INFORMATION NEEDS OF AGRICULTURAL RESEARCHERS AND EXTENSION AGENTS IN ADDRESSING FARMERS' PRODUCTION-RELATED CONSTRAINTS AND INFORMATION NEEDS IN THE GAMBIA

by

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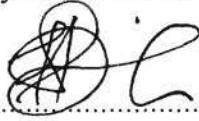
2001

DEDICATION

This work is dedicated to my father, the late Sheriff Janneh, for his vision, foresight and inspiration.

DECLARATION

I hereby declare that the entire thesis is my own original work and has not been submitted to any other University for a similar or any other degree.

Student: Falankoi Manyima Sheriff Janneh

Signed: .... Date: 4 FEBRUARY 2002

Supervisor: PROF. A. M. KANIKI

Signed: .... Date: 4 FEBRUARY 2002

ABSTRACT

This study investigated the information needs of agricultural researchers and extension agents in addressing farmers' production-related constraints and information needs in The Gambia. The overall objective of the study was to identify the types of farmers' production-related problems faced by the above agents of change, which were translated into information needs, types of information providers and delivery systems used, and to assess their effectiveness. Coupled with this was the need to gauge the status of the T & V (Training & Visit) model of extension in the country as well as the linkage between research and extension. The sample comprised 32 researchers from NARI who were all included because of their small number and 68 extension agents selected through stratified random sampling from the Departments of Agricultural Services, Livestock Services, Fisheries and Forestry. Self-administered questionnaires were distributed among the respondents located in the five divisions across the country.

The findings indicated that out of a total of 54 respondents, 63% represented the extension agents while 37% were researchers. Of the same figure, 92.6% were male while 7.4% were female. The researchers' ages ranged from 31 to 56 years old, while the extension agents were between 25 to 55 years old. With regard to educational qualifications, most of the highly qualified staff were within the research services while extension had the least. It was also revealed that 59.3% of the respondents have more than 15 years of work experience. In respect to language proficiency, it was observed that 98.1% could speak more than one local language, that is to say, ranging from two to four languages.

The findings also established 44 cases of information needs, which Gambian researchers and extension personnel experienced with only 11 information providers used to satisfy those needs. Of these information providers, professional forums (96.3%) and personal sources (81.5%) featured prominently as the most frequently used and effective sources. Personal contact (81.5%) was the most common delivery system employed to disseminate information and technical advice to farmers.

As regards the respondents' perceptions about the T & V (Training & Visit) model of extension in the country and the linkage status between research and extension, 68.5% believed that T & V is non-existent while 79.6% attested to the current weakness of the research-extension linkages in the country.

Finally, it was recommended that an agricultural library be established in each division to cater for the information needs of all the stakeholders. Also, the unit for the Research-Extension Liaison Officer (RELO) should be reinstated to further strengthen the linkage, coordination and interactive communication between research and extension services.

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List of Acronyms and Abbreviations

ADB	Agricultural Development Bank
ADP	Agricultural Development Project
ANOVA	Analysis of variance
ARREV	Agricultural Research Review meeting
ASFE	African Swine Fever Eradication Project
ASP	Agricultural Services Project
BSc	Bachelor of Science
CBO	Community-based Organisation
CORAF	West and Central African Council for Agricultural Research
CRD	Central River Division
CRS	Catholic Relief Service
DAR	Department of Agricultural Research
DAS	Department of Agricultural Services
DLFA	District Level Farmer Association
DLS	Department of Livestock Services
DOA	Department of Agriculture
DOF	Department of Forestry
DOP	Department of Planning
DOSA	Department of State for Agriculture
DOSFNE	Depart of State for Fisheries, Natural Resources and Environment
EA	Extension Agent

FAO	Food and Agriculture Organisation of the United Nations
GARD	Gambia Agricultural Research and Diversification project
GDP	Gross Domestic Product
GOTG	Government of The Gambia
GGFP	Gambia-German Forestry Project
Ha	Hectare
HOS	Head of Schools
IFAD	International Fund for Agricultural Development
IAALD	International Association of Agricultural Information Specialists
IPM	Integrated Pest Management
ISNAR	International Service for National Agricultural Research
ISS	Information Seeking Situation
LADEP	Lowland Agricultural Development Programme
LRD	Lower River Division
MCP	Mushroom Cultivation Project
MIS	Management Information System
MOA	Ministry of Agriculture
MSc	Master of Science
MTRM	Monthly Training and Review Meetings
NARB	National Agricultural Research Board
NARI	National Agricultural Research Institute

NARS	National Agricultural Research Systems
NAWFA	National Women Farmers Association
NBD	North Bank Division
NEA	National Environment Agency
NFP	National Farmers Platform
NGO	Non-Governmental Organisations
PhD	Doctor of Philosophy
PRA	Participatory Research Appraisal
PRO	Principal Research Officer
R	Researcher
RDP	Rural Development Project
RELO	Research-Extension Liaison Officer
RELU	Research-Extension Liaison Unit
RFCIP	Rural Finance Community Initiative Project
SMC	Village Site Management Committee
SMS	Subject Matter Specialist
STTA	Short-Term Technical Assistant
SWMU	Soil and Water management Unit
TA	Technical Assistant
T & V	Training and Visit system
TV	Television
URD	Upper River Division

VISACA	Village Savings and Credit Association
VEW	Village Extension Worker
WARDA	West Africa Rice Development Association
WD	Western Division
WID	Women in Development project

CHAPTER ONE
INTRODUCTION

1.1   Background to the problem

The Gambia is a former British colony on the West Coast of Africa. It attained its independence in 1965. It has a population of 1.3 million people. Agriculture, which has been, and continues to be, the most important sector of the economy of the Gambia, employs over 70% of the population, but contributes only about 22% to the Gross Domestic Product (GDP) (Gambia Government, 2000: 8 - 10). Being the primary means of livelihood for the majority of the rural population and potentially the main source of foreign exchange earnings, agriculture has always been ranked as one of the highest development priorities of the country by the government.

In 1990, a survey, which was part of the short-term technical assistance (STTA) of The Gambia Agricultural Research and Diversification (GARD) project on farmer constraints analysis in The Gambia was carried out by Torrence (1991) in order to shed light on the nature and extent of the problems and constraints faced by farmers. The report of the survey, was meant to serve as a checklist and basis for predicting the type, and to some extent, the volume of information that might be needed by researchers and extension agents in order to resolve farmers' production-related constraints and problems when and where they arose. In addition, the Government's decision to re-organise the Ministry of Agriculture (MOA) which led to the establishment of both the Department of Agricultural Services (DAS) and the Department of Agricultural Research (DAR) in 1988 as separate entities among others, presents some indication of the Government's concern to more proactively address, the plight of the farmers through research and extension services.

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The MOA was reorganised in 1988 (Trent, 1988:1) and was renamed the Department of State for Agriculture (DOSA) by the new civilian government in 1996. Figure 1 shows the structure of DOSA. This was done by the government in order to enhance its recognition for and its commitment to the improved standards of living of farmers, and to strengthen agricultural research and extension services.

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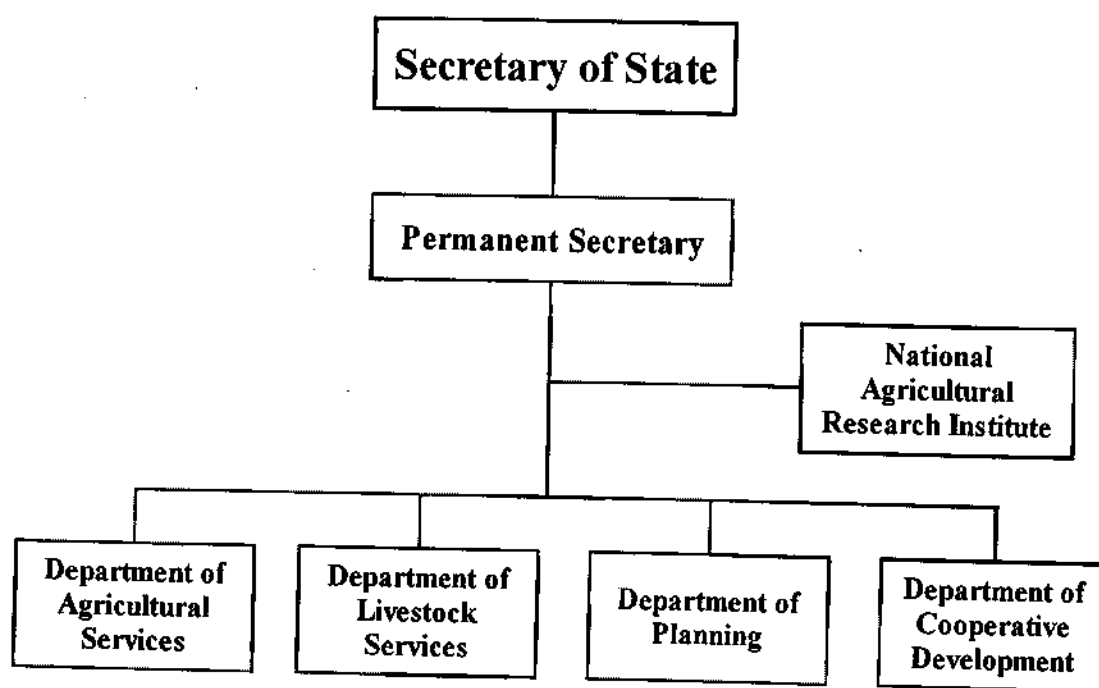
Figure 1: Organisation structure of
The Department of State for
Agriculture (DOSA), The Gambia

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The reorganisation of agricultural administration affected the research component which was separated from the Department of Agriculture (DOA) and established as the new Department of Agricultural Research (DAR) in July 1988 (Department of Agricultural Research, 1988: i). The DOA was renamed, the Department of Agricultural Services (DAS). These developments, according to the Director of Research were a recognition of the importance and anticipated contribution that agricultural research can make to the development of Gambian agriculture (Trent, 1988: 1). In a similar vein, Samaha (1985: 210-216) and Thorpe (1985: 78) also regard agricultural research as one of the most important stimulants for accelerating agricultural production and/or development in a country. However, Kaniki (1989:1) points out that quality research is meaningless if results or information generated from such research are not effectively disseminated to the end users. The dissemination of research information is vital to ensure that technologies developed from research activities reach the end user who would, hopefully, translate such technologies into actions that lead to improved agricultural production.

