic libraries the on-line OCLC data base has over four million cataloguing records representing books and other publications in approximately 1,600 libraries throughout the United States. The information about each publication in the data base is a version of the familiar library catalogue card in the MARC format developed in the mid-sixties by the Library of Congress. Each participating library can access the central computer
through remote terminals connected to it by a telephone network.

OCLC was set to meet the need for an effective union catalogue to record holdings in each library, the need to encourage resource-sharing, and the desire to avoid duplication of effort when many libraries independently catalogue the same books (4). The original plan was to develop a full range of services with sub-systems for acquisition, inter-library loan, serials and circulation control. OCLC's goals thus include increased availability of library resources and lower unit costs. Its new inter-library loan sub-system, believed to be the first of its kind (4), is expected to contribute to both these aims, and F.G. Kilgour (23) reports the findings of a study which indicates that the on-line union catalogue increased the availability of books for inter-library lending from Ohio libraries participating in the OCLC network.

This study is concerned primarily with the first type of network identified, which is a document delivery system. This is because this study is about Nigeria, a developing country in which computers and computer-based bibliographical networks are yet to be in common use. A document delivery system is the oldest, most common and still one of the most important kind of network. There could be several possible models for a document
delivery or inter-library loan system. M.B. Line (28) identifies four basic models (Figure 1) relating to the degree of centralization or concentration. Model A is one of concentration on a single library. The concept here is of a single collection on which inter-lending demand is concentrated. Such a collection may be dedicated solely to inter-lending, or may include an inter-lending function together with other functions.

The British Library Lending Division, BLLD, is one of the best examples of a centralized network model for making documents available to users. The BLLD which has been described as "the most comprehensive centralized access system in the world," (26) is the only national library specifically devoted to inter-lending. Its aim is to acquire for loan, and stock as comprehensively as possible, those materials that are in greatest demand and which are hard to obtain otherwise. The BLLD has a high volume of demand. It receives about 11,000 requests every working day of which over 15 percent are from overseas, with demands currently increasing at the rate of 15 percent per annum (32). Eighty-four percent of the requests received at the BLLD are satisfied from the central stock, and the system is designed for speed of service and low unit cost of transactions.
The advantages of a central loan collection, as demonstrated by the BLLD, include the reduction of the most serious barriers to efficient inter-lending systems, by providing a single channel to which many or most requests can be sent. Also, high satisfaction levels can be attained by gearing acquisition closely to demand. The main disadvantage of this network model, however, is the high cost of setting up and maintaining central collections.

Model B is one of concentration on a few libraries. This model of inter-lending network is considered an attractive solution for smaller countries where a high proportion of all the country's holdings is already concentrated on two or three major libraries. An example of this model for inter-lending can be found in Denmark where three libraries could, between them, probably satisfy a high proportion of all inter-lending demands in the country. This model would be considerably cheaper than the establishment of a central loan collection. However, a substantial re-adjustment of routines in the libraries concerned may be necessary to give a good inter-lending service, and there may be a severe conflict with service to local clients.

Model C is a planned decentralized network, where provision of material is allocated among libraries on a more or less syste-
matic basis. In some countries, strong subject libraries may be set up, or existing strong collections enhanced, with inter-lending emphasized as one of their functions. The main advantage of this model is that participating libraries can send their requests direct to the libraries holding items. However, the overall cost of such a system may be high because of the extensive duplication that is likely to occur among the specialist libraries and between them and other libraries.

The OCLC inter-library loan sub-system is a planned decentralized network for the supply of documents that makes use of an on-line union catalogue. On the other hand, AGLINET, another decentralized document inter-lending network, operates with the aid of a printed union catalogue. Inaugurated in 1974, AGLINET (3) is a cooperative system which seeks to provide and promote efficient delivery of agricultural library materials from "haves" to "have-nots" through a network of Regional centres and an International centre at the David Lubin Memorial Library, FAO, Rome. The AGLINET Union List of Serials, which is published at the international centre, has holding library codes indicated after each serial title to facilitate resource-sharing.

Model D, which is an unplanned decentralization network, is the model found in most countries. With this model, there is no
FIGURE 1

Models for Inter-Library Lending.

MODEL A

Centralization in a single library

MODEL B

Centralization in a few libraries

MODEL C

Planned decentralization

MODEL D

Unplanned decentralization
attempt at subject or other specialization and libraries simply make their resources available to other libraries by means of union catalogues. The main disadvantage of this model is that owing to the absence of any formal inter-lending system, a high degree of cooperation is required from libraries, both in reporting additions and withdrawals to the union catalogues, and in meeting requests. There might also be conflict with service to local clients of the libraries.

Several advantages of both the centralized and decentralized network models have been stated in the literature. Justifying the BLLD centralized system, M. Line says that "a library devoted almost entirely to inter-lending can give faster and more efficient service than a local library, even when the latter has the required items on the shelf; in fact, commonly held and commonly wanted items are often not on the shelf, and even when they are, a library may be reluctant to lend them" (26). Line further reiterates that "the superiority of central collections is demonstrated by the fact that the largest foreign user of the BLLD is the U.S.A., and that a third of the requests from the U.S.A. are for U.S. journals" (29).

On the other hand, F.G. Kilgour, after reporting the results of his study on the effect of an on-line Union Catalogue on UAP, states that it is apparent that making known the contents of
heretofore little known library collections increases the availability of such publications. He concludes therefore that "rather than by increasing dependence on central collections to increase UAP, as has been emphasized in recent decades, the greater increase in availability of library resources will come from on-line catalogues" (23).

Despite the above arguments, the precise manner in which each country should organize its inter-lending system must be a matter for the country to decide according to its peculiar internal circumstances. Given a particular country, one model of document delivery network may be preferable or more effective than another. At the one extreme is a centralized system with a comprehensive central collection containing copies of all native publications, and making them available by loan as exemplified by the BLLD. At the other extreme are the decentralized systems relying entirely on union catalogues, which provide access to the holdings of a number of libraries in different locations. Between these two extremes are systems relying partly on centralized collections and partly on union catalogues or systems based on the holdings of a few regional libraries.

It would not be advisable, for instance, for Nigeria to blindly import a network model that happens to work in another country,
having totally different internal conditions and infrastructure. Nigeria is a country of 356,669 square miles, with an estimated population of 72 million by 1978 (55), and an annual growth rate of 2.4 to 2.8 percent. The heaviest concentrations of the population are in the south-western, south-eastern and northern sections, separated by a sparsely inhabited middle belt. Considering that agricultural research institutes are situated in all three regions of the country and that none of the special libraries in these institutes can claim to be self-sufficient in their holdings, there is a need for cooperation and resource-sharing amongst them. Commendable, therefore, is the view of Adimorah (l) who called for an efficient library network system to help "foster inter-library cooperation which may lead to cooperative acquisitions, bibliographic exchanges and control, centralized processing of materials, better inter-library lending, photocopying services among cooperating libraries and information users".

However, in order to determine the kind of network model suitable for Nigeria, it would be essential to know something about the demands that would be put on such a network. It would be necessary to determine the extent to which the existing document delivery system is satisfying the document needs of its users and the percentage of user needs that is not being satisfied. It would be necessary to examine the
communication system within the country and determine how long it would take to satisfy demands from a central service.

Consequently, this study will examine the existing document delivery system in Nigeria and the extent to which it is satisfying the demands made to it as well as the infrastructural deficiencies in the country in order to determine the network model that would best suit the country.
CHAPTER III

RELATED RESEARCH

1. INTRODUCTION
Several studies on the availability of documents to library users have been found in the literature. Since this study is concerned with the availability of publications to a wider group of users than those in a particular library, particular attention has been given to studies of availability that involve users and resources in more than one location. Single library availability studies have been considered only when the methodology employed is of particular interest.

The studies listed in the attached bibliography have been examined to determine their relevance to this study and to determine whether they sought answers to interesting questions or suggested a new approach to collecting information. The examples of questionnaires found in these studies have been examined and some of the studies have proved useful either in defining the objectives of the study or in the development of the methodology. Seven of these studies have been selected for detailed description below to provide background for this study.

2. DOCUMENT DELIVERY TEST
In 1968, R.H. Orr (39) attempted to develop a methodology for measuring a library's capability for providing documents to its
users, a function he regards as the most basic service a library performs. A library's capability for providing this service he called "document delivery". Orr's document delivery test involved two important aspects that had not previously been considered in library evaluation. Firstly the library being assessed was considered as part of a larger system. Secondly, Orr introduced the idea that the real criterion for assessing a library's document delivery performance, from the user's point of view, is not whether the library can supply the document he wants, but how long it takes to supply it.

In a subsequent study, Orr and Scheless (40) went further to employ these standard Document Delivery Tests (DDTs) to assess the capabilities of 92 medical school libraries and 15 major resource libraries. They developed a mathematical model in which the virtual capability as seen by users is equated to variables like the basic capability afforded by holdings and gains realized by coupling with other resources. Regression equations are derived that provide useful predictions of basic capability from collection size.

Orr's use of "delivery speed" as a measure of a library's capability for providing the documents needed by its users has influenced the concept of satisfaction time used in this study as well as in several other availability studies. An example
is R.J. Penner's study (41) in which the DDT was applied to test the ability of a library to provide documents for research.

3. SATISFACTION OF POTENTIAL DEMANDS

A study by M.B. Line (25) on the ability of a university library to provide books wanted by researchers started off with lofty aims. Some of these aims were to find out how high a proportion of potential demands was being satisfied from the library's stock; the relative availability level of the library in different subjects; and the effect of non-availability on use. However, the study ran into difficulty over the problem of determining potential demands. At first, members of staff at the University of Bath were asked to record what references they came across on a particular day. Later, both staff and research students were asked to record the first twelve references they picked up in a month.

Both procedures met with little success. Of the small percentage of people who responded by returning the forms, many did not complete the forms correctly. Either, they replied that they did not come across any references on the particular day, or they filled in forms for a different day. Some confessed that they found it hard to record all references unless they carried the form around with them everywhere, and some gave up after recording one or two.
Line's study confirms the difficulty of identifying potential demands. Line himself conceded, at the end of his study, that actual demands on the library are a good deal easier to study than potential demands. He further stated that if the library's ability to satisfy actual demands is measured, remedial action can be taken and this would be expected to increase demands, since the expectation level would rise. In the present study, therefore, only expressed demands will be studied.

4. EFFECTS OF DELAYS IN SUPPLYING PUBLICATIONS

Two significant studies, both published in Great Britain, on availability of documents in a wider context are of particular interest. Houghton and Prosser (18) studied the delay period experienced by users in special libraries while awaiting the arrival of journal requests from the British Library Lending Division (BLLD) as a possible drawback to the reduction in journal holdings in favour of increased external borrowing. This OSTI-supported project aimed at producing a procedural model which would determine the optimum number of journals that a library might economically retain that would result in minimum reduction in services to the users.

The opinion survey was undertaken by means of a questionnaire designed to evaluate user inconvenience caused by the non-
availability of materials. Staff in cooperating special libraries were asked to attach one questionnaire form to every journal item or photocopy received from the BLLD in response to a request by a user. The results indicated that only 10 percent of the users who responded reported that their work was inconvenienced by delay in receiving journals. Thus the Houghton and Prosser study indicated that the delay factor appears less significant than was supposed by many librarians and inconvenience to users at present levels of borrowing is minimal. It is noteworthy, however, that these results may not hold true in another situation with a lending system that is not as efficient as that of the BLLD.

The second study, by M. Stuart (51) is an investigation, at Lancaster University, into the effects on library users of delays in supplying publications. The meticulous care taken in the definition of the various terms used, as well as in its finding, makes this study a valuable contribution to the literature. The methodology was devised to study the effects of satisfaction time (time taken to satisfy a request) in two areas of library operations at Lancaster University, in the reservations and the inter-library loans system, and it consisted of attaching a questionnaire to a sample of satisfied demands before they were distributed to users.
The questionnaires were designed to collect information on three measures of the effects of satisfaction time: incidence of delay, defined as the proportion of a set of demands which have been delayed; dis-benefit, a measure of the effect of satisfaction time ranging from 0 (no effect) to 1 (maximum effect); and cost of satisfaction time, which is measured by asking users how much they would have been willing to pay for immediate satisfaction of a request. The mean satisfaction times were found to be 7.5 days for reservations and 13.6 days for inter-library loans. When the above three measures were used to measure the effects of satisfaction times, they revealed, not surprisingly, that the longer the satisfaction time, the greater the effect on users. Sets of demands with relatively long satisfaction times tended to have high values for incidence of delay, dis-benefit and cost, and sets with relatively short satisfaction time tended to have low values.

Stuart also discovered that users were more affected by the satisfaction times in the reservations system than in the inter-library loans systems because reservations were wanted more urgently than inter-library loans. These results, according to Stuart, support the conclusion by Williams (58) that minimum user cost would be achieved if a library's money was spent on providing more duplicate copies and faster access to titles frequently used, rather than on local ownership for
faster access to titles less frequently used. The validity of this conclusion for agricultural libraries in Nigeria will be tested in the present study.

The above research efforts, namely, Orr's Document Delivery Speed, Line's measure of a Library's ability to satisfy actual demands, Houghton and Prosser's study of the delay factor in document supply, and Stuart's measures of the effects of satisfaction time, have all had an impact in shaping the methodology of this study, as well as in providing a better understanding of the many facets of the problem at hand.

A reference interview with a patron is a pre-requisite to the operation of a document delivery system by a library staff. In fact, the effective operation of a document delivery system depends to a large extent on the ability of the reference staff to communicate successfully with the user and on the patron's confidence in the capabilities of the reference staff.

Several papers were observed in the literature on the subject of staffing the reference desk. However, most of them are speculative or review papers concerning the qualifications needed for reference work. The following three studies, which are distinctive in their objectivity and in the methodologies used in the treatment of the subject, have been examined in an
attempt to gain some insight into the role of the reference staff in the effective operation of a document delivery system.

5. **FORMAL LIBRARY TRAINING AND REFERENCE EFFICIENCY**

In 1967 Charles A. Bunge (10) conducted a study at the Library Research Centre, University of Illinois, aimed at exploring the relationship between formal library training and effectiveness in answering reference questions. The hypothesis for the study is that professionally trained librarians will be able to answer a larger proportion of information requests and will do so in less time than will untrained staff members. Data were gathered in a field study to test the hypothesis in a limited way, while allowing for the discovery and exploration of inter-relationships among other important factors in reference staffing.

Reference staff having formal library education were compared with those lacking such education in 12 medium-sized public libraries. A research strategy called the ex post facto experiment was used, wherein an attempt is made to trace a measured difference on the dependent variable back to a pre-existing difference on the independent variable. In order to minimize the inter-library variations, such as size and composition of book collection, which could affect the success rate of the reference service, pairs of staff members at each
of the libraries were used. To measure the reference performance of staff members, a test set of questions that has actually been asked in libraries similar to those studied was constructed. The scoring procedure used on the test instrument was to categorize each response as either "answered correctly" or "not answered correctly".

The main conclusion was that the hypothesis was supported by the data from the study. This was attributable to the fact that the trained librarian will have developed skill in a reference process or technique that affords him effective access to a large amount of the information contained in the library's collection. However, the findings of the study also showed that staff members lacking formal library education can answer accurately and quickly a wide range of factual reference questions and can, under some circumstances, perform as efficiently as professionally trained librarians.

The second part of the present study will examine the applicability of the findings of Bunge's study to the reference service provided in the agricultural research institute libraries in Nigeria.
6. RELATIONSHIPS BETWEEN QUANTIFIABLE REFERENCE SERVICE AND REFERENCE PERFORMANCE

Ronald R. Powell (42) investigated the relationships between reference performance (dependent variable) and various quantifiable reference characteristics (independent variables) such as reference collection size. A questionnaire was designed to collect data from the libraries participating in the study relating to various independent variables, such as reference collection, expenditures, experience of their reference librarians, educational background and professional activities of their reference librarians. The data for the dependent variables which measured reference performance were obtained by testing the ability of the participating libraries to answer reference questions correctly. Ninety-two public libraries in Illinois were randomly chosen and a group of test reference questions was compiled and mailed to their reference librarians.

