

**AN ASSESSMENT OF THE PROVISION OF AGRICULTURAL RESEARCH
INFORMATION AT ARIS, KAWANDA**

BY

BAYUNGA ANDREW

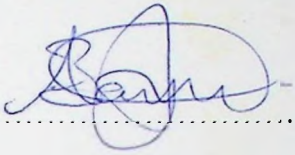
**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENT FOR THE AWARD OF THE DEGREE OF BACHELOR OF
LIBRARY AND INFORMATION SCIENCE, MAKERERE UNIVERSITY**

MAY 2003

DECLARATION

I, Bayunga Andrew declare to the best of my knowledge, that this dissertation is my original work and has not been submitted for the award of a degree in any other university.

Sign:.....

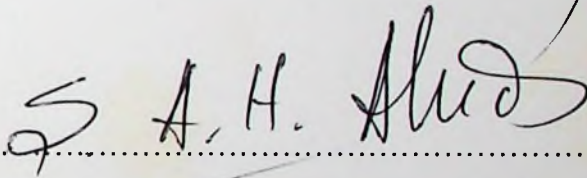


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DEDICATION

I dedicate this work to my parents Mr. Gerald Kaggwa and Mrs. Lucy Kaggwa for the love they have always shown me. You will always be an inspiration in all my struggles.

ACKNOWLEDGEMENT

In a special way, I would like to thank Dr. S.A.H. Abidi for the effort and time he put in to guide me as my supervisor. His efforts and encouraging words will never varnish from my mind.

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The staff at ARIS who did a great job by not only giving me the information but also allowing me to use their facilities in preparing this work. Joyce, Simba, Joseph, Peter, Hilda, Juliet and Beatrice, thank you very much.

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ABSTRACT

The agricultural sector is a very important sector in Uganda. The provision of agricultural information is very important in the development of this sector. Many people influence or are influenced by the agricultural sector. These involve researchers, farmers, students, policy makers, and community leaders among others.

This study looks at ARIS as the body responsible for disseminating agricultural research information first by evaluating its resources and services and then looking at the partners in providing the information and the major targeted users who are the rural farmers.

The survey design was used and data was obtained by use of questionnaire for ARIS users and interviewing key informants, the staff of ARIS as well as the rural farmers. The information obtained was centered around the nature of ARIS resources, the users of ARIS and their attitudes towards the services provided, information needs of the users, methods of providing information and the problems faced.

The preliminary results of the study show that the services provided by the ARIS library are fair but that the dissemination of information to the rural farmers still has a lot in question. It was also found that users at ARIS and in the rural areas differ in many aspects and so the means for disseminating information must be different. The major problems identified in disseminating agricultural information are lack of sufficient funds, lack of trained and skilled personnel, low literacy levels in the rural areas and little involvement of farmers in the whole process. Cooperation of all stakeholders has been strongly emphasized if the whole process is to be successful.

LIST OF ABBREVIATIONS

AGRIDEA: Agricultural Information for Development of Eastern Africa

AGROVOC: Multilingual agricultural thesaurus

ARIS: Agricultural Research Information Service

ASARECA: Association for Strengthening Agricultural Research in Eastern and
Central Africa

CBO: Community Based Organisation

CD-ROM: Compact Disk Read Only Memory

DENIVA: Development Network of indigenous Voluntary Associations

FAO: Food and Agricultural Organisation

GTZ: German Technical Co-operation (Deutsche Gesellschaft für Technische Zusammenarbeit)

ICT: Information and Communication Technology

IDRC: International Development Research Center

IFLA: International Federation of Library Association

IFPRI: International Food Policy Research Institute

ISNAR: International Service for National Agricultural Research

NARS: The National Agricultural Research System

NGO: Non-Governmental Organisation

PRA: Participatory Rural Appraisal

TEAL: The Essential Agricultural Research Library

EAAFRO: East African Agriculture and Forestry Research Organization

UDC: Universal Decimal Classification

UNCST: Uganda National Council of Science and Technology

USAID: United States Agency for International Development

DEDICATION

I dedicate this work to my parents Mr. Gerald Kaggwa and Mrs. Lucy Kaggwa for the love they have always shown me. You will always be an inspiration in all my struggles.

CHAPTER ONE

1.0 INTRODUCTION

Agriculture is the major economic activity for Uganda. Some people carry it out on subsistence level while others do so on commercial level. In Uganda people are involved in crop farming as well as animal husbandry.

This chapter provides a background to the study problem. The background of agriculture activities in Uganda, explains the concept of agriculture research. It gives the major aim and the specific objectives of the study, justification of the study, scope, limitations and it also outlines the research questions used in the investigation of the research problem and finally the definition of the terms used.

1.1 BACKGROUND

Uganda spans across the equator and covers an area of 94,000 sq.miles (about 242,000 sq.kms) with a population of 24.6 million people (2002 census). Agriculture contributes 90% of the export earnings. Most of the estimated 3.5 million households live on small holdings and practice a mixed agriculture. The proportion of commercial and large scale farmers is small, estimated at less than 5% of the population and is mainly characterized by the key plantation crops, namely sugar cane and tea. A number of farmers have started producing maize, flowers, vegetables and livestock on a commercial scale.

Uganda attained independence from the British in 1962 and the 1st decade experience relative political stability and positive GDP growth. However, the 1970s and 1980s were

characterized by high levels of political and social mismanagement resulting in economic decline, breakdown of the social fabric and loss of lives caused by the state machinery.

Agriculture being the major economic activity is very important to the Ugandan people in the following ways:

- i) Provides food to the people.
- ii) Provides employment.
- iii) Is a source of raw materials.
- iv) Provides foreign exchange.

1.1.1 AGRICULTURE RESEARCH IN UGANDA

A lot of research has been carried out in the field of agriculture. This has been done by individual researchers, by universities or agricultural research institutes.

Traditionally many research managers have seen their main responsibility to be supervising scientific experiments, however a critical role today is to ensure that scientists are supported by an effective research information system.

The most important part of agriculture research is probably conducting experiments, but providing policy advice to governments, acquiring information from external sources and transmitting research results to extension agents and farmers are equally important. A well managed system to access and use research results from other organizations is needed to economize on resources, avoid duplication of effort and increase the return on resources dedicated to research. The means of disseminating information should be appropriate to the people to which it is being provided. Research information some times gets out dated quickly so it must reach its users on time.

Agriculture research in Uganda was formalized with the establishment of the Botanic gardens in 1898. The aim was to investigate crops that could be grown for export and also to improve the variety and quality of native foods. A Department of Agriculture was created in 1910 to further streamline research on the most suitable export crops and in which parts of the country they grow best. The establishment of the East African Agriculture and Research Organization (EAAFRO) in 1946 greatly helped to co-ordinate research efforts and minimizes duplication in research efforts in the region as well as boost information exchange amongst researchers. More basic research was done at Kawanda Research Center in Central Uganda. More applied research was conducted at Serere Research Center in Eastern Uganda. The main research activities were collecting of information and establishing inventories on soils, agricultural land use, forestry and rangelands.

During 1950s to 1970s, a series of improved plant and animal technologies and information packages were released from research stations, thus helping to make Uganda a leading producer and exporter of agriculture produce in East Africa. However, during the 1970s - the period of political turmoil and the break-up of the East African Community the agricultural system lost direction and organizational framework.

Although agricultural research activities have been going on in Uganda for along period of time, sharing of research findings among scientists especially those at remote locations has not been in line with the level of research activities. Similarly the dissemination of research findings to users has also been inadequate. In some cases information generated

through research unfortunately remains in the scientists drawers or files and therefore not made known to the public.

Scientific information is very important to agriculture research. It is both an input and the main out put of the research process (Horton and Elliot, 1993). As research organizations grow in size and complexity, there is need for a more formal information system for an effective information flow. Access to agricultural technologies is the key to increasing agricultural productivity, promoting food security and eradicating poverty (IFAD, 1995). However traditional extension systems charged with delivering information and technologies have many times failed to meet their objectives (Garforth and Lawrence, 1999)

Agriculture research information is the major contributor to agriculture development. The agriculture research scientists supported by the agricultural information worker are the key players in developing a country's food and other agricultural resources (Kanyunyuzi-Asaba, 1996)

1.1.2 NATIONAL AGRICULTURAL RESEARCH ORGANISATION (NARO)

In 1992 NARO was created to coordinate the various agriculture research efforts in Uganda. NARO brought together all agricultural research centers under the Ministry of Agriculture, Animal Industries and Fisheries (MAAIF). These research institutes have gone on to carry out a lot of research in the field of agriculture and this needs to be effectively provided to the end users.

NARO as the main public research institution has a statutory obligation to provide relevant and effective research services to the farmers. Specifically, NARO must help ensure that technologies acceptable to farmers are identified, developed and disseminated.

Research institutions under NARO include the following;

1. Kawanda Agricultural Research Institute (KARI)
2. Namulonge Agricultural and Animal Production Research Institute (NAARI)
3. Serere Agricultural and Animal Production Research Institute. (SAARI)
4. Livestock Health Research Institute (LIRI)
5. Forestry Research Institute (FORI)
6. Fisheries Research Institute (FIRI)
7. Food Science and Technology Research Institute.
8. Agricultural Engineering and Appropriate Technology Research Institute. (AEATRI)
10. Coffee Research Center, Kituza. (COREC)

Agricultural Research and Development Centers (ARDCs)

The Agricultural Research and Development Centers are NARO's strategic outlets to farmers in the different farming systems in the country. The different ARDCs are: Mukono, Ikulwe, Buginyanya, Serere, Kachwekano, Bulindi, Abi, Ngetta, Kitgum, Moroto (Nabuin) and Mbarara Stock Farm. A map of ARDCs is available in appendix 7.

ARDCs are managed and operated as integral parts of NARO's research management structure, and will be staffed and supported to enable them to facilitate adaptive research, training, information exchange and technology transfer activities. With respect to capture fisheries, a network of technology testing and dissemination sites are established at selected locations on the major lakes.

Farmers, policy makers, agriculture extension workers, people engaging in agricultural business need information from these research institutes and therefore there has to be a good dissemination mechanism for this information.

Research organizations also require different kinds of information for different purposes. They need scientific information for the use in planning and conducting experiments. They require information on farm level constraints that may be solved through research. They also need information from policy makers on priorities for research (Ballantyne, 1993).

In 1995 NARO formulated an information policy, which had the following objectives:

- i) To strengthen the institutional capacity through appropriate staffing and human resource development.
- ii) To acquire and maintain adequate physical facilities to perform information activities.
- iii) To ensure that NARO's use of information technology (IT) is planned, coordinated and fully integrated.
- iv) To facilitate faster and more effective communication and access to information within NARO and beyond both nationally and internationally.

- v) To disseminate effectively NARO's research results to the research community as well as the users, by strengthening the capacities for production and publication of scientific information and agricultural extension materials.
- vi) To provide information services of primary relevance to users, for example Selective Dissemination of Information (SDI) to scientists and other interested parties.
- vii) To provide compatibility in processing of information in order to facilitate access to exchange of information on with NARO and at a broader level.
- viii) To improve functional linkages at national and international level.

Bringing the various organizations together may be difficult. This is partly due to accepted wisdom in the donor and international agricultural communities that developing country research organizations are unable to do all the research that they need and that they must draw heavily on outside sources of information (World Bank, 1997). Numerous foreign organizations have also provided assistance and support to individual organizations in developing countries in the form of information, advice, training and equipment like computers. Foreign organizations that are partners with NARO include the following CTA, GTZ, UNESCO, and ISNAR among others.

These have played a great role especially in funding research projects and making available research findings from other countries.

1.1.3 AGRICULTURE RESEARCH INFORMATION SERVICE (ARIS)

Libraries/ information centers exist virtually in every agricultural research center or institute. ARIS collaborates with all the libraries of the other research institutes.

The Agricultural Research Information Service (ARIS) is one of the support service units of the National Agricultural Research Organization. (NARO). It is charged with the responsibility of coordinating information and library activities within NARO and enhancing access to national and international agriculture research knowledge.

An Agriculture Information System is very essential to the development of agriculture in general and the operation of agriculture research. The major responsibility of this unit is to provide guidance, support, and centralized services to the agricultural researchers and the users of the research findings in the country.

The main task is identifying, selecting, recording, processing, and storing for use both national and international documents relating to agriculture.

The primary objective of this center is to collect, process, store and disseminate scientific information for current and future use.

FUNCTIONS OF ARIS

- To provide information to agricultural researchers and to the agricultural sector at large.
- To serve as the principle information center for housing nationally generated information on computerized database and hard copy microfiche.
- To serve as the main agricultural sector library with all the rare collections of publications.
- In future to include publishing and reprographic services
- To coordinate an agricultural information network within the country.

Information in a sector like agriculture should be made available to all those who need it.

Article 4 of the constitution of the republic of Uganda (1995) makes it clear that

"Every citizen has the right to access to information in the possession of the state or any other organ or agency of the state except where the release of the information is likely to prejudice security or sovereignty of the state or interfere with the right to the privacy of any other person."

Most agricultural research libraries in developing countries struggle to do a good job of storage but have difficulties in disseminating the information. The roles of circulation, automation, Current Awareness Services are generally limited due to lack of resources.

Information is an essential input for an effectively operating NARS. It is also the final output of research and should contribute to agricultural development.

ARIS works in collaboration with all the libraries of the agriculture research institutes and the regional research institutes. These too play a major role in disseminating information in the areas where they are located. They are also a major source of information found in the ARIS library. When making acquisitions, they also make it through ARIS.

1.2 STATEMENT OF THE PROBLEM

Agriculture being the major economic activity, very many people are engaged in it at various levels. It also affects the lives of very many people since it is a source of food, income and other products like timber.

Before any one engages in any agricultural activity, there is some information which he has to know for example; information on the climate where he is going to do the farming; the most productive breed of animals; better farming methods e.g. on how to stop soil erosion; information about the fertility of soils of a given area. This information will lead

to successful agricultural practices and increase production. In addition the majority of farmers in Uganda are illiterate and have not had chance to study modern farming methods. They need information on better farming methods so they can leave their old primitive ways.

Information is also necessary for researchers who want to do further research so they can see what was done before and there is no duplication.

A lot of research has been carried out in the field of agriculture covering various aspects. The research information has been acquired, processed, stored and disseminated in research information centers like ARIS. There is need to find out how effectively the information has been disseminated to see that the problems concerning agriculture are solved up to a certain extent.