Historically, as depicted by Trent (1989: 1), the research and extension functions of MOA were administered through the same Department, that is, the DOA. In this structure there was an assistant director for research and an assistant director for extension, both of whom reported to the Director of DOA. However, Trent (1989: 1) argued that even though the two units were in the same department, each pursued its own goals, there was little communication between them and there was little coordination from the administration. After the split of DOA into two departments, the role of DAR became specifically that of research, while DAS was more of extension and information services. The Departments of Fisheries and Forestry have recently been relocated under the Department of State for Fisheries, Natural Resources and Environment (DoSFNE). This is why they are not reflected in the above organisational structure as presented in Fig.1.

The philosophy behind these organisational and structural changes which were part of the Government's development planning process, was to consolidate the operations and services provided by the departments to the farming community and at the same time, to ensure the effective and efficient use of technology for information processing and delivery. It goes without saying that well-structured and adequately funded research and extension systems and services are the key to generating new agricultural technologies to be adopted by farmers (Coulibaly, 1996: 50). Similarly, an effective two-way linkage between farmers, extension, and research services is critical for an effective agricultural system (Kaniki, 1989: 42). In addition, Aina (1991: 20) emphasises that agricultural extension agents occupy a strategic position in the agricultural production cycle, as they are a link between the farmers and research scientists and between farmers and policy makers. Therefore, the Government of The Gambia (GOTG) has in the recent past been investing and continues to invest in both research and extension services because it believes that they are critical structural instruments for carrying out policy and achieving government goals. In other words, their services are central to economic-development programmes.

The general agricultural-related goals of the Gambia government are articulated in The Gambia Inc...Vision 2020 (2000: 8-10) as follows:

> ➤ increase food production;
> ➤ stimulate economic growth;
> ➤ provide better welfare for farm families and rural people; and
> ➤ promote sustainable agriculture.

In 1986 a seven-year project called The Gambia Agricultural Research and Diversification (GARD) project sponsored by the United States of America, was initiated to provide both financial and technical support to departments within the then Ministry of Agriculture. The various departments included DAR, DAS, Department of Livestock Services (DLS), Department of Forestry (DOF), Department of Planning (DOP), and Fisheries and Natural Resources. DAR,

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which hosted the GARD project, was responsible for conducting research on crops, production of technical information and improved technologies for diffusion to farmers through the extension services. Aims of the GARD project as reflected in the Annual Report (GARD project, 1991:20) were to:

> institutionalise the agricultural research process in the Gambia. This was to be achieved by setting up a National Agricultural Research Board (NARB) which would formulate the mandate for the National Agricultural Research Institute (NARI) and build the institutional capabilities of the Gambian researchers to address their own problems without heavy dependence on external support;

> provide measurable impact on agricultural income;

> measure meaningful research results;

> ensure sustainability of the progress;

> facilitate an increase in food production, such as (poultry/livestock production) so as to meet domestic food consumption needs ;

> strengthen linkages between research and extension;

> facilitate the mapping of cropping systems to capture the diversity of farm environments so as to help extensionists and researchers target technology for particular farm groups.

Following the conclusion of the GARD project in 1992, DAR was transformed by an Act of Parliament (The Gambia: Act no.15 of 1993), into the semi-autonomous National Agricultural Research Institute (NARI). The Institute was established in 1993 and has ten discipline and/or commodity based research programmes: cereals programme; cropping systems and resource management programme; agricultural engineering programme; socioeconomics programme; horticulture programme; seed technology management programme; grain, legumes and oilseeds programme; pest management programme; fisheries programme; and agroforestry programme (CORAF, 1998: 29-30). NARI is currently responsible for conducting research on a wider scale including: crops, livestock, fisheries, forestry and other natural resources of the country. The Institute is also responsible for the development of appropriate agricultural technologies that are

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expected to contribute to the conservation of the natural resource base and enhance sustainable agricultural production systems. It is argued that in order to achieve realistic development within the agricultural sector, development of need-oriented research and technology transfer is required. This must be based on the farmers' environment and input (Sonko et al, 1988:9, Kaniki, 1989:41-42). The aim is to improve the production levels of the farmers by providing improved technologies that are compatible with their biophysical and socioeconomic environment, and technical information through the extension services to complement this effort.

In order to effectively resolve farmers' production constraints, as outlined in the Torrence report (1991: 4) and/or address their information needs, NARI researchers believe that "adaptive research" is the key. This is because, in adaptive research, the researchers are expected to tap the wealth of information and technologies already available among their peers and adapt them to the Gambian situation. However, in some instances some of the technologies have not worked successfully in the country partly because of their unsuitability to the Gambian conditions. A case in point is the use of animal traction such as a single mouldboard plough with oxen or a seeder with a donkey on rice fields. Implementation of this technology had been attempted in various areas of Western Gambia with very little impact. Many farmers have abandoned this technology for various reasons. Some of the reasons are: the unsuitability for some rice ecologies (e.g. swamp or mangrove conditions), the lack of draft animals or equipment, the conflict between men and women in terms of the times of use of such technology and so on (Jones, 1989: 38-44). A recent survey by the West and Central African Council for Agricultural Research also supported this opinion (CORAF, 1998: 36). It attributed non-adoption of animal traction technology to its inappropriateness for lowland rice cultivation. In fact, the report highlights additional reasons from farmers for the non-adoption. These include the heaviness of the soils in the lowland areas of the country; the weakness of N'Dama cattle in relation to the weight of the standard plough and the heaviness of the soils; and complex constraints on women adopting animal traction such as limited access to implements and oxen. However, this notwithstanding, the report further indicates that the adaptive research being carried out by NARI under the Lowland Agricultural Development Programme (LADEP) aims at alleviating labour constraints, for land preparation,

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that is ploughing and harrowing in the lowland farming system, and thereby encouraging increased production. Another example of low or non-adoption of new agricultural technology is that pertaining to a sorghum variety which was believed to be striga-tolerant and was expected to do well in a striga-infested environment. This did not live up to the expectations of some farmers.

The lack of suitable technology and inputs is one of the reasons why researchers often have to include a literature review or the experiences of their peers in their proposed seasonal research programmes. Reviewing literature or the available information on a given technology and input is necessary in order for researchers to be aware of their advantages and disadvantages. Unfortunately, the information infrastructure in the country does not appear to cope with the increased information needs of the researchers, because the existing number of agricultural information management systems in the country are far from adequate to effectively cater for their information needs. Furthermore, the lack of understanding of the main problems or information needs of researchers and extension agents in relation to farmers' problems exacerbates the problems. The key structure, DAS operates entirely in the rural sector of the country. It constitutes a basic structure or policy implementation arm of government expected to stimulate agricultural development in order to bring about changes in agricultural production and raise rural living standards. The objectives of extension in DAS are to:

> increase agricultural income and improve the nutrition of the people through increased agricultural production and diversification;

> intensify efficient agricultural production in a sustainable manner and promote locally-produced agricultural products;

> diversify income resources of the farming population, improve processing and storage of agricultural produce and demonstrate the effective use of well-balanced diet by using local food crops;

> diversify production and productivity of crops for export in order to increase rural income and foreign exchange earnings;

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- develop rural finance through functional rural credit markets;

- identify, develop and promote adaptable, cost-effective technologies that will increase efficiency on a sustainable basis;

- diversify agricultural production with a view to reducing the vulnerability of the sector on exogenous stock and strengthening the linkages between agriculture and other sectors, notably tourism in order to improve and expand the local market;

- improve access to input, research and seed multiplication;

- teach farmers improved group management, agronomic practices and to help them understand and adopt them on their farms to improve crop quality and yields;

- increase extension/farmer contact through groups and media contacts to facilitate sharing of knowledge and experience and building mutual confidence between them;

- create awareness through demonstrations, on-farm trials and micro-plots on relevant recommended practices that are critical to improve crop yields;

- sensitise farmers on the importance of soil and water conservation measures that increase soil fertility and conserve fertility of the soil and water on a sustainable basis;

- provide assistance to front-line extension workers to improve their extension messages delivery systems in order to help farmers identify and define production, marketing and storage constraints with suggested solutions;

- develop viable irrigation and water control schemes for agriculture;

- create employment opportunities and generate income for the majority of the rural population who are largely dependent on the agricultural sector; and

- establish and implement an integrated/unified extension system fusing crop and livestock extension services with particular reference to the front-line extension workers - polyvalent approach to extension message delivery (Department of Agricultural Services, 1998: 202-204).

To deal with all these objectives requires up-to-date and relevant information. This information must be supplied through the most appropriate delivery systems. The extension services together with researchers, farmers and farmer organisations are expected to be responsible for the planning

and implementation of programmes and projects for agricultural change within a local environment.

However, it must be mentioned that farmers' participation in this planning process in The Gambia has been on an ad hoc basis. It is very limited because the main forum or channel for farmers' input is through meetings which are not always most appropriate for them (farmers). These meetings are usually organised at the village level with a few days' notice and attracts few farmers because membership to the established representative structures at the higher level are not yet open to farmers. This means that with the exception of NARI, which allows the President of the National Farmers Platform (NFP) to sit on its governing board (CORAF, 1998: 7) farmers have not yet been given the chance to become part of the decision making process at the higher level.

Although farmers express their problems at these meetings, some of which are translatable into information needs, the problems are often complex and multifaceted. The change agents, researchers and extensionists, cannot address these farmers' problems spontaneously and instantaneously without further research, consultation with their peers and collaborators in the sub-region and or similar systems elsewhere and/or reference to various information providers in well-established National Agricultural Research Systems (NARS) around the world. In other words, most of the farmers' problems and information needs require informed decisions based upon appropriate information. The extension agents' or researchers' own experience and personal information resource collections are not always sufficient and accessible to make decisions. They require more than personal experience or own acquired knowledge to deal with farmers' complex problems. It is essential that both research and extension personnel have information, which is useful for them if they are to work effectively.

To compound the situation, many extension personnel lack adequate transport facilities to reach farmers effectively because the average ratio of extension agents to farmers in the Gambia is 1:6296 (Central Statistics Department, 2000). With this alarming ratio in the country many farmers never come into contact with extension agents so that many farm problems never come

to the attention of extension personnel. It follows, therefore, that some of the technologies, such as micro plots' demonstrated on farmers' fields through the training and visit (T&V) system, have not been successful or have not made significant impact on production levels in most areas. The results of the evaluation of the effectiveness of DAS crop extension conducted from November 1991 to May 1992, also confirmed that the T & V system in the country has some shortcomings (Agricultural Services Project, 1992: 41). The T & V system, which is an interactive system of implementing the adoption process in agriculture worked well among peasant farmers in India, but almost failed in The Gambia. It would be interesting, for example, to establish why such a system did not operate successfully in The Gambia. To do this, of course, requires adequate information.