In addition to the descriptive breakdown of the study variables, relationships between key independent variables and certain dependent variables representing actual and potential reference performance were analyzed statistically using product moment correlation, multiple regression, and analysis of variance. The correlation and regression analysis indicated that the relationship between reference collection size and the percentage of test reference questions answered correctly was
significant. Other variables indicated by multiple-regression analysis as being strongly related to reference performance were the number of reference questions received by each participant in an average week, the academic degree held by each participant, and each participant's judgement of the adequacy of the size of his or her library's reference collection.

Powell's study confirms the use of the dependent variable, reference performance, as a valid measure of the efficiency of a library's reference service. However, Powell's identification of several independent variables, such as educational background of the reference staff, size of the reference collection, expenditures and experience of reference staff, that affect the performance of the reference personnel will influence the choice of independent variables in the present study.

7. PERFORMANCE OF PROFESSIONALS AND NON-PROFESSIONALS IN THE REFERENCE INTERVIEW

E.A. Halldorson and M.E. Murfinn's study (17) on the performance of professionals and non-professionals in the reference interview investigates the communications problems in traditional reference service. In view of the fact that observational studies, such as Cole's (12) have reported that
25 percent of all questions were "indirect" or not stated clearly, the authors considered it necessary to reduce reference service failure due to communication problems. Consequently the Halldorson and Murfin's study was concerned specifically with the following problems:

1. What is the relative success rate of professionals and non-professionals in resolving "indirect" and "faulty information" questions? What are the reasons for any differences found? What are the implications of this for reference staffing?

2. How successfully do non-professionals make appropriate referrals when they fail to determine patrons' information needs?

Two medium-sized midwestern University libraries were selected, both having a centralized reference service, one staffed by non-professionals who had access to subject specialists for consultation and the other staffed at all times by professional reference staff. Twenty-five different reference interviews were prepared, each consisting of an "indirect" question followed by a "faulty information" question taken from actual reference experiences. Each prepared "set" of two questions was asked of a non-professional at the information centre and of the professional at the second library.
A judgement of success was made if at anytime during a five minute period the reference staff member probed further by asking more specific information about what the patron wanted. Failure was judged if the reference staff member accepted the "indirect" question as representing the patron's real needs and did not ask further questions about more specific information needs before attempting to terminate the interview. In the case of faulty questions, a judgement of success was made if the reference staff member detected the faulty information and obtained correct information or showed the patron where correct information could be found before the termination of the interview. Failure was judged if the reference staff terminated the interview without having done this.

The results of this study show that the professional librarians in this sample were clearly superior to the non-professionals in achieving successful solutions on "faulty information" questions in the reference interview, having achieved 52 percent success rate as compared to 20 percent for non-professionals. These results are, to some extent, in line with those of Bunge who found that the speed and efficiency of professionals were significantly greater than that of non-professionals. Bunge however found no significant difference in the percentage of questions answered correctly by the two groups, while this study shows that professionals were more
than twice as successful as non-professionals in obtaining correct information.

In order to determine how applicable the above findings are to the Nigerian context, the role of the reference staff in the operation of the document delivery system and in the level of availability of scientific publications to agricultural research scientists in Nigeria will be examined. In particular, an attempt will be made to determine any differences in the performance of professional and non-professional reference staff in the operation of the document delivery system.
CHAPTER IV
METHODOLOGY

1. INTRODUCTION
There is a growing realization in the library and information profession that systematic programmes of evaluation are essential to ensure the effectiveness of developing library programmes, if not their very existence (44). However, as E.T. O'Neill (37) pointed out, if evaluation is to be meaningful, there should be a direct relationship between the objectives of the libraries and the measures of performance used to evaluate them. Every library exists mainly to serve the needs of its users. It follows then that any overall evaluation of a library should be based on how well it does, in fact, serve these needs.

Consequently, satisfaction rate, or the ratio of demands satisfied, has come to be accepted as a valid means of determining a library's effectiveness. The demands made on a library are affected by the user's expectation level of the library's performance and, since actual demand is only a subset of potential demand, ideally it is against potential demand that a library stock needs to be measured. Thus the real "availability level" (25) of a library-based information network should be the proportion of potential demands that are being satisfied by the system. However, because of the difficulties of determining potential demands, as stated
earlier (25), only the ability of the document delivery system in Nigeria to satisfy expressed demands of agricultural scientists will be measured in the first stage of this study.

The study is in three stages. Stage one is a quantitative measure of the ratio of expressed demands for documents made at the respective institute libraries that were satisfied within a specified time period. The second stage of the study is an opinion survey of agricultural research scientists in the country, which aimed at determining their satisfaction with the availability level of scientific publications, and with the existing document delivery system. The third stage consists of in-depth interviews of both librarians and researchers in four agricultural research institutes, aimed at determining the motives behind the information-seeking behaviour of the researchers, and the effect of the qualifications of reference staff on the availability level of scientific documents to agricultural researchers.

In order to determine the availability level of relevant journals to agricultural scientists in Nigeria, it was decided to assess the percentage of such journals available in the country. However, this had already been done by S.M. Lawani (24) who assessed the holdings of tropical agricultural journals in Nigerian libraries. Even though this study is
concerned with all literature needed by Nigerian agricultural scientists, it was considered logical to assume that since Nigeria is a country completely in the tropics, its agricultural scientists would be interested in tropical agriculture, and that tropical agricultural journals would constitute a valid representation of the journals relevant to their work. The results of Lawani's study was therefore adopted for this study to provide an indication of the adequacy of agricultural journals available in Nigeria.

In his study, S.M. Lawani reported that 37.1 percent of the "important" titles in the list of periodicals abstracted by Tropical Abstracts from January 1967 to December 1970 was not available in any library in the country. He also found that, of the titles available in Nigeria, 23.4 percent were held in no more than one library, while 50 percent were held in, at most, three different libraries. An analysis by language of the periodical titles showed that 62.7 percent of titles in languages other than English and 22.1 percent of English language titles were not available in Nigeria.

Lawani himself admitted that his "master list" of important titles was only as good as Tropical Abstracts was representative of the literature of tropical and sub-tropical agriculture. The fact that many popular titles such as
Agronomy Journal, Crop Science, and Plant Physiology, as well as several non-English tropical journals were not covered by Tropical Abstracts detracts from the validity of the "master list". Also, as noted by Lawani, The Union List of Scientific and Technical Periodicals in Nigerian Libraries, second edition, which was used as the record of holdings of tropical and sub-tropical agricultural periodicals, did not include the holdings of some major libraries in Nigeria. In the introduction to the second edition of the list, the Director of the National Library admits that the issue has neither claim nor presumption to completeness because it does not cover every title held by the libraries listed. It has also not been possible to indicate all the holdings of each participating library.

The availability figures given in Lawani's study, therefore, may not be entirely accurate. Nevertheless it was the best indication of the spread and availability of journals of interest to agricultural researchers in the country. Thus rather than duplicate the ground already covered by Lawani's study, it was decided to use it as a background and to investigate how accessible the percentage of relevant journals available in the country are to researchers in the different research institutes.
2. **DATA-COLLECTION INSTRUMENTS**

The questionnaire is the main data-collection instrument for the first and second stages of this study. Despite the well-known disadvantages of the questionnaire, such as the risk of poor response, this study instrument was chosen because it allowed for a wider range and distribution of sample. It was also chosen because it allowed for greater economy of effort and finances by making it possible to survey respondents scattered all over Nigeria, simply by duplicating the single questionnaire and mailing it to the respondents.

Two different questionnaires were administered. For the first stage of the study, a questionnaire (Appendix II) was sent to the libraries of the eighteen Agricultural Research Institutes in the country (see Appendix I for list of Institutes). Attached to this questionnaire was a letter (Appendix IV) addressed to the heads of libraries requesting them to record on a copy of the questionnaire, each demand made by a user for publications during a period of six months. The libraries were also requested to keep a record of the sources used in satisfying the demands; the satisfaction time, measured in hours or days; and the reasons for failure in cases where the demands were not satisfied. Some factual information about each of the participating libraries, such as number of professional librarians employed in the library, size of the collec-
tion, availability of telephone, photocopying and translation services, were also requested from the head librarians.

In the second stage of the study, a list of all the research scientists working in each of the agricultural research institutes surveyed was obtained from their respective institutes through correspondence. These lists were merged into a single alphabetical list and a sample of 400 research scientists was drawn from the total number of 800 scientists by systematically picking every second name on the list. A second questionnaire was sent to each of the 400 research scientists in the sample asking them to state among other things:

- the frequency of their need to consult the literature
- whether they have access to a library
- whether they have any document needs that were not being met by the libraries
- their evaluation of the performance of the document delivery system in use
- the availability of translation services and their adequacy
- whether delays in obtaining publications had any effect on their research work.

Both questionnaires for the first and second stage of the study were designed to be as clear and concise as possible,
overcome respondent resistance to surveys. For the opinion survey of researchers, questions were stated precisely and only information that could be easily provided by the respondents was requested. Emphasis was placed upon brevity and economy of participant effort by providing a list of alternative answers to questions where possible to facilitate completion of the questionnaire. Open-ended questions were kept to a minimum, and the respondents were assured complete anonymity to encourage frank replies. To each copy of the questionnaire was attached an introductory letter (Appendix V) stating the objectives and the purpose of the survey. The letter also appealed to the respondents for their cooperation.

The questionnaire for the opinion survey was used in a pilot survey of agricultural research scientists in the Faculty of Agriculture of the University of Science and Technology, Port Harcourt to test the reliability of the individual answers to the questions. From the responses to this survey, it was found necessary to categorize the answers to some of the questions to make for easier analysis. Also one open-ended question was added to the questionnaire to provide the respondents with an opportunity for a less restricted communication.

The interview was the data collection method used for the third stage of the study. In each of the institutes studied, the
head librarian, the library personnel manning the reference desk, and ten research scientists were interviewed in-depth to cover the following areas:

1. The deployment of professional librarians in the respective libraries.

2. The qualification of the reference staff.

3. The existence of suppressed demands.

4. The effectiveness of inter-library lending.

5. The availability and use of comprehensive agricultural bibliographies and location tools.

6. The desirability of a centralized translation service.

7. The desirability of a nationally organized document delivery system and the network model considered suitable for the country.

A set of questions were compiled for the interviews of both the library personnel and the research scientists, and these can be seen in Appendix IX and Appendix X respectively. However, the
interviews were not formally structured and the procedure adopted was that of a free-flowing discussion of the topics raised with occasional prompting and directing on the part of the interviewer in order to elicit more informative responses. The aim was to encourage the respondents to express their feelings and opinions without restriction. The interviews were all carried out in the offices of the individual interviewees at times convenient to them. This again was aimed at creating a relaxed and conducive atmosphere for a detailed discussion. The answers of the respondents were coded to facilitate the recording of what transpired during the interviews and to enable some summation of the responses to be made.

3. SURVEY POPULATION

There are seventeen agricultural research institutions financed by the Federal Government of Nigeria. These are all being administered by the Agricultural Research Council of Nigeria which advises the Federal Government on national policies for research and training with respect to agriculture and allied disciplines, as well as coordinating agricultural research and training. Sixteen of these institutes have been surveyed. The seventeenth, The Leather Research Institute, Samâni, Zaria, could not be surveyed because the Institute expressed, in a letter, its inability to participate in the survey because it did not have adequate library facilities at the time.
Of the sixteen Federal Government research institutes surveyed, seven are located in the Northern region of the country, eight are located in the Western region, but only one is located in the Eastern region. Consequently, the Faculty of Agriculture of the University of Nigeria, Nsukka, located in the Eastern region, was included in the survey in order to have a better reflection of research activities in the Eastern region. The International Research Institute for Tropical Agriculture located at Ibadan in the Western region was also included in the survey, because it has one of the largest concentrations of agricultural research scientists in the country. Thus a total of eighteen Agricultural Research Institutes located all over Nigeria were surveyed, and their libraries constitute the population for the first questionnaire.

The research workers at these eighteen institutes who satisfied the definition of an agricultural research scientist stated in this study, constitute the population for the second questionnaire for the opinion survey. To identify these researchers, a letter (Appendix VII) was sent to each of the eighteen institutes requesting a list of their research scientists.

Most of the institutes responded by sending a copy of their entire staff list. Fortunately these lists include the qualifications and designation of each staff member. It was
thus possible to identify the research workers from the staff list of the individual research institutes.

Subsequently, in compiling the list of research workers, laboratory technicians, administrators and other professionals were excluded, even though they may be senior staff members of the respective institutes. Only people with a university degree, who are actively engaged in agricultural research at these institutes, constituted the population for the opinion survey.

4. RESPONSE TO THE QUESTIONNAIRE

The initial response to both questionnaires was very poor, even after two reminders to solicit response. For instance, after the first reminder, only five out of eighteen libraries had returned their completed forms, while only about 20 percent of the research workers surveyed had responded. When even a second reminder failed to generate a significant increase in the response rate for both questionnaires, a decision was made to resort to more dynamic methods.

For the library survey, personal letters were written to library personnel in the defaulting libraries. These letters not only sought their help in retrieving the completed forms, but informed the library personnel of the intention of the
originator of the survey to visit their library to collect the forms on a particular date. This accomplished two things. It eliminated the risk of the forms being lost in the mail (at least two packages sent by mail never arrived), and it also emphasized the determination of the researcher to retrieve the forms. This approach compelled some libraries that had tucked the forms away in some cupboards to commence their completion, in order to have them ready when the researcher visited. This, unfortunately, resulted in two libraries completing the forms for a period less than the six months originally intended for the survey.

In a few cases, a second or even a third batch of questionnaires had to be sent to a library because it was discovered during the visits that the first lot sent either were never received or had disappeared from the library after a change of personnel at the reference/circulation department. At the end of the exercise, fourteen out of the eighteen libraries responded and a total of 506 completed forms were received.

In the case of the opinion survey, it was the efforts of a network of acquaintances who are research scientists themselves at some of the research institutes, that contributed to increase the response rate. A list of researchers to whom questionnaires were sent in the different institutes was sent
to these acquaintances. They then dropped notes in the letter boxes of the researchers concerned informing them (the researchers) that the completed questionnaires could be dropped with them instead of being mailed to the originator of the survey. The fact that a colleague had expressed interest in the return of the questionnaire coupled with the fact that the inconvenience of going to the post office to mail it has been eliminated, prompted quite a few researchers to complete the questionnaire. As a result of such efforts, the response rate improved from a discouraging 25 percent to 74.5 percent. That is, out of the 400 questionnaires that were sent out, 298 were returned duly completed.

The Minitab computing system was used for the initial analysis of the data obtained from the two surveys. Minitab is a simplified computing system specifically developed "to relieve students of the computational drudgery usually associated with statistics" (45). Its use of commands similar to English sentences makes the Minitab system ideal for a student with little computer background.

The final data analysis was done by means of the Statistical Package for the Social Sciences (SPSS), an integrated system of computer programmes designed for the analysis of social science data, on a Control Data Corporation (CDC) computer system Cyber
73 model. The SPSS system provides a unified and comprehensive package that enables the user to perform many different types of data analysis in a simple and convenient manner (33). SPSS was found particularly suitable because it enables the researcher to perform an analysis through the use of natural-language control statements.

In preparation for the analysis, the two questionnaires were coded (Appendix IV and V) into the column format acceptable to the Minitab computing system. Care was taken to provide as many categories for each column as possible, in recognition of the fact that it is easier to provide many categories initially and to combine them later if necessary, than to have too few categories. For all "yes" and "no" answers, the binary codes "0" and "1" were used for ease of calculation. The code 88 was given to all cases where the question did not apply to the respondents, while the code 99 was given to all missing values.

For column eleven of the coded library survey questionnaire (Appendix IV), the actual demands made by agricultural researchers were categorized into two types of questions—simple questions and complex reference questions. J.P. Wilkinson and W. Miller in their "step approach to reference service" (57) had categorized reference questions into three
groups, depending on the number of steps involved in finding solutions to the questions. They identified one-step or directional questions; two-step; and multiple-step questions. A step was defined as a distinct and definable judgement leading to a decision, action, or recommendation. Example of multiple-step questions given are bibliographical searches and complex data gathering requests. An inspection of the demands recorded during the library survey revealed that there were very few examples of multi-step or complex data gathering requests. The Wilkinson categorization was therefore abandoned in favour of an earlier one by K. Emerson (15).