1.3 AIM OF THE STUDY

The major aim of the study is to find out the ways in which information from agricultural research gets to its end users.

1.4 OBJECTIVES OF THE STUDY

The specific objectives of the study are;

1. To identify the available resources and the services provided.
2. To identify the information users.
3. To identify the problems in delivering the services.
4. To identify the tools used in handling information at ARIS.
5. To analyze the information handling process.

1.5 RESEARCH QUESTIONS

In order to start the research process the following questions will be used.

1. Who are the major users of the library users?
2. What are the types of information resources contained in the library?
3. What is the major source of information materials?
4. How regularly are information materials received?
5. How often is the collection updated?
6. What are the information dissemination methods used?
7. What are the major hardships found in providing the information?
8. What is the condition of the available resources?

1.6 SIGNIFICANCE OF THE STUDY

The study is important because it will show why information from agriculture research is very important to different groups of people and the need to use different media for different groups of people if the information is to be properly understood by those people.

The findings from this study may be used by the information workers at ARIS to arrange for an improved and more effective method of disseminating information from various agricultural research projects in the country and outside the country. It will lead to improved services in the provision of information to farmers so they can improve on their methods of farming and increase production.

Policy makers will see the need to direct attention to the agriculture sector, as it is a very significant sector in our country. This study will show why there is need for more resources to wards the area of research and also the dissemination of the findings.

Research is a process that goes on ever time. This study will show areas for further study when the need arises.

The research shows the need for integrating an information system in the processes of the research so that the findings can be communicated to the target audience. It may mean wastage of resources if the findings of the research are not put to use.

The study is about dissemination or provision of agricultural research information. Other sectors of the country may use the findings to develop or improve their information delivery systems.

Other sectors depend heavily on agriculture and there is no doubt that they will benefit form this research for example; the business sector may improve when the farmers start producing better quality crops for export.

The information should benefit both the locals (people living and working in Kawanda) and the remote users (rural farmers).

1.7 SCOPE OF THE STUDY

The study deals with agriculture research information and the need for its effective provision. It covers the provision of agricultural research information to its end users who

include the farmers (rural and urban), the researchers and research managers, policy makers, teachers and students and the means by which it reaches them. The study also covered the people who process, retrieve and disseminate the information and the users.

1.8 DEFINITION OF TERMS

The meanings of the terms used in this research are given below.

Agriculture

Agriculture can simply be defined as the science and art of cultivation of crops and rearing of animals. It involves experimentation and application of scientific knowledge in such areas as soil analysis, pests and diseases, farm machinery, animal and plant breeding e.t.c.

Agricultural research information

Agricultural research information can take two forms:

- Information as an input for agricultural research. This is mainly used by research managers and researchers themselves.
- Information as an output of agricultural research. This is used by policy makers, farmers, businessmen e.t.c

Information

Information can also defined as data that has been analyzed and can be put to use.

Research

- According to the New Oxford English Dictionary research is defined as a systematic investigation into and study of materials and sources in order to establish facts and reach conclusions.

Media

Without media or a medium, one cannot express a message or communicate with any one. A medium is the means by which some thing is communicated. There are different kinds of media that can be used to achieve ones objectives. Some media have the capability to reach mass audiences while others are more effective on a one to one basis.

Selective dissemination of information

Selective Dissemination of Information is a procedure for supplying each user or group of users with the reference of documents relating to their centers of interest selected from among the descriptions of all the documents received during a given period.

Information needs

The term information needs refers to the information that people require in their activities. In this study information needs refer to the information that is need to carry out any activity related to agriculture.

Information dissemination

This refers to the distribution of information to a group of potential users.

Information technologies

This term refers to technologies that pertain to human communication process and the information they handle. It may refer to how computers, store process and transmit information through for example, satellite, telephone lines, telex and cable (Woheren 1993)

Agriculture extension

Swanson (1983) defines agricultural extension with two dimensions. First as the “ongoing process of getting useful information to the farmers (communicating

dimension) and assisting them to acquire the necessary knowledge, skill and attitudes to effectively utilize the information or the technology to achieve their own respective goals (education dimension). Agriculture extension is a component of the agricultural development process.

Disaster

Is defined as an event the timing of which is unexpected and the consequences seriously destructive. Disasters can be distinguished between manmade and natural. Library and archival disasters may include; fire, water, vandalism, war and earth quakes among others.

Telecenters

There is currently no single clear definition of Telecentres. Some have defined by services they offer while others prefer to emphasize the structure of organization. Generally telecentres are seen as physical centers providing access for the public to communications and information services using a variety of technologies including, library services, phone, faxes and computers as well as Internet and e-mail

1.9 LIMITATIONS OF THE STUDY

In carrying out the study, the researcher found the following limitations;

- The major limitation of the study is the fact that the researcher did not have all the time he needed due to the busy semester schedule, which had other course units to complete.
- Resources were not enough especially to cover the production costs like the printing, photocopying.

- The researcher found a problem with some of the local farmers who couldn't answer the questions well. A lot of time had to be spent in interpreting the questions.
- Some of the rural farmers were not very cooperative and showed some reluctance in providing the responses to the questionnaire claiming they gain nothing from the research despite the efforts of the researcher to explain the purpose of the research.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter discusses the literature relating to agriculture research information provision. The information is related to the topics of research that has been done by other researchers. This chapter enables the researcher get familiar with the sampling techniques, data collection method, data analysis and the problems faced by the earlier researchers.

The major topics discussed here are agriculture research, information needs, information provision.

2.2 AGRICULTURAL RESEARCH

2.2.1 Importance of agricultural research

Agricultural research systems in developing countries play a major role in creating and adapting improved agricultural technologies, as well as advising national government s on agricultural development policy. To carry out these tasks, national agricultural research systems (NARS) not only need a strong scientific base, in the form of good scientists and equipment but they must also be able to a manage and plan their organization, programs and resources effectively.

Farmers and researchers in small low income countries have the same needs and face the same problems that agricultural research generates, but resources available to small

countries' NARS are much less than those available to a larger country and this necessarily limits the scope of the research effort.

2.2.2 Research utilization

Bottema (1989) pointed out that inclusion of utilization in research means that business economics becomes part and parcel of the approach. Although the concepts of marketing, distribution and utilization are used in various ways, they belong more or less to the same cluster of activities, which add value to agricultural produce. The justification for research on utilization in its wider meaning is expressed primarily in market opportunities rather than direct benefit for producers and farmers.

Okabe (1989) found out that traditional research on markets, utilization and product development has been conducted by larger food companies in the industrialized world. Private agricultural research institutional agencies as well as national institutes have recently recognized the importance of food technology and market research. The interest should be understood as an extension of the long established post harvest research drive international as well as national institutes. In view of the dominant role of the private sector in market and food technology research, the public sector agencies are perhaps in considering utilization and market research.

Butandwa (2001) reports in a participant at a two day environment workshop recommended that agriculture research be carried out on farmers' lands and not only in the research institutes; one participant is noted to have said

"...the experts carry out research on land in Kawanda and Namulonge research institutes, which is fertile. They should do it on our land, which is in most cases exhausted. When we plant the seeds on our land, they fail to germinate"

This means that in some cases the knowledge from the research remains at Kawanda and the people do not get the chance to learn the skills.

2.2.3 Information management in agricultural research

ISNAR (1990) carried out a study on information management in agricultural research systems of small countries. The study focused on three basic elements:

- The demand for information. This presents the needs of scientists, research managers and others for specific pieces of information. The factors of demand are determined by the factors within the research system itself as well as its external environment.
- Information sources to satisfy the demand. These organizations and individuals that generate distribute information.
- Information mechanisms used by scientists and organizations to contact sources and obtain information to meet identified needs. Since scientists and research organizations have diverse needs and must use a variety of information sources, they require access to a diverse set of information mechanisms. These mechanisms include libraries, information networks, research networks, meetings, study tours, visitors and personal contacts.

3 INFORMATION NEEDS IN AGRICULTURE

The information needs in the field of agriculture take on various dimensions. Basically they could be categorized into two; Information needs by the researchers and then information needs by the end users. Agricultural libraries and information centers should play a great role in disseminating information. IFLA (2001) argues that the main content of the library is information and not the book. The library forms a community of users, whose knowledge creation needs are met through the information provided by the library. Librarians need to utilize all opportunities to put the library in center of the world of information and knowledge.

3.1 Research information needs

Research organizations require different kinds of information for different purposes. They need scientific or technical information for use in planning and conducting experiments. They also need information on farm level constraints that may be solved through research. They also need information from policy makers on priorities for research. Various kinds of management information are required on resources such as people, supplies and equipment and on research projects and programs. Information is managed for a variety of reasons. Scientific information must be preserved, stored and made available to researchers, so there is a storage or repository function. Scientists must be kept abreast of new developments, so there is a current awareness function. And potential sources of information must be identified and tracked to ensure that new sources of information are accessible. This is done through a scanning function.

Nestel (1993) urged that an effective research information system must be able to identify and respond to the organizations information needs, identify and access key information sources and employ appropriate mechanisms to select, channel and store information. Information needs vary over time and shift with each change in research priority or research project emphasis (Mook 1993). The assessment and understanding of scientists' needs for information are the weakest part of the most research information systems. Monitoring and understanding these needs should be at the heart of a research organizations approach to information management.

The identification of the need for specific technologies is the first step in the research development chain. This involves the characterization of the production systems and farming households present in the selected area in order to arrive at a reliable diagnosis of the problems and their ranking, and further to identify the technology to be developed, jointly with the urban farmers. Also, other stakeholders at various levels of the production, distribution, transformation and consumption chain should be included in the analysis . The study location implies physical and socioeconomic characterization of the target area. Special attention should be given to the analysis of the direct stakeholders: their number, ethnic group and social behavior. This analysis needs to be participatory and ending with a consensual characterization of various social groups involved, especially concerning their skills, preferences and technological needs (Quansh 2001)

Ballantyne (1993) makes an attempt to explain the strategic approach to information management. Managers need to recognize that an information system is made up of

several different information mechanisms, each with its own users, strength and weaknesses. He suggests that in future, however, research managers and information specialists will need to work together more closely to develop broader visions of what information management is, how it can contribute to agriculture research and how it can be managed as part of the organization's overall strategy for research planning and management. The systems view is based on the idea that many information mechanisms, each interacting with different information sources and serving different needs, make up an information system.

In selecting information mechanisms one should take into consideration the demands to be met, the sources to be tapped and the options to be tapped by other mechanisms.

The key elements of an information strategy are identified as;

- The identification of information needs.
- Assessment of information sources.
- Selecting information mechanisms.

2.3.2 Information needs for small-scale farmers

Otim (1998) challenged farmers in Uganda treasure knowledge. He said, “ *knowledge is power and knowledge is wealth. All farmers should hunt for the treasure knowledge in order to modernize agriculture and banish poverty from homesteads.*” Agriculture problems in Uganda are due to poor coordination, lack of relevant, timely and accurate information and insufficient interaction between farmers and other key players in agricultural sector. Leaders of farmers' organizations should initiate and implement programs to bridge the gap.

one can categorically claim to know all the information needs of farmers especially in information dependent sector like agriculture where there are known and rather complex problems every day. Studies carried out by (Gregorio and Sison, 1989) indicate it is dangerous to make such a claim especially as there are as many differences between agriculture information needs within a country as between countries.

Information needs of small scale farmers in Uganda mainly revolve around solving problems such as pest hazards, weed control, water moisture insufficiency, soil fertility, credit, labour shortage, soil erosion and so forth. The information needs may be grouped into five headings: agriculture inputs; extension education; agricultural technology; agricultural credit; marketing.

3.2.1 Agricultural inputs

There is need for modern farm inputs to raise the low level of productive efficiency on all farms in Uganda.

A small-scale farmer who, for example decides to cultivate hybrid maize, will require the necessary information if he hopes to make a successful venture. These may include sources of input, variety of maize, suitable soil and weather condition for planting, choice of fertilizer or proper plant growth and yield, source of fertilizer, method of application, plant spacing, choice of herbicide, ways of dealing with possible plant diseases that affect maize, when to harvest and so forth. The list is by no means exhaustive.

An examination of factors influencing the adoption and continued use of these inputs will show that information dissemination is a very important factor. It is a factor that requires more attention than it now gets.

2.3.2.2 Extension education

The general lack of awareness among Ugandan small-scale farmers can be attributed to their high level of illiteracy. This contributes to the low level of adoption of agriculture production technology. For farmers to diffuse information on agriculture production technology, they need extension education. Williams (1995) service which assists farmers through educational procedures in improving their farming methods and techniques, improving their production efficiency and income and improving their levels of living.

Farland and Parkinson (1991) succinctly enumerate the benefits of education to small-scale farmers in these words:

Education is needed to provide such benefits as accumulation of knowledge, the application of knowledge, the ability to calculate, the opportunity to place sellers and buyers on the equal footing...and the ability to participate in institutions conducive for improving farm practices (such as cooperatives and use of extension services).

This type of education is better described as functional rather than formal. It is better provided by extension workers whose main task is to convey information in a meaningful form to the farmers. One of the ways of doing this is by training a group of model farmers with the hope that such farmers come in contact with other farmers.

This method is recommended because the number of farmers is very big compared to the number of extension workers.

2.3.2.3 Agricultural technology (need)

Olayide (1980) defines agriculture technology as the application of technology for the promoting and development of agriculture. Agriculture technology for small-scale farmers he says must grapple with the minimization of the drudgery or irksomeness of farm chores. In this case agriculture technology should be labour saving, labour enhancing and labour enlarging at the minimum possible expenditure of energy.

The agriculture technology information needs of farmers range from the type of appropriate technology to adopt for a given farm chore, to the use of such appropriate technology. The farmer needs information on production technology that involves cultivating , fertilizing , pest control , weeding and harvesting. This kind of information should be diffused by extension workers, other farmers, governmental parastatals and agricultural equipment dealers. The impact is not yet felt.

2.2.2.4 Agriculture credit:

Agriculture credit as defined by Abe (1993) encompasses all loans and advances granted borrowers to finance and service production activities relating to agriculture, fisheries and forestry and also for the processing, marketing, storage and distribution of products resulting from these products.