The Torrence's survey (1991) on farm constraints referred to earlier, covered only the crop production aspect. It is important and it is proposed in this study that other aspects such as livestock, forestry and fisheries, which are the main activities of the Gambian farmers also be investigated so as to establish key areas of research and extension for farmers, and how these are translated into information needs. In many instances, these needs are work related. Through this study the researcher aims to establish the types of production problems and/or information needs farmers experience and report to agricultural researchers and extension staff in these sub-sectors. The study also aims to establish the type of information providers that are used to resolve farmers' concerns. In the course of food production and other related activities, farmers face constraints such as fertilisers, pest and disease control, adequate planting materials, financed credits and so on. These can be translated into information needs. The translation of production constraints into information needs can be done by farmers themselves or with the assistance of information experts and relayed to extension agents and researchers for help. On the other hand, extension agents and researchers can recognise the constraints, translate them into information needs and provide assistance. Knowledge or the expertise required to deal with specific agricultural problems or constraints can only be conveyed in the form of information. In other words, tacit knowledge has to be converted into explicit knowledge (information) to be transferred to others. It is assumed that a constant supply of appropriate agricultural information

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to extension agents will enhance the quality of information they provide to farmers, researchers and policy makers (Aina, 1991: 21).

The role of extension, as indicated by Jones (1986: 11), is to comprehend the social, economic and technical environment of the producers, and their objectives, resources, existing methods and difficulties; to represent their needs to the administrative apparatus as well as to the rest of the knowledge system; and to help convey the products of that system, and options derived from them, to producers. This effort is essential because the more farmers become aware and understand matters that relate to their everyday work, the better informed and knowledgeable they will become. Although there is potential for researchers and extension personnel to deal with farmers' problems, some of which have already been mentioned in Torrence's findings (1991: 4), the comprehensive linkage between research and extension is weak. This has been highlighted by various researchers like Trent (1989), Eponou, (1996) and international agencies, such as the International Service for National Agricultural Research (ISNAR, 1996: 1-2), CORAF (1998: 8-9) and the African Development Bank (1998: 40). Eponou (1996: 1) also points out that, donors as well as research and extension managers recognise that unless linkage problems are properly addressed, the chance that any African research strategy will succeed is unlikely.

Prior to the conclusion of the GARD project, common areas of collaboration between DAR and DAS were identified and instituted. One of these was the Research-Extension Liaison Unit (RELU) headed by one of GARD's Technical Assistants (TA) designated as the Research-Extension Liaison Officer (RELO). This officer's mandate was, amongst other things, to coordinate activities between research and extension, enhance their collaborative efforts and provide a common platform for the exchange of information and experiences. The effectiveness of this linkage mechanism was only conspicuous during the life of the GARD project. This was largely due to the fact that RELU's activities geared toward the strengthening of the linkages between research and extension, were financed by donor resources.

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Following the conclusion of the GARD project in 1992, the RELO's office was temporarily staffed by one of the senior extension personnel who was on the NARI pay roll. Unfortunately the appointed senior extension personnel only spent a couple of months as the RELO before taking up a higher position at the National Environment Agency (NEA) in 1993. Since then the RELO position has remained vacant because the cost of maintaining the position cannot be borne by NARI or DAS without donor or government support. As a result, the linkage between NARI and DAS has become weak. In addition, all the linkage mechanisms like research task force meetings, Agricultural Research Review (ARREV), field days, on-farm trials and bi-monthly research and extension workshops which were in place at the time of the GARD project, were used to convey information from research to extension and to farmers. However, due to lack of donor support after the completion of the GARD project, the effective flow of information between extension and research became weak. In fact, Trent (1989: 5) points out that, although the above mechanisms were in place, the linkages are still weak and need great attention and nurturing to make them effective and productive. Torrence (1991:9) also indicates that the production constraints faced by the Gambian farmers, are further compounded by poor infrastructures, inefficient marketing systems, and inadequate research and extension programmes and services.

The other area of collaboration between NARI and DAS was the establishment of the NARI Library and Documentation Centre, aimed at providing current and relevant agricultural information to the staff of DAS and NARI and their local collaborating NGOs and institutions. The collection of this centre includes materials both on extension and research, but because of the lack of an effective linkage between NARI and DAS, the extension personnel appear not to make maximum use of these resources. It is mostly the researchers from NARI itself and other departments reflected in the organogram of DOSA (see Fig.1), and agricultural students at the school of agriculture of the Gambia College who frequently use the resources of the library.

After the conclusion of the GARD project, two other projects - the Agricultural Services Project (ASP) and the LADEP aimed at strengthening the extension and research services to adequately address farmers' problems, were launched in 1994 and 1998, respectively. This study has, in the process of looking at the information needs of researchers and extension agents, also attempted to assess the nature of these projects and whether or not they have registered any significant achievements with respect to providing information and solutions to farmers since their establishment.

1.2   Statement of the problem

The lack of clear understanding of the type and extent of the information needs of agricultural researchers and extension agents in their attempt to resolve small-scale farmers' production-related problems which are often reflected as farmer information needs in The Gambia, has made it difficult for appropriate institutions to provide the necessary information. This is exacerbated by the lack of clarity on the type of structures which agricultural researchers and extension agents, and other experts like information and knowledge workers believe should be instituted in order to meet their information needs efficiently and effectively.

In addition to Torrence's findings, which clearly showed the weakness of the linkage between research and extension and consequently farmers, the vacancy of the RELO's position also attest to this problem. It is part of the organisational culture of NARI to present its research findings at an annual agricultural research review (ARREV) meetings. These meetings provide the opportunity for NARI's research results, as mentioned earlier, to be critically reviewed by both national and sub-regional peers. In other words, these research findings are presented to:

➢ fellow research scientists for critical evaluation and inclusion in the permanent store of scientific knowledge;

➢ enable the extension/NGO staff working closely with farmers to select technologies appropriate to farmers in their respective varied environments;

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> officials of the Government/DOSA on whose goodwill part of NARI's funding depend.

However, following these meetings, it is still not entirely clear as to how effectively these findings are diffused to the farmers and the expected feedback is given to the researchers. This research aims to find the additional obstacles and provide a clear picture of where the apparent cause of the weakness between NARI and the Extension Services Department lies. It also aims to identify possible information service-related solutions that can enhance this linkage.

The Gambia is divided into the following agroecological zones:

Sahelian zone: This has open dry savannah vegetation, covering parts of Upper Saloum and Sami districts. Rainfall is erratic and less than 600 mm annually with an effective cropping season less than or equal to 75 days. The zone is drought prone and water stressed. It also has low water holding capacity soils with early maturing, medium duration and drought tolerant crops such as, cassava, cowpea, sesame and millet.

Sudano-Sahelian zone: Includes parts of Central River Division (CRD) North, all CRD south, Upper River Division (URD) and North Bank Division (NBD). It lies within 600-900 mm rainfall isohyets and has Savannah woodland vegetation interspersed with a network of tributary lowland valley system. There the flood plains serve as excellent rice growing catchments under tidal swamp irrigation. Soil types include clay and sandy loam with a long growing season - 79-120 days. Types of crops grown include groundnuts, rice, maize and cotton.

Sudano-Guinean zone: All of Western Division (WD) which lies within 900-1210 mm rainfall isohyets and receives about 80% of its total rainfall between late July and early to mid-September. Maximum daily temperatures is 29-32 degrees and minimum 26-28 degrees. Vegetation is savannah woodland and becomes woodland in some places. Crops grown include rice, groundnuts, maize and cowpea. (Field Document TCP/GAM/6611:

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47, 68 & 105)
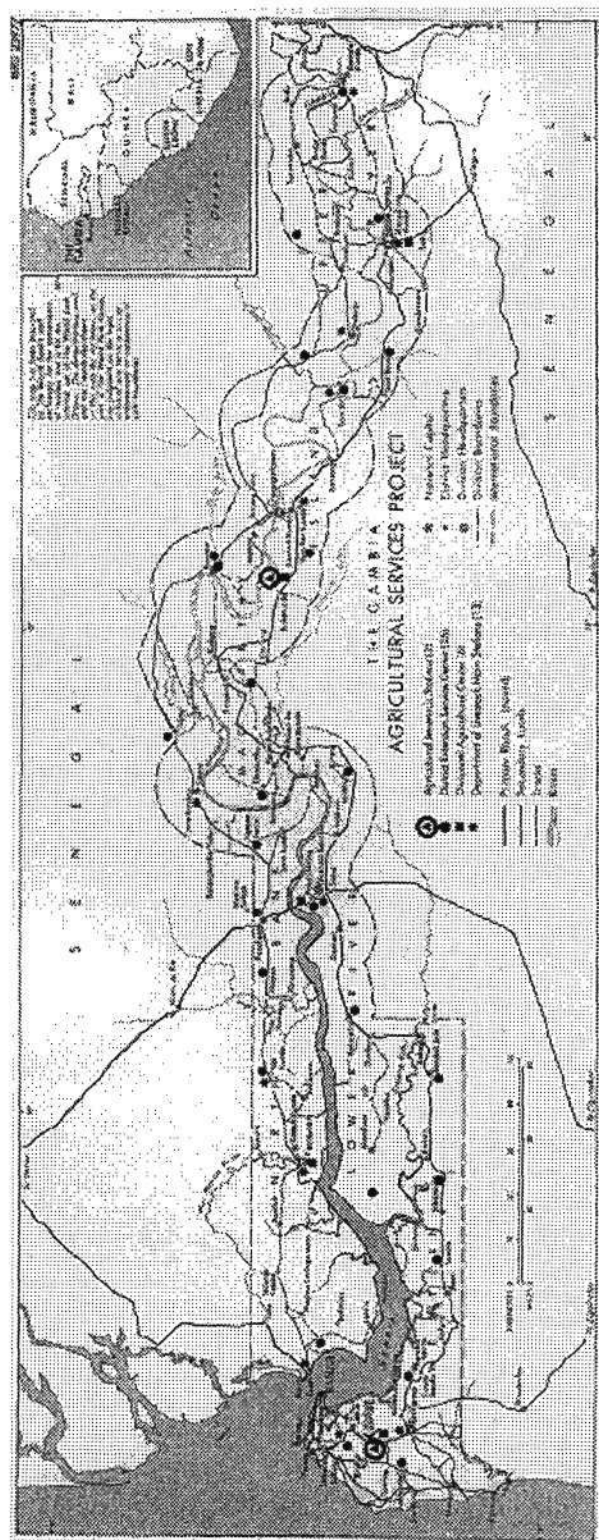
Figure 2: Map showing the Divisions.

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The implication of the above characterisation of the existing zones is that farmers' production problems in the areas of crop, livestock, fisheries and forestry, and therefore their information needs, will vary from one zone to another, depending on their varied socio-economic circumstances. This implies that the status quo is likely to influence the information needs and information seeking patterns of both researchers and extension agents serving these respective zones. This study attempts to establish whether in fact the needs of extension agents and researchers vary by zone.