K. Emerson categorized reference transactions into two main groups - directional questions and reference questions. On the basis of this categorization, all demands that were satisfied immediately in this study, simply by locating materials on the shelves of the libraries concerned, were classed in the first category as directional questions. The other demands that were satisfied after several days with material from sources outside the library stock were placed in the second category as referenced transactions. This category incorporated Wilkinson's two-step and multi-step categories as it required several decisions and actions on the part of the library personnel to satisfy these demands. Such action would include identifying a source library by looking in an appropriate location tool and initiating inter-library loan.
The data were input into the computer, using TECO, the Text Editor and Corrector programme available in a DEC system 10 interactive computer. TECO is a powerful editor capable of editing any source document, written in any programming language. The use of TECO, which is a character oriented editor, capable of changing one or more characters in a line, made it simple to correct errors and insert omissions while inputting the data.
CHAPTER V

DATA ANALYSIS

1. LIBRARY SURVEY

The questionnaires returned from the library survey consisted basically of records of demands made to individual research institute libraries by agricultural scientists. These demands fell into two main categories: satisfied demands and unsatisfied demands. The recorded satisfaction time enable the satisfied demands to be further categorized by means of a time factor as follows:

1. Immediately available - demands that were satisfied within a few minutes after they were made or within the same working day.

2. Readily available - demands that were satisfied within two weeks.

3. Delayed availability - demands that were satisfied within three months.

The analysis of the data indicated that 471 of the 506 demands made were satisfied, thus giving a very high satisfaction rate of 93 percent (Table 1). This appears to reveal a very admirable picture of the availability level of scientific publications to agricultural research scientists in Nigeria.
Moreover, the histogram of column five (Figure 2), which is the categorization of satisfied demands, indicates that out of the 471 satisfied demands, 440 were satisfied within the same day that they were made. That is, 93.4 percent of the materials demanded were immediately available.

This high availability level could mean that the different research institute libraries have very comprehensive collections that are capable of satisfying 93 percent of the information needs of their research workers. This is not very likely, as very few libraries, certainly not in a developing country like Nigeria, can claim to have such comprehensive collections. Besides, Lawani has already revealed that 37.1 percent of the important titles in the list of periodicals abstracted by Tropical Abstracts were not available in any library in Nigeria. He also found that of the titles available in Nigeria, 23.4 percent were held in no more than one library.

The high availability level revealed in this study could not therefore be attributed to comprehensive institute library collections, nor is it consonant with the views expressed in the literature about the Nigerian Library system (6).

Acting on the suspicion that there might be some other factor responsible for this unbelievably high availability level, it
was decided to subdivide the data into libraries with professional library personnel and those with non-professional workers manning the reference desk. It was discovered that only three out of the fourteen libraries surveyed have profes-

**TABLE 1**

<table>
<thead>
<tr>
<th>Types of Libraries</th>
<th>Satisfied Demands</th>
<th>Unsatisfied Demands</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Libraries with Professional Reference Librarians</td>
<td>80</td>
<td>85</td>
<td>14</td>
</tr>
<tr>
<td>Libraries with Non-Professional Reference Personnel</td>
<td>391</td>
<td>95</td>
<td>21</td>
</tr>
<tr>
<td>TOTAL</td>
<td>471</td>
<td>93</td>
<td>35</td>
</tr>
</tbody>
</table>

**TABLE 2**

<table>
<thead>
<tr>
<th>Types of Libraries</th>
<th>Demands that are immediately satisfied</th>
<th>Demand satisfied within two weeks</th>
<th>Demands satisfied within 3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Libraries with Professional Reference Librarians</td>
<td>58</td>
<td>72.5</td>
<td>12</td>
</tr>
<tr>
<td>Libraries with Non-Professional Reference Personnel</td>
<td>382</td>
<td>97.7</td>
<td>8</td>
</tr>
</tbody>
</table>
FIGURE 2
Bar Graph of Satisfaction Time

Satisfaction Time

Table 1 demonstrates that in these libraries, the availability level is less than 90 percent and Table 2 shows that only 72.5 percent of the demands were satisfied within the same day. On the other hand, the availability level of the eleven libraries with non-professional library personnel is 95 percent and 98 percent of the demands were satisfied within twenty-four hours.

Table 3 shows the sources from which materials were obtained to satisfy the demands that were made. Of the 471 demands, 94 percent were satisfied with materials from the stock of the libraries where the demands were made. However, it is noteworthy that whereas 99.2 percent of the demands made at the
libraries with non-professional library personnel were satisfied from local stock, only 67.5 percent of the demands made in the libraries with professional reference librarians were satisfied from local stock.

<table>
<thead>
<tr>
<th>Types of Libraries</th>
<th>Demands Satisfied from Local Stock</th>
<th>Demands Satisfied with Materials from Other Libraries in Nigeria</th>
<th>Demands Satisfied with Materials from Libraries outside of Nigeria</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Libraries with Professional Reference Librarians</td>
<td>54 67.5</td>
<td>22 27.5</td>
<td>4 5.0</td>
<td>80 100</td>
</tr>
<tr>
<td>Libraries with Non-Professional Library Personnel at the Reference Desk</td>
<td>388 99.2</td>
<td>2 0.5</td>
<td>1 0.3</td>
<td>319 100</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>442 94.0</strong></td>
<td><strong>24 5.0</strong></td>
<td><strong>5 1.0</strong></td>
<td><strong>471 100</strong></td>
</tr>
</tbody>
</table>
This seems to indicate that research workers using libraries with non-professional reference librarians were influenced in their request for materials by their perceived notion of the ability of the librarians serving them. Researchers in these libraries seem to be demanding only materials that they expect would be held by the libraries. Demands for materials not held in the libraries were not made either because the researchers had no confidence in the ability of the library personnel to obtain them or because of unsuccessful attempts to obtain such materials in the past. S.W. Nwoye attempts to explain this situation by commenting that "many libraries in Nigeria are not geared to deal with demand for documents they do not have, partly because they are unaware of possible sources of supply, and partly because the machinery for requesting is inconvenient and clumsy. Long delays are frequent and the rate of ultimate satisfaction is low" (36).

This opinion is reinforced by Figure 3 which demonstrates that the most frequent reason for failure to satisfy demands is that the material required is not held in the library. Another conspicuous reason for failure to satisfy demands is that the library personnel concerned could not locate a source for obtaining the materials requested. It would appear, therefore, that the availability level indicated by the survey of the research institute libraries is a good deal higher than the
actual state of affairs. The survey of the research scientists should indicate the degree of distortion and provide a more realistic picture. It should be noted that the maximum standard error for all the above calculated proportions, based on an infinite population of demands for documents is 2.2%.

2. **OPINION SURVEY**

Figure 4 demonstrates that 70 percent of the respondents to the opinion survey expressed a need to consult the literature frequently. Twenty-seven percent said they need to consult the literature only occasionally, while three percent rarely consulted the literature. Contrary to the high availability level reported in the earlier survey of research libraries, Table 4 shows that 64 percent of the respondents to the opinion survey needed to consult journals that were not held in their respective institute libraries. Respondents listed a total of 188 journals that they needed to consult that were not held by the libraries serving them. This reinforces the earlier argument that the various institute libraries could not be reporting a very high availability level because they have comprehensive collections.

Table 4 also indicates that only 39 percent of the respondents used the inter-library loan service to obtain materials they needed that were not held in their institute libraries. Of
**FIGURE 3**

Reasons for Failure to Satisfy Demands Made by Research Scientists

- Material not held in library: 34.3%
- Material out on loan: 22.9%
- Unable to locate a source library: 20%
- No response from source: 11.4%
- Other (Material lost or mis-shelved): 11.4%

**FIGURE 4**

Researchers' Expressed Need to Consult the Literature

- Frequently: 70%
- Occasionally: 27%
- Rarely: 3%

Total number of researchers, n = 298
these 59 percent found the service satisfactory, while 41 percent found it unsatisfactory. The reasons for dissatisfaction with the inter-library loan service were mainly because it was too slow, and it did not yield results (Figure 5). This may partly account for the tendency discerned in the first survey, for researchers to restrict their demands to materials held in their respective institute libraries.

Eighty-four percent of the respondents expressed a need to consult materials in languages other than English (Table 4). Of these 60 percent made an attempt to obtain translations while 40 percent made do with English abstracts of the articles. The main reason given for not obtaining translation was the lack of a translation service. Seventy-seven percent of those who tried to get translations found them satisfactory. These translations were provided mainly by colleagues or acquaintances as shown in Table 5. It is not surprising therefore that the main reason given for dissatisfaction with translations is that they take too long. Other reasons are that the translations cost too much or that the respondents did not wish to impose on their colleagues' time (Figure 6).

Only two of the research institutes surveyed have formal translation services, and one of them is the International Institute for Tropical Agriculture. The other, the National Cereals Research Institute Library, is able to provide a trans-
TABLE 4

Information-Seeking Behaviour of Agricultural Research Scientists

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Number of Respondents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Need to consult journals not held in own library?</td>
<td>Yes</td>
<td>No</td>
<td>192</td>
<td>106</td>
</tr>
<tr>
<td>2.</td>
<td>Use of inter-library loan Service?</td>
<td>Yes</td>
<td>No</td>
<td>116</td>
<td>181</td>
</tr>
<tr>
<td>3.</td>
<td>Found inter-library loan service satisfactory?</td>
<td>Yes</td>
<td>No</td>
<td>69</td>
<td>47</td>
</tr>
<tr>
<td>4.</td>
<td>Need to consult foreign language materials?</td>
<td>Yes</td>
<td>No</td>
<td>248</td>
<td>49</td>
</tr>
<tr>
<td>5.</td>
<td>Made attempt to obtain translations?</td>
<td>Yes</td>
<td>No</td>
<td>148</td>
<td>34</td>
</tr>
<tr>
<td>6.</td>
<td>Found translation satisfactory?</td>
<td>Yes</td>
<td>No</td>
<td>114</td>
<td>34</td>
</tr>
</tbody>
</table>

FIGURE 5

Reasons for Dissatisfaction with Inter-Library Loan Service

- Too slow 54%
- Did not yield results 32%
- Other 14%
lation service because the librarian happens to be bilingual and has a good knowledge of both English and French. The research scientists in the other institutes appear to be entirely dependent on colleagues or acquaintances for translations.

**TABLE 5**

Reported Sources for Obtaining Translations

<table>
<thead>
<tr>
<th>S/No.</th>
<th>SOURCE</th>
<th>NUMBER</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Colleague/acquaintance</td>
<td>103</td>
<td>71</td>
</tr>
<tr>
<td>2.</td>
<td>Institute library</td>
<td>21</td>
<td>15</td>
</tr>
<tr>
<td>3.</td>
<td>Other</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>4.</td>
<td>Translation service</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>145</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Analysis of the data indicates that the average time lag from the date of publication of scientific journals to when they become available in the institute libraries is 5 months with a mode of 6 months and a range of 10 months. The wide range is accounted for by the fact that some libraries fail to renew their subscriptions on time, owing to the complicated foreign exchange regulations (36). This results in a break in subscription and subsequent delays in the arrival of new journal issues. It is not surprising, therefore, that 69 percent of the respondents find that the time lag affects their work seriously. The situation is further aggravated when libraries fail to obtain missed issues and thus create gaps in the run of journals of importance to the work of researchers.
FIGURE 6

Reported Reasons for Dissatisfaction With Translations

- Takes too long: 50%
- Too expensive: 14%
- Other: 36%

FIGURE 7

Extent to Which Time Lag Affects Work of Research Scientists

- To some extent: 63%
- Seriously: 31%
- Not at all: 6%
3. **BARRIERS TO THE AVAILABILITY OF SCIENTIFIC PUBLICATIONS**

From the analysis of the data obtained from the opinion survey of the agricultural research scientists, the following obstacles to the availability of scientific publications in Nigeria were revealed.

a) **Lack of an Effective Inter-Library Loan System**

Figure 8 demonstrates that by far the largest number of the respondents replied that they would like an effective inter-library loan service, when asked to name an additional service they required from their library. This is indeed very significant because according to S.W. Nwoye (35) librarian of the University of Nigeria, Nsukka, there is no national inter-lending system operating in Nigeria. He describes the existing inter-lending system as "ad hoc". He further states that an attempt was made by the National Library of Nigeria in 1974 to evolve a National Inter-Lending System. However, the National Library could not implement this system, despite a conference on library co-operation sponsored by the National Library, the production of inter-library loan forms, and the publication of a handbook on Library Co-Operation in Nigeria.

When asked for suggestions for improved access to documents needed, 40 percent of the researchers mentioned increased journal subscriptions (Figure 9). However, according to Figure 8, the most prominent additional service the researchers
required from their institute libraries is effective inter-library loan service. The researchers seem to realize that it is not feasible to expect their libraries to stock all the journal titles they would require for their work, for obvious reasons such as limited budgets, even though that would be the ideal situation.

Rather they are realistic enough to indicate the need for an effective inter-library loan service which would augment the short-comings of the libraries serving them. This realization of the difference between the ideal and the realistic solution to the problem of increased availability of scientific documents in the country seems to explain the switch in priority from Figures 8 to 9.

**FIGURE 8**

**MAJOR ADDITIONAL SERVICES REQUIRED FROM INSTITUTE LIBRARIES**

<table>
<thead>
<tr>
<th>Service</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective Inter-Library Loan Service</td>
<td>24%</td>
</tr>
<tr>
<td>Increased Journal Holdings</td>
<td>21%</td>
</tr>
<tr>
<td>Photocopying Facilities</td>
<td>17%</td>
</tr>
<tr>
<td>Reference/Literature Search</td>
<td>10%</td>
</tr>
<tr>
<td>Transliteration Service</td>
<td>9%</td>
</tr>
<tr>
<td>Routing of Current Journal Issues</td>
<td>8%</td>
</tr>
</tbody>
</table>

Total Number of Respondents, n = 184
FIGURE 9
Suggestions For Improved Access to Documents Needed

Total Number of Respondents, n = 269

(b) Photocopying Facilities
Seventeen percent of the respondents (Figure 8) regarded the lack of efficient and cheap photocopying facilities in several of the research libraries as an obstacle to the accessibility of needed documents. The survey revealed that where photocopying facilities exist at all, they often fail for simple reasons such as lack of paper or ink, or because of mechanical faults in the machine. Even when the photocopiers do function, they are expensive to operate and therefore not economical for extensive use by researchers.
Cheap and efficient photocopying facilities have the potential of increasing the availability of scientific publications in Nigeria. They could eliminate the hesitation in lending materials due to fear and risk of loss in transit by making it possible to loan photocopies instead of original materials.

(c) **Translation Services**

Nine percent of the respondents (Figure 8) listed translation services as the additional service they would like from their institute libraries while nine percent also suggested that having a translation service would improve their access to documents needed (Figure 9).

In a typical year, it is estimated that some two million documents and articles, 26,000 journals and over 30,000 books are published on scientific and technical topics in a wide range of languages (47). Even more important is the fact that 49.7 percent of this literature is published in languages other than English. Thus it could be said that even though English is a major language of publication of scientific literature, it is not the only language. The library survey has revealed that only two of the libraries surveyed have a formal translation service. Thus the lack of translation services in most parts of Nigeria could result in a considerable loss to scientific enlightenment and progress.
Table 5 reveals that 71 percent of the research scientists surveyed have attempted to overcome the foreign language barrier by resorting to asking colleagues knowledgeable in a particular language for translations of required documents. However, it is not surprising that 23 percent of them (Table 6) found this situation unsatisfactory because the translation takes too long. Such translations can be provided only at the convenience of the colleagues concerned, even when they are willing to oblige, and this does not appear to be a satisfactory means of overcoming the foreign language barrier.

(d) The Absence of a Reliable Union Catalogue

Improved bibliographic and location tools was the suggestion made by eight percent of the respondents for improving access to documents needed, as shown in Figure 9. A national union catalogue is a key factor in inter-lending because it is through such a tool that libraries may be aware of each other's holdings. In Nigeria the attempt by the National Library to organize a National Union Catalogue has not been very successful because the contributing libraries have not given their full cooperation. For instance, new additions to an individual library's stock are not reported for the updating of the Union Catalogue. Also, there has been no attempt to print the existing incomplete catalogue for distribution to libraries.
A National Union List of Serials in Nigerian Libraries is published by the National Library on an irregular basis. Unfortunately, as noted earlier, this list is not complete because serial titles from some major university libraries are not included. Some of the researchers surveyed recognized this lack of comprehensive and reliable location tools in the country as a barrier to resource-sharing and consequently to the availability of scientific publications.