Small scale farmers are one of the beneficiaries of agricultural credit but because of their low literacy levels they are unaware of the existing loan facilities. To reap the benefits of

agricultural credit, small scale farmers need information relating to sources of loan such as names of lenders, location and types of existing credit facilities. They need information on the terms of loans such as the interest rates. They need to know the loanable amount and the mode of payment. Information regarding agriculture credit gets to small scale farmers through channels like relations, friends, neighbors, government officials, commercial and agricultural credit banks. To ensure that information is properly disseminated to grass root organs like village heads and local government officials are used to diffuse such information because of their personal touch to small-scale farmers. Loans are more effective if they are combined with input supplies and if the formalities are simple. It is important that the farmers who are given the credit are also given the information on how they can use the credit if it is not to be wasted.

2.3.2.5 Marketing information

All business activities involved in the movement of commodities from production to consumption is marketing. The farmer's market information needs are those that enable him make rational and relevant decisions. This type of information is provided by the market information services.

Schubert (1993) points out that market information services have the function of collecting and processing market data systemically and continuously, and of making it available to market participants in a form relevant to their decision making.

The nature of market information needs of small scale farmers include: information on product planning; information on current prices; information on forecast of market

trends; information on sales timing; information on improved marketing prices; information on group marketing.

Rosser (1988) urged that factual information is required in respect of the annual guaranteed process for staple and export crops and livestock, prices being paid for commodities traded at auction and in the daily wholesale markets.

Many times the ground is not fair for the rural people. Rural-urban terms of trade have been heavily weighted in favour of urban consumption by many African governments in their attempts to placate politically powerful urban interest.

4 INFORMATION PROVISION

4.3.1 Agriculture extension

In Uganda agriculture extension is the most important means by which agriculture information can reach its end users who are the farmers. However due to the limited resources, many hardships are still being faced in creating a strong and efficient agriculture extension network. There should be extension staff, who are well trained and can accept the rural life.

4.1.1 Weak Extension Services in Uganda

The Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) was responsible for the provision of agricultural information to farmers and extension staff through the Extension Service Programme. However, it has been realized that extension services have not been effective in reaching the farmers. The general trend has thus been that of agricultural researchers work in isolation from extension agents

and farmers. Consequently, research findings have not been passed on to extension agents for onward transmission to farmers.

2.4.1.2 Agriculture extension services

Extension personnel use various methods and strategies in bridging the gap between farmers and researchers and researchers. Adupa (1988) carried out a research on extension services. The major focus in this research is the interaction between researchers, extension personnel and the farmers. Information on current research activities provides an overview of ongoing activities and organizations involved. Policy makers require primary location specific and past research information, analyzed according to its strategic and prospective nature. This is most important for guiding policy decisions based upon potentials and constraints for agricultural development in various geographical areas. This kind of information supports effective priority setting and resource allocation for agricultural research and development. Information on past research is the major input for dissemination of already existing knowledge by extension services or for direct use by end users at the local level.

2.4.2 Information systems in Agriculture:

Subega (1996) argued that the most sophisticated information system is of no value unless users have the motive and skill to use them. Though the need for information is obvious, the desire to read should be created by the librarians/ information scientists through user education. Production of macro documents should be replaced by production of micro documents, which are analyzed, consolidated repackaged and brought to the attention of specialized users through (SDI).

beck H.W. Jones (1994) laments that information retrieval system for agriculture extension was developed using CD ROM technology as the primary medium for information delivery. Object oriented database techniques were used to organize the information. Conventional retrieval techniques including hypertext, full text, searching and relational databases and decision support systems such as expert systems were integrated into a complete package for accessing information stored on a CD ROM. A multimedia user interface was developed to provide a variety of capabilities including computer graphics and high resolution digitized images. Information for the disk was gathered and entered using extension applications, which were tagged using, mark up language. The fully optional CD-ROM system has been implemented in all 67 county extension offices in Florida.

AIS 2000 was launched to help six countries (Burundi, Cameroon, Chad, Congo, Gabon and Rwanda) improve their agriculture information systems. This project covered extension, training, research and documentation. For each country the ultimate aim was to provide farmers with information on agricultural technologies and how they apply to them. The following recommendations were made: they focused on three different areas.

- Access of agriculture information to rural women.
- The prospects of AIS in Central Africa.
- The sustainability of AIS operations.

With regard to rural women, it was recommended that governments and decision makers support training and better access to agricultural information, that women show more

interest in efforts to improve their access to information, and that men recognize the crucial role the women play in development.

Bell and Chung (2000) endeavor to explain the Trop Rice information system. They define the Trop Rice as an information system for rice crop management in the tropics. They found out that lack of access to knowledge on management options is limiting rice production and profitability. The problem in such a case is not whether the knowledge exists, but rather moving the knowledge from research 'knowledge' centers to the farmers. They note:

'...researchers have a full reservoir of scientific knowledge, but the knowledge is trying to flow to the farmer through old, small rusty pipes. The message can't get through as needed'

Besides the typical inadequacy of most extension systems, the process of communicating knowledge in and of itself is extremely complex – especially in Asia, this is due to the social economical conditions. For example, multiple factors limit communication and adoption.

- The large number of farmers.
- Farmer education and beliefs.
- Language and cultural diversity.
- Access to resources on credit.
- Limited communication channels.

Mass media: radio, television

Written: magazines, calendars, and posters

Other: telephone

- Poor infrastructure.
 - Limited access to extension systems, consultants, universities
 - Under funded and under trained extension systems.
 - Limited private sector development.

Communication with farmers can involve two factors:

- i) Who will do the communication?
- ii) How the knowledge will be presented.

One who can include work with non-traditional partners to build multi-sectoral partnerships. The potential partners in the chain include farmers, cooperatives, national and international bodies, extension groups, policy groups, NGOs, distributors and manufacturers, financial institutions, marketing and export companies.

4.3 Role of the political leaders in information dissemination

Mazibwe (1997) indicates the role political leaders should play in delivering information to the people they lead. She stressed the importance of involving leaders in mobilizing for food security and urged MPs to be instrumental in transfer of technologies from research institutes in their constituencies. She further said NARO would be responsible for the generation and dissemination of information of technologies to producers and other users.

4.4 Relevant and timely provision of information

Welsue Neil H. (1991) explains why it is important that research information reaches its users early enough by saying *“one of the most important objectives of Low Input Sustainable Agriculture and related programs is to get study results to users in a timely and usable fashion.”* Farmer, researchers and members of the industry must be able to take advantage of proven and available information delivery systems, developing new or modified systems only as existing systems are shown to be inadequate.

Epouyou and Roling, (1992) while studying an integrated agricultural technology system considered the system perspective. They say:

“By ‘system perspective’ we mean, first, that all research and technological transfer institutions serving a given set of farmers/clients are part of a single agricultural technology system. Second all the components share and adhere to an agreed upon strategy which allows them to work towards a shared strategic goal or mission, in this case to make relevant technologies available to farmers.”

They identified six elements, one of them being farmers as partners. If the aim of the system is to make relevant technologies available to farmers then the farmers should be considered full partners by other participants of the system rather than passive recipients of technologies. They should be involved in identifying problems to be addressed. They should also evaluate the output.

2.4.5 Free access

FLA (2002) stresses the freedom of access to information, the Internet and library and information services.

Library and information services are vibrant institutions that connect people with global information resources and ideas and creative works they seek. They make available the richness of human experience and human diversity of all media.

“The global Internet enables individuals and communities through the world, whether in the smallest and most remote villages or the largest cities, to have quality access to information for personal development, stimulation, cultural enrichment, economic activity and information participation in democracy.”

Libraries and information centers have the responsibility to facilitate and promote public access to quality information and communication. The library users need to be assisted with the necessary skills and a suitable environment in which to use freely and confidently the chosen information source.

2.4.6 Evaluation of information provision:

It is very dangerous and a lot of resources may be wasted if there is no evaluation of the services provided. Webb (2000) indicates the criteria we can use to judge the equality of information and its provision. She provides two checklists that will provide a useful starting point. She says,

“ Both in terms of the information its self and possible provides from whom we may obtain it, we need to be able to determine for our own the purpose that we are retrieving, or buying in, good quality information.

Equally if not more important we need to do as much as we can to ensure that it will best meet the customer or users needs in content and delivery"

To assess the information we need to ask our selves questions such as:

- Is it accurate?
- How reliable and authoritative is it?
- Is the output relevant?
- Is the coverage comprehensive?
- Is the level appropriate to the need?
- How retrospective and up-to-date is it?
- What is the value for the fitness or the purpose?

In terms of quality provision we need to look at:

- Balance of internal/external provision (convenience)
- Range of services, which can be offered.
- Timeliness of provision
- The speed and method of delivery
- Ease of access to sources whether print or electronic
- Appropriateness of the format
- Adequacy of related equipment in terms of amount, location, facilities
- Style and presentation of the information provided.
- Cost to provide /charges to the users /buyers.
- Liability, accountability of what is provided.

You may add further questions according to the type of organization, user groups and information needs provided.

2.4.7 Information and communication technologies (ICTs)

2.4.7.1 Need of ICTs for rural areas

Much of the poor performance of agriculture in rural areas can be attributed to failures in the process of information transfer, upon which agricultural development is becoming increasingly dependent. Lack of appropriate information has also been identified as one of the social and technical factors responsible for low adoption and poor impact of new technologies in the rural areas, which are chiefly responsible for farming and feeding the population of Uganda.

Two consensus-building workshops held at Nabweru and Buwama in Mpigi District in April 1998 identified various information needs. Those that relate to the agricultural sector include information: practical skills such as maintenance of wells; farming methods and techniques; sources of high yielding seeds and animal breeds; market information; technologies and innovations; research findings; training opportunities; training institutions; proper project planning/management; soil types and their appropriate uses; employment opportunities; zero grazing; nutrition; afforestation; weather forecasts; herbicides and pesticides and pesticides; credit; financing institutions and schemes and farm produce processing methods at household level. Acquisition and use of information by farmers and other players at the grassroots level is therefore a key process in stepping up agricultural productivity in Uganda, as access to information means access to power. There is information available, but it remains unutilised because it is not appropriately packaged or adequately disseminated to grassroots communities that need it.

2.4.7.2 ICT efforts in Uganda

Bold initiatives to test and promote the applicability and use of ICTs in rural development have been taken by the government, development agencies and non-governmental organizations in Uganda. Some of the major ones include:

Initiatives by the Canadian government through the International Development Research Centre (IDRC) is supporting the Acacia Initiative Programme in Africa. The Acacia initiative is an effort to empower sub-Saharan rural communities with the ability to apply information communication technologies (ICTs) to their own social and economic development. Acacia is testing the proposition that ICTs can also have significant transformation effects on the developing world as it did in developed countries. IDRC selected Uganda to support under this program through the funding of the telecentres of Nabweru, Buwama and Nakaseke, the later being a joint effort with ITU, UNESCO and the Uganda government. IDRC is supporting the project several ICT related projects in Uganda, among them is the project on:

2.4.7.3 The role of ICTs in developing agriculture

There is increasing recognition that information can play a vital role in development. In view of this access to information has the potential to contribute to poverty alleviation, ensure food security, creation of employment opportunities and facilitate informed decision-making by all. The role of ICTs in developing local agriculture may extend from allowing:

- Faster and more efficient delivery of information
- More relevant and adapted content

- Wider dissemination of information to people hitherto unreached or underserved, and a deeper geographic penetration, especially to rural areas
- Access to information sources world wide hence fostering empowerment of men , women and the youth in the communities
- Spreading of knowledge and information about good practices
- Rare opportunities and challenges for government to provide services to the rural population to participate in the development process.

These elements feature prominently in the national agricultural development policy of Uganda, with particular reference to rural areas. Currently information comes mainly from research institutions, which generate new technologies for farmers. The Agricultural Research Information Service (ARIS) houses several information resources including CD-ROM databases (bibliographic, research, factual), multi-media knowledge bases, in-house databases, regional databases, national and in-house publications, from which it offers a range of services and products. Other sources include agricultural information providers such international organisations and local NGOs and CBOs. The main modes of delivery are farmers' magazines, newspapers, posters, leaflets, handbooks, radio, television, films and videos.

The need to reduce rural poverty through provision of information is apparent. Although access to modern ICTs in Uganda is largely available in large cities, opportunities for including rural areas now do exist with advances in developing technologies appropriate for rural areas.

Small low earth orbit satellites are also becoming good tools for exchanging electronic data.

To achieve equality between the urban and rural communities, the rich and the poor, it is essential that all people have equal access to the same information resource bases. With the increasing recognition of the importance of information communication technologies (ICTs) in accelerating development, Uganda has been in the forefront and was one of the first countries in sub-Saharan Africa to obtain full Internet connectivity. Although access to modern ICTs in most African countries is largely available in the major cities, Uganda's rural sector has not been left far behind. The Uganda Communications Commission for Rural Communications Development (FRCD), has a policy that requires that telecom operators provide 2.5% of their gross revenues for rural communications. Telecommunication operators also have an obligation to deliver telecommunications services to the Local County level by legislation.

2.4.7.4 The future of ICT

According to FAO (1996) cooperation in transfer, adaptation, and dissemination of technologies for food production in favors of the developing countries will be indispensable. The greatest challenge for the future will be to intensify, the use of science and technology. Maximum use of science and technical knowledge will be especially important, combined with easier access to innovations and new technologies. This will assure efficiency and cost effectiveness in the producing, processing, and marketing of food and agriculture products.

2.4.8 The media and agricultural information dissemination

SPORE (2002) points out that the media ranging from daily newspapers, throughout national and international television to Internet magazines all cover agriculture. The sector should be made visible, understood, credible and capable of feeding them. As long as news agencies, Internet sites and other media suppliers classify the sector as some sort of subset to the environment, it will never get noticed. Media professionals need to explain why the sector is crucial for food security, environmental management, and employment and income generation. They must allow the highest possible journalistic standards seeking stories rather than copying press releases.

For agriculture to capture a leading place in the mainstream media it is necessary to:

- Explain the fundamental importance of agriculture.
- Convey the vibrancy of farmers and farming
- Develop media strategies, which explain issues not just praise institutions.
- Never err from reliable credible stories.

Maintain the highest possible professional standards.

Webb (2000) describes media as tools. The task is to find out which of them can reach out most effectively to the largest number of users to attract their attention and to stimulate their interest. According to FAO in most developing countries government extension services have been the initiator of agricultural activities. The usual media they use to reach the farmers have been field trials, demonstration plots, and farmer meetings. Although these are effective, they are severely limited with regard to the number of

farmers. The choice of the media to be used depends on some variables which include; literacy rate of the region, cultural and social constraints, and costs among others.