1.3   Purpose of the study

The main purpose of the present study is to identify the work-related information needs of agricultural researchers and extension staff in addressing small-scale farmer production problems, which are or can be expressed in the form of information needs. The study attempts to establish the extent to which the existing agricultural information systems and services like radio programmes, agricultural libraries, agricultural shows, extension bulletins, research-extension bimonthly meetings, agricultural research review (ARREV) meetings, farmer field-days and so on, meet or do not meet these needs. It also aims to establish the problems that inhibit the operations of these information systems and services and which information sources are perceived more significant and reliable by researchers and extension staff in meeting the relevant information needs.

1.4   Objectives of the study

The objectives of the study are:

- ☐ To identify the types of farmers' production-related problems which agricultural researchers and extension agents face

- ☐ To determine the problems or constraints faced by researchers and extension agents in addressing farmers' production-related problems and information needs

- ☐ To determine the information providers that agricultural researchers and extension agents use to meet their information needs and those of farmers

- ☐ To determine the effectiveness of the information providers used
- ☐ To determine the delivery systems used by researchers and extension agents to communicate solutions and advice to the identified or expressed problems to the farmers

- ☐ To determine the effectiveness of these delivery systems.

- ☐ To determine what structures, in the opinion of agricultural researchers and extension agents, should be in place to adequately address their information needs.

1.5   Research questions

1.   What type of farmers' production-related information problems do agricultural researchers and extension agents encounter?

2.   What problems or constraints do researchers and extension agents face in addressing farmers' production-related information needs?

3. What are the existing agricultural information systems and services used by researchers and extension agents to meet their information needs?

4. How effective are these information providers?

5. What types of delivery systems are used by researchers and extension agents to communicate information or diffuse improved technologies to the farmers?

6. How effective are these delivery systems?

7. What structures should be in place to adequately address the information needs of agricultural researchers and extension agents?

1.6 Specific assumptions

This study was based on the assumption that if the information needs of researchers and extension agents related to farmers' agricultural production are met, the needs of farmers are likely to be met. This is because, as indicated earlier, the reason for establishing research and extension is to facilitate agricultural communication. Researchers' and extension agents' work is targeted at facilitating the agricultural production of farmers.

1.7 Delimitations and limitation of the study

This study only focused on agricultural researchers (in NARI, DLS, Fisheries & Forestry) and extension staff (in DAS & ActionAid, The Gambia) operating in each of the five divisions of The Gambia. It was beyond the scope of this study to determine and assess farmers on the impact of the solutions/advice provided by the above agents on their (farmers') socioeconomic status, such as production, income levels, creditworthiness, standard of living and so on. This was due to the

fact that the study was expected to be small and therefore time, human and financial resources were limited. The study specifically looked at the information needs of researchers and extension agents in addressing their work-related problems, and farmers' information needs or production problems.

1.8   Justification of the study

It was the researcher's view and based on his work experience with various projects of the Ministry of Agriculture and NARI for 11 years and 7 years, respectively, that this study would provide the Gambian Government and other public policy makers with better insight into and understanding of the various information providers employed by research and extension personnel to access relevant information, in order to address farmers' production-related problems and/or information needs. Furthermore, it would explore the difficulties which researchers and extension staff themselves encounter in fulfilling this role and examine the steps that should be taken by the authorities to help address them. Although these issues have been studied in many countries and general trends given, the philosophy of user studies also argues that specific environments present peculiarities in information needs, systems, services and users. Studies related to The Gambia in this area have been severely lacking. With the rise in the use of information technology and recent establishment of the Internet services in The Gambia, it is believed that agricultural libraries and other information systems and services will make the necessary adaptation to these technologies to enhance their services. To do this, however, needs an analysis of current systems, services and their usage.

1.9   Definition of key concepts

A number of key concepts have been used to operationalise this study. Their operational definitions are presented below.

1.9.1 Agricultural production

The process of cultivating crops, catching fish and rearing of animals and overall output for consumption or cash to improve one's well-being or living standards.

1.9.2 Agricultural researcher

A person who undertakes systematic investigation or experimentation in particular area [s] for the purpose of generating data, information and knowledge (new methods or technologies or know-how) to increase agricultural productivity or technical efficiency in order to help resolve particular problem [s] of farmers and other stakeholders.

1.9.3 Agro-ecological zone

This refers to an area with a distinct microclimate. It has a unique vegetation cover, a particular rainfall patterns with soils that support particular crop varieties.

1.9.4 Effectiveness of information system and/or provider

The extent or degree to which an information system, service or provider is able to meet the needs of the users of the service. This may be farmers, extension agents or researchers.

1.9.5 Extension agent

A person whose main task relates to conscious communication of information to help people (mainly farmers) form sound opinions and make decision on agricultural-related activities and personal improvement. He/she manages an extension-related organisation [s] at the field level (Van den Ban, & Hawkins, 1996: 278).

1.9.6 Information

The knowledge communicated by others or obtained by study and investigation. Ideas, facts, imaginative works of the mind and data of value potentially useful in decision making, problem solving, etc. (Kaniki, 1989:19).

1.9.7 Information need

The state of lack of desirable requisite(s) or commodity [ies], namely information that is necessary to deal with a situation as the individual sees fit (Kaniki, 1989:19).

1.9.8 Information provider

Communication channels and/or sources, that is, person [s], publication [s], agency [ies], organisation [s], institution [s], or group of institutions that an individual uses as a means to meeting an information need (Kaniki, 1989:20).

1.9.9 An outline summary of the major points made in the chapter

The lack of clear understanding of the type and extent of the information needs of agricultural researchers and extension agents in their attempt to resolve small-scale farmers' production-related problems which are often reflected as farmer information needs in The Gambia, has made it difficult for appropriate institutions to provide necessary information. This is exacerbated by the lack of clarity on the type of structures, which agricultural researchers and extension agents believe should be instituted in order to meet their information needs efficiently and effectively.

The aim of this research therefore is not only to bring to light the technical problems and information needs of the change agents, but also to highlight the variety of information providers used to provide solutions to such problems and to those of the farmers. It is also hoped that the

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findings, conclusions and recommendations will enable the policy makers and planners, particularly in The Gambia, to get a better insight into and understanding of the nature of these problems and find ways and means of resolving them effectively. It is, therefore, believed that the findings of this research will galvanise the Government and relevant stakeholders to take appropriate and/or corrective measures to redress the situation.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

This chapter focuses on the review of related literature with particular emphasis on the information needs of agricultural researchers, extension staff and farmers. The chapter further explores the type of problems brought to the attention of the agents of change by farmers and the various agricultural information sources used to satisfy needs. The chapter is divided into the following sections: introduction; information needs; information providers; and problems associated with information dissemination to meet the needs of agriculturists in Africa.

2.1.1 The contributions of the agricultural extension projects in The Gambia

According to CORAF (1998: 28), the Gambian extension system has since 1972 been supported by six major internationally-financed projects. These have included: the Agricultural Development Project (ADP); the Rural Development Project (RDP); the Agricultural Development Project II (ADP II); the Women in Development project (WID) which had an agricultural component; the Agricultural Services Project (ASP); and the Lowland Agricultural Development Programme (LADEP).

For the purpose of this study, as briefly mentioned in Chapter1, only the achievements and problems of the two most recent projects (ASP and LADEP) will be discussed in detail. This is because their impact is still felt by both the change agents and farmers alike.

2.1.1.1   Agricultural Services Project (ASP)

The Agricultural Services Project (ASP) was established in 1994. Its main components were to:

> ➤ strengthen natural resources and agricultural sector analysis and planning;

> ➤ consolidate, improve and strengthen agricultural extension services covering crop, livestock production and natural resources management;

> ➤ improve and strengthen the Gambian agricultural research system and modest support to the Agricultural School of The Gambia College; and

> ➤ promote self-reliance: farmer empowerment through pilot activities in Central River Division (CRD) that test new approaches to farmer participation and self-management in the areas of irrigation water management, rural savings and loans, training of rural entrepreneurs, and rural social infrastructure.

The ASP also included some capacity-building activities like functional literacy training and planning techniques and so on which contributed to farmers' ability to form effective organisations, an opportunity for them to express their interests and to work with research, extension and other actors.

The main objectives of the project were:

> ➤ to generate increased agricultural productivity and sustained growth of incomes of small farming families, through the strengthening of support services in agricultural extension, research and training; and

> ➤ to promote self-reliance and farmer empowerment.

According to the project's completion report (Agricultural Services Project, 1999: 1-2), the above objectives were consistent with the Government of The Gambia and World Bank's Country Assistance Strategy for agricultural development by encouraging increased efficiency and

diversification in the production of cash and food crops. It is also mentioned in the same report that the project's support services to DAS, DLS and NARI between1992 and 1998 were aimed at consolidating and enhancing the functional operations of these institutions, in order to better generate and disseminate improved technologies with a view to increasing the production and productivity of resource-poor farmers in ensuring increased food security. Improving food security, which according to the African Development Report (1998: 36) has been defined as the ability of people to obtain adequate food at all times, is a key objective of a policy to eradicate one of the most adverse effects of poverty.

Thus, the project's support services to these institutions substantially increased their human resource capacities as evidenced by the number of staff at various levels who received professional training through the project. Staff training which took place at local, regional and overseas institutions ranged from certificate, diploma to masters level. Initially, 23 staff members of the implementing institutions were anticipated to be trained in various disciplines of agriculture. However, at the end of the project, 115 staff had received training. These were in the following categories: 58 at certificate/diploma, 16 and 41 at BSc and MSc levels, respectively. ASP made significant contribution in that there was potential for strengthening participating institutions through human resources capacity building and improving other support services (ASP, 1999: 2-3). However, the extent to which the trained staff effectively executed their tasks is in fact what this study attempted to assess. This is because in order for researchers and extension agents to be effective they need appropriate information in addition to other resources. At the same time, in order to provide appropriate information to end users, information workers and information providers need to know what the information needs of the users are.

With regard to achieving increased production and productivity of crops and livestock to ensure increased food security level of rural households, the report pointed out that the results were mixed. The report stated that the project was unsatisfactory in the crop sub-sector and encouraging in the livestock sub-sector. However, it is indicated that a significant increase had been made in the cultivation and the production of horticultural crops. Services to farmer empowerment institutions to enhance capacity building and provide invaluable support to community-based organisations (CBOs), producer associations and various other groups had been successful. For instance, the strengthening of Village Savings and Credit Associations (VISACAs) at least in the Central River Division (CRD) had been phenomenally successful as they provided a conducive environment for farmers to mobilise local resources and manage their savings and credit to boost agricultural production in various sub-sectors like crops, livestock and entrepreneurship.