(e) Poor Communications

It is vital for the effective sharing of resources among a group of libraries that they be linked by an effective communication system. This appears not to be the case in Nigeria because 54 percent of the respondents are dissatisfied with the existing inter-library loan service because it is too slow (Figure 5).

The telephone is not used at all as a means of communication between libraries and the mail is used only in 28.5 percent of the cases (Figure 10). Figure 10 also reveals that the popular means of communication for inter-library loans are personal visits and delivery van or courier service. The implication is that, owing to the poor and unreliable communication system in the country, inter-lending can be done only between libraries within a few miles of each other. This makes the materials
stocked by libraries in other parts of the country unavailable. It is not surprising therefore, that Figure 9 demonstrates that the provision of improved communication systems in the country was regarded by eight percent of the respondents as a means of improving the accessibility of needed documents.

The maximum standard error for all the calculated proportions of the opinion study, based on a finite population of agricultural research scientists of 800 is 2.3 percent. This implies that for a 95 percent confidence interval, the error margin for all the above proportions is 4.6 percent.

4. THE LITERATURE OF INTEREST TO NIGERIAN AGRICULTURAL SCIENTISTS

Modern agriculture is an applied science which is founded upon, and depends upon, the vast amount of research developed by the basic sciences, mathematics, and even some of the social sciences. The term "agricultural literature" is therefore vague and difficult to define. An analysis of the demands made by researchers during the library survey reveals that publications such as Journal of Biological Chemistry, Drainage Design Theory and Practice, The Accountant, The New Scientist, Computers and Problem Solving, Annals of Botany, Journal of Microbiology, were requested, to mention just a few examples. These demands by the researchers indicate that the literature
of interest to them is not confined to agricultural literature, but extends to include chemistry, biology, statistics, physics, engineering and even accountancy.

In a study on agricultural journals and the agricultural literature, Eugene Garfield and M. Weinstock (16) attempted to distinguish between the literature of agriculture and the literature of interest to agricultural scientists. From a citation analysis of agricultural journals, they discovered that the core agricultural journals cited journals in other
disciplines much more widely than they themselves were cited; that the literature that agricultural scientists use is not congruent with the literature that agricultural scientists produce. They also discovered that agricultural scientists use and cite the same hard core of frequently cited basic research journals used by all other research workers in the life sciences.

The analysis of the actual publications demanded by the agricultural researchers confirms the findings of the Garfield and Weinstock study and leads to the conclusion that an agricultural research library, or an agricultural information service, should be a science research library or a science information service embracing all the literature that is of interest to the users.

It was also discovered that of the 506 requests for documents made during the period of the study, 366 were for journal articles. In other words 72.3 percent of the requests were for journal articles. This tends to confirm the findings of Earl and Vickery (14), who in their study of literature use as indicated by citations, reported that periodicals account for between 70 percent to 82 percent of all literature used in science and technology.
It is generally agreed that journals are the source of up-to-date information for scientific research and that they constitute the most important form of publication in the field of science and technology. It is not surprising therefore, that great effort is put into providing intellectual access to journal publications, as is evident in the numerous indexing and abstracting services. However, as it has been pointed out earlier, such efforts at bibliographic control of periodicals do not ensure the availability of the journals themselves to research workers in developing countries. This study in fact has revealed that quite often the only journals available to the research scientists in these countries are those held in the library they use. Even journals held in other libraries in the country are mostly beyond reach because of the barriers that have been discussed.

5. HYPOTHESES TESTING

Assuming that the demands made by the agricultural research scientists in this study reflect their information needs, the satisfaction of these needs is a function of two factors:

- The formulation of the need by the research scientists.
- The interpretation of the need by the library personnel.

An expressed need is satisfied if the information provided matches the request made. The preliminary analysis of the data
obtained from the survey of the research institute libraries indicates that:

- Most of the expressed needs of the agricultural researchers were met from resources in their respective institutional libraries.

- In most of the cases, the library personnel that provided the materials to satisfy the needs of researchers were non-professional library workers.

On the surface, this would tend to indicate that the information needs of agricultural researchers in Nigeria were being adequately satisfied. Consequently, there would appear to be no urgent need either to improve the document delivery system serving these researchers or even to recommend a network model for resource-sharing to improve availability. However, from the results of the opinion survey of agriculture research scientists, it is evident that the researchers do not, in fact, have most of their information needs satisfied. One hundred and ninety-two researchers, or 64 percent of the sample surveyed, indicated that there are journals they need to consult frequently that are not held in their respective libraries. It was also revealed that libraries make little
effort to obtain for the researchers materials they do not
stock either because they do not engage in inter-library
lending, or because the existing system does not yield results.

Several factors seem to be responsible for this discrepancy
between the availability level of scientific documents as per-
ceived by the library personnel and by the research scientists.
Conspicuous among these factors is the qualifications or rank
of the library personnel interacting with the agricultural
research scientists. Figure 8 demonstrates that in answer to
the open-ended question requesting suggestions for improved
access to documents needed, eight percent of the researchers
surveyed indicated a need for qualified and/or trained library
personnel. It thus seems that at least some of the research
scientists were aware of the limited ability of the library
personnel serving them. This is further underscored by the
fact that although Figure 8 demonstrates that the largest
number of researchers cited effective inter-library loan
service as the additional service they required from their
institute libraries, the libraries manned by non-professional
personnel made very little attempt to obtain materials outside
their library stock. In fact, Table 2 demonstrates that only
eight percent of the demands made of such libraries were
satisfied with materials from outside sources.
Thus, there seems to be an indication that research scientists using libraries manned by non-professional reference personnel did not make "difficult" demands that would require to be satisfied with materials from outside sources by operating the existing document delivery system. It was therefore decided to test whether the research scientists were deliberately tailoring their demands for publications to match their knowledge of the capabilities of the library personnel serving them.

The preliminary analysis of the data has shown that in a majority of the libraries surveyed, research scientists had expressed only those demands which they felt could be met with resources in their libraries. This implied that not all the researchers' demands for documents were being expressed at their institution library. The data gathered in this study are therefore not adequate for proving or disproving the original hypothesis that half of the demands for scientific documents made by agricultural research scientists in Nigeria are not being satisfied, because not all their demands for documents have been recorded. It was therefore decided that it would not be useful to test this original hypothesis. Rather, the results of the preliminary analysis led to a decision to convert two assumptions made at the beginning of the study into null hypotheses and to test for their acceptance or rejection. However, in recognition of the validity problem that might arise out of developing new hypotheses at this stage of the
study, it was decided to gather more data through in-depth interviews which were used later as validity checks on the results of the two hypothesis tests.

The hypotheses are:

- There is no relationship between the rank or qualification of the library personnel manning the reference desk of a research library and the source from which materials are obtained to satisfy demands for documents.

- There is no relationship between the rank or qualification of the library personnel manning the reference desk of a research library and the type of questions asked by research scientists.

For the first hypothesis, a Chi-square test of statistical significance was carried out between the two variables, rank of library personnel and source of materials obtained to satisfy demands. Column three of the coded questionnaire used for the survey of institute libraries, provided the rank of the library personnel manning the reference desk as a professional or non-professional library worker, and column seven provided the source from which material was obtained to satisfy each demand. Material was either obtained from the recording library or from another library in Nigeria or outside Nigeria. By combining the coded categories 2, 3, and 4, the number of demands satisfied with materials outside the recording library's stock was obtained. It was thus possible to have a 2 x 2 table for the Chi-square test of statistical significance (Table 6).
Table 6 shows that the Chi-square value for the test is 119.56, with one degree of freedom for a 2 x 2 table. This is much greater than the critical Chi-square value at 0.05 level of significance, which is 3.84. This implies a rejection of the null hypothesis that there is no relationship between the rank of the library personnel and the source from which materials were obtained, and establishes that there is a systematic relationship of some sort existing between the two variables.

However, since the Chi-square test by itself could only indicate that the variables tested are related, it was found necessary to carry out further tests to measure the strength of the relationship between the two variables. First the Phi test of statistical significance was carried out to measure the strength of the relationship between the two variables. The Phi test which is specifically suitable for a 2 x 2 table because it makes a correction for the fact that the value of the Chi-square is directly proportional to the number of cases by adjusting the $\chi^2$ value. Thus, the value of $\Phi$, $\Phi$ is given by the equation

$$\Phi = \left( \frac{\chi^2}{N} \right)^{1/2} = 0.50$$

Where the Chi-square, $\chi^2 = 119.56$

Number of cases, $n = 472$
### TABLE 6

**Cross Tabulation of Rank of Reference Staff by Source of Document**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Count</th>
<th>Local Stock</th>
<th>Another Library</th>
<th>Row Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Row PCT</td>
<td>Col PCT</td>
<td>Tot PCT</td>
<td></td>
</tr>
<tr>
<td>Non-Professional</td>
<td>388</td>
<td>99.2</td>
<td>87.8</td>
<td>82.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.8</td>
<td>10.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Professional</td>
<td>54</td>
<td>66.7</td>
<td>12.2</td>
<td>11.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>33.3</td>
<td>90.0</td>
<td>5.7</td>
</tr>
<tr>
<td>Column Total</td>
<td>442</td>
<td>93.6</td>
<td>29</td>
<td>6.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CORRECTED CHI SQUARE = 114.15**

**RAW CHI SQUARE = 119.56**

**PHI = 0.50330**

**CONTINGENCY COEFFICIENT = 0.44957**

Phi takes on the value of 0 when no relationship exists between the two variables, and the value of +1 when the variables are perfectly related. The Phi value of 0.50 therefore indicates a fairly strong relationship.

A further measure of the strength of the association between the two variables was carried out using the contingency co-
efficient formula. The value of the contingency coefficient $C$ was given by the equation

$$C = \left( \frac{\chi^2}{\chi^2 + N} \right)^{\frac{1}{2}}$$

Where the Chi-square $\chi^2 = 119.56$

Number of cases $N = 472$

$C$ takes on a minimum value of 0 but a maximum value of 0.7 for a 2 x 2 table. Thus, the calculated value of the contingency coefficient $C$ of 0.45 confirms that a fairly strong association exists between the two variables.

A Chi-square test of statistical significance was also carried out to test the second hypothesis. The rank of the library personnel manning the reference desk of the research libraries was obtained as described above from column three of the coded questionnaire used for the library survey. The second variable, the type of question, was obtained from column eleven of the coded questionnaire used for the library survey, which consist of a categorization of the actual demands made by research scientists into two types of questions: simple location questions and complex reference questions.
The result of the Chi-square test between the two variables, rank of library personnel and type of questions asked, gave a value of 229.52 with one degree of freedom for a 2 x 2 table. The critical value of the Chi-square for one degree of freedom at the 0.05 level of significance is 3.84 as indicated earlier.

**TABLE 7**

Cross Tabulation of Rank of Reference Staff by Type of Question

<table>
<thead>
<tr>
<th>TYPE OF QUESTION</th>
<th>Count</th>
<th>Simple Question</th>
<th>Complex Question</th>
<th>Row Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Row PCT</td>
<td>Col PCT</td>
<td>Tot PCT</td>
<td></td>
</tr>
<tr>
<td><strong>Rank</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Professional</td>
<td>379</td>
<td>92.0</td>
<td>95.0</td>
<td>74.9</td>
</tr>
<tr>
<td>Professional</td>
<td>20</td>
<td>21.3</td>
<td>5.0</td>
<td>4.0</td>
</tr>
<tr>
<td><strong>Column Total</strong></td>
<td>399</td>
<td>78.9</td>
<td>107</td>
<td>21.1</td>
</tr>
</tbody>
</table>

**CORRECTED CHI SQUARE = 225.3**

**RAW CHI SQUARE = 229.52**

**PHI = 0.6735**

**CONTINGENCY COEFFICIENT = 0.55862**
The test value is thus much greater than the critical value, and this indicates that there is a relationship between the two variables. Consequently, the null hypothesis, that there is no relationship between the rank of the library personnel and the type of questions asked, was rejected.

As in the case of the first hypothesis, both Phi and contingency coefficient formulas for statistical significance were used to measure the strength of the association between the variables (Table 7).

\[ \Phi = \left( \frac{X^2}{N} \right)^{1/2} = 0.67 \]

Where the Chi-square \( X^2 = 229.52 \)

Number of cases, \( N = 506 \)

Contingency coefficient \( C = \left( \frac{X^2}{X^2 + N} \right)^{1/2} = 0.56 \)

Where the Chi-square \( X^2 = 229.5 \)

and number of cases \( N = 506 \)

The values of both Phi and the contingency coefficient do indicate that there is a strong relationship between the rank of the library personnel and the type of questions asked.

Fiscal realities such as the economic environment created by rising costs and reduced government and institutional financial
support for libraries have compelled libraries in many countries to acknowledge the impossibility of building totally comprehensive collections and providing totally comprehensive services to their users. Consequently, resource-sharing has been accepted, perhaps reluctantly, as an effective means of improving a library's service performance.

The results of the above tests have revealed that most of the agricultural research libraries in Nigeria where there were non-professional reference librarians, did not engage in resource-sharing and research scientists were consequently restricted to the use of publications stocked in the respective libraries. Since it has already been indicated that none of these libraries could claim to be totally comprehensive collections, it could be concluded that the deployment of professional reference librarians who could engage in resource-sharing, would significantly improve the availability of publications to the libraries' clientele.
CHAPTER VI

THE DEPLOYMENT OF TRAINED LIBRARY PERSONNEL AND ITS EFFECTS ON THE AVAILABILITY OF SCIENTIFIC PUBLICATION

- A CASE STUDY

1. INTRODUCTION

The analysis of data obtained from the survey of agricultural research institutes in Nigeria in the previous chapter, has revealed that there is a significant difference in availability level of scientific documents in the different research libraries. The most distinctive variable factor that was identified in these research libraries was the deployment of professional librarians in reference/readers services sections of individual libraries. It was therefore decided to investigate further the effect of the qualification of library personnel manning the reference desk of a particular library on the information-seeking behaviour of researchers using the library.

The previous investigation also revealed a gap between the adequacy of availability level of scientific documents as perceived by the library personnel and by the research scientists. Whereas the library survey of recorded demands indicated a very high level of availability of documents, the opinion survey of researchers revealed that sixty-four percent (Table 4) were not satisfied with the availability of documents to them. Consequently it was decided to carry out case studies.
of four of the research institutions representing the two types of libraries; that is, those with professional reference librarians and those with non-professional library personnel. The aim was to attempt to come up with an explanation for the disparity in the availability level of publications in the country as perceived by library personnel and research scientists.

The four research institutions studied were: The International Institute for Tropical Agriculture, Ibadan (I.I.T.A.); The National Horticultural Research Institute, Ibadan (N.H.R.I.); The Nigerian Institute for Trypanosomiasis Research, Kaduna (N.I.T.R.); and The Institute for Agricultural Research, Samaru Zaria (I.A.R.). The first two institutes are located in the Southern region of Nigeria, while the second two institutes are located in the Northern region. This was done deliberately to ensure that the two educationally dichotomous\(^1\) regions were represented.

---

\(^1\) Formal education, as we know it today, came to Nigeria with the advent of the Christian missionaries in the mid-nineteenth century to the Southern region of Nigeria (53). The Wesleyan Methodist Society established a station at Badagry in 1841 closely followed by the Church missionary Society and other religious sects. Establishment of Schools was an integral part of the activities of the missionaries. Almost wherever they established stations, the missionaries established schools starting from the coast and moving inwards.

By 1929, there were 2,715 primary schools in the Southern regions of Nigeria with over 140,000 pupils and 19 secondary
The reference services of the libraries of the I.I.T.A. and the N.I.T.R. were manned by professional librarians at the time of the first library survey, while those of the N.H.R.I. and the I.A.R. were manned by non-professional staff. The I.I.T.A. though located in the Southern region of Nigeria, is an international research institute which does not cater to the interest of the south alone but to the whole country as well as other tropical countries. It has nevertheless been chosen as one of the institutes to be studied because its comparatively sophisticated documentation service has earned for it the status of an ideal research institute with attributes that other research institutes in the country should aspire to. A brief history of all the agricultural research institutes studied can be seen in Appendix XII.