Villet (1988;8) defines a target audience as “ *a specific group of people with whom you want to communicate.*” For example a group of herds men in a given area could be considered as a target audience. For planning purposes, it is important to divide up the mass of people in your country into target audiences. This is because you have different messages for different audiences where by only a given media can reach these audiences. It is important to make use of all the different media available to you, but use them selectively for different purposes. Consider the various target audiences which you would like to inform, motivate and communicate with in order to make the campaign proceed smoothly and effectively e.g. Nomadic herds men must be informed that vaccination and ear punching are mandatory. The herds men don't watch television but they may listen to radio.

Schlicke (1995) attempts to give an explanation for visual information strategies. Image databases have recently been developing at a much faster rate than bibliographic or full text databases. In an image database, the information is held in the form of an image rather than in the form of text rather than words. The images may be pictorial, schematic, or diagrammatic, of course but they may also be facsimiles.

In visual information, however, the content or meaning, or message will be communicated by means of the image itself. There are a number of areas and activities,

where information in a visual format is essential, although it is often supplemented by textual and /or numerical information.

Traditional media for visual information were initially paper, later supplemented by the film. These were cumbersome and occasionally clumsy, but familiarity had led to the development of techniques to cope with the storage, indexing for retrieval, display, reproduction, and copyright e.t.c. With the arrival of the electronic format for visual information, new methods for these must evolve.

2.4.8.1 Channels for disseminating information to the rural farmers

Villet (1988) suggests the following channels for disseminating information to the rural areas:

Personal contact:

This is very effective for example in the veterinary service where the veterinary officer maintains contact with the cattle owners when treating their animals.

Flip charts

A flip chart consists of illustrations arranged in a sequence that can help field staff and extension workers describe a method or technique of farming to the rural farmers.

These can be used in explaining ideas or an activity that appears to exist in a sequence.

Adult literacy

This is through the use of literacy books for adults and children. These can be used to teach essential agricultural practices and at the same time teaching literacy.

Official meetings: Meetings with representatives from various government departments and organizations or individuals who have contact with the rural people.

NGOs

Non-governmental organizations have a very strong influence over the rural people most of them have an aim of eradicating poverty and improving livelihoods of the rural people. These may include women's groups, trade organizations and rural development organizations.

Demonstrations

These can be very effective especially in communicating the information to the rural farmers. For example a demonstration of how to avoid crop pests can be done on one plantation in the community by spraying the crops with the community farmers all present and observing.

Radio broadcasts

Radio broadcasting is used to inform and involve a wide variety of audiences through interviews, news announcements, entertainment, educational programmes, and participatory programmes with the rural farmers. The programmes should be broadcast in the language best understood by each particular audience.

Television

Television announcements and programs can be very effective because on top of listening, the message can also be seen. These could include news programs reporting recent findings, general TV programs describing how to apply the information got from various research projects.

News services

These include:

- **Press releases:** these should be precise, non-technical and should contain any thing newsworthy
- **Newspapers and magazines:** these may include new stories and feature articles on recent research projects.

Publicity materials

These may include posters, leaflets, billboards, postage stamps, printed T-shirts.

The words on posters should be bold and simple. Each poster should contain only one message.

The T-shirts should be sold at a much-subsidized price so that many people can buy them.

Local dramas

These involve an entertaining way to get your message across to the rural people. These shows should be in the local languages and the actors should act in the way that fits the local situation.

Events

An event like the visiting of the Minister of Agriculture in a given rural area would make a great impact. The rural farmers are likely to take in all that he says

These means of passing on information should also be given great consideration because they are good at attracting big crowds of people.

Market day demonstrations

These are also very effective because people will want to come and see what the others have done and know how they have done it to succeed in their farming.

2.5 RESEARCH GAP

With all this research that has been done on agricultural practices, technologies needs of the rural people and so on. More research needs to be done because of the still poor situation in developing countries like Uganda. There has been great focus on the research part but little focus on the actual process of passing on this information to the end users.

If all this has been done before then there is need to ask some important questions; why are there still poor farming practices? Why are farmers still failing to find market for their products? Why are farmers shy to seek information?

These are just a few of the questions. It is good to invent the appropriate technologies but it is also good to find methods of proper technology transfer and information on how to use them.

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

This chapter discusses the procedures that were undertaken in accomplishing the study. It contains a detailed technical aspect of how the study was carried out. It will also involve describing the study population under investigation. It explains the different methods that were employed in order to come up with valid and reliable findings. The research was carried out in the following method.

3.2 RESEARCH DESIGN

The research design, which the researcher used, consisted of both qualitative and quantitative methods.

Quantitative method was used to collect data that involves for example the number of books, which are borrowed from the library during a particular month.

Qualitative method was used for example when the researcher wanted to know the problems the information workers faced in the provision of information.

3.2.1 Research methods

The methods that were used in carrying out the research were literature search and a survey involving key informants as well as a few farmers and researchers who use the ARIS library.

3.3 AREA OF STUDY

The study was conducted at the Agriculture Research Information Service library and information center, Kawanda. This area was purposely chosen because it is a very important resource center for agriculture information and especially that from research.

3.4 POPULATION OF THE STUDY

A population can be defined as a group of people or a set of objects that have common characteristics. In this the researcher considered people who handle or use agriculture research information.

The population of the study consisted of the staff at the library and the end users of the information who include farmers, researchers and agriculture extension workers. The staff were 8 in number. The users were 60 in number. The rural farmers were 70 in number. It also included one extension officer, one representative an NGO, and one LC official.

3.5 SAMPLE SIZE AND SELECTION

The study considered all those who are concerned with agriculture information providers and those who use the information at the ARIS library and information center. They were selected because they are knowledgeable as concerns handling and using information from agriculture research. The researcher considered only those who are present at the time of the research.

Simple random sampling was used and the questionnaire was given to every third user who entered the Library or information center for information.

For the rural farmers due to transport costs and the time factor, the researcher randomly chose rural farmers in Nabweru sub county in areas which included; Nakyesanja, Tula, Nansana, Namalere. These villages were also randomly selected as long as they qualified to be typical rural areas. Purposive sampling was used for the key informants, who included an LC information officer, extension officer, personnel from NGOs.

3.6 DATA COLLECTION METHODS AND INSTRUMENTS

The data was collected using the following methods and research instruments;

3.6.1 Observation

Observation can be defined as the selection, provocation, recording and encoding of a set of behavior consistent with the empirical aims. The method of observation was used during the regular visit to ARIS and also with the rural farmers. The findings obtained from this method were used to supplement the information obtained from the other methods. They are presented together with the results of the other methods. The purpose of this method was to ascertain the status of information materials at ARIS and the information services provided by ARIS and also to look at the ways of livelihoods of the rural farmers to see if the information provided is put to practice.

The researcher used the observation guide (appendix 6) at strategic places for example the information desk. This helped the researcher to study the behavior of the population as it occurred. The researcher filled the observation schedule himself.

3.6.2 Interview

An interview can be defined as a face-to-face conversation between an interviewer and respondent conducted for the purpose obtaining information. The researcher interviewed the staff at ARIS using an interview guide (appendix 3), which he filled himself. This helped the researcher to get first hand information. The interviews were meant to acquire first hand information on management of information resources at ARIS and especially to get information in the following areas; source of information materials; the availability of information resources; the information services provided; human resources and the information technologies present.

Another interview guide (appendix 5) was used to interview the agricultural extension officer of Nabweru sub-county, the manager of Nabweru telecenter and two LC1 information secretaries of a randomly selected area. This was to help the researcher find out the efforts the rural community leaders have put in to make sure that agricultural information reaches to the rural people. This was very important because it is not the information workers at ARIS who reach out to the rural farmers but the telecentres, community leaders and extension officers.

The rural farmers interview schedule (appendix 4) was also used to interview the rural farmers.

This was meant to collect data on the information needs of the rural farmers, the means through which the information reaches the rural farmers and whether they understand the information that is given to them. It also finds out whether there is a two-way communication or just a one-way (top down) communication.

3.6.3 Questionnaire

A questionnaire is defined as a group of related questions designed to collect information from a respondent. A questionnaire (appendix 2) was designed for the users of ARIS. It had some structured questions and some unstructured questions. A pilot study was done on the questionnaire using two ARIS users. Modifications were done to fit the actual situation in the field. A questionnaire was given out to the users of the ARIS library, those who came in person.

The questionnaire was meant to collect data on information needs and there after determine if these needs were being satisfied. The questionnaire covered the following areas; Identification of the users; the information services provided; the use of library and information services at ARIS; the users satisfaction with the given information.

3.6.4. Literature search

This involved looking at some important documents about the operations of ARIS. It was very important especially in finding the retrospective information. Literature search was very helpful in supplementing and complimenting the information that was got from the librarian

3.7 RESEARCH PROCEDURE

- An introductory letter from the school administration, Directors office was sought (Appendix 1). The researcher then made a familiarization visit to the area of study. The aim of this was to plan how the data is going to be collected and who

to get it from. At this point the researcher also identified the research assistant to help him in his research.

- The researcher designed the research instruments, which included one questionnaire (for users), interview schedules for the staff at ARIS rural farmers and the selected key informants.
- He then went out to the field to collect data under the guidance of a research supervisor. He went to the target population and collected data using the research instruments described.
- After collection of the data it was analyzed and interpretations were made.
- Conclusions and recommendations were made with a basis on the research findings.

3.8 DATA ANALYSIS AND PRESENTATION

The data collected was edited first and schedules were checked to see if they are correctly filled. The data was then coded. The coded questionnaire responses and information from other research instruments was transferred to a summery sheet. The data was then processed using Ms Word. The data was presented using tables, graphs, and charts, using Ms Excel. Frequency distributions were used to provide the basic statistics. Analysis was done in relation to the research objectives.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 INTRODUCTION

This chapter discusses and presents the research findings of this study. The findings are reported and analyzed according to the objectives and research questions.

The objectives of the study were:

- 1 To identify the available resources and the services provided.
- 2 To identify the information users.
- 3 To identify the problems in delivering the services.
- 4 To identify the tools used in handling information at ARIS.
- 5 To analyze the information handling process.

The results presented in this chapter are based on the responses from the questionnaires, interviews and the observations as obtained from the respondents in the area of study.

The population of the study was divided into three, the farmers, the users of ARIS, and the middle organs, which include the extension workers, NGOs, local leaders, and other governmental information organs.

The results are also presented according to these five sections:

- ARIS resources
- ARIS USERS
- Middle organizations
- Rural farmers
- The limiting factors in disseminating agricultural information

4.2 ARIS RESOURCES

4.2.1 Organization of knowledge

Materials selected and acquired for addition to the collection of the library must systematically be identified by means of cataloging and classification so that the library clientele may know their contents.

4.2.1.1 The library tools include the following

Cataloging: Anglo American Cataloging Rules (AACR2)

Classification: UDC

Subject headings: AGROVOC

The tools are all up to date and the latest editions.

4.2.2 The sources of information

- Government publications.
- Publications from foreign supporting bodies.
- Research publications from the various agricultural research stations.
- The Internet and other online resources.

There is no regularity in the updating of the collection.

4.2.3 Information materials

The center has various information materials, which include the following:

Databases

The center has several databases, which are related to agriculture, and makes available the required information to the user scientists, students and the farmers.

CD-ROM databases

- AGRIS forestry
- Animal production and dairy technology information
- Current Agricultural Research information system (CARIS)
- Current contents (Agriculture, Biology and environmental Sciences)
- Development activity information
- International information systems for agriculture sciences and technology.
- Farm animal genetic resources.
- Food and human nutrition in AGRIS.
- PROSPECT: The wood database
- World wide forestry information
- Veterinary science and animal health information
- And many others.

In-house databases

- National Information System For Agricultural Science And Technology (AGRIN)
- National Current Agriculture Information System
- Information For Research Managers

Regional databases

- African Highlands Initiative Database

International databases

- Union List of Serials from international and agricultural research centers
- PC Globe (1992)

In house publications

- NARO bulletin (monthly)
- Uganda Journal for Agricultural Sciences
- FORI-News
- The African Journal of Tropical Hydrobiology and fisheries.

National documents

Such reports as Uganda gazette, workshop proceedings. Theses, dissertations, cartographic materials, newspapers, a special collection of microfiche from FAO with information from Uganda. (1945-1998)

Published books and periodicals

- Purchase and subscription from government funds
- Donations from: British council, CTA, FAO, IFPRI, NUFFIC, USAID

The forms of information materials at ARIS

Journals, Online publications, Books, Published reports, Conference proceedings.

4.2.4 Information services offered

- Literature search service
- Current awareness service: Pages of contents, accession lists
- Referral service

- Document delivery
- Loan service (NARO staff only)
- Newspaper cuttings: Agriculture in the news service.
- Photocopying services (these are paid for)
- Interlibrary lending

4.2.4.1 Free services: through cooperation

- CTA Document delivery services
- CTA Selective dissemination of information (SDI)
- ICRAF Reprints
- ILRI Pages of contents and document delivery

Technology can be very useful in improving these services, however it should be noted that technologies could only improve the effectiveness of information services if they are introduced in an already structured context. Technology has enhanced the services at ARIS.

4.2.4.2 Selective dissemination of information

In order to run an automated SDI service, two files are maintained on disk. One contains users' profile, and the other holds the bibliographic database. The users' profiles are then matched by a computer program against regular updates of the bibliographic database. The corresponding abstracts are then sent to the user, usually accompanied by a control-and-follow-up form on which the user can indicate the document that really interests him or her, whether a copy should be sent or has one already, or why is not interested in the topic. This service has been easier only with those researchers with electronic facilities.

4.2.4.3 Cooperative and net working activities performed at ARIS

The following methods have been used to share information with other libraries:

- Interlibrary lending
- Electronic networking
- Production of union lists
- Circulation of bibliographies
- Circulation of pages of contents
- Exchange of research publications

Benefits that have been achieved from networking

Net working has been beneficial in many ways, which include the following:

- ❖ Documents, which are not available in the library, can be obtained from the other libraries through networking with them.
- ❖ The libraries in the network help ARIS in disseminating the information.
- ❖ It has helped to overcome the problem of scarcity of resources.
- ❖ Deposited items can be made available through interlibrary loan to users who cannot visit the library personally.

4.2.4.4 Interlibrary loan

A few international organizations of agriculture librarians and documentalists are making a concerted effort of share information and resources through a network of interlibrary loans and cooperatives as well as coordinated acquisition programs and documentation services. ARIS has benefited greatly from this practice.