The Non-Formal Education component of the project had also registered some positive impact in providing access to basic literacy and numeracy to farmers (Agricultural Services Project, 1999: 3-4). As reported by CORAF (1998: 28), the project had a significant positive impact on building the capacities of farmers, and on linking research and extension. However, on the negative side, a medium-term evaluation of the ASP (DOSA/IFAD/World Bank, 1997) stated that ... a remaining problem was that farmers themselves were too little involved in the development and dissemination of technologies, information and skills. In addition, CORAF findings indicated that DAS had been less dynamic and slow in promoting new technologies.

Although the project had achieved most of its objectives, it is observed that its activities were not underpinned with a strong and effective information system. An information system, according to Castro Neto, M. et al (1999: 85), can be seen as a system that collects, processes and delivers information to the end user taking advantage of some information technology. This important omission in the programme planning of the above project could have a negative impact on the ability of both research and extension personnel to meet farmers' information needs effectively.

As the number of agricultural libraries in the Gambia is very minimal, it would have been advantageous to establish such a service within the project to underpin the activities of both extension and research staff. Alternatively, strengthening the capabilities of the existing libraries mentioned above would have been a better option in order to enable them to repackage and disseminate quality information in a simplified manner understandable to both extension agents and farmers. It is further envisaged that such a development could have made a significant difference in terms of timely access to and provision of agricultural information in the country. Nwali (1992: 147) has argued that significant agricultural development cannot be achieved without adequate agricultural information and dissemination. Similarly, Aina (1989: 25) stated "that ...the non-provision of adequate agricultural information is a key aspect that has greatly limited agricultural development in developing countries". Hence the need for agricultural libraries and extension workers for the benefit of the end user. An effective agricultural information service is an essential element of the agricultural development infrastructure.

In support of the above viewpoints, the researcher observed from his long experience of working in the agricultural sector that some of the features responsible for low food production in the Gambia include: inadequate appropriate technology for farmers, low investment, low income, inadequate infrastructure such as good roads, water, electricity, low literacy rates of farmers, scarcity of agricultural inputs and an inadequate supply of agricultural information in an appropriate format and which is responsive to farmers' needs..

2.1.1.2   Lowlands Agricultural Development Programme (LADEP)

The LADEP project was approved in 1996. It had been jointly financed by the Agricultural Development Bank (ADB), International Fund for Agricultural Development (IFAD) and the Government of The Gambia (GOTG). It commenced its operation in April 1997. The Project is a 20 year programme projected in the following three phases:

❖ Phase 1 which is expected to take eight years is expected to :

increase total rice harvest in the traditional rice production systems of the lowlands by about 12,500 tonnes per annum in the first eight years on a sustainable basis using community based and demand driven approach. This implies that LADEP would put in place, a nation-wide sustainable rice development project based on low cost but proven technology in the field, and on a response to beneficiary demand where the beneficiaries would contribute their labour. About 3,735 hectares (ha) would be developed and 1,640 ha of existing swamps would be upgraded benefiting 14,000 farmers. The programme is also expected to develop 2,700 ha of tidal swamp schemes benefiting an additional 7,560 farmers. In addition, training workshops at the community level and within the context of participatory rural appraisal (PRA) would be carried out (Lowland Agricultural Development Programme, 2000:1).

❖ Phase 2 which will be the second eight-year period of the project is expected to cover:

➢ Soil and water management schemes

➢ Agronomic follow-up based on low-input and low-cost improvements to crop husbandry (including training) as well as first year deep ploughing on part of the schemes

➢ Tidal swamp access schemes

➢ Support services

➢ Adaptive research (NARI) focusing on animal traction, natural fertility maintenance, trials on improved varieties under low and no fertiliser conditions

➢ Agricultural extension (DAS) involving mainly farmer-to-farmer visits or tours, 3-day courses for farmers in new intervention sites, training of non agricultural extension workers, trainee supervision of farmers and training of new extension workers

➢ Lowland development strategy (DOP & NEA) which will include surveys and special studies to define the physical features of the lowlands as well as their

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potential, and appropriate technologies for exploiting that potential; formulation of a rolling strategy for lowlands development that defines the roles of different players; cost-benefit analysis and socio-economic evaluations of viable development options and

➤ Programme management which will include the co-ordination of inputs of all the actors involved in LADEP and assure overall management (including farmer evaluation) of the programme as well as internal monitoring.

❖ Phase 3: 4 years will be the consolidation and institutionalisation phase

The objectives of the LADEP programme are: to establish a national policy and institutional framework for lowland agricultural development; develop approximately 5 600 ha of lowland rice areas through application of appropriate soil and water management techniques and agronomic practices; improve access to approximately 2 375 ha of tidal swamp; and strengthen community based organisations concerned land and water management in the project sites (CORAF, 1998: 29). Presented below are some of the achievements registered by the project:

2.1.1.2.1 Soil and Water Management Schemes

This component which includes Soil and Water Management Engineering, Agronomic Follow up and Tidal Swamp Access sub-components have so far achieved the following:

2.1.1.2.1.1 Soil and Water Management Unit (SWMU) Engineering

From 1997 to mid-September 2000, steady progress in the implementation of the above sub-component's work planned for LADEP intervention has been registered. A total of 1784 ha was developed against a target of 1735 ha and 903 ha upgraded against the objective of 800 ha during the period. Specifically the SWMU:

> constructed 3 225 m of spillways out of the four year target of 4380 m which correspond to 73.6% of the four-year target;

> rehabilitated 1784 ha, representing 103% of the set target of 1735 ha;

> covered 122 rice sites or 111% of the four-year target of 110 sites; and

> maintained 903 ha, representing 112.8% of the target of 800 ha (LADEP, 2000:2).

2.1.1.2.1.2 Agronomic Follow-up

In 1997 and 1998, 48 936 kg of rice seeds were made available for distribution to farmers and for demonstration purposes. Out of this a total of 43 215 kg were distributed to farmers and 4 720 kg utilised in demonstration plots. The quantity recovered was 32 384 kg, representing 74% of the total distributed. In 1999, 58 384 kg of rice seeds were distributed and 15 001 kg were recovered, representing 25.7%. For the year 2000, 20 000 kg of rice seeds had been purchased and 6100 kg distributed. Fertiliser distribution to farmers on a credit basis has been stopped on the recommendation of the supervision mission, and this responsibility has been shifted to the Rural Finance Project (funded by the IFAD and GOTG) which is doing its best to meet farmers' needs in this area. As a result, LADEP is undertaking fertiliser distribution only for demonstration purposes (LADEP, 2000: 2-3).

2.1.1.2.1.3   Tidal Swamp Access

This sub-component is concerned with the construction of foot bridges and causeways for easy access to the rice fields by farmers. From 1997 to 2000, a total of 972.4 m of bridges had been constructed against the target of 912 m, representing 106.6%. An additional 260 m of bridges are reported to be at various stages of completion out of which 200 m or 77% was completed by the end of the year 2000. The construction of causeways (defined as raised roads/paths, usually built across wet ground or shallow water) was planned at 59 000 m for the 1997 to 2000. But the actual achievement during this period was 30920 m, representing 52% of target (LADEP, 2000: 3).

2.1.1.2.2   Support Services

The other major aspect of the LADEP is the support services. This sub-section presents a discussion and commentary of the support services established under the project.

2.1.1.2.2.1   Community Mobilisation

In 1999, seven participatory research appraisal (PRA) training sessions for 126 village extension workers (VEWs) were conducted. From these training sessions 74 000 PRA volunteer farmers benefited and participated in identifying production-related problems and proposing their solutions. In addition, 47 village Site Management Committees (SMCs) were formed and trained. The report indicates that in the wake of the PRA training sessions, the component started on the transformation of SMCs into District Level Farmer Associations (DLFAs). From January 2000, seven cluster and district sensitisation workshops were organised in 5 districts with each session attended by 35 farmers (Lowland Agricultural Development Project, 2000: 3).

2.1.1.2.2.2   Extension Services

From 1997 to year 2000 the following activities were conducted:

- ➤ training of 99 trainers (50 in 1999 and 49 in 2000);
- ➤ training of 184 extension workers (64 in 1999 and 120 in 2000);
- ➤ training of 455 farmers (227 in 1999 and 228 in 2000); and
- ➤ study tours for farmers (figures not given).

As was the case with ASP, LADEP does not have an information services component *per se* to cater for the information needs of researchers, extension agents and farmers. However, the project has established a Management Information System (MIS) which was tailored to the management requirements of the main implementing agencies (NARI, SWMU, DAS, DOP, NEA and so on) mentioned under the first phase of the project above. According to the LADEP report

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(2000: 4), this system would enable the participating agencies to plan effectively and react quickly to unforeseen management problems.

2.2   Information needs of extension agents and researchers

According to Dervin (1976) as cited by Aina (1985: 36), an individual, whether literate or non-literate, needs information in order to increase his/her productivity. Thus a study of the information needs of the agents of change should enable agricultural information managers to determine what factors affect their effort in accessing quality information to resolve their work-related problems as well as meeting farmers' needs. This is critical, as Lawani (1981: 13-21) rightly observed that information to be disseminated to farmers must match their needs or else it would amount to information wastage. This is an undisputable fact, as Coover (1969: 446-456) also opined that information becomes useful only when it is packaged in the right format and delivered to the right user at the right time. Dulle (1998: 19) shared the same view, when he pointed out that the information needs expressed by different categories of users, as revealed in similar studies in both developed and developing countries, are not same because needs in one geographic location do not necessarily represent the needs of similar users in different locations. For that reason, he argued that there is a need to conduct a needs assessment of this nature in order to deliver the right information to the right group of users at the right time.

However, it is evident from the literature over the years, as argued by Kaniki (2001: 190-191), that there is still continuing debate on the understanding of the concept of information need(s), assessment and identification of information need(s), and satisfaction of information need(s). In information terms, according to Kaniki (2001: 190-191), the difficulty in defining [information] need is further compounded by the fact that information itself is an abstract concept. A need can be defined as that which a human should have in order to function effectively. In other words, Dervin and Nilan (1986: 3-33) describe need as a ... state that arises within a person, suggesting some kind of a gap that requires filling. However, a clear understanding of the concept of information and information need is critical in further understanding, developing and/or applying

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the various techniques of information needs assessment. Although sometimes, and mainly in an ordinary usage, information is often interchangeably used with data and knowledge, they are not necessarily the same.

Information is defined as a data set which, when supplied at the right time and form, increases the knowledge of the person who receives it making him/her more skilled to develop some activity or make some decision (Castro Neto, M. et al, 1999: 86). As indicated by Kaniki (2001: 191), information is simply an awareness of facts or organised data, which can lead a person to a state of knowing, whereas knowledge is transformed (applied or applicable) information assimilated by a person and used in appropriate situations. Thus, information need can be defined as the state of lack of desirable requisite [s] or commodity [ties], that is to say, information necessary to deal with a situation as the individual sees fit (Kaniki, 1989: 19).