In each of the four institutes studied, the head librarian, the library personnel manning the reference desk, and ten research

-------------------------------
schools with about 600 students. Apart from a few small schools set up by provincial residents for the training of the sons of Chiefs, the colonial system of education did not start in the North until 1909 when a government school was opened at Nassarawa, near Kanō. About the same time, the missions also started work in the North, amidst strong resistance.

Consequently, by the mid-twentieth century there was a wide disparity between the North and Southern regions in the percentage of children attending school. In the Eastern region about eighty percent of the boys between the ages of six and fourteen were in school while only eight percent of the total population of children of the same age group were in schools in the Northern region.
scientists were interviewed in depth to cover the following areas:

1. The deployment of professional librarians.

2. The existence of suppressed demands.

3. The effectiveness of inter-library lending.

4. The availability and use of comprehensive agricultural bibliographies and location tools.

5. The need of a centralized translation service.

6. The desirability of a nationally organized inter-library loan scheme and the network model considered suitable for the country.

A set of interview questions were compiled for the interviews of both the library personnel and the research scientists, and these can be seen in Appendix IX and Appendix X respectively.

The answers of the respondents were coded to facilitate the recording of what transpired during the interviews and to enable a summation of the responses to be made.
2. PURPOSE OF INTERVIEW QUESTIONS

A majority of the questions discussed were common to both groups of respondents. There were, however, a few questions that were unique to each group. For instance, questions 1 and 2 of the librarians' interview questions (In what service areas are the professional librarians in your library deployed, and, if a non-professional worker is in charge of reference services, do you think such staff is capable of handling complex reference questions?) have a similar objective to question 1 of the research scientists' interview questions (When you visit your library to obtain a document you need, are you aware of the status of the library personnel you approach to make your request?). These questions sought to elicit information on the status of the library personnel that usually handled the document requests of researchers and on whether researchers were aware of the status of the library personnel they approached for information. The ultimate aim was to determine whether there were any perceived differences in the performance of professional and non-professional library staff in a reference situation and to determine whether such differences have any significant effect on the information-seeking behavior of the research scientists.

Question 4 of the librarians' interview questions (What factors in your opinion contribute to the slow and/or poor response to
ILL request?) corresponds to question 5 of the researchers' questionnaire. The question sought to identify the factors that hinder or make ineffective efforts at inter-library lending among research libraries.

Questions 6 and 7 of the librarians' questionnaire (Does your library subscribe to AGRINDEX, and are there Union Lists and other tools in your library to indicate the holdings of other research libraries in the country?) correspond to questions 7 and 8 of the researchers' questionnaire. These questions were aimed at determining the extent to which both the researchers and the librarians were aware of the potential demands for documents of interest and relevance to agricultural research. From the initial survey of the agricultural research institutes reported in Chapter V, three types of demands for documents by research scientists could be identified: The EXPRESSED DEMANDS, which were recorded during the library survey by the personnel manning the reference desk; The SUPPRESSED DEMANDS, which were hinted at by the positive reply to question 7 of the general questionnaire (Appendix II) used to survey the opinion of agricultural research workers on the availability of scientific journals (Are there any journals that you need to consult often that are not available in the library you use?); and finally, the POTENTIAL DEMANDS, which are indicated by comprehensive compilations of literature of interest to agricultural research scientists, such as AGRINDEX.
Questions 8 and 9 (librarians' questionnaire) and questions 9 and 10 (researchers' questionnaire) were designed to determine what attitude respondents had to improving availability of publications through centralizing translation services and establishing a formal national inter-lending scheme. They were also designed to find out what attitudes respondents might have to the concept of library networking, and what implications these might have for a network model suitable for Nigeria. The questions were: Would you consider a central translation service a better solution to the translation needs of researchers, than individual attempts by research libraries? and Do you think the availability of scientific publications in Nigeria will be improved by a nationally organized inter-library lending scheme?

Question 11 of the librarians' questionnaire (In your opinion, what factors could improve the availability of publications to research scientists in Nigeria?) is unique to this group. The question provides the librarians with an opportunity to express what factors, in their opinion, constitute a barrier to the availability of publications and how these barriers can be overcome.

Question 2 of the researchers' questionnaire is again unique to this group. The question, Do you normally request all
materials you need at your library? Or are there some materials you need that you do not demand because you do not think you can get them?, was designed to determine the extent of suppressed demands and the reasons for their suppression.

3. **ANALYSIS OF DATA OBTAINED FROM THE INTERVIEWS**

(a) **Deployment of Professional Librarians**

In the libraries where a non-professional library worker manned the reference desk, the main reason given for such deployment was the inadequate number of professional librarians. At the Horticultural Research Institute Library, the available two professional librarians were deployed to take care of administration and technical (that is, acquisition, cataloguing, and classification) services. In 1981, however, a third librarian joined the staff of the library and she is currently in charge of the reference services. The Institute of Agricultural Research, Samaru, Zaria, also has only two professional librarians on its library staff. These are again deployed to cover administration and technical services. At the I.A.R. a staff member described as a para-professional is in charge of reference services.

Despite the low priority given to reference services in the deployment of professional librarians, both heads of these libraries were unanimous in admitting that non-professional
personnel were not capable of handling complex reference questions. It was further gathered that such personnel have been instructed to refer complex reference questions to professional librarians, even though it was admitted that very little referral is actually done. It will be revealed later that few or no complex reference questions are being referred to professional staff because the researchers just do not make such requests when dealing with non-professional personnel.

The libraries of both the Nigerian Institute for Trypanosomiasis Research, Kaduna (N.I.T.R.), and the International Institute of Tropical Agriculture (I.I.T.A.) have professional reference librarians. It is noteworthy that the N.I.T.R. library has only two professional librarians on its staff. Nevertheless, one of the librarians is in charge of reference and documentation services. Heads of both libraries, not surprisingly, expressed the opinion that a non-professional staff member is not capable of handling complex reference questions. The reason given by the librarian at I.I.T.A. was that such questions usually required a knowledge of the literature and contents as well as in-depth knowledge of location tools and possible sources.

All the research scientists interviewed using both types of libraries (that is, libraries with professional and non-
professional reference personnel) admitted being aware of the status of the library personnel they approach for requests in their respective libraries. A research scientist at I.I.T.A. said that if he had a complex reference question to ask and the professional reference librarian was not available at the time, he would rather wait than approach a non-professional staff member. On the other hand, another research scientist at the N.I.T.R. opined that he expects to make his information requests to a professional librarian or he would not make them at all, as he does not expect a non-professional to understand his complicated demands. Thus it would appear that researchers in agricultural research institutes are conscious of the status of the library personnel serving their information needs. Moreover, further evidence will show that this awareness of the status of the library personnel in charge of reference has some influence in the information-seeking behaviour of the researchers.

(b) Suppressed Demands

On this topic, two different opinions were discerned in the two types of Institutes. All but one of the twenty research scientists interviewed in the institutions with professional reference librarians admitted to requesting all their document needs at their library, irrespective of whether such documents were held in the library or not. The one dissenting respondent, a research scientist at I.I.T.A., explained that he
found it faster to write directly to the authors of journal articles he required for a copy, rather than requesting the library to get the articles for him.

On the other hand, eighteen of the twenty respondents from the institutions with non-professional reference staff admitted suppressing some of their document needs. The demands that were not expressed at these libraries, it was discovered, were mainly for documents that were not stocked in the respective libraries. The reasons given for suppressing some of their document needs and not expressing them at their institute library are given in Table 8.

**TABLE 8**

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Reason</th>
<th>Number of Researchers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Does not have the confidence that the reference personnel in the library can obtain such documents</td>
<td>9</td>
</tr>
<tr>
<td>2.</td>
<td>Owing to the proximity of other research institutes, the researcher finds it easier and quicker to drive to other research libraries to locate documents needed</td>
<td>7</td>
</tr>
<tr>
<td>3.</td>
<td>Writes to request copies of such articles from their authors</td>
<td>2</td>
</tr>
</tbody>
</table>

**TOTAL** 18
Even though only half of the respondents specifically gave lack of confidence in the reference staff as the reason for suppressing some of their demands, it could well be deduced from the discussions with the researchers that this is the indirect reason for the suppression of demands in the institutions without professional reference librarians. Consequently, this exposes the very high availability figures obtained from these libraries in the first stage of the study to be a false picture as the figures did not take into account these suppressed demands, but only recorded the expressed demands of the researchers for documents stocked in the libraries.

(c) Inter-Library Lending

As the suppression of needs was more common in the libraries with non-professional reference staff, it was not surprising that little or no inter-library lending was carried out in these libraries. The senior librarian in charge of the Horticultural Research Institute Library explained that inter-library lending is in the library's policy. However, no inter-library borrowing has been initiated by the library because the research scientists do not request materials not held in the library. Rather, the librarian reported that the researchers sometimes asked for letters of introduction to enable them to use and/or borrow materials from other research libraries. It is evident that such requests for letters of introduction to
other libraries should have indicated to the librarian that some of the researchers' demands were not being met. Nevertheless, there has been no attempt to identify these demands nor to provide the documents to satisfy them.

The librarian of the Institute of Agricultural Research, Samaru, reported that some inter-lending is carried out by his library. He expressed the view that the para-professional in charge of reference services has acquired a lot of experience on the job. It was however admitted that most of the inter-lending was done with other libraries in the vicinity, and the reference staff went physically to the other research libraries in the city to borrow the required materials. Thus it is evident that, even though in this Institute the non-professional reference personnel carried out some inter-library lending, his sphere of operation was restricted to the city in which the Institute was located.

At the N.I.T.R., the Institute librarian reported a lot of inter-library borrowing. Mainly photocopies of articles are requested from libraries outside the city and the country, such as the British Library Lending Division, BLLD. However, it was reported that materials were borrowed from research institute libraries of neighbouring cities by personal visits in order to reduce the waiting period.
At the I.I.T.A. library, considerable inter-library lending was reported. Both the librarians and the researchers reported that a majority of the inter-lending requests were successful and arrive within a satisfactory period of time. The reference librarian further explained that two factors contributed to the success of their inter-lending efforts. First, only photocopies are requested from or loaned to libraries outside Ibadan, the city where the I.I.T.A. is located. Second, when a document not held in the library is required, the reference staff first try to obtain it from libraries in and around Ibadan. If the document could not be located, then an attempt would be made to obtain it from an overseas library, most often the British Library Lending Division. Other libraries in Nigeria are contacted last, and only if the document could not be obtained from the first two sources. The reasons for this procedure in the inter-lending practice of this library were given as follows:

1. There is a large concentration of agricultural research libraries at Ibadan. Consequently, the chances of obtaining any document in other libraries in Nigeria when not found in the research libraries at Ibadan were slim.

2. The poor attitude of library workers contributes to the delay or even non-response to inter-library requests
made to other Nigerian libraries. Letters requesting an inter-library loan were often not answered, and material loaned was sometimes not returned in time to its original library. By borrowing from and lending to libraries at Ibadan, the I.I.T.A. reference staff eliminated this obstacle by visiting the libraries physically to transact their inter-library requests.

3. There is a genuine risk of original materials sent through the mail being lost or damaged, and this makes some libraries in Nigeria reluctant to loan out their original documents. Photocopies eliminate the risk factor but quite often libraries either did not have photocopying facilities or such facilities were broken down or lacked paper. As a result, several Nigerian libraries were unable to send photocopies of articles when requested to do so by another library. Consequently, the I.I.T.A. staff prefer to make requests for photocopies of articles from an overseas library that would invariably fulfill the request than to send such requests to libraries in other parts of Nigeria.

It could be concluded from the above findings that resource-sharing among agricultural research institute libraries in the
country is currently being done in a very restricted fashion amidst libraries within a given locality. This is as a result of certain constraints such as lack of a fast and efficient communication system, risk of loss or delay of material, and the poor attitude of library workers. Unfortunately, such restricted resource-sharing prevents researchers from benefiting from the the materials held in libraries in other parts of the country.

(d) Potential Demands
Potential demands is a nebulous area that is difficult to define, and the difficulties involved in determining the potential demands of any group of users have been stated earlier in this study. Nevertheless, it was decided to make an attempt to get an indication of the potential demands of the agricultural research scientists from their awareness and use of AGRINDEX, the comprehensive listing of Agricultural literature. AGRINDEX is the monthly bibliography published by FAO from a data base at the AGRIS Coordinating Centre. It provides references to current literature, collected from world-wide sources, relevant to research and development in the food and agriculture sector and allied fields. It was felt that regular consultation of AGRINDEX would enable researchers to come across publications of interest to them and thus make them aware of their potential demands.
Three of the four institute libraries covered in the in-depth interviews subscribe to AGRINDEX. The fourth library, which is the N.I.T.R. Library, does not subscribe to AGRINDEX because, according to the Chief Librarian, it is a repetition of other bibliographies already being received in the library. However, it is noteworthy that even in the libraries that subscribe to it, none of the scientists interviewed admitted to consulting AGRINDEX regularly. In fact, only four researchers of the forty interviewed in the four research institutes reported consulting AGRINDEX occasionally. Up to ten researchers were not even aware of the existence of AGRINDEX.

The most common reason given for not consulting AGRINDEX was the existence of other more relevant subject bibliographies and abstracting journals. At the N.I.T.R., Kaduna, researchers reported that they find publications such as TSETSE and Trypanosomiasis Information Quarterly and Quarterly Bibliography of Major Tropical Diseases to be more useful current awareness tools than an all-purpose tool such as AGRINDEX. At the I.A.R., Zaria, even though the library subscribes to AGRINDEX, publications such as Current Contents and other subject bibliographies and abstracts were preferred and consulted more often. At the Horticultural Research Institute, Ibadan, half the researchers interviewed were not aware of the existence of AGRINDEX, even though the library receives some copies of
AGRINDEX from the National Library. The other half of the researchers knew of the existence of AGRINDEX, but they did not consult it.

However, it was remarkable that AGRINDEX was also not consulted much by the researchers at I.I.T.A., Ibadan, even though the library subscribed to it. A researcher at this Institute explained that he, and some others like him, do not consult AGRINDEX because they enjoy a selective dissemination of information service from FAO which enables them to receive directly, by mail, bibliographies and references of interest and relevance to their respective areas of research. Nevertheless by far the most common reason given by the researchers at I.I.T.A. for not consulting AGRINDEX was the existence of the monthly accession list put out by the library of the Institute, called Selected List of Publications Received in the Library. This is a listing in alphabetical order of authors of scientific articles contained in the most recent journal issues received at the library. Eight of the ten researchers interviewed at this institute mentioned this publication as their main source of current awareness in their subject area. However, when it was pointed out that this publication restricted their literature search to materials received in their library, it was further revealed that international bibliographies and abstracting journals, such as Current
Contents and Citation Indexes were also consulted in search of materials not held at the library.

All the four Institute libraries studied stocked accession lists of other agricultural research libraries and the Union List of Serials in Nigerian Libraries. However, ninety percent of the researchers interviewed admitted that they did not consult these tools. At the I.I.T.A., N.I.T.R., and I.A.R. the librarians reported that such lists were consulted extensively by the library staff for inter-library loan requests. The library staff at the Horticultural Research Institute, however, admitted not consulting these accession lists of other libraries mainly because the library did not initiate any inter-library lending, as was reported earlier.

The above has confirmed that the potential demands of the researchers were indeed difficult to ascertain. The only indication so far were the listings in the many different subject bibliographies and abstracts. The above findings have also revealed that the usefulness of comprehensive interdisciplinary bibliographies such as AGRINDEX was questionable, judging from the very little use that was made of AGRINDEX by the research scientists despite the fact that many of the libraries subscribed to it.
In Nigeria, there are no widespread computer facilities. Consequently, AGRINDEX is not available in the form of a computerized data base from which only relevant information can be retrieved. Rather, it is received only as a printed bibliography. It would appear therefore that for countries without computer facilities, specialized subject bibliographies are more useful to researchers for current awareness than are comprehensive bibliographies such as AGRINDEX.