4.2.5 State of resources at ARIS

These can be categorized into human resource (staff) and financial resources, infrastructure. The study established the following facts about the resources.

4.2.5.1 Human resources

When talking about human resources, we basically mean the staff. The staffing of ARIS was investigated to see if it is adequate. ARIS has 8 staff members. These include; the coordinator, documentation officer, Librarian, assistant librarian, chief cataloger, an accountant and two secretaries. The working conditions for the staff are okay at least they all relate with each other very well since they are not many. It is important that the library and information workers enhance their efficiency by way of exposing them to the latest developments in the field (Abidi, 1991)

Training

Staff training is very essential in a library and information center especially because of the rapid technological changes. ARIS has taken a wide range of approaches when it comes to staff training. This has been in form of workshops on information retrieval techniques and ICTs.

An attempt has been made to see all staff is kept up-to-date with any development, which in any field that may affect the services offered.

4.2.5.2 Financial resources

Financial resources for ARIS are not enough. This automatically leads to not having some of the equipment, which should have been there. The workers too have some

complaints on the salary, which they get. This crisis has severe implications. This has in one way led to a slow process in carrying out some of these activities.

This may reduce the efficiency of information activities in general such as data collection and hampers the exchange of information. The source of funds is the government of Uganda through NARO. ARIS does not have external funders. It was not possible to get the statistics regarding the financial resources.

4.2.5.3 Physical resources

The physical sources considered included library building and the equipment.

Library building

The building where ARIS is found is not big enough to accommodate the library and the offices. Some of the records in the library have been put on the reading tables because of lack of space.

Information infrastructure

The information infrastructure is not sufficient enough and needs some improvement. Apart from the telephone, fax and email service, ARIS needs equipment like a mast for easy reception of signals from all over the world.

Equipment available at ARIS

5 computers; 3 printers and a scanner; Photocopier machine; Digital camera.;

Equipment is up-to-date. Updating takes place frequently.

Needed equipment that is lacking

Normal/ still camera. Video camera, Photo printer., Voice recorders, Cassette recorders.

Reasons for not having sufficient equipment

When asked why the ARIS lacked certain equipment, the following reasons were given.

- Lack of funds to purchase the equipment.
- Misappropriation of resources and some times equipment itself. For example special equipment given to ARIS was one time taken away to the NARO head quarters in Entebbe yet it was best suited for ARIS.
- There is still general lack of awareness by the researchers and NARO.
- The space is also very little, the building is poorly planned and there is excessive heat during sunny days.

4.2.6 Storage facilities

The storage facilities include the following:

- i) **Open shelves:** The materials kept here can be accessed by any one in the library.
- ii) **Closed shelves:** These are used to restrict access to documents. The documents kept here are either very expensive or on high demand and few in number.
- iii) **Diskette racks:** These are used to store the diskettes.
- iv) **Box files:** These are used mainly to store materials like conference papers, unbound reports and other materials for which shelving is not possible.

4.2.7 Disaster control and planning

Librarians are usually too obsessed with the content of documents, paying limited attention to the message-carrying medium itself.

The staff were asked if they had taken any courses in disaster preparedness or if they had any of the following skills: risk management, firefighting ability, paper conservation, repair of materials. All the staff said they had not taken any course in disaster-preparedness. The librarian said he had some skills in paper conservation and repair of materials.

The librarian was asked if there were any disaster control plans. He said that there is no written plan that is being followed to control disasters although he urged that there are some strategies that have been used for disaster control. These include:

The availability of telephones at the various strategic points and the emergency numbers like police (fire department), hospital, Electricity Company.

There is a fire extinguisher, but is surprising enough that some staff don't know how to use it.

Nature of the building

Disaster control planning is invariably tied with the nature of the building in which the library materials are kept. The building is strong enough with two openings in case of a fire are easy to escape. The floor is raised about one foot from the soil to guard against floods. The windows have some burglar proof to prevent against vandalism. No fire detection devices are present and no insurance has been made for the building and the materials.

All this is mainly because no major disaster has ever happened so there is a lot of reluctance on some of these issues.

4.2.8 Information dissemination

The study established that ARIS provides information to a limitless number of people because unlike public libraries it is a research library which contains research publications that can be exchanged all over the world. But also ARIS is a special library in that it contains only information in the field of agriculture. The information that people get from ARIS is agricultural and excludes that other subject fields.

4.2.8.1 Methods of dissemination of information

This includes the attention given to the special groups like the illiterate farmers especially in the rural areas. When disseminating the information to these people it is also important to motivate so that the information can be understood. This is very important because some rural people especially the old ones think that when you come to give them information you're undermining them of what they know.

The dissemination of information to people who directly use ARIS is much easier and much quicker than disseminating to those people in the rural areas mainly because of the low literacy levels and the resources involved especially the financial resources.

The format in which information is provided is given below starting with the most used to the least used.

4.2.8.2 Formats

The following formats were identified.

- Full text original document
- Abstract of original document

- Bibliographic citation from database.
- Others which include; extracts and photocopies

4.2.8.3 AGRIDEA QAS

In QAS the client requests for scientific or technical information. Using the various information sources the information requested is looked for. When the information is got the answers are faxed, posted or sent by person to the person who had requested for the information. When the information can't easily be got we look around for an expert in the field of interest and convey the questions to them.

The major aims of QAS are:

- Promoting the use and access to information in order to enhance sustainable agriculture.
- To identify user needs on the many issues pertaining to the market, international trade and the research carried out so far.
- Identifying information sources particular those from the counters in the region.

The information is searched from the available resources in the library like books, magazines, reports, CD-ROMs. The QAS service is mainly computer oriented today unlike in the past and this has helped to save a lot of time. The client brings the request, the title is fed into the computer that has the FOLIO software, a search is made through the available CD-ROMs. A search is also made on the Internet especially when the information requested has not been got using the other means. A database is created for the users of this question and answer service.

4.2.8.4 Publications

In an effort to disseminate information the ARIS documentation unit produces some publications. These have been given in table 1 below. These contain scientific information and are produced in various frequencies. The table shows also the frequency in which the publications are produced.

Table 1: Publications that are produced by ARIS documentation unit

PUBLICATION	FREQUENCY
AGRIDEA newsletter.	Quarterly
Agriculture in the news	Quarterly
Directory of Agriculture research projects.	Every two years
Agriculture bibliography of Uganda.	Every two years.
Brochures	Irregular
Small booklets	Irregular
Flyers	Irregular

These publications are distributed to the Ministry of Agriculture headquarters, the different Agricultural Research Institutes, ARDCs and the telecenters. The brochures, flyers and small information contain information for specific groups of people.

4.2.9 Automation

Library automation in ARIS occurs in the following areas:

1. Automation of library functions e.g. accessioning.

2. The use of electronic resources within the library.
3. The use of the internet
4. Office automation e.g. Microsoft word, excel.
5. Client services e.g. searching using the Internet.

The library software includes the following; Folio (TEAL), Ms Excel, Microsoft word among others.

4.2.9.1 The major software used

TEEAL (folio software)

In full it is The Essential Agriculture Research Library. It is a compilation of the most important journal literature in the field of agriculture chosen specifically for researchers in the developing countries. Annual updates supplement the initial list. The system consists of an index, which is, loaded into the hard drive of your computer, and multiple compact disks, which contain the page images of the articles.

The software used is called FOLIO it is a search and retrieval software. The IMAGE VIEW software is also used to view the images of the articles plus the complete TEEAL bibliographic record. The program facilitates the retrieval of information on different aspects based on either single field to a combination of fields.

This software among many other things provides for printing of citations, tagged records, all records, citation records, table of contents, printing articles e.t.c.

Folio also provides for a dictionary. These are just some of the few features of this software. The software has been installed on all the computers of NARO. So the individuals in the different sections can browse through the index to see the records they

are looking for. They then come to ARIS to get the CD-ROMs that contain that information so that they can print it out. The software index provides for a citation, which includes the CD-ROM number that contains that information.

ARIS has very many CD-ROMs, which contain information on a wide range of agricultural topics. It continues to receive regular updates of the information.

4.2.9.2 Internet

Internet enables people and communities throughout the world whether in the remotest areas or in the largest cities to have access to information. The Internet has been extensively used especially in the Question and Answer service when the collection in the library does not have the information.

4.2.9.3 Computer literacy

All the staff said they know how to use the computer at least the basic applications. The librarian is well versed with the software that is used to handle the information in the library. The respondents were asked how computer literate they were. The table 2 below shows their responses.

Table 2: Level of computer literacy of ARIS users

LEVEL	NUMBER	PERCENTAGE (%)
Never used	25	42.3
Basic knowledge	25	39
Competent	11	18.7

About using a computer 42.3% have never used a computer, 39% have used but can not do the basic searches for the information which they want, and 18.7% were well versed

with many computer applications and were able to do the basic searches of information themselves. This meant that there is a need to train the users because even those who had basic knowledge could not do a basic search for information.

4.3 ARIS USERS

This was meant to get some basic characteristics of the users that could be used to determine their information seeking behavior and use.

4.3.1 Age of the respondents

The respondents (ARIS users) were asked about their age and sex. Their responses are summarised in table 3 below

Table 3: Age and sex of the respondents

AGE	MALE	FEMALE	TOTAL	PERCENTAGE (%)
Below 10	-	-	-	-
11-20	1	1	2	3.4
21-30	9	3	12	20.7
31-40	8	5	13	22.4
41-50	9	4	13	22.4
51-60	7	3	10	17.2
61-70	5	1	6	10.4
71 and above	2	-	2	3.4
TOTAL	41	17	58	-

The results obtained show that there were more men (70.7%) who visited ARIS for information than the women (29.3%). This was attributed to fact that the education level of men in Uganda is higher than that of women and also the low interest of women in science subjects like agriculture.

No respondents were found below ten years of age. Majority of the respondents (82.7%) were between twenty and sixty years of age.

4.3.2 Education level

The respondents were asked the level of education which they have achieved. This was partly to establish how capable they are to understand the information provided. Their responses are given in table 4 below.

Table 4: Education level of ARIS users

LEVEL OF EDUCATION	NUMBER	PERCENTAGE (%)
Primary	-	-
Secondary	11	18.6
Tertiary	48	81.4
None	-	-

No respondents were identified to use the library from the primary level of education.

18.6% of the respondents were or had attended secondary school. 81.4% of the respondents had attended tertiary institutions. These included mainly researchers some doing their PhDs and others conducting research in agricultural research institutes.

4.3.3 Occupation of ARIS users

The respondents were also asked about their occupation. Their respondents are given in the table 5 below.

Table 5: Occupation of ARIS users

OCCUPATION	NUMBER	PERCENTAGE (%)
Researcher	20	33.9
Student	12	20.3
Farmer	5	8.5
Food processor	6	10.1
Teacher / trainer	6	10.1
Information personnel	5	8.5
Extension worker	2	3.4
Others	3	5.2

The majority of the users (33.9%) were researchers in the NAR research institute and ARDCs. 20.3% of the users were students, 8.5% were farmers (mainly commercial farmers) food processors and teacher (trainers) each constituted 10.1%. Information personnel constitute 8.5%. Extension workers constituted 3.4%. Other users constituted 5.2% these included drivers, secretaries and other support staff of mainly KARI because ARIS is located there. The ARIS library is a research library and that explains why the biggest group of the users is researchers.

4.3.4 Use of ARIS

The respondents were asked how often they used the ARIS library to get information.

Table 6 below gives their responses.

Table 6: Frequency of use

N=56

TIMES	NUMBER	PERCENTAGE (%)
Daily	15	26.8
2-3 times a week	12	21.4
Once a week	8	14.3
Once in two weeks	6	10.7
Once in a month	5	8.9
Very rarely	10	17.9

The people who use the library daily (26.8%) mainly come to read Newspapers and have nothing much to do with agriculture research. Those who use 2-3 times (21.4%) a week are the busy researchers especially those at Kawanda research station. Those using it once a week (14.3%) are researchers from other research stations who have been referred and some extension workers. Those who use it once in a month (8.9%) are mainly those researchers who do not do a lot of research, those who have so many other sources of information and students who come mainly to do some little research and also to complete their assignments. The very rear users (17.9%) include farmers (mainly large-scale or commercial farmers), teachers, and policy makers.

4.3.4.1 Reasons for rarely using the library

The reasons for rarely using the library were identified as:

- Nothing much to get from there.
- Some of the resources are available at the libraries of the other research centers.
- Many of the researchers have internet resources and this makes them lazy to come to ARIS for information.

4.3.5 Use of the information

The respondents were asked how they used the information. There responses are shown in the table 7 below.

Table 7: Information use

N=57

USE	NUMBER	PERCENTAGE (%)
Research	40	70.1
Academic	35	61.4
Agricultural production	12	21
Education	27	47.4
Agribusiness	20	35
Agro processing	23	40.3
Other	30	52.6

Many of the uses (71.1%) have used this information for research. 61.4% of the ARIS users have used the information for academic purpose. Very few users (21%) have used the information for agricultural production. Some of the users (47.4) have used the

information for education purposes. 35%of the users used this information for activities related to agribusiness. 40.3 % of the users used this information in processing their produce. Other uses of the information were identified as policy making preparing statistics among others.

4.3.6 Access to information

Respondents were also asked how they located information materials and what problems they encountered in finding titles. Table 8 below shows the methods used to access information.

Table 8: Methods used to access information **N=57**

METHOD	NUMBER	PERCENTAGE (%)
Personal browsing	26	45.6
Request forms.	44	77.2
Help from the librarian	55	96.5
Accidental discovery	7	12.3

It was established that most of the users (96.5%) to get the information that they need had consult the librarian first.77.2% got information by filling a request form (appendix 6). Just 45.6% could get the information by personal browsing and 12.3% accidentally discovered information. This confirms to some extent the difficulties surrounding bibliographic access.

4.3.7 Forms of information provision

The form in which the information is provided is very important because it can affect the perception of the information.

The librarian was also asked in what form information is provided. The forms are given in table 9 below. The table also gives who is best suited to what form.

Table 9: Forms of information provision

FORM	TO WHO
Textual	To researchers and users who need literature for further reading
Audiovisual	To researchers other agricultural personnel and the rural farmers. Used for demonstrations.
Verbal	To researchers and users of the library who simple and very short reference queries e.g. where is ARIS found?
Electronic	To researchers who have electronic facilities like the internet and e-mail.

4.3.8 Opening and closing time

ARIS is open 9:00 a.m.- 04:30 p.m. every day from Monday to Friday.