In an attempt to diagnose the information needs or critical tasks of agriculturists in Africa, Kaniki (1995: 18) first attempted to define the concept of agricultural information user population. This he reported, simply consists of persons whose nature of work involves some part or the whole of the field of agriculture or its products, and therefore requires agricultural information to accomplish their work. Thus, in a survey conducted to establish the information needs of agriculturists in Zambia, Kaniki (1989: 117-120), has exclusively summarised the information needs of agricultural researchers and extension agents as follows:

> new technologies
> personnel problems
> planning and/or designing research
> planning demonstration programmes
> field-days and
> applying research results.

The results of this survey highlighted that a large number of agricultural researchers (79%) used a library to meet their information needs. Also, a relatively high number of extension agents had used a library too for the same purpose. In a nutshell, researchers and extension agents need information, according to Kaniki (1995: 25-26), about "who", "what", "where", "when", "why" and "how" of different aspects of their work. Most of these needs, he added, refer to research (past, present and future) of a particular aspect of agriculture and other information needs that relate to their advisory work and forecasting aspects of agricultural work. The methods used in the data collection process of this survey included: a self-administered questionnaire distributed to agricultural researchers and extension agents; a structured interview protocol administered to farmers; and personal, unstructured interviews/discussions with key persons at the Ministry of Agriculture and Water Development, research stations and agricultural offices (Kaniki, 1989: 99). The methodology worked relatively well in collecting use data. However, it did not avoid the problem associated with the ASK technique. The ASK approach simply refers to...the anomalous state-of-knowledge...which examines how people seek information concerning situations about which their knowledge is incomplete (Kaniki, 1995: 25). The difficulty, however, is that the Ask approach is cognitive and many people are unable to accurately articulate their anomalous state of knowledge. The reliability and validity of the methodology for identifying information needs assumes that the person experiencing the need is able to express his/her need. It also assumes that the person is highly information literate.

In a similar study, Aina (1991: 22) also identified the information needs of extension officers as:

> - control of major pests
> - credits and co-operatives
> - proper handling of insecticides
> - marketing system of agricultural products
> - field supervision of programme
> - organising farmers' associations
> - principles of crop production

- conduct of field trials
- national prices of commodities
- legislation on agricultural products
- innovation approaches in extension
- socio-economic characteristics of farmers
- production skills and propagation techniques
- community development
- animal production and management
- programme planning
- administration and supervision
- import duties on farm machinery
- data analysis and research writing

In his paper titled "The changing needs of the information professionals and the adaptation of the training curriculum" presented at IAALD's 10th World Congress in Dakar from 24-28 January 2000, Aina (2000: 2) enumerated some of the information needs of agricultural researchers. These needs, he reported, ranged from the awareness of new information that would increase yields and produce resistant seedlings to the latest information on the new frontiers of knowledge. However, he reiterated that the extension workers need advisory information on how to improve the farmers' productivity - information such as the provision of resistant varieties, control of major pests, credit sources as well as providing information on farmers' problems to the agricultural researchers. Similarly, a study conducted by Ogunrombi and Marama (1998: 42-43) reported that farm managers have a variety of information needs. However their most important needs were new farming techniques (75.7%) and research activities/data analysis (53.75%).

Ojiambo (1995: 119) also intimates that as the major link between researchers and farmers, extension personnel need up-to-date information to enable them help farmers improve their farming practices and production. These needs, according to the author, encompass the following: insecticides, crop production management, animal production management, agricultural research

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results, marketing, credit and cooperative systems in the country, legislation on agricultural products, government policies on food and other agricultural products, community development farmers, duties on agricultural machinery and better methods of communicative agricultural information.

2.3 Farmers' constraints and information needs

This section reflects the major problems or constraints and information needs experienced by Gambian farmers. Similar farmer problems identified by other scholars or researchers in Africa are also discussed in this section.

The main constraints of farmers in The Gambia have been highlighted by Torrence (1991: 6). These include:

- ➢ labour shortages
- ➢ land scarcity
- ➢ pests/diseases
- ➢ financial credit
- ➢ input availability (e.g. seed, fertiliser, pesticide, herbicide, etc)
- ➢ soil fertility/soil acidity

According to Torrence (1991: 7) pests and diseases and input availability were the two major constraints with the highest percentages in all the agroecological zones (Divisions). This is indicative of the environmental and infrastructural problems that pervade the country. As soil fertility and pests/diseases have direct biological and agronomic consequences for crops, Torrence (1991: iii) opines that it is in these two areas that research and extension should make their greatest impact in terms of alleviating the situation of the farmers. The results of Torrence's survey also indicate that extension is the primary source of information about new and improved technologies for farmers in the country, as given below:

- Extension services (38%)
- Radio programmes (32%)
- Other farmers (28%) (Torrence, 1991: 7)

This report was widely distributed among all the stakeholders, including agricultural researchers, policy makers, extension, and other collaborators in the country and abroad with the exception of the farmers. This indicates that, farmers' production-related problems and constraints have been taken very seriously both by the Government and donors. Torrence's survey was in fact sponsored by the GARD project. In this respect, it is strongly believed that given their wealth of experience in addition to the information provided in Torrence's report, researchers and extension agents have a better understanding of the nature and extent of the problems facing Gambian farmers. This contention is in line with Kaniki's (1989: 2) argument that in order to conduct end-user oriented research and generate user-oriented information, it is necessary for agricultural researchers and or extension agents to be aware of the farmers' problems and or needs. However, this wealth of experience and understanding alone cannot readily solve all the problems of the farmers, but needs to be backed by a comprehensive and strong information base as well as strong financial commitment. The researcher, therefore opines that some of the major obstacles or constraints that seem to be facing the Gambian agricultural researchers and extension staff in tackling farmers' production-related problems at this stage are those related to access of timely and relevant information, and the availability of adequate work-related facilities to carry out their work and meet farmers' needs effectively. Furthermore, because of the weak linkage between research and extension, and the fact that very few agricultural libraries exist in The Gambia, researchers and extension agents have no choice but to exploit all potential avenues including the Internet and the findings of their peers outside for current and relevant agricultural information in order to make more rational decisions and provide better advice or service to farmers. To achieve this requires a coordination of information systems. It is generally known that the provision of timely, relevant and appropriate information will enhance the decision making process. Given their common purpose of fighting to alleviate and/or reduce farmers' problems, Aina (1991:21) argued that providing information only to the research scientists without

providing the same to agricultural extension officers will negate the desirability of integration. On that note, it is equally imperative that research and extension workers have assistance in being informed of the current state of scientific investigations all over the world in order to benefit from the incentives which can be obtained from the knowledge of the results of other research investigations. To this effect, Russell (1997: 219) states that information is essential in agricultural research and extension for developing ideas, conducting research, planning extension programmes, communicating results, and making those results useful in the future. He further reports evidence for the value of information, inter alia, in the following areas:

> Creativity is essential in agricultural research, and information is important to creativity, because useful scientific breakthroughs can happen earlier than expected if the right information is available and used at the right time.

> Researchers working in an information-rich environment or who use more information than their colleagues are more productive.

> Information is essential in technology transfer and diffusion of innovation.

> Information has an important role to play in changing paradigms. Paradigms are the mental models that influence the thinking and actions of scientists, and affect how new information is received.

> Information is particularly valuable as scientists begin to work in unfamiliar subject areas.

> Information is critical in solving national and regional crises relating to food production, food safety, and agricultural aspects of the national economy, and

> Information can prevent duplication of effort in agricultural research (Russell, 1997:219-220).

This is where the pivotal role of agricultural libraries and similar information systems and services will come into play. To improve the effectiveness and efficiency of this role, research of this nature is essential in The Gambia. It will give agricultural libraries and information services a better perspective of the range of information needs experienced by researchers and extension staff, as "it is almost impossible to deliver a service to a client community if the characteristics, needs and aspirations of that community are not fully understood" (*Farmer's Weekly*, 1994: 46). Entsua-Mensah (1995: 122-123) argues that it is one problem to be able to identify correctly the information needs of the peasant farmers and quite another to develop the relevant services and products to meet them. He therefore postulates that location-specific and impact-bearing services with feedback mechanisms, which reflect local conditions, should be instituted to adequately meet the information needs of rural communities. He further states that such an approach should not only aim at providing the information needed to solve farmers' problems, but also, it should motivate them to accept changes so that they can use the improved agricultural practices.

Ozowa (1997: 1) has also reported that, given the complexity of the problems facing farmers, which in turn influence the information needs of extension agents and researchers, and agriculture being an information dependent sector, no one can claim to know all the information needs of the stakeholders, including extension agents and researchers. This, he argued, is attributed to the fact that there are as many differences in agricultural information needs within a country as between countries. The fact that this kind of survey (i.e. information needs assessment) which had never been conducted in The Gambia before, it would be very interesting to know the "critical tasks" which the agricultural researchers and extension staff employ to mitigate farmer constraints in the country. "Critical task" can be defined as a "mental or physical step which is essential or required in order to change the mental or physical state, condition or property" (Kaniki, 1989: 20).

In a study by Aina (1985: 38-39) on farmers' information needs, it showed that farmers need information on fertilisers, pest and disease control, planning materials, and credit and loans. In this study self-administered questionnaires were distributed among the respondents and those who were unable to complete their questionnaires, were assisted by the researcher. Also, in a recent survey in which the objective was to determine the information needs of both the extension staff and dairy farmers in the Southern Highlands of Tanzania, Dulle (1998: 63) identified the information needs of extension workers as follows:

> ➤ diagnosis and treatment of diseases
> ➤ animal husbandry
> ➤ parasite disease control
> ➤ dairy technology or milk processing
> ➤ extension methodology and
> ➤ animal nutrition.

Following a critical analysis of the views expressed by farmers at some open forums in Ghana, Entsua-Mensah (1995: 121) has classified farmers' information needs into three broad categories:

> ➤ information on resource management which covers aspects like land preparation and management, the use and maintenance of simple farm machinery;
> ➤ information on available support systems which cover techniques for the application of inputs like fertiliser, pesticides, and herbicides as well as information on the conditions under which new varieties of seeds are introduced; and
> ➤ information on economic factors of production covering areas like available credit guarantee schemes operated by the banks, modern techniques of preparing the farm produce for the market (such as processing, packaging and storage), post-harvest losses and information on guaranteed prices.