(e) Networking or Formal Organization of Inter-Library Cooperation

During the earlier survey of eighteen agricultural research libraries in the country, it was revealed that there were some inter-library cooperative activities in the country. However, such cooperative schemes were not effective because of their voluntary and arbitrary nature, the lack of an up-to-date Union Catalogue and some physical and environmental constraints of the larger society such as communication difficulties. Accordingly, it was decided in the second phase of the investigation, to determine the attitude of both librarians and the researchers to formally organized inter-library cooperation, and the model of networking considered appropriate for the country.

There was a unanimous acceptance of the principle of a nationally organized borrowing scheme both by librarians and
researchers. The librarian of I.I.T.A. feels that such a formally organized scheme with laid down procedures would circumvent some of the problems inherent in the present cooperative activities. For instance, there would be a moral obligation to respond to loan requests on the part of libraries in such a system. Also some of the apprehensions in lending, such as the loss of materials would be eliminated as there would be an undertaking for materials loaned out to be safeguarded.

In practice, however, doubts were expressed about the effectiveness of such a nationally organized borrowing scheme. All the librarians interviewed, as well as three quarters of the researchers, expressed the opinion that cooperative activities are more likely to be effective between libraries within the same vicinity. It was the majority opinion that cooperative activities should be encouraged between groups of libraries in different sub-regions of the country, with a provision to resort, occasionally to a central resource library when the need arises. The reasons given for this opinion were the same as those mentioned earlier. These are mainly the communication difficulties in the country and the poor attitude of library personnel to their work. It was felt that cooperative activities between libraries within the same locality were more likely to succeed because personnel in such libraries could
easily visit other libraries physically to borrow required documents, thus eliminating the delays and risks attributed to communication difficulties.

The idea of a national translation centre or even a regional (West African) translation centre was generally accepted as a worthy concept by both the libraries and researchers interviewed. The Chief Librarian at N.I.T.R. as well as several researchers interviewed expressed the view that such a centre would avoid duplication of translation efforts by the different research libraries as well as be more organized and productive because of the concentration of qualified personnel. This would be a great improvement from the present situation whereby many research libraries do not have translation services or at best can provide such services for only one foreign language and on an ad hoc basis. However, most of the researchers interviewed again expressed misgivings about the practicability of a national translation service. In fact some of them expressed very strong ideas on the topic of networking or centralization of any service in Nigeria.

Sixty percent of the researchers interviewed felt a central translation service would not be able to cope with the volume of work it would attract and the quality of the work produced would be poor. It was also felt that the poor attitude of the
average Nigerian worker to work would make a central translation service ineffective. The majority opinion of the researchers interviewed was that a more practical approach would be to have several translation centres for different parts of the country to be used by the Libraries in the respective areas. Such a decentralized service, it was felt, would be more efficient than a highly centralized one.

(f) **Suggestions for Improved Availability of Documents**

At the end of the interview of each librarian, he/she was given an opportunity to give suggestions on how to improve the availability of scientific publications to agricultural research scientists in the country. This opportunity, it will be recalled, had already been given to research scientists at the end of their opinion survey. It was therefore felt that it would be interesting to compare the suggestions of the two groups of people involved in the dissemination of scientific information, that is the librarians and the scientists, as displayed in Table 9.

Table 9 reveals that the two groups of respondents made similar suggestions on how to improve the availability or access to scientific documents. In fact the first two suggestions are the same for both groups. Whereas the researchers' first priority was for their libraries to increase their subscrip-
tions to journals, the librarians' first priority was that Government should relax its stringent foreign exchange regulations to enable libraries to purchase more journals abroad and in good time. On the other hand, both researchers and librarians indicated an effective inter-library loan scheme as their second suggested means of improving access to documents. This indicates that both groups are aware of the role an effective inter-library loan scheme could play in making the resources in different libraries available to researchers in other institutions. In fact, in the earlier opinion survey of researchers in the eighteen research institutes, the majority of researchers had indicated the existence of an effective inter-library loan scheme as the priority service required from their respective libraries (Figure 8). It could be deduced therefore, that the desire for an effective inter-library loan scheme was only reduced to a second place in the suggestions for improved access because of an awareness of the realities of inter-lending practices in the country. The researchers thus displayed an awareness of the fact that an inter-library loan scheme was the best means of increasing the availability of publications in the country.
### TABLE 9

**Suggestions for Improved Access to Documents**

<table>
<thead>
<tr>
<th>Order of Priority</th>
<th>Suggestions made by Research Scientists</th>
<th>Suggestions made by Librarians</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Increased journal subscriptions</td>
<td>Relaxation of foreign exchange restrictions</td>
</tr>
<tr>
<td>2.</td>
<td>Effective inter-library loan scheme</td>
<td>Effective inter-library loan scheme</td>
</tr>
<tr>
<td>3.</td>
<td>Current awareness service</td>
<td>The production of meaningful accession lists by research libraries</td>
</tr>
<tr>
<td>4.</td>
<td>Translation Services</td>
<td>Increase of the library's budget by the parent institution</td>
</tr>
<tr>
<td>5.</td>
<td>Improved Communication System in the country</td>
<td>Improved Communication links between libraries</td>
</tr>
<tr>
<td>6.</td>
<td>Qualified library personnel</td>
<td>A more cooperative attitude from library workers</td>
</tr>
</tbody>
</table>
CHAPTER VII

SUMMARY OF FINDINGS AND SUGGESTIONS FOR FURTHER RESEARCH

1. SUMMARY OF FINDINGS

The primary aim of librarians and information scientists is to serve users by providing them with access to recorded information. Two requirements are necessary to accomplish this aim. The first is to aid users to discover which records may be of interest and, secondly, to make it possible for users to have access to these records. The first major finding of this study is that the deployment of professional librarians in Nigeria affects the effective performance of the above two functions in the agricultural research libraries in the country.

By deployment is meant the assignment of actual jobs performed by professional librarians available in a library, which could vary from administrative duties, acquisitions, cataloguing and classification, to reference and readers services. Whereas each of the eighteen research libraries surveyed has at least two professional librarians on their staff, professional librarians were in charge of reference services in only three of the fourteen libraries that responded. Data provided by questionnaires established that in those libraries with non-professional reference staff, research scientists asked mainly simple locational questions that were satisfied with materials stocked in the library.

122
On the other hand, most of the complex reference questions requiring literature searches and materials outside the library's stock were recorded in the three libraries with professional librarians manning the reference desk.

The result of a Chi-square test of statistical significance into the relationship between the rank or qualification of the library personnel manning the reference desk and the sources from which materials were obtained to satisfy the demands made, indicated the existence of a relationship between the two variables. Also the Chi-square value for another test into the relationship between qualification of the reference staff and the type of questions asked by research scientists was much greater than the critical value at 0.05 level of significance, and thus established the existence of a relationship between the two variables.

The two tests therefore suggested that the qualification of the staff manning the reference services of the agricultural research libraries surveyed is a major factor that influences the availability of scientific publications to researchers. In the agricultural libraries with non-professional reference staff, the documents available to the researchers were restricted mainly to the publications stocked by the respective libraries. Whereas, in those libraries with professional reference staff, researchers were able to benefit from
publications stocked not only in other libraries in Nigeria but also in libraries outside Nigeria.

The second major finding of this study is that research scientists in the institutes surveyed tailor their expressed demands according to their perception of the status and ability of the reference staff serving them. Data obtained from interviews of agricultural research scientists in the third stage of the study revealed that the qualification of the staff manning the reference service had an influence on the information-seeking behaviour of the research scientists using the library. In the two institutes with non-professional reference staff covered during the interviews, it was discovered that ninety percent of the researchers deliberately suppressed some of their document needs. It was also discovered that those suppressed needs were mainly for documents not stocked in the institute library. The researchers gave as their main reason for suppressing some of their needs a lack of confidence in the non-professional reference staff's ability to obtain such materials. In fact some of the researchers reported that they preferred to resort to obtaining such materials themselves from other research libraries or even to writing directly to authors for reprints.

All forty research scientists interviewed in the four research institutes indicated that they were aware of the status of the
reference staff they interacted with, that is, whether the person was a professional librarian or non-professional library staff. It could therefore be concluded that the researchers consciously adjusted their document demands depending on the rank of the reference staff they were dealing with.

The third major finding of this study is the identification of barriers to the establishment of an effective network for resource-sharing. These barriers can be grouped into two major categories: financial or infrastructure related barriers and personnel related barriers. Financial or infrastructural barriers include:

(a) Foreign language materials. A significant proportion of scientific and technical literature being published is in languages other than English, yet most of the agricultural research institutes surveyed did not have any convenient access to translation service. This is a serious barrier in agricultural research where scientists stand to benefit from research in countries with similar geographical and climatic conditions. Many countries with a tropical climate similar to that of Nigeria such as some Latin American and African countries are non-English speaking. Without effective translation service, the language barrier is certainly obstructing the availability of relevant materials from such countries to the researchers.
Research scientists were agreed on the need for more concerted efforts at providing translation for a variety of foreign languages. They also agreed that such efforts be coordinated in some fashion to reduce cost and duplication of effort. However, a majority of the researchers did not support the idea of a centralized national translation service mainly because it was felt that it would not be effective, given the infrastructural facilities in the country. Rather it was suggested that groups of libraries in a particular vicinity should cooperate by establishing one translation centre that could serve the participating libraries effectively.

(b) Inadequate photocopying facilities. Cheap and reliable photocopying facilities have the potential of increasing the availability of scientific documents in Nigeria mainly by eliminating librarians' hesitation in lending materials because of fear and risk of loss in transit. Unfortunately, a majority of the research libraries surveyed either did not have such facilities or lacked proper maintenance of existing equipment. Consequently, it was often not possible to send photocopies in response to loan requests.

(c) Poor communication systems. The communication system in the country is still not efficient by international standards. Telephones do not exist in ten of the fourteen research
libraries surveyed, and where they exist, half the time they are not functioning properly. The data from the questionnaire for the first stage of the study revealed that the telephone was not used at all as a means of communication between libraries. The mail is not much better. Whereas the time given for postal transmission of items sent abroad from the BLLD in 1980 ranges, for photocopies from 4 - 7 days for Western Europe and 7 - 8 days for North Africa (49), in Nigeria the situation is quite different. Mail services are supposed to have improved in recent years, but it still takes an average of 14 days for letters to move from one part of the country to another. Parcels could take as much as one month or more, and that is when they arrive at their destination at all. This unreliable postal system contributes to the reluctance of libraries to send materials through the mail.

(d) Inadequate funding was one of the major barriers to the availability of publications identified by both librarians and researchers. While inadequate funding is a complaint common to libraries in different parts of the world, this problem is further complicated in developing countries such as Nigeria, by foreign exchange restrictions imposed by Government. These restrictions limit the number of publications that a library could purchase from overseas countries. Even more serious is the fact that because of the complicated and slow processing of
payment in foreign exchange, subscriptions for journals are either missed or received long after their date of publication. The loss of journal issues resulting from late renewal of subscription reduces the availability of such journals. First on the list of suggestions made by librarians interviewed for improved access to documents is the relaxation of the existing foreign exchange restrictions in the country. The librarians were unanimous in their conviction that a relaxation of the stringent foreign exchange regulations would permit libraries to renew their journal subscriptions in time and purchase other materials with whatever funds that were available, and thus improve on the availability level of publications in the country.

Personnel related barriers identified in this study are:

(a) The deployment of professional librarians in the respective research libraries. The interviews of research institute librarians revealed that administration and technical services, such as cataloging and classification took precedence over reference and readers services in the deployment of professional librarians in the library. The non-professional library personnel deployed to reference and readers services admitted to engaging in very little inter-library lending. In fact, some of them had made no inter-library loan requests at
all, nor had they devised ways of circumventing the existing communication difficulties to operate the document delivery system as the professional reference librarians did. Thus, the researchers using libraries with non-professional reference staff were not benefiting from materials held in libraries other than their own. Since a research library in a developing country such as Nigeria is very unlikely to become self-sufficient, the deployment of non-professional librarians in some research libraries has significantly affected the level of availability of publications to researchers using those libraries.

(b) Poor work attitude. Another personnel related barrier to availability of publications revealed during the interviews is the poor attitude of library personnel to their work. Librarians interviewed expressed a strong preference for personal visits as a means of obtaining materials requested from other research libraries. They felt it was the most effective way to ensure prompt response to a request from the library personnel in the source library. The librarians further explained that requests for publications made by mail were often delayed or left unanswered. This was not because the mail was too slow or that the letters did not arrive at their destination. Requests for publication to overseas libraries pass through the same postal system and yet they get
answered and the materials arrive in fairly good time. The postal system in the country is certainly not up to the standard in the advanced countries, but it certainly is not as bad as it is made out to be. Both researchers and librarians said during the interviews that they realized that the poor postal system was being used only as a scapegoat to camouflage the inefficiency of the library personnel.

Some research scientists interviewed gave poor attitude to work of library personnel as the reason for the strong sentiments they expressed on the impracticability of any decentralized cooperative activity by libraries. Such sentiments and misgivings about workers' attitude explain why the largest proportion of researchers provided contradictory data. They listed inter-library loan service as the major additional service required from their institutional libraries, but listed increased journal subscription as their first suggestion for improved access to documents needed. Inter-library loan service was relegated to a secondary position in the list of suggestions for improved access to documents. Interviews of researchers revealed that this reversal of the order of priority was because of the skepticism of researchers about the ability of library personnel to ensure the effective operation of centralized inter-library cooperative schemes.
As far as the researchers were concerned, the personnel-related barriers were the main obstacles to the availability of scientific publications existing in the country. The researchers felt that library personnel limited resource-sharing between libraries which is a practical means of increasing availability of publication to users.

Most of the researchers interviewed stated that financial limitations mainly restrict the number of publications a library can add to its own collections. Infrastructural barriers are the inevitable signs of a developing country and these can be circumvented as some dedicated and efficient librarians have shown. Therefore, the most effective way to increase the level of availability of materials already in the country is to remove the personnel-related barriers by deploying dedicated and efficient professional librarians to be in charge of reference and inter-library loan services in research libraries.

However, the present ad hoc inter-lending system in the country will not suffice, and can not be expected to provide the needed solution to the problem of increased availability even with dedicated and efficient staff in charge of affairs. For inter-lending to be effective, a formal system has to be designed specifically to serve present and future needs as effectively and economically as possible.
The above findings of this study in general and the existing infrastructural barriers in particular make it inadvisable to recommend a centralized network model for the purpose of resource-sharing in Nigeria. The results of the study would support those who believe that a more appropriate model for the country would be a decentralized network system with clusters of libraries in different sections of the country cooperating amongst themselves, as demonstrated by Model B in Figure 1. Such a model would enable libraries to send their requests directly to other libraries close to them, by means of courier service or even personal visits. However, for each subject group, such as agriculture for instance, there could be a fairly comprehensive collection located somewhere in the country to act as a resource centre to which other libraries could resort. With such a system, only demands that could not be satisfied by libraries close-by would be sent to the appropriate subject resource centre. Of course, it would not always be necessary to establish new subject resource libraries. The collection of an existing library could be developed to attain the status of a resource library.

Nigeria, like many other developing countries, needs to be encouraged to streamline and review her national systems of document availability, if it is to respond positively to the ideals of the UAP programme. The low level of inter-library
borrowing revealed between the agricultural research libraries surveyed has shown that the research scientists are not making optimum use of the national resources available in other libraries. It is only logical that the optimum utilization of the library resources within the country should first be encouraged before any effective use or sharing of resources beyond national boundaries could be contemplated.

2. SUGGESTIONS FOR FURTHER RESEARCH

A lot of emphasis has been placed in this study on personnel related barriers to the availability of publications. Nevertheless, financial and infrastructural-related barriers still constitute factors that should be considered in any further studies on availability. It would be necessary to identify all such barriers which will include the size of the individual library collections, and their location in relationship to other research libraries, and to weight these barriers. This would enable a proper assessment of the importance of these financial and infrastructural deficiencies in relation to other personnel-related barriers.

As can be seen in Appendix 1, the response rate to the questionnaire for the opinion survey was not as high in the larger research institutes with over fifty research scientists as in the smaller research institutes with fewer researchers.
In further research, it would be interesting to investigate what effect this tendency which biased the sample in favour of smaller research institutes might have on the results. It would also be informative to correlate the responses from research scientists with the responses from the librarians of their institute library. Such a comparison was done in this study with the suggestions for improved availability of scientific information in Nigeria. However, in a further study more extensive correlation of the responses from the two groups of respondents in the same research institute should be carried out.