The respondents were asked if they were satisfied with the opening and closing time of ARIS.

The table 11 below shows how they responded.

Table 10: Feelings about opening and closing time **N=56**

TIME	NUMBER	PERCENTAGE (%)
OKAY	45	80.4
NOT OKAY	11	19.6

The majority of the respondents (80.4%) didn't have any problem with the opening and closing of the library. They found it okay because they visit the library during their working time. A few of the respondents (19.6%) did not find it okay and urged for more time for opening the library especially the closing time because they find it more appropriate to visit it after their work.

4.3.9 Users rating of the services provided at ARIS

The respondents were also asked how they rated the services provided by the library. Their responses are given in the table 10 below.

Table 11: Users rating of the services provided**N=57**

RATING	NUMBER	PERCENTAGE
Good	35	61.4
Average	18	31.6
Poor	4	7
Very poor	-	-

Majority of the respondents (61.4 %) rated the services as good. The major reason they gave was the professional and friendly attitude of the librarians. Some respondents

(31.6%) indicated that the service was average. Very few (4%) of the respondents rated the service as poor. They gave reasons like not being allowed to borrow items like newspapers and some books.

Suggestions to be put in place to ensure better provision of information

The respondents were asked for suggestions on how to improve the library service. They gave the following suggestions.

- Increasing the time when ARIS is open.
- More computers should be put in place to strengthen
- Lending of books should not only be to NAR staff but all users should be registered and issued borrowers cards.

4.4 COLLABORATING BODIES

ARIS is not a big organization and on top of that it doesn't have the resources in terms of money, personnel and equipment. To engage in the process of disseminating agricultural research information, there has to be collaboration with some other parties. These include the local leaders, telecenters, government organizations and NGOs, extension staff.

4.4.1 Local Councils

LCs should play a major role in disseminating information to the people in their parishes. Differing from the findings of Olinga (2002) LCs were found to be ineffective in disseminating agricultural information. Most of the time, they are concerned with political issues than those to do with agriculture development. Some of the respondents when asked about the help they have got from the LC officials said they hardly get any

information. One respondent is quoted to have said “they don’t mind about us after electing them”. This shows that there is little attention given to serving the rural farmers. Some of the farmers said they are afraid of going for information because they fear being asked to give some money as a general practice (corruption). This makes it harder because most of the rural farmers are poor people. However the blame shouldn’t be put on LCs because they too have got some problems such as; lack of funds to do their work, lack of training, large area to cover among others.

4.4.2 Telecenters

The information about telecenters was got by interviewing the manager of Nabweru telecenter.

Emphasis is placed on meeting the agricultural information needs of rural communities. The objective of the telecenter was established as to disseminate accurate and critical information through appropriate and preferred ICTs that include e-mail, radio, print media, television, video, web sites and CD-ROMs. Communication channels are made available to ensure effective exchange of information, knowledge and ideas to improve the practices of those seeking to change. It was established that the telecenter in conjunction with Buwama and Nakaseke produces a monthly publication, the Telecenter Newsletter. It is in Luganda and contains a lot of information for rural development.

The success of a multipurpose community telecenter is due to the fact that they are a means of overcoming barriers hampering access to information communication services in rural and low-income areas (Kibaya, 2001).

Infrastructure is agreeably the core of Telecentre operations. Telecentre infrastructure is the nerve of its services therefore must be reliable and effective at all times.

Many efforts have been made by the telecenter to provide information to the rural farmers. One of the efforts identified was organization of sensitization workshops.

Sensitization workshops

The telecenter manager said attempts have been made by organizing stakeholder workshops jointly with Buwama and Nakaseke telecenters. These are attended by representatives from IDRC, FAO, UNCST, Uganda Public Libraries Board, Uganda Telecommunications Limited, CBC (radio), ASARECA, Telecentres, local administration, local leaders, telecenter management committees, youth groups, women groups, extension services, research institutions, schools and farmers, various NGOs and CBOs – notably Action Aid, World Vision and Environmental Alert, COOPIBO and DENIVA.

Problems faced by the telecenter.

- Challenges of maintaining stable infrastructure and services.
- Lack of equipment to process information and make more copies. There should at least be an editor.
- Very few staff compared to the number of the farmers
- The telecenters serious problems with reliability of electricity and telephone connectivity.

4.4.3 Agriculture extension

The work the extension officers in agriculture information dissemination cannot be left unnoticed despite the problems that they face.

Agriculture extension involves the following:

- Advisory service to farmers in agricultural production.
- Establishing a research base and enabling the researchers to know the conditions in the fields before they start the research.
- Carrying feed back from the farmers to the researchers so better technologies can be developed.
- Supervising farm trials being carried out on the farms (crop demonstration program).

This kind of approach helps in the breaking the top down to communication and also reduces on the gap between researchers and extension workers and farmers. There should be proper benefit between the researchers and the farmers.

Agriculture extension officers and their interaction with the rural farmers

The study found that interaction with farmers has benefits such as knowing the farmers problems and also learning from the farmers (their local technologies).

However it was found that extension officers realize the following problems;

- Poor transportation facilities for extension staff.
- Lack of suitable markets and favorable prices for farm produce.
- Lack of cooperation of the rural people in implementing the program
- Lack of incentives for staff

- Reluctance of farmers to accept new practices.
- Demonstration equipment is also lacking.

The extension research linkage in Uganda can be seen in appendix 8.

4.4.4 Governmental bodies

The connection with governmental bodies was found to be indirect. For example information taken by the policy makers in the Ministry of Finance that the rural farmers need credit will lead to the ministry to arrange for projects where the rural people including farmers can get credit.

4.4.5 Non-Governmental Organizations

It was found that NGOs play major role in information dissemination. Many of them have as their primary objective, the eradication of poverty in rural areas. Agriculture being the major economic activity in the rural areas, emphasis has been put on it to see that the rural farmer's information needs are met. Good examples of NGOs that play a major role in agricultural information dissemination in rural areas are UNFA and EDAI. NGOs were found to be very effective because they reach down deep in the villages and to the most remote farmers unlike the telecenters and rural libraries.

4.4.6 Mutual cooperation

This involves the understanding between the library, telecenters, NGOs and other providers so as to avoid distrust, jealousy and duplication of effort, which may occur.

Some cooperation was found to exist between ARIS and the telecenters around like Nabweru, Nakaseke, and Buwama. One of the direct activities done is the repackaging of the information for these telecenters. The documents are translated into their local languages and even made simpler so that the local people can understand them.

- Cooperation with the NGO like the Uganda National Farmers Association.
- Ministry of Agriculture.
- Makerere University. Faculty of science, Faculty of Agriculture and faculty of veterinary medicine.
- Nkozi University. Faculty of agriculture.
- National Council of Science and Technology.

4.5 THE RURAL FARMER

It is very important that we realize that the majority of the users of this information are the rural people because they are the majority that carry out agriculture in Uganda. The main target of this information is the farmer on the fields. The researcher may only use it in the process of generating more information. The policy maker may use it just to see how much money can go to the field of agriculture. There fore if this information does

not reach the rural farmers it means that the efforts of ARIS to provide this information will just be done only half way. The main link observed is through extension work.

4.5.1 Age and sex of the rural farmers

The farmers were asked their age and by their appearance the researcher established their sex. Their responses are given in table 12 below.

Table 12: Age and sex of the rural farmers

N=70

AGE	MALE	FEMALE	TOTAL	PERCENTAGE (%)
Below 10	-	-	-	-
11-20	2	1	3	4.3
21-30	5	7	12	17.1
31-40	8	14	22	31.4
41-50	6	9	15	21.4
51-60	5	4	9	12.9
61-70	4	3	7	10
Above 70		2	2	2.9
TOTAL	30	40	70	

No respondents were found below ten years of age. Between ten and twenty years 4.3% was found. Few farmers (only 17.1%) were found between twenty and thirty years. This is the with young energetic men and women but many of them do not like to stay in the village and do farming, they prefer to do other small jobs in the surrounding towns. Majority of the farmers (31.4%) were found between thirty and forty years. Only two

farmers (2.9%) were found to be above seventy years of age. The study found that women farmers (57.1%) were more than the male farmers (42.9%). In the rural areas women are more active than men in issues to do with agriculture despite some cases of oppression.

4.5.2 Education level of the farmers

The education level of the farmers was asked in order to determine how well they could understand the information. The responses are given in the table below.

Table 13: Education level of the rural farmers **N=70**

LEVEL OF EDUCATION	NUMBER	PERCENTAGE (%)
Primary	24	34.3
Secondary	14	20
Tertiary	4	5.7
None	28	40

Some of the farmers have attended primary school and know some little English. 20% percent have attended secondary school. Only 4% of the farmers have been to tertiary institutions. The majority of the farmers (40%) have never attended school. This shows how difficult it to disseminate information to rural areas since you have to translate the publications and the films to local languages but still many can not even read the local language.

4.5.3 Type of farming respondents were engaged in

To find out which type of farming the farmers engaged in, they were asked for the use of the crops they grow. This helped to judge whether they are commercial farmers (produce for sell) of whether they are subsistence farmers (consume some and sell the rest)

Table14: Type of farming

N=70

TYPE	NUMBER	PERCENTAGE (%)
Subsistence farming	50	71.4
Commercial farming	20	28.6

The majority of the farmers (71.4%) practice subsistence farming. 28.7% of the farmers do commercial farming.

4.5.4 Needs assessment for the rural farmers

A participatory needs assessment can help to identify the information and training requirements of the local population. At the same time, it is important to uncover local skills and knowledge. These two items will help guide the selection and development of applications and help make the technology useful and appropriate for local people. Good techniques for these kinds of assessment, such as participatory rural appraisal (PRA) tools, have already been developed and can be selected according to specific situations.

The time required for the assessment will vary depending on factors such as the literacy levels of the population, how knowledgeable the rural people are.

The rural farmers were asked what information they needed in carrying out their activities. The rural farmers information needs are given in the table 15 below.

Table 15: Rural information needs**N=70**

INFORMATION NEED	NUMBER	PERCENTAGE
Disease and pest control	55	78.6
Processing information	28	40
Farm practices	48	68.8
Management information	25	35.7
Marketing	44	62.9
Rights	9	12.9
Others	29	41.4

78.6% of the farmers identified disease and pest control as their most urgent need. Many were worried of diseases that come to wipe their plantations like banana wilt, cassava mosaic among others. 68.8% of the farmers needed information on improved farming practices such as crop rotation, mulching, irrigation among others. 62.9% of the respondents needed information marketing and credit opportunities. These included information like where to sell their produce and at how much, where to get credit and the interest rates. This need was realized because some of the farmers got loans and failed to pay back and their land was taken. They didn't have sufficient information on how the credit system works. Few farmers (9%) admitted they need information on their rights but according to observation the number is much more than that. Many of them have been cheated of their land. At times they have been sidelined as very low profile people of the society yet they play an important role of producing food and raw materials. It is not

uncommon to find the middlemen (those who buy the farmers produce) disrespecting the farmers' rights. Other information needs of the farmers were identified as:

- Education: Many of the farmers are illiterate and in order to understand the brochure and leaflets in English, they need to have gone to school
- Counseling about different psychological issues, which could affect there farming.
- Information about where to get information. Many of them are not even aware that research is going on. They have never had of research centers and telecenters. They need to know where and how to get the information.
- Nutrition: most of the farmers were identified as subsistence farmers. They need information on which nutritious foods they should grow.

4.5.5 Sources of information used by the farmers

The farmers were asked which sources they used to get the information they need. They were also asked which sources they preferred. This information is given in table 16 below.

Table 16: Used sources and those preferred by the farmers

N=70

SOURCE	ACTUAL		PREFERRED	
	NO.	%	NO.	%
Farmer groups	42	60	53	75.7
NGOs	37	52.9	44	62.9
Extension agent	22	31.4	42	60
Telecenters	4	5.7	11	15.7
Farmer to farmer	53	75.7	50	71.4
Research centers	2	2.9	3	4.3
L.C s	3	4.3	8	11.4
Other sources	42	60		

The study established that the three most used sources of information are farmer to farmer (75.7%) followed by farmer groups (60%) and NGOs (52.9%). The least used source of information was found to be the research centers (2.9%). This shows that there is need to disseminate information from research libraries to the rural farmers since it is very rare for the farmers to visit these centers.

Most farmers (75.7%) preferred farmers groups as a source of information. The major reason given was that they felt at ease to participate in these groups. The least preferred source was the research center library. The major reasons were that they are very far and that they gave complicated information (probably the English language and the technical terms used). This meant there is need for information to be repackaged to fit the rural farmers situation.

4.5.6 The means used by the different sources to provide information

Farmer groups: These were found to mainly use meetings and communication through word of mouth (verbally). In a few instances brochures and leaflets were used but these were limited by production costs. Some times the group leaders may be hosted on a radio programs.

NGOs: The major means used to communicate information by NGOs were found to be; radio leaflets, poster seminars and verbally.

Extension agents: These were found to mainly use word of mouth, posters and radio.

Telecenters: These were found to mainly use posters, leaflets, newsletters, audiovisual means, verbally and electronic means

Farmer to farmer: It was found that farmer to farmer communication is mainly verbal.

Research centers: These mainly use words of mouth, leaflets and photocopies.

LCs: These mainly use words of mouth.

Other sources of information include the religious leaders, teachers, old people, and students. It was found that these sources are very important although they seem not to be recognized. In these sources the means used is word of mouth.

It can be seen that the source, which uses the largest number of means, is the telecenter. However it is one of the least used sources. This means that there is need to link between the telecenter and the information users is very poor and needs improvement.

5.5.6.1 The radio as an important tool for information dissemination

The radio was identified as the most appropriate way of disseminating agricultural information. The strength of the radio includes factors like immediacy, big coverage, adaptable, portability, and ability to use local language. However the study also established some limitations of the radio as an information dissemination medium. These limitations include; presenting programs at the wrong time, the message may not be stored, lack visual image limits its capabilities, and some of the farmers in the most remote areas cannot afford a radio.