The above mentioned open forums were organised by agricultural research stations where farmers were invited and shown new developments and new findings. These activities were usually followed by question-and-answer sessions, which helped provide farmers with information. Because of the difficulty associated with getting such large numbers of farmers from different backgrounds to one particular location, the author perceived such forums as ideal for the conduct of a research of this nature (Entsua-Mensah, 1995: 122).

In a recent case study of North-Central Nigeria conducted by Olowu and Yahaya (1998: 4) to determine the information needs of women farmers, the findings revealed that the specific information most critically needed by women farmers were: disease/pest control (65.1%), cropping systems (59.6%), crop production (59.3%). The results further indicated that these needs of the women were positively and significantly related to tasks performed by them. The findings also showed that there was no significant difference in the information needs of rural and urban women farmers. These women (376), according to the authors, were randomly selected and a semi-structured interview method was used to collect the data.

Similarly, in a paper presented at an international conference on "African Women and Economic Development: Investing in our future" in Addis Ababa from 28 April to 1 May 1998, Munyua (2000: 3) also highlighted some of the key problems facing women in the agricultural sector in Africa. These included cultural, social, economical, legal, and educational handicaps and a lack of appropriate and usable information that could help them improve their farming activities. She noted that a lack of reliable and comprehensive information is a major hindrance to agricultural development. Unfortunately, she argued, this has received inadequate attention in most African countries, especially in rural areas, where 70-80% of the African population still resides. Munyua further indicates that women's information needs include further knowledge of agricultural production, processing, marketing, decision-making, trade laws, and the natural-resource base. She further intimated that women also need to exchange information on indigenous knowledge, and they require appropriate information and communication technologies (ICTs) to access vital information efficiently and cost-effectively. She therefore emphasised that the content of the

information must be relevant to the requirements of rural women and that existing information should be repackaged in an appropriate format, size, and language and must be affordable.

A similar research study on small scale farmers' information needs was conducted in Nigeria by Ozowa (1997: 1) and the findings identified that farmers' needs revolved around the resolution of problems such as pest hazards, weed control, moisture insufficiency, soil fertility, farm credit, labour shortage and soil erosion. These needs were further grouped into five main headings: agricultural inputs; extension education; agricultural technology; agricultural credit; and marketing. The findings of a study on the information needs of herdsmen in Senegal (Ndiaye, 1995: 119) were similar to Dulle's. In Dulle's study the information needs of small scale dairy farmers included availability of animal feeds and feeding techniques, parasite and disease control, general animal husbandry, heat detection and breeding techniques, marketing of milk, milking practices, input credits and financial loans, and vaccination and disease control. In a similar vein, Ojiambo (1995: 119) indicated that the most frequently cited information needs by farmers were on farming methods (99.8%), appropriate fertiliser (98.8%), crop husbandry (72%), credit and marketing (39.8% and animal husbandry (28.2%).

Underpinning Dulle's viewpoint on the importance of education to farmers, Farland and Parkinson (1991: 264) succintly described the benefits of education to small-scale farmers in the following 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 an equal footing... and ability to participate in institutions conducive to improved farming practices (such as cooperatives) and use of extension services...

The authors further revealed that this type of education is better described as functional rather than formal, and is better provided by extension agents whose main task is to convey information in a meaningful form to farmers. One of the ways the extension agents do this, according to the authors, is by training a group of model farmers with the hope that such farmers come into

contact with other farmers (Farland & Parkinson, 1991: 264). This trickle down effect is particularly necessary because farmers outnumber available extension agents in The Gambia with the present ratio of 1: 6296 (Central Statistic Department: 2000). It should be noted that extension agent to farmer ratio, as reported by Dutta (1995: 4), is one of the primary indicators of used to measure the intensity of extension coverage in a country.

2.4 Information providers used by extension agents, researchers and farmers

This section reviews usage of a range of information providers highlighted by similar studies.

An information source, according to Cook (1999: 13), is generally used to refer to information, which has been written down or recorded in some form for future use. This includes: books, newspaper articles, and videocassettes. However, she argued that different users would define different things as an information source, hence the variety of sources in different contexts. Similarly, Kaniki (1989: 129) identified the following information providers in Zambia, which were used by the respondents to meet their information needs. These information providers included: personal experience, agricultural-related radio programmes, co-workers/workmates, agricultural libraries, newspapers, and agricultural - related T.V. programmes. Other providers are magazines/journals, friends/relatives/neighbours, books, meetings/conferences, parastatal organisations' personnel, government officers, university and college staff, agricultural cooperatives, farmers, clubs, field days and agricultural shows, international organisations, local leaders, personal notes, primary data collection, private consultants, trial and error, workshops and short courses. Ogunrombi and Marama (1998: 44) also revealed that the main information sources used by farm managers in Nigeria included seminars, conferences, symposia, workshops and visits to other agricultural institutes. From the researcher's perspective, the difference between information sources and information providers is that the former is used in a narrow sense by referring to only impersonal sources while the latter is used in a broad sense, which is encompassing both personal and impersonal sources. For instance, according to Prytherch (2000: 373 & 684), an information provider refers to the individual or organisation responsible for

preparing the information content of a database, directory, or source item. But he defines an information source as any document or record (manual or electronic) which provides the users of libraries or information services with the information sought.

In view of the above, and based on personal experience, it is observed that the various local information providers which are used in the dissemination of agricultural information in The Gambia correlate with those identified in similar studies. These include: agricultural related radio and T.V. programmes, agricultural bulletins (like Senela), agricultural libraries, posters, folk songs, video shows, field days, agricultural shows, extension agents, policy makers and NGOs' staff. This is similar to the findings of the study by Leach (1999: 78-79) in which posters, photos or slides, radio, video and theatre were used by non-governmental organisations (NGOs) to disseminate information to adults. In a case study of the information needs of women farmers in North-Central Nigeria, Olowu and Yahya (1998: 4) also identified some major sources of agricultural information used by women to meet their needs. These were: extension agents (92.6%), radio (72.1%), (58.8%) and women groups (51.1%). The studies like Kaniki's (1989), Ojiambo's (1995) and others have also addressed the levels of satisfaction in the use of information providers by different groups of the agricultural population.

From the foregoing, it has become clear that both impersonal and personal information sources are quite significant as "the former is most important at the awareness stage and the latter at the evaluation stage in the adoption process" (Roger and Shoemaker, 1971). This is because impersonal sources like magazines and newspapers are generally intended to provide awareness.

The results of Dulle's study (1998: 54) have shown that the majority of extension agents (85.7%) depended on their personal sources (i.e. college notes, books, leaflets etc.) most of the time. A high percentage of dairy farmers (88.7%) also claimed to have attended extension meetings, whilst 83.1% depended on the visit of extension agents, 74.6% on their fellow farmers, 53.5% read extension bulletins and 40.8% listened to agricultural-related radio programmes to resolve their information needs. Thus, the findings do not only indicate the variety of information

providers used by both farmers and extension personnel, but also highlight the importance of basic education to farmers, which can and does create awareness and need for seeking more useful sources of information. The survey used a combination of questionnaires and semi-structured interviews as data collection instruments.

2.5 Problems of agricultural information dissemination to researchers, extension workers and farmers

As rightly indicated by Ozowa (1997: 18), there are some limiting factors and apparent constraints in agricultural information dissemination in Africa in general and in Nigeria in particular. These limiting factors are discussed by Awa (1990: 158-169) in his study and they include: status differences between extension agents and their clients, agents' inadequate knowledge of the communication process namely, how communication works; lack of inter-agency cooperation both in programme planning and in implementation; and extension's general lack of interest in traditional media. This is true as some of them still occur in The Gambia. For instance, in The Gambia there is lack of effective cooperation between libraries to establish interlibrary loan services in order to adequately cater for the variety of needs of their clients, particularly those in the agricultural sector. Also, the linkage between research and extension services is still weak due to various limiting factors. These include the lack of effective interactive communication and government and donor support. For instance, lack of reliable transport for the change agents to meet farmers in the villages frequently in order to furnish them with advisory information, and their lack of formal training in information repackaging in appropriate formats understandable to farmers.

According to Richardson (1996: 4), communication is the key component of human resource development for sustainable agricultural production and improved food security in Africa. The author opined that the full potential of agricultural development and ensuring food security can only be realised if improved farming knowledge and technology are communicated effectively, and if rural people are involved in the process and motivated to achieve success. He further

argued that effectively using communication to improve food security in Africa first requires an understanding of the knowledge and information needs of farmers and rural people and then the application of appropriate communication strategies. Munyua (2000: 3) also pointed out that the media play a major role in delivering agricultural messages, with radio being the main source of information for many people in rural areas. This means that extension agents and other development workers need training in communication skills, methodologies and media uses.

Ozowa (1997: 19) intimated that one of the major constraints to agricultural information dissemination is the inadequacy of the existing extension programmes. Some of these programmes, he indicated, were conceived without well thought-out plans and were prepared in a hurry without the farmers whose attitude are to be changed making any input. He further argues that agricultural information packages prepared under this condition can neither sustain farmers' interest nor effect the desired attitudinal change. In the same vein, he lamented that the failure could also be attributed to the treatment of information delivery as a matter of course by most African governments. He argued that, as often happens, agricultural information is not integrated with other development programmes to address the numerous production related problems that face farmers. Thus he concluded that if the approaches to agricultural development programmes are to work, African governments need to take new approaches to information dissemination and management that grow out from a clear understanding of what farmers' information needs are.

However, Aina (1991) as cited by Ogunrombi and Marama (1998: 42), reported that the prominent factor underlying the acute food crises in African countries is the unavailability of timely and appropriate information to users of agricultural information: researchers, policy makers, planners, farm managers, extension workers and farmers. This predicament, according to the author, is not peculiar to Africa and according to Gregorio and Sison (1989: 7-12) this problem also exists in South East Asia. (Ozowa, 1997: 16). Aboyade (1987: xiv) also pointed out that the information provided was exclusively focused on policy makers, researchers, and those who manage policy decisions with scant attention paid to the information needs of the targeted beneficiaries of the policy decisions. In a related development, Youdeowei, Diallo and Spiff

(1995: 113-138) observed that one of the most serious constraints to agricultural development in West Africa is limited access to agricultural information. In a related development, Youdeowei, Diallo and Spiff's (1995: 113-138) observed that one of the most serious constraints to agricultural development in West Africa is limited access to agricultural information. In line with the opinion of Youdeowei, Diallo and Spiff's, Kaniki (1988: 321-324) pointed out that a low priority given to information services by policy makers; lack of trained personnel in agricultural information; poor communication; illiteracy; and complexity of the discipline of agriculture as some of the problems hindering dissemination of agricultural information to users in developing countries. Similarly, in The Gambia, one of the major constraints in agricultural information dissemination is a shortage of staff with skills in such areas like editing, publication design, desktop publishing, publication management, repackaging and graphics.