Three categories of demands have been identified in the course of this study. They are expressed demands, suppressed demands, and potential demands. The case study of four research institutions revealed that scientists, especially those using libraries without professional reference librarians, suppressed some of their demands for publication because of reasons already discussed earlier. Consequently, it is now evident that the demands recorded during the first stage of the survey were only the expressed demands of the scientists and that they did not represent their entire document needs. It would be informative therefore, to determine what percentage of the entire document needs of the researchers is constituted by the expressed demands.
Also, the interviews conducted revealed that most researchers did not consult AGRINDEX, one of the most comprehensive listings of agricultural literature, on a regular basis. They rather restricted their literature searching efforts to accession lists and abstracting journals that are not quite as comprehensive. It could be inferred therefore, that the margin between the conscious demands of the researchers (made up of expressed and suppressed demands) and the potential demands (if the researchers had a better knowledge of possible literature) was not wide. Rather, it was the gap between the expressed and suppressed demands that was wide, especially in those institutes with nonprofessional reference staff. In order to bridge this gap and to improve the availability of publications to researchers in Nigeria, further research efforts need to be made to identify these suppressed demands. It would be essential to determine some characteristics of the documents relating to the suppressed demand, such as their language of publication; their subject matter; the form of the material — whether a journal, book or micro-film — and their availability in other libraries in Nigeria. Moreover, in order to obtain a more realistic satisfaction rate, it would be essential to determine what percentage of their suppressed demands would have been satisfied by materials in the libraries serving the scientists, and by materials held in other libraries in the country.
The results of this study have shown that the deployment of professional librarians in agricultural research libraries affects the performance of the libraries in identifying records of interest to research scientists and in obtaining those publications they demand for their use. In fact, the data have shown that the deployment of non-professionals in the reference services of these libraries reduces the level of availability of publications to researchers. As far as it can be determined from the literature, these findings have not been documented before and they open up many possibilities for practical application for the library profession, not only in Nigeria, but in other developing countries. For it is now obvious that it was not just inadequate funding and other external factors that affect the satisfaction rate of users' demands for publications. The internal assignment of duties of professional librarians has a lot to do with the quality of service rendered to a library's clientele.

However, in order to test the generalizability of these results, a similar investigation needs to be carried out in research libraries serving research scientists other than agricultural scientists (such as medical research libraries). It might even be necessary to go a step further to carry out comparative studies in another developing country to confirm these results. If the results are found to be generally true
to library service in developing countries, it would imply that the library management in such countries could make a great impact on the campaign for increased availability of publication to users by ensuring that dedicated professional librarians are deployed to be in charge of reference and readers services.
BIBLIOGRAPHY


APPENDIX I

SOME ATTRIBUTES OF RESEARCH INSTITUTES SURVEYED
APPENDIX I

SOME ATTRIBUTES OF RESEARCH INSTITUTES SURVEYED

<table>
<thead>
<tr>
<th>Library</th>
<th>No. of Librarians</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NORTHERN NIGERIA</strong></td>
<td></td>
</tr>
<tr>
<td>1. Agricultural Extension &amp; Research Liaison Service, Ahmadu Bello University, Zaria</td>
<td>2</td>
</tr>
<tr>
<td>2. Institute for Agricultural Research, A.B.U. Samaru, Zaria</td>
<td>2</td>
</tr>
<tr>
<td>3. Kainji Lake Research Institute, New Bussa, Kwarra State</td>
<td>1</td>
</tr>
<tr>
<td>4. Lake Chad Research Institute, Maiduguri</td>
<td>1</td>
</tr>
<tr>
<td>6. National Veterinary Research Institute, Vom</td>
<td>4</td>
</tr>
<tr>
<td>7. Nigerian Institute for Trypanosomiasis Research, Kaduna</td>
<td>2</td>
</tr>
<tr>
<td><strong>WESTERN NIGERIA</strong></td>
<td></td>
</tr>
<tr>
<td>1. Cocoa Research Institute of Nigeria, Ibadan</td>
<td>4</td>
</tr>
<tr>
<td>2. Forestry Research Institute of Nigeria, Ibadan</td>
<td>5</td>
</tr>
<tr>
<td>3. Institute of Agricultural Research &amp; Training, University of Ife, Ibadan</td>
<td>2</td>
</tr>
<tr>
<td>4. International Institute for Tropical Agriculture, Ibadan</td>
<td>6</td>
</tr>
<tr>
<td>5. National Cereals Research Institutes, Ibadan</td>
<td>2</td>
</tr>
<tr>
<td>6. National Horticultural Research Institute Idi-Ishin, Ibadan</td>
<td>2</td>
</tr>
<tr>
<td>7. Nigerian Institute for Oil Palm Research, Benin-City</td>
<td>2</td>
</tr>
<tr>
<td>8. Nigerian Institute of Oceanography and Marine Research, Lagos</td>
<td>1</td>
</tr>
<tr>
<td>9. Rubber Research Institute of Nigeria, Benin-City</td>
<td>1</td>
</tr>
<tr>
<td><strong>EASTERN NIGERIA</strong></td>
<td></td>
</tr>
<tr>
<td>1. Faculty of Agriculture, University of Nigeria Nsukka</td>
<td>2</td>
</tr>
<tr>
<td>2. National Root Crops Research Institute, Umuahia</td>
<td>1</td>
</tr>
</tbody>
</table>
## ATTRIBUTES

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>42</td>
<td>1,020</td>
<td>7,000</td>
<td>--</td>
</tr>
<tr>
<td>13</td>
<td>82</td>
<td>1,146</td>
<td>17,290</td>
<td>38</td>
</tr>
<tr>
<td>7</td>
<td>22</td>
<td>262</td>
<td>1,500</td>
<td>--</td>
</tr>
<tr>
<td>5</td>
<td>24</td>
<td>149</td>
<td>2,847</td>
<td>--</td>
</tr>
<tr>
<td>5</td>
<td>30</td>
<td>114</td>
<td>804</td>
<td>48</td>
</tr>
<tr>
<td>9</td>
<td>80</td>
<td>180</td>
<td>6,000</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>40</td>
<td>508</td>
<td>1,240</td>
<td>48</td>
</tr>
<tr>
<td>7</td>
<td>96</td>
<td>241</td>
<td>10,500</td>
<td>78</td>
</tr>
<tr>
<td>19</td>
<td>72</td>
<td>250</td>
<td>14,000</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td>55</td>
<td>250</td>
<td>20,000</td>
<td>19</td>
</tr>
<tr>
<td>10</td>
<td>108</td>
<td>21,500</td>
<td>17,600</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>80</td>
<td>520</td>
<td>21,415</td>
<td>--</td>
</tr>
<tr>
<td>2</td>
<td>29</td>
<td>150</td>
<td>699</td>
<td>46</td>
</tr>
<tr>
<td>5</td>
<td>42</td>
<td>2,420</td>
<td>1,750</td>
<td>49</td>
</tr>
<tr>
<td>3</td>
<td>45</td>
<td>1,016</td>
<td>1,805</td>
<td>26</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
<td>568</td>
<td>850</td>
<td>31</td>
</tr>
<tr>
<td>4</td>
<td>78</td>
<td>451</td>
<td>2,121</td>
<td>14</td>
</tr>
<tr>
<td>11</td>
<td>50</td>
<td>2,208</td>
<td>1,353</td>
<td>20</td>
</tr>
</tbody>
</table>
APPENDIX II

RECORD OF DEMANDS MADE IN RESEARCH LIBRARIES

1. Name of Library: ________________________________

2. Name of Recording Officer: ________________________

3. Rank of Recording Officer: _________________________

4. Time and Date when demand was made:
   Hour    Day    Month    Year

5. Language of document demanded: _____________________

6. Demand: _______________________________________

7. Satisfied demand (if demand is satisfied, please complete the following):
   (a) Source used to satisfy demand:
       Own Library: ________________________________

       Another Library in Nigeria (please name library):

       ________________________________

       Other: (Please specify): _______________________

   (b) If source other than own library was used, what means of communication was used to initiate request for material? (e.g. by mail, telephone, etc.)

   ________________________________

   (c) In what form was the material given to the user? (e.g. hard copy or photocopy) _______________________

   (d) Time and date when the user was given the requested material:
       Hour    Day    Month    Year

145
8. Unsatisfied demand (if demand is unsatisfied, please complete the following):

Reasons for failure (please tick appropriate reasons):
(a) Material not held in your library: ____________________________
(b) Material out on loan: ____________________________
(c) Inter-library loan initiated but source library did not respond to request for material: ____________________________
(d) Inter-library loan not initiated because:
   Unable to locate a source
   Unable to communicate with library holding material
   Your library does not have a formal inter-library loan policy: ____________________________
(e) Material only available in language other than English: ____________________________
(f) Other (please specify): ____________________________
APPENDIX III

QUESTIONNAIRE FOR THE OPINION SURVEY OF AGRICULTURAL RESEARCH SCIENTISTS ON THE AVAILABILITY OF SCIENTIFIC JOURNALS IN NIGERIA

(All replies will be treated as strictly confidential)

1. Employing Institution or Organization: ______________________

2. Name (please print): ______________________

3. Official title of position held: ______________________

4. How often do you usually consult the literature in your subject area? (please tick appropriate answer):
   (a) rarely (about once in three months) ______________________
   (b) occasionally (about once a month) ______________________
   (c) frequently (several times a week) ______________________

5. When you need to consult a publication that you do not own, where do you usually go to obtain it?
   (a) your institution library: ______________________
   (b) a library in your town of residence: ______________________
   (c) a library in another town: ______________________
   (d) other (please specify): ______________________

6. If the answer to (5) is "c" or "d", state how far away the library is from your institution:
   (a) within twenty miles: ______________________
   (b) within fifty miles: ______________________
   (c) over fifty miles: ______________________

7. Are there any journals that you need to consult fairly often that are not available in the library you use?
   (a) Yes: ______________________
   (b) no: ______________________
   If "Yes", how many such journals can you think of? (please give the name of journals)

8. Have you made use of inter-library loan service through the library you habitually use?
   (a) Yes: ______________________
   (b) No: ______________________

9. If the answer to (8) is "Yes", did you find it satisfactory?
   (a) Yes: ______________________
   (b) No: ______________________
   (c) Sometimes: ______________________
10. If the answer to (9) is "No", what did you find unsatisfactory about the inter-library loan service?

11. Are there any services that you would like the library you use to provide which it is not providing now?
   (a) Yes: (please specify) 
   (b) No: 

12. In your reading, do you often come across works in languages other than English whose subject matter is of relevance to your work.
   (a) Yes: 
   (b) No: 

13. Have you ever made an attempt to obtain translations of such foreign language materials?
   (a) Yes: 
   (b) No: 

14. If the answer to (13) is "No", what are your reasons?

15. If the answer to (13) is "Yes", who provides these translations?

16. Is this translation service satisfactory to you?
   (a) Yes: 
   (b) No: 

17. If the answer to (16) is "No", please give reasons for your dissatisfaction:
   (a) too expensive: 
   (b) takes too long: 
   (c) other (please specify) 

18. If you request a publication at your library at a time when the publication was not physically available at the library, how long a delay in obtaining it would you consider reasonable?
   (a) two weeks or less: 
   (b) one month of less: 
   (c) six months or less: 
   (d) more than six months:
19. On the average, how long does it take from the time a journal is published to when you get to see it?

20. Is this time lag satisfactory to you?
   (a) Yes:
   (b) No (please give reason)

21. Could delay in obtaining publications you need affect the progress of your work as a research scientist?
   (a) not at all:
   (b) to some extent:
   (c) seriously:

22. What would be your suggestions in order of priority for improving access to the materials you need?
## APPENDIX IV

### CODED LIBRARY SURVEY QUESTIONNAIRE

<table>
<thead>
<tr>
<th>COLUMN</th>
<th>ITEM</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Region of Library:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>North</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>West</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>East</td>
<td>3</td>
</tr>
<tr>
<td>C2</td>
<td>Identity of Library</td>
<td>1 – 9</td>
</tr>
<tr>
<td>C3</td>
<td>Rank of Recording Officer:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-Professional Library personnel</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Professional Librarian</td>
<td>1</td>
</tr>
<tr>
<td>C4</td>
<td>Status of Demand:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not satisfied</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Satisfied</td>
<td>1</td>
</tr>
<tr>
<td>C5</td>
<td>Time taken to satisfy demands:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Less than 24 hours (Immediately available)</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Within two weeks (Readily available)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Within three months (Delayed availability)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
<td>88</td>
</tr>
<tr>
<td>C6</td>
<td>Language of Document:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>English</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>French</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>German</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
<td>88</td>
</tr>
<tr>
<td>C7</td>
<td>Source from which material was obtained</td>
<td></td>
</tr>
<tr>
<td></td>
<td>to satisfy Demand:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Own Library</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Another Library in Nigeria</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>British Library Lending Division</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
<td>88</td>
</tr>
<tr>
<td>C8</td>
<td>Means of Communication with source</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Library</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mail</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Telephone</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Courier Service</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Personal Visit</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
<td>88</td>
</tr>
</tbody>
</table>
C9 Form of Material:
Hard Copy -- 0
Photocopy -- 1
Not applicable -- 88

C10 Reasons for Failure:
Material not held in Library -- 1
Material out on loan -- 2
No response from source library -- 3
Unable to locate a source library -- 4
Communication difficulties with source library -- 5
No formal inter-library loan policy -- 6
Material only available in language other than English -- 7
Other -- 8
Not applicable -- 88

C11 Type of Question:
Simple location question -- 1
Complex reference question -- 2
# APPENDIX V

## CODED OPINION SURVEY QUESTIONNAIRE

<table>
<thead>
<tr>
<th>COLUMN</th>
<th>ITEM</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Region of Library:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>North</td>
<td>-- 1</td>
</tr>
<tr>
<td></td>
<td>West</td>
<td>-- 2</td>
</tr>
<tr>
<td></td>
<td>East</td>
<td>-- 3</td>
</tr>
<tr>
<td>C2</td>
<td>Identity of Library</td>
<td>-- 1 - 9</td>
</tr>
<tr>
<td>C3</td>
<td>Frequency in consulting the literature:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>-- 1</td>
</tr>
<tr>
<td></td>
<td>Occasionally</td>
<td>-- 2</td>
</tr>
<tr>
<td></td>
<td>Frequently</td>
<td>-- 3</td>
</tr>
<tr>
<td>C4</td>
<td>Source for obtaining or consulting Publications:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Own Institution Library</td>
<td>-- 1</td>
</tr>
<tr>
<td></td>
<td>Another library nearby</td>
<td>-- 2</td>
</tr>
<tr>
<td></td>
<td>A library in another town</td>
<td>-- 3</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>-- 4</td>
</tr>
<tr>
<td>C5</td>
<td>Distance of library in another town:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within twenty miles</td>
<td>-- 1</td>
</tr>
<tr>
<td></td>
<td>Within fifty miles</td>
<td>-- 2</td>
</tr>
<tr>
<td></td>
<td>Over fifty miles</td>
<td>-- 3</td>
</tr>
<tr>
<td></td>
<td>Not Applicable</td>
<td>-- 4</td>
</tr>
<tr>
<td>C6</td>
<td>Are there journals you need to consult that are not in your institution library?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>-- 0</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>-- 1</td>
</tr>
<tr>
<td>C7</td>
<td>Approximate number of such journals:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>-- No. of journals</td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
<td>-- 88</td>
</tr>
<tr>
<td>C8</td>
<td>Use of Inter-library Loan Service:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>-- 0</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>-- 1</td>
</tr>
<tr>
<td>C9</td>
<td>Was Inter-library loan service satisfactory?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>-- 0</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>-- 1</td>
</tr>
<tr>
<td></td>
<td>Sometimes</td>
<td>-- 2</td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
<td>-- 88</td>
</tr>
</tbody>
</table>
### C10
Reasons why inter-library loan service was unsatisfactory:
- Too slow: 1
- Do not yield results: 2
- Other: 3
- Not applicable: 88

### C11
Additional services required from own library:
- No additional service required: 0
- Effective Inter-library Loan Service: 1
- Translation Service: 2
- Micro-film and other audio-visual equipment: 3
- Reliable and cheap Photocopying facilities: 4
- Increased and up-to-date Journal holdings: 5
- Reference, information retrieval, or literature search service: 6
- Current awareness service (routing of Journals etc.): 7
- Other: 8

### C12
Need to consult materials in language other than English:
- No: 0
- Yes: 1

### C13
Attempt made to obtain translations:
- No: 0
- Yes: 1
- Not applicable: 88

### C14
Who provided the translation?
- Could not obtain translation: 0
- Institution Library: 1
- Colleague or friend/aquaintance: 2
- A translation service: 3
- Other: 4

### C15
Was translation satisfactory?
- No: 0
- Yes: 1
- Not applicable: 88

### C16
Reason for dissatisfaction with translation:
- Too expensive: 1
- Takes too long: 2
- Other: 3
- Not applicable: 88
C17 Reasonable delay in obtaining documents through Inter-library Loan:
  Two weeks or less -- 1
  One month or less -- 2
  Six months or less -- 3

C18 Time lag from date of publication to when documents became available in the library:
  (Actual time in months).