4.5.7 Comparison between rural farmers and ARIS users

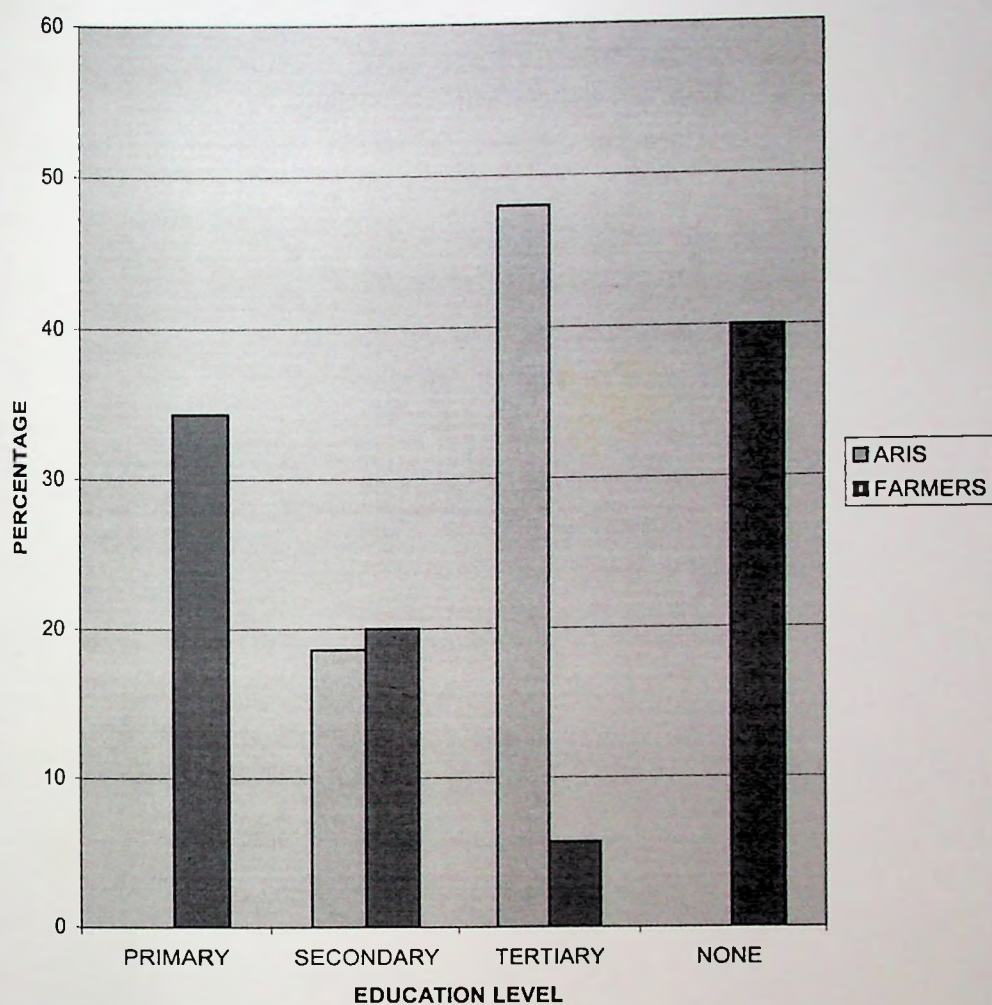
The categories of users who go directly to ARIS for information mainly use it for research, policymaking or academic work. In the rural farmers, the information is used practically on the field (agricultural production) they are the major target of the information and that's why it has to really be packaged in the best way to reach them. The problem is that the rural farmers are the least likely to understand the research information. This brings out the need for proper communication channels if the information is to be transmitted effectively.

The following differences were noted between ARIS users and the rural farmers:

- Users at ARIS mainly use the information for academic and research purpose while the rural farmers mainly use in on their farms.
- Users at ARIS mainly seek the information themselves while the rural farmers just receive the information.

- Users at ARIS always have a positive attitude towards the information personnel, while the rural farmers are at times conservative and suspicious of the information providers.
- ARIS users can understand the information directly from the information materials, while for the rural farmers information needs to be repackaged to suit their understanding.
- Dissemination of information to the rural farmers requires more parties than to the ARIS users.
- The users at ARIS are well educated while the users in the rural areas have low literacy levels. This can be shown very well by the graph below. At least all the ARIS users have passed the primary level of education. For the rural farmers a considerable percentage (40%) have not gone to school. This means they cannot read and write.

**A BAR GRAPH COMPARING THE EDUCATION LEVEL OF ARIS
USERS AND THE RURAL FARMERS**



4.5.8 Communication to the rural farmers

In the process of communication to the rural farmers, there has been little or no involvement of the farmers. Where the collaboration has existed, it has been very informal and it has not been expressed clearly.

4.5.8.1 Two-way flow of information

The essence of involving rural people in the process of their own development lies in the sharing of knowledge.

The people are very poor and do not have much to contribute in terms of money, expertise or equipment. All they can do is to give the knowledge, which they have. Sharing is not a one-way transfer of information; it implies rather an exchange between the concerned parties. On one hand the extension officers or the technical staff learn about the people needs and their techniques of production, on the other hand people learn of the techniques and proposals of the specialists. The problem is that in most cases there is much more communication from the extension officers than from the rural farmers. Useful sharing of information has not taken place spontaneously between extension agents and the rural farmers because neither side has possessed the skills to overcome certain barriers. These barriers include: social cultural barriers, differing levels of education, language difference, lack of interest by the extension staff to work in rural areas.

There has been an attempt to shift from the top down approach of communication to knowledge sharing to allow all our people make informed decisions concerning adoption, adaptation or even rejection of innovation.

4.5.8.2 Upward communication may take place in the following

This is mainly through feedback to the extension workers. The information may include;

- The technologies that have been invented by the local farmers. It doesn't mean that the rural farmer who did not go to school cannot invent a good method of storing for example grain.
- Informing the extension workers that the advice given has failed to work. For example a given pesticide may prove to be ineffective. This information is got from the farmers themselves.
- Farmers also give information about the climate, nature of people and other social activities in their areas, which will be useful to the extension personnel and the researchers.

Other identified forms of upward communication include village meetings where the farmers may say out their problems directly to the village leaders.

4.5.8.3 Promoting participation and mobilization

There has been an effort by the rural farmers to create farmers groups. These have executive members on which there is a member concerned with information affairs. They have gone ahead to invite extension officers and agriculture specialists to come and give talks to them. There are also prizes given the farmers who have excelled (for example one with the biggest bunch of matooke) this encourages the farmers to practice the knowledge which they get and even strive to acquire more farming knowledge.

There is also sharing of knowledge on the farms. One successful member in a group may be used to teach the other member.

Some of the groups are typical farmers groups i.e. involved with only farming and related activities. Others are groups formed for developmental purposes but with farming as a

major activity. Some of these groups include Kamakamu women's group in Tula village and Tukolerewamu farmers group in Nansana village.

4.5.8.4 Farmer participation

Just like Roger (1995) found Results show that farmer participation in FRG tend instead to follow a "U" shaped curve, with high participation at the initial stages of the process, followed by dramatic decrease as many farmers drop out from the groups, and slow increases towards the end of the first seasons. Many farmers participated in the diagnosis and group formation stages expecting free handouts (fertilizers, seeds, pesticides and credit...). They later dropped out when they discovered that there were no immediate personal benefits and free handouts. One of the farmers said, *" some of these organizations pretend to give us help but in the end they take our produce and don't pay. Some times they take our land when we fail to pay the money in time"*

Unlike the findings of Ashley (2000) in Uganda the majority of the participants are women. Many of the rural men are engaged in various other activities rather than farming. They would rather go out to the village trading center and do some small businesses that stay in the gardens. Even in the farmers groups which the researcher investigated the majority are women, very few men have the interest. Women's groups have proved to be one of the most effective entry points for activities reaching poor households, and among the most effective local-level institutions (World Bank 1998).

5.8.5 Attitudes of the rural farmers

- Some feel they need the information and have cooperated in the best way possible in all attempts.
- Others are very conservative especially the old people they feel they know much of what takes place and that no one from outside and especially if younger than them can come to give them advice.
- Suspicion still exists in some rural people especially those who have not gone to school. Some of them think that get involved with the extension workers may lead to the loss of their land.

4.6 LIMITING FACTORS AND APPARENT CONSTRAINTS IN AGRICULTURE INFORMATION DISSEMINATION

The research established the following limiting factors and constraints in disseminating agriculture information:

- Status difference between the extension workers and the clients, the agents inadequate knowledge of the communication process and how communication works, lack of proper cooperation both in program planning and implementation, and extension agents general lack of interest in traditional media.
- Many of the popular radios broadcast messages which are not tailored to the rural people. Even when information is relevant it is seldom aired at the proper time and so does not get to the targeted audience. This is especially true in agriculture education.

- The other problem is the much use of the print media. These are of limited use to the illiterate farmers. The technical languages sometimes used in communicating the information are sometimes useless to the farmers.
- One major constraint to the dissemination of agricultural information is the inadequacy of extension programs. The majority of these programs are conceived without well thought out plans and are prepared in a hurry without the farmers whose attitude is to be changed making an input.
- Well-intentioned plans and programs have been marred by the poor implementation and the too much bureaucracy.
- Some of the farmers loose interest in coming to get this information from these NGOs because of some of their policies like those involving agricultural credit. Some NGOs that provide credit to farmers take their property when they fail to pay back.
- Some of the farmers are not interested in the long boring lectures that are given by the agricultural specialists invited by the NGOs or the local leaders.
- Farmers don't understand the leaflets, which are some times in English. The messages on some leaflets is also not clear due to the lack of enough production costs.
- Many of the rural farmers have the tendency to think that every time a research extension worker, an officer from the NGO or a local leader comes to them, they are going to solve their problems immediately by giving them money or other tangible valuable materials. Every time they don't get this (which happens in most cases), they lose morale and they never come again.

- Lack of adequate modern equipment and facilities for rapid processing and dissemination of agricultural information especially in the telecenters.
- Lack of adequate budgetary allocations for library acquisitions and for sustained subscriptions to key agricultural journals.
- There are difficulties of the free flow of information primarily to due language barrier e.g. between English and the other local languages.
- Weakness in the operation of agricultural extension systems due to insufficient support from the national government. These weaknesses harbor the free flow of information to the rural people.
- Limited use of rural radio and television in disseminating this information.

CHAPTER FIVE

CONCLUSION & RECOMMENDATIONS

1 INTRODUCTION

This chapter presents the conclusion of this study and also gives the recommendations.

2 CONCLUSION

Experiences in African countries indicate that unless an adequate national information policy is formulated, efforts of information experts to develop effective information services are hampered. The study established that there was no information policy to be followed. Many policies have been formed at different times but implementing them has always failed the major reasons being lack of funds and lack of staff

The need to strengthen agricultural extension and training systems was recognized as an important activity in promoting agricultural development.

There was a general weakness in efficiently linking research, extension, and the farmers because of the absence of well-trained primary workers.

The target users of the agricultural research information are the farmers most of whom are found in the rural areas. All the efforts that are taken to generate, process, store, and retrieve this information will be wasted if the information stays in information centers like ARIS with out being used. The timely provision of information has also been hampered by lack of funds and the necessary equipment. Putting aside all the problems concerning lack of training, lack of fund and lack of equipment, if the participation of the rural farmers in the whole process is ignored, little will be done. It is not about how many

technologies are discovered in a given time or how many brochures, flyers are produced, what is important is to get the rural people to participate actively even if they may only understand their local languages.

RECOMMENDATIONS

Agriculture extension systems should be strengthened in order to make them more efficient. Group training courses for training specialized extension workers should be organized

Support should be provided for the establishment of more rural radio and television stations for more effective dissemination of information at grass roots level. Wider coverage would be made possible.

RIS should be having its own website to publicize all the documents online. There should also be an electronic document management system to enable easy access to parliamentary documents.

RIS should extend the scope and reach of some of its roles, for example in the training of staff in communication and in the development and promotion of systematic communication strategies.

Mechanism should be put in place by ARIS to follow up and implement the recommendations of seminars and workshops organized regarding agricultural research information. It is useless to hold the seminars and workshops if the information generated is not going to be utilized.

Consideration should be given of the existing knowledge and experience of the community information systems. Successes and failures should always be documented and referred to.

The staffing in the research institute libraries and telecenters should take into account the quantity, quality and permanence of assignment in order to ensure required efficiency.

The education of the rural people should be strengthened not only through UPE but also through adult literacy programs.

Extension officers should work hand in hand with the rural farmers in identifying their problems and in identifying the solutions. The rural farmers should not be sidelined in the whole process yet they are the major targets of the information.

Training in extension should also be on technical skills rather than just persuasive communication skills.

More money should be put to extension and dissemination work as in research findings are to be used. Money should not only be directed to research budgets but also to designing and implementing extension programs.

An effort should be made to follow extension programs and other policies regarding agriculture information dissemination. They should not be left on paper. If possible money used to facilitate the policy meetings should be cut and directed to follow up activities.

Channels of information dissemination such as religious leaders, schoolteachers, and clan leaders should not be ignored. These people have the ability to influence the groups of people who they lead.

Through donor agencies, the government should procure audiovisual equipment for use by extension workers in their interaction and communication with the farmers.

Audiovisual equipment is of great importance since few people in the rural areas can understand print media.

Because the majority of the users of agricultural information are in the rural areas, the government should make sure that more telecenters are put in place in the rural areas to cater for the rural agricultural information needs.

More equipment such as computers, photocopiers duplicating machines should be made possible to the telecenters by the government to ease information flow to the rural people.

It is important that the extension workers are deployed in areas whose language they are conversant with. They should be familiar with the culture and the well being of the rural people in the areas where they are working so as to avoid misunderstanding.

The government through the collaboration of the Ministry of Information and Ministry of Agriculture should make sure the rural radio is strengthened by increasing its area coverage and making sure that the programs are aired in the right time with the right information and in the right language if the intended impact is to be made.

The extension workers should be taught communication skills. They should not just be taught how when and to who to pass on information they must be acquitted with interpersonal and convincing skills if they are to make an impact.

Feasibility studies and proper budget allocations should be done so as to avoid surprise setbacks and misuse of funds. If feasibility studies are done, it will be possible to know what is likely to work and what is likely to fail and then funds will be directed to what is likely to work.

Religious leaders, teachers, LC officials and other community leaders should not be overlooked in the process of disseminating agricultural information to rural areas. These people informally pass on the information to the people they lead, their family members, their students or any other person.

Finally, in order to look for an appropriate solution to some of these problems discovered in this research, the concept of cooperation must be fully practiced. The NGOs, extension centers and local farmers groups should be registered and reinforced in order to back up the responsibilities of ARIS.

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APPENDIX I

MAKERERE

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EAST AFRICAN SCHOOL OF LIBRARY AND INFORMATION SCIENCE

Your Ref:

Our Ref:

February 26th 2003.

The coordinator
ARIS

Dear Sir,

RE: INTRODUCTION LETTER: MR. BAYUNGA ANDREW REG. 00/U/1135

This is to introduce to you the above named student who is our student at this school offering a bachelor of library and information science (BLIS).

As part of the degree course, he is required to carry out a research entitled: "AN ASSESSMENT OF THE PROVISION OF AGRICULTURAL RESEARCH INFORMATION AT ARIS, KAWANDA".

The purpose of this letter is therefore to request you to assist him with the information to use in his dissertation.

All the information given will be for academic purposes only.

Yours faithfully,

Assoc. Prof. I M N Kigongo-Bukenya (DIP. LIB, MLS, MLIB, PhD)
DIRECTOR

IMNKB/juk

APPENDIX II

QUESTIONNAIRE FOR ARIS USERS

ASSESSMENT OF THE PROVISION OF AGRICULTURAL RESEARCH INFORMATION AT ARIS, KAWANDA

Dear sir/madam,

A study is being conducted with a principle aim of examining how information obtained from agricultural research can be provided to the different users to meet their needs. The study is only for academic purpose and the information obtained will be handled with confidentiality.

CIRCLE THE APPROPRIATE OPTION IDENTIFICATION

What is your age?

& below

-20

-30

-40

-50

-60

-70

above 70

Sex

a) Male

b) Female

Level of education

a) Primary

b) Secondary

c) Tertiary

d) None

What is your occupation?

a) Researcher

b) Student

c) Farmer

d) Food processor

e) Teacher/ trainer

f) Information personnel

g) Extension worker

Others

USE OF ARIS

How often do you use ARIS to get information?

- ☐ a) Daily
- ☐ b) 2-3 times a week
- ☐ c) Once a week
- ☐ d) Once in two weeks
- ☐ e) Once in a month
- ☐ f) Very rarely

If you answer f), what are the reasons for rarely using the library?

.....

.....

.....

What do you use the information for?

- a) Research
- b) Academics
- c) Agricultural production
- d) Education
- e) Agribusiness
- f) Agro processing
- g) Others (specify).....

What method do you use to access information in the library?

- a) Personal browsing
- b) Request forms
- c) Help from the librarian
- d) Accidental discovery

USERS RATING OF THE SERVICES PROVIDED

The opening and closing time of ARIS is 9:00a.m. and 4:30 p.m. Is it O.K. for you?

- a) Yes
- b) No

If no, why?

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.....

How would you rate the services provided at ARIS?

- a) Good

- Average
- Poor
- Very poor

What suggestion do you have in mind to ensure better provision of information?

.....

.....

.....

THANK YOU

APPENDIX III

INTERVIEW GUIDE FOR THE ARIS STAFF

ASSESSMENT OF THE PROVISION OF AGRICULTURAL RESEARCH FORMATION AT ARIS, KAWANDA

1. What kind of work do you do at ARIS?
2. For how long have you worked at ARIS?
How do you feel about working at ARIS?
3. To what people do you provide information?
4. In what forms is the information provided?
5. How regularly are the information materials received?
6. How often is your collection updated?
7. How are the information materials stored?
8. What are the information dissemination methods you use?
9. Are the information resources enough for the library users?
10. In what areas has automation taken place?
11. What is your opening and closing time?
12. Have you any specific library services for the illiterate deaf or the visually impaired?
13. Are there any referral services in case the information the user wants is not there?
14. Do you provide SDI and current awareness services?
15. If yes, what services do you provide?
16. What library equipment do you have?
17. Is there any equipment that you feel you lack?
18. If yes, what equipment?
19. What are the reasons for not having the equipment?
20. Do you subscribe to electronic databases?
21. How have you involved yourself in providing information to people who may not be able to come to ARIS?
22. What kind of interaction do you have with the telecenters, LCs and NGOs?
23. What precautions have you taken in case of any disaster?

APPENDIX IV

INTERVIEW SCHEDULE FOR RURAL FARMERS

ASSESSMENT OF THE PROVISION OF AGRICULTURAL RESEARCH FORMATION AT ARIS KAWANDA

The study is being conducted with the principle aim of examining how information
gained from agricultural research can be provided to the different users to meet their
needs.

A) IDENTIFICATION

What is your age?

- a) Below 10
- b) 11-20
- c) 21-30
- d) 31-40
- e) 41-50
- f) 51-60
- g) 61-70
- h) Above 70

Sex

- a) Male
- b) Female

What level of education did you or have you reached?

- Primary
- Secondary
- Tertiary
- None

What kind of crops do you grow and for what use? (What type of farming do you
practice?)

- a) Subsistence farming
- b) Commercial farming

INFORMATION NEEDS AND SOURCES

What kind of information about agriculture would you like to have and why?

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.....

.....
.....
From what sources do you get the information?
.....
.....
.....

.....
.....
What sources would you prefer?
.....
.....

FARMER PARTICIPATION AND FEED BACK INFORMATION

How actively have you been involved in the process of information dissemination? For
example in formulating the best method to use?
.....
.....
.....

What kind of information may you provide in turn to the people who bring you
information about agriculture?
.....
.....
.....

How do you feel about the whole idea of bringing agricultural information to you? Do
you like it?
.....
.....

If not why, and what suggestions can you make to make it better?
.....
.....
.....

What problems have you faced in receiving this information?
.....
.....

.....
.....

13. How has your LC 1 information secretary helped you in providing agricultural information?

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.....

APPENDIX V

INTERVIEW GUIDE FOR KEY INFORMANTS

AN ASSESSMENT OF THE PROVISION OF AGRICULTURAL RESEARCH INFORMATION AT ARIS, KAWANDA

1. What position do you hold in your jurisdiction (e.g. LC, NGO, Telecenters, other)?
2. What kind of contacts do you have with ARIS as regards agricultural information?
3. What role have you played in the dissemination of agricultural information in the areas of your service?
4. What activities do you do as regards agricultural information dissemination?
5. What problems have you faced?
6. What suggestions can you provide for solving the above problems?

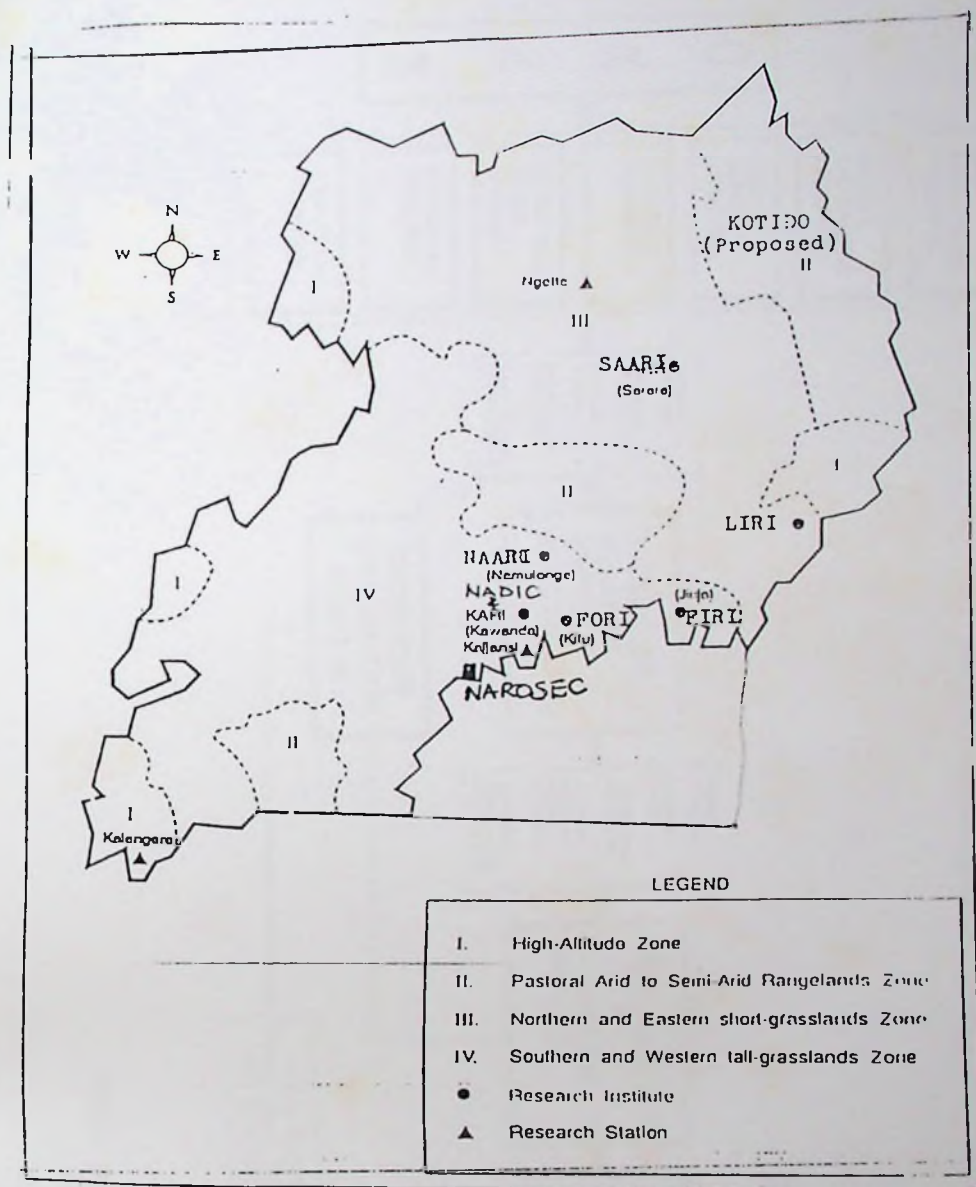
APPENDIX VI

OBSERVATION GUIDE

AN ASSESSMENT OF THE PROVISION OF AGRICULTURAL RESEARCH INFORMATION AT ARIS, KAWANDA

1. The equipment at ARIS.
2. The information materials.
3. The information handling process.
4. The lively hood and characteristics of the rural farmers.

APPENDIX VII



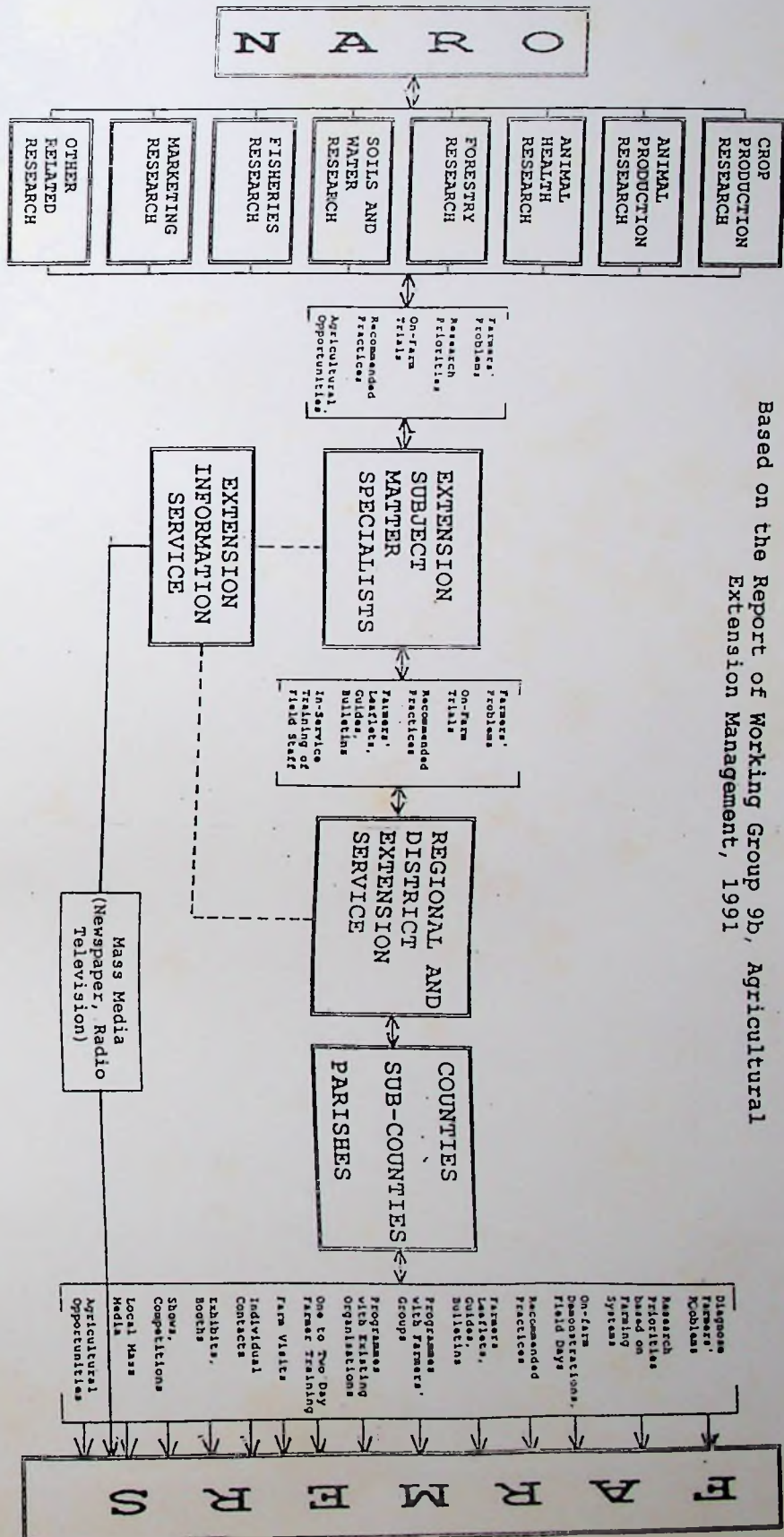
MAP OF UGANDA SHOWING THE LOCATION OF THE RESEARCH INSTITUTES IN THE AGRO-ECOLOGICAL ZONES

Source: Uganda Working Group 9A - Agricultural Policy Committee. 1991. National Agricultural Strategy and Plan: Strategy, Organization Management, vol. 1.

APPENDIX VII

EXTENSION-RESEARCH LINKAGE IN UGANDA

Based on the Report of Working Group 9b, Agricultural Extension Management, 1991



Robert L. Johnson
FAO CTA IC/93/234
Agricultural Extension Management

NARO = National Agricultural Research Organisation