C19 Satisfied with Time Lag?
  No -- 0
  Yes -- 1

C20 Extent to which Time Lag affects work:
  Not at all -- 1
  To some extent -- 2
  Seriously -- 3

C21 Suggestions for improved access to documents needed:
  Quick and effective Inter-library loan service -- 1
  Increased subscription and faster arrival of current journals -- 2
  Provision of Translations -- 3
  Abstracting and Indexing services and other current awareness services -- 4
  Improved bibliographic control and location tools -- 5
  Improved postal and other communication services -- 6
  Other (e.g. Qualified Library Personnel, multiple copies of documents, back volume) -- 7
APPENDIX VI

LETTER TO RESEARCH LIBRARY PERSONNEL

Dear Sir/Madam,

THE DEMAND AND AVAILABILITY OF SCIENTIFIC DOCUMENTS IN NIGERIA

I am conducting research into the Demand and Availability of Scientific Documents in Nigeria. The data collected from this survey will be used in writing a Dissertation which will be submitted towards a doctoral degree in Library and Information Science at the University of Western Ontario, London, Canada. I am interested in determining the subjective opinion of agricultural research scientists on the availability in Nigeria of scientific documents relevant to their work, and in determining objectively the percentage of the expressed demands of agricultural researchers that are being satisfied. The first part, I hope to determine through an opinion survey; It is for the second part that I need your co-operation and support.

I am requesting that you ask your library personnel manning your Circulation/Reference desk to keep a record of all demands made to them for publications for a period of six months. Enclosed are special forms to enable your staff to keep this record in a uniform pattern. Each demand made by a researcher for a material should please be recorded on a separate form.

I am depending on your goodwill and co-operation for the success of this survey. Please return the completed Forms to the undersigned at the end of the six months period. Extra Forms will be gladly sent to you if you should require them.

Yours sincerely,

G. K. N. NWAGHA (Mrs.)
APPENDIX VII

LETTER TO AGRICULTURAL RESEARCH SCIENTISTS

Dear Sir/Madam,

SURVEY OF THE OPINION OF AGRICULTURAL RESEARCH SCIENTISTS ON THE AVAILABILITY OF SCIENTIFIC JOURNALS IN NIGERIA

I am undertaking a survey of the opinion of Agricultural Research Scientists on the Availability in Nigeria of Scientific Journals relevant to their work. The data collected from this survey will be used to write a Dissertation which will be submitted toward a doctoral degree in Library and Information Science from the University of Western Ontario, London, Canada. The title of the dissertation will be "Bibliographical Control in the field of Agriculture in Nigeria - A Study of Demand and Availability".

Your co-operation is highly sought for the success of this survey. Please take a few minutes to fill in the enclosed Questionnaire and return it to the above address at your earliest convenience.

Yours sincerely,

G. K. N. NWAGHA (Mrs.)
APPENDIX VIII
REQUEST TO ADMINISTRATIVE HEADS OF AGRICULTURAL
RESEARCH INSTITUTES FOR COMPREHENSIVE RESEARCH STAFF LISTS

Dear Sir,

RESEARCH INTO THE DEMAND AND AVAILABILITY OF SCIENTIFIC JOURNALS IN NIGERIA

I am undertaking an opinion survey of Agricultural Research Scientists on the availability in Nigeria of Scientific Journals relevant to their work. The data collected from this survey will be used to write a Dissertation which will be submitted towards a doctoral degree in Library and Information Science from the University of Western Ontario, London, Canada.

In order to obtain an unbiased sample of researchers for the survey, I need a fairly comprehensive list of agricultural scientists actively engaged in research in the different institutions in the country. I will be very grateful, therefore, if you can provide me with a list of the Agricultural Research Scientists currently working in your institute at your earliest convenience.

Your co-operation will be highly appreciated.

Your sincerely,

G. K. N. NWAGHA (Mrs.)
APPENDIX IX

INTERVIEW QUESTIONS FOR LIBRARIANS

1. In what service areas are the professional librarians in the library deployed?
   
   Administration
   Technical Services
   Reference Service

2. If a non-professional worker is in charge of reference services, do you think such a worker is capable of handling complex reference questions?
   
   YES
   NO

3. Does your library engage in inter-library lending?
   
   YES
   NO
   
   If No, why not?
   
   If Yes, how successful are you in your ILL requests?

4. What factors in your opinion, contribute to the slow and/or poor response to ILL requests?
   
   Communication System in the Country
   Library workers' attitude
   Other

5. Why do you think some research libraries are reluctant to loan materials?
   
   Lending is detrimental to local researchers' interest.
   Fear of loss of material or delay in return
   Other

6. Does your library subscribe to AGINDEX?
   
   YES
   NO
   
   What other bibliographies do you subscribe to?
7. Are there Union Lists and other tools in your library to indicate the holdings of other research libraries in the country?  
YES
NO

8. Would you consider a central translation service a better solution to the translation needs of researchers to individual attempts by research libraries?  
Prefer a central translation service  
Prefer institute translation service  
Prefer a regional translation service

9. Do you think the availability of scientific publications in Nigeria will be improved by a nationally organized inter-library lending scheme? Why?  
YES
NO

10. Should such a national lending scheme be compulsory or voluntary for all research libraries in the country?  
Compulsory
Voluntary

11. In your opinion, what other factors could improve the availability of publications to research scientists in Nigeria?
APPENDIX X

INTERVIEW QUESTIONS FOR RESEARCH SCIENTISTS

1. When you visit your library to obtain a document you need, do you know the status of the library personnel you approach to make your request? That is, do you know whether the staff is a professional librarian or a non-professional worker?

2. Do you normally request for all the materials you need? Or are there some materials you need that you do not request for? If so, why?

3. If you are aware that a document you need is not stocked in your library, do you still request for it at your library with the hope of getting it through inter-library loan?

4. Are you satisfied with the success rate of such inter-library loan requests?

5. What factors in your opinion, contribute to the slow and/or poor response to ILL requests?

   Communication System in the Country
   Library workers' attitude
   Other

6. Why do you think some research libraries are reluctant to loan materials?

   Lending is detrimental to local researchers' interest.
   Fear of loss of material or delay in return
   Other

7. Are you aware of an FAO Publication called AGRINDEX? If Yes, do you consult it, and how often?

   YES
   NO
8. Do you consult the Union Lists and other tools in your library that indicate the holdings of other research libraries in the country?  

[YES]  [NO]

9. Would you consider a central translation service a better solution to the translation needs of researchers to individual attempts by research libraries?  

- Prefer a central translation service  
- Prefer institute translation service  
- Prefer a regional translation service

10. Do you think the availability of scientific publications in Nigeria will be improved by a nationally organized inter-library lending scheme?  Why?  

[YES]  [NO]

11. Should such a national lending scheme be compulsory or voluntary for all research libraries in the country?  

- Compulsory  
- Voluntary
APPENDIX XI

BRIEF HISTORY OF AGRICULTURAL RESEARCH INSTITUTES IN NIGERIA

1. AGRICULTURAL EXTENSION AND RESEARCH LIAISON SERVICE, AHMADU BELLO UNIVERSITY, ZARIA.

This Institute was founded in 1963 to serve as a link between research and extension, interpretation and dissemination of research findings and practices of long standing to state extension field staff. It was also to encourage the identification and feedback to research institutes of field problems as well as provide in-service training for States extension staff. Its programme areas are: crop production, including mechanization and irrigation; animal production, including poultry and veterinary service; home economics; farm management; and rural youth organization. The Institute publications include Extension Bulletins, Guides, Recommended Practices, Conference and Seminar Proceedings, Extension Newsletter and Annual Reports.

2. INSTITUTE FOR AGRICULTURAL RESEARCH, AHMADU BELLO UNIVERSITY, SAMARU, ZARIA.

Founded in 1924, this Institute is responsible for carrying out research in support of all aspects of the agricultural industry of Northern Nigeria. In recent years increasing efforts have been directed towards improving the food crops of the country. In particular, research work is carried out for the improvement of production of sorghum, millet, wheat, groundnuts, cotton and
fibres, cowpea, sesame, soyabean and vegetables. Also the Institute is involved with the maintenance of soil fertility; land resources assessment, crop environment; mechanization, soil and water management, marketing, credit, supply systems and extension. The Institute's publications include Samaru Research Bulletins, Newsletter, Conference Papers, Soil Survey Reports and Annual Reports.

3. **KAINJI LAKE RESEARCH INSTITUTE, NEW BUSSA, KANO STATE**

This Institute was founded in 1965 and is engaged in research into the Limnological behaviour and characteristics of the Kainji and other man-made lakes and their effects on the fish and other aquatic life. It is also involved with the abundance, distribution and other biological characteristics of species of fish and practical methods of their exploitation; the behaviour and characteristics of wildlife and its conservation; range ecology; the development of irrigated crops; public health problems, and the socio-economic effects of the construction of the Kainji and other man-made lakes on rural populations. The Institute's publications include Newsletter and Annual Reports.

4. **LAKE CHAD RESEARCH INSTITUTE, MAIDUGURI**

Founded in 1975, this Institute is engaged in research into the hydrological behaviour and characteristics of Lake Chad and the limnology of the associated surface and ground waters; the
abundance, distribution and other biological characteristics of the wildlife associated with the lake and its conservation. It is also engaged in the socio-economic and public health effects of the introduction of large-scale irrigation schemes and improved methods of animal husbandry and fishing on the rural populations around the lake.

5. **LEATHER RESEARCH INSTITUTE OF NIGERIA, SAMARU, ZARIA**

Founded in 1964, this Institute trains hides and skins improvement officers, leather craftsmen, boot and shoe technologists. Research is carried out into indigenous tanning materials and techniques. The Institute serves as the Nigerian Standards Organization's Centre for leather and leather goods. The publications of the Institute include a Monthly Newsletter and Journals. The Institute has three sub-centres at Sokoto, Maiduguri and Oji River for extension services.

6. **NATIONAL ANIMAL PRODUCTION RESEARCH INSTITUTE, SHIKA, A.B.U., ZARIA**

This Institute was founded in 1927 and is engaged in research on dairy, beef and sheep production with emphasis on nutrition, management and breeding, range and pasture research and improvement, livestock economics and rural sociology of pastoral nomads. It publishes jointly with the Institute for Agricultural Research the publications listed earlier.
7. NATIONAL VETERINARY RESEARCH INSTITUTE, VOM
This Institute which was founded in 1924 carries out intensive research into all aspects of animal diseases and their treatment and control; all aspects of animal nutrition; production of vaccine and sera; introduction of exotic stock to improve meat, milk and egg production; standardization and quality control of manufactured animal feeds; training livestock superintendents, laboratory technicians and technologists. The publications of the Institute include Index of Veterinary Research, Annual Report, Research Papers and Quarterly Newsletter.

8. NIGERIAN INSTITUTE FOR TRYPANOSOMIASIS RESEARCH, KADUNA
This Institute, founded in 1951, conducts research into trypanosomiasis and onchocerciasis generally; the pathology, immunology and methods of treatment of the disease; the ecology and life-cycle of the vectors and the mode of transmission of the disease. Other areas of research include the chemical, biological and other methods of vector control, the socio-economic effects of the disease on the rural populations. The Institute publishes an Annual Report.

9. COCOA RESEARCH INSTITUTE OF NIGERIA, IBADAN
This Institute was founded in 1938 and it conducts research into cocoa, cola, coffee, cashew and tea. Research aspects include entomology, plant-breeding, plant pathology, soil

10. **FORESTRY RESEARCH INSTITUTE OF NIGERIA, IBADAN**

Founded in 1954, this Institute conducts intensive research into all aspects of forestry and forest products utilization. It has two Forestry Schools at Ibadan and Jos and its publications include Annual Report, Index of Research, Technical Notes and Research Papers.

11. **INSTITUTE OF AGRICULTURAL RESEARCH AND TRAINING, UNIVERSITY OF IFE, IBADAN**

This Institute founded in 1954 became a part of the University of Ife in 1970. Its Research Unit works on improvement of food crops, control of diseases, soils and livestock; its services unit works on production of improved seeds for Ministries of Agriculture, soil survey and land use development for government, private and other agro-based agencies; while its Training Unit provides training for middle and junior manpower in the agricultural sector. This Institute has experimental stations at Ikenne, Ilora, Pashola and Eruwa. Its publications include Annual Reports, Research Bulletins, Farmer's Guides and Agricultural News.
12. INTERNATIONAL INSTITUTE FOR TROPICAL AGRICULTURE,
IBADAN

This Institute was founded in 1968 with funds provided by the Ford Foundation, Rockefeller Foundation, World Bank, Canada, U.S., Iran, Netherlands, Nigeria, U.K.; Belgium, and Federal Germany. It has four main research programmes - farming systems, grain legume improvements, cereal improvement, and root and tuber improvement. It also has a training programme for researchers in tropical agriculture. Its publications include Annual Report, IITA Letter, Technical Bulletins and IITA Reprints.

13. NATIONAL CEREALS RESEARCH INSTITUTE, IBADAN

This Institute which was formerly the Federal Department of Agricultural Research, was founded in 1910. It researches into the production and products of rice, maize and grain legumes of economic importance for improving the genetic potential of the crops; improving agronomic and husbandry practices; mechanization and improvement of methods of cultivating, harvesting, processing and storage of crops. Other areas of research include the ecology of crop pests and diseases and improved methods of their control, integration of crop cultivation into farming systems in different ecological zones and its socio-economic effects on rural population. The Institute has a Plant Quarantine Training Centre and publishes an Annual Report, Memoranda, Research Bulletins, and Information Papers.
14. NATIONAL HORTICULTURAL RESEARCH INSTITUTE, IBADAN

This Institute, which has two sub-stations at Mbato, Imo State and at Baganda, Kano State, was founded in 1975. It researches into fruit and vegetable production and consumption, improvement of agronomic and husbandry practices; mechanization and improvement of methods of cultivating, harvesting, processing and storage. Other areas include the ecology of crop pests and diseases and improved methods of their control; integration of crop cultivation into farming systems in different ecological zones and its socio-economic effects on the rural populations.

15. NIGERIAN INSTITUTE FOR OIL PALM RESEARCH, BENIN-CITY

This Institute was founded in 1939 and it researches into the production and products of oil palm and other palm of economic importance and recommendations of improved methods. It publishes a Journal and Annual Report.

16. NIGERIAN INSTITUTE OF OCEANOGRAPHY AND MARINE RESEARCH, LAGOS

Founded in 1975, this Institute researches into the resources and physical characteristics of the Nigerian territorial waters and the high seas beyond. Its publications include Newsletter and Annual Report.
17. **RUBBER RESEARCH INSTITUTE OF NIGERIA, BENIN-CITY**

Founded in 1961, this Institute researches on natural rubber (Hervea brasiliensis) production. It publishes an Annual Report and Advisory Circular Letters.

18. **NATIONAL ROOT CROPS RESEARCH INSTITUTE, UMUAHIA**

This Institute was founded in 1955 but obtained Federal status in 1972. It has experimental farms and researches on yams, cocoyams, cassava, sweet potato and Irish potato. Its publications include Annual Report, Programmes of Work, Advisory Bulletins.
END
1603184
FIN