The findings of this study are therefore expected to provide the Government of the Gambia with a better insight into and understanding of, not only the various mechanisms/sources employed to access information by extension and research workers to address farmers' production-related problems and/or information needs, but also the difficulties they themselves encounter in fulfilling this role, and what steps should be taken by the authorities to help address them. Furthermore, with the recent establishment of Internet services in The Gambia, it is believed that agricultural libraries and other information systems established for this purpose, would make the necessary adjustments to their programmes, in order to address these needs more effectively and efficiently.

2.6   Conclusion

In view of the above, it is discernible that both the farmers and the change agents namely, extension agents and researchers are faced with a variety of problems in their varied information seeking situations. This lends support to Ozowa's (1997: 1) argument that no one can categorically claim to know the information needs of all the agriculturists including extension agents and researchers especially in an information dependent sector like agriculture where there are new and complex problems facing the stakeholders every day. Thus Gregorio and Sison

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(1989: 7-12) rightly cautioned that it is dangerous to make such a claim especially as there are as many differences in agricultural information needs within a country as between countries.

The above literature review highlights the information needs of agriculturists - researchers, extension agents and farmers as well as the various information providers used to resolve their information needs. Also, various research methodologies employed by some of the previous researchers to collect data on agricultural information needs of the target population of this research have also been provided. For instance, the review has shown the importance of using both self-administered questionnaire and semi-structured interviews as significant instruments for collecting data in survey research, depending on the appropriateness of the circumstances in which they are used. Also, some of the major factors hindering the dissemination of agricultural information to the various categories of users have been clearly articulated. Finally, the chapter also briefly highlights some of the achievements and problems registered by the two recent internationally-financed projects in meeting the needs of researchers, extension agents and farmers in the Gambia.

CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

3.1   INTRODUCTION

The study is designed to investigate the information needs of agricultural researchers and extension agents in addressing Gambian farmers' production-related problems and information needs. The assumption of the study was that by meeting the information needs of agricultural researchers and extension agents most of farmers' problems will be attended to. This is because some of the information needs of extension agents and researchers are related to farmers' problems. The study also aims to identify and establish the use and effectiveness of the agricultural information systems and services and/ or information providers. The research design and methodology reflected the nature of the problem and was based on previous similar studies.

3.2   Restatement of the problem and purpose

The lack of clear understanding of the type and extent of the information needs of agricultural researchers and extension agents in their attempt to resolve small-scale farmers' production-related problems, which are often reflected as farmer information needs in The Gambia, has made it difficult for appropriate institution to provide necessary information. This is exacerbated by the lack of clarity on the type of structures, which agricultural researchers and extension agents believe should be instituted in order to meet their information needs efficiently and effectively.

The purpose of the study is to investigate the information needs of agricultural researchers and extension staff in addressing small-scale farmers' production-related problems, which are or can be expressed or translated into information needs. In the process of establishing these needs, the study further seeks to identify the various information providers used by the agricultural researchers and extension agents to meet their information needs and also the information dissemination channels employed to resolve farmers' problems or information needs.

3.3   Target population

At the time of conducting this study in 2000/2001, there were over 30 agricultural researchers with NARI and 500 extension staff in the Gambia in the DAS, DLS, Fisheries, Forestry and ActionAid combined. This did not include the National Women Farmers Association (NAWFA) and other agricultural-related non-governmental organisations (NGOs). In spite of the time constraint, which the researcher had to face in conducting the study, the target population covered the entire country - i.e. the five divisions (Western, Lower River, North Bank, Central River and Upper River). The selection was based on the formal staff list, specifically prepared for this purpose by the participating institutions and presented to the researcher as a sampling frame. A sampling frame, as defined by Nachmias and Nachmias (1982: 296), is a list of the sampling units that is used in the selection of the sample was employed. The Catholic Relief Services (CRS) was excluded from the study due to the transfer of its extension component to NAWFA. Several attempts were also made to get NAWFA involved in the survey by the researcher but to no avail. This was because the authorities of the Association were preoccupied with a series of meetings with women farmers, the beneficiaries of the Association. Given the shortage of time available for the survey, there was little room for the researcher to make any further consultation or negotiation with the authorities of the Association for its possible inclusion in the study, hence its exclusion. Thus, this survey was conducted with respondents from various institutions who were dispersed across the entire country.

Burton (2000: 308) argues that researchers need to carefully consider the population to be studied and ensure that the sampling strategy is consistent enough to produce accurate results. In this study, the target population included agricultural researchers at NARI and extension staff at DAS, DLS, Fisheries, Forestry & ActionAid operating in each of the five divisions mentioned above in the Gambia. As said earlier on, CRS and NAWFA extension staff were not included in the study due to the reasons given above.

Farmers were excluded in this study because the researcher did not have the capacity in terms of adequate time, financial and human resources to investigate them. An extension of the study to determine or assess the impact of the information, solutions or advice given by the agricultural researchers and extension agents on farmers' socioeconomic status would have provided a more complete picture. It is an area, which will require in-depth study in the future in order to establish the changes that might have occurred as a result of these interventions. In spite of this however, the researcher was of the view that the assessment of agricultural researchers' and extension agents' information needs is the beginning of this process.

3.4 Sampling Method

A proportional stratified random sample was used with the extension agents. It is an appropriate and widely used sampling method in social science research where the units of analysis are heterogeneous. In this study, the respondents were researchers and extension agents representing the above-mentioned institutions. In the process of selecting the sample, the sampling frame of each institution based on the workstations of the respondents, was divided into the existing five divisions of the country. The instrument used in the selection process was a statistical random table. Following the sample selection from each institution, except NARI, the figures were put together to make up the total sample size of 100 potential respondents for the survey. In line with this view, Burton (2000: 310) points out that, this strategy is useful if the aim is to compare groups, as the sampling technique requires that subjects in the sample are reflected in the same proportions as those in the population. Powell (1985: 62) also emphasised the importance of the sampling technique used, as a description of the characteristics of the population is often based on a description of the characteristics of a representative sample. This knowledge, according to Busha and Harter (1980: 54), allows generalisation to be made about the characteristics, opinions, beliefs, and attitudes, of the entire population being studied. During the selection procedure given above, the researcher realised that the total number of researchers available on the NARI staff list was too small (only 32) to warrant random selection, and so the entire research staff were selected for the survey.

These were then added to the randomly selected 68 extension staff to make the target sample size of 100 potential respondents.

3.4.1 Sample

The total number of the sample was 100, that is to say, the whole 32 researchers with NARI and 68 extension personnel from a combination of DAS, DLS, Fisheries and ActionAid to whom the self-administered questionnaires were distributed by the researcher himself.

3.5 Instrumentation

The appropriateness of research methodology used, as highlighted by Kaniki (2001: 197), must be determined by the circumstances in which it is used. A technique, which is often hailed as a better indicator of information needs, according to Kaniki (1995: 11), is the diary approach first used by Allen (1964). In this technique individuals are requested to keep a record of their information seeking processes and use over a given period of time. These processes are then analysed to identify how and what information was sought, its source(s), how and for what purpose it was used and perhaps how effective it was. However, Kaniki (1995: 11) cautions users of this technique that it requires adequate time on the part of the researchers, resources at their disposal and a lot of cooperation on the part of the respondents. He indicates that the problem with this technique, which still attempts to quantify occurrences, is that it works well only in a closed environment and can be time consuming on the part of the data recorder.

A descriptive survey research method was considered most appropriate in this study as both quantitative and qualitative data were collected. Survey or descriptive research, as defined by Goldhor (1972: 118.), consists of those techniques, which serve to gather contemporary data either by direct measurement or by solicitation from others. Busha and Harter (1980: 54) also argued that survey research techniques could save time and money without sacrificing efficiency, accuracy, and information adequacy in the research process, as informational adequacy and

efficiency are usually major considerations in survey research.

From the literature review it can be seen that survey methods with self-administered questionnaires and or interview protocols with closed and some open-ended questions have been used by previous researchers such as Aina (1985), Ojiambo (1989 and Kaniki (1991; 1995b). Within the closed question category, as given by Burton (2000: 337-338), there are questions which generate dichotomous response (yes or no), multi-choice questions and those which require respondents to choose a response from a scale. With regard to open-ended questions, Burton (2000: 339) further indicates that these provide a response format that gives respondents the freedom to provide any answer, which they care to make. The researcher then has to make sense of the responses given, construct appropriate categories so that the data can be statistically analysed. However, she cautions that, dealing with open-ended questions can be time consuming, but they can be the most important questions on the survey by offering important and unpredictable insights into human behaviour. In this survey, most of the closed questions sought multi-choice answers from the respondents while the rest generated dichotomous responses.

In view of the above, self-administered questionnaires were therefore considered the most appropriate instruments for this research study due largely to time and resource constraints facing the researcher. Burton (2000, 335-336) states that the most widely used survey instrument across the social sciences is the questionnaire. Good questionnaires maximise the relationship between the answers recorded and what the researcher is trying to measure. In spite of their disadvantages, well-constructed self-administered questionnaires can save a lot of the researcher's time and resources, which could be used effectively in other aspects of the study. In other words, if face-to-face interviews are time consuming and costly to undertake, as argued by Burton (2000: 328-329), self-administered questionnaires are the opposite as a result of subjects completing a questionnaire themselves. However, she argues that, in order to be effective it is absolutely crucial that self-administered questionnaires are easy to use: respondents do not usually have the benefit of research training; they do not tend to be motivated to do the job well; and they are generally not selected on the basis that they are good at form filling. The questionnaires included both

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closed and open-ended questions to give the respondents the freedom to express their opinions, perceptions and aspirations.

3.5.1 Pre-testing of the instrument

The purpose of a pilot test or pre-test, according to Saunders, Lewis and Thornhill (1997: 269), is to refine the questionnaire so that respondents will have no difficulties in answering the questions and there will be no problems in recording the data. In addition, it will enable the researcher to obtain some assessment of the questions' validity and the reliability of the data collected. The authors cited Bell's advice that, "however pressed for time you are [as a researcher], do your best to give the questionnaire a trial run", as without a trial run, you have no way of knowing that your questionnaire will succeed.

To test the appropriateness, clarity and validity of the self-administered questionnaire for this study, the researcher distributed ten draft questionnaires among five research assistants and five village extension workers (VEWs) in the Gambia before using the instrument in the actual survey. The pretest questionnaires were distributed on the 15 and 16 January 2001. The pilot responses indicated that the questions were well understood and only some slight changes were needed to be made to avoid clumsiness and clutter of the responses to a few questions. These slight problems were taken care of after the pretest. Also, every attempt was made to keep the skip pattern to a bare minimum to avoid confusion from one question to another among the respondents. The final version of the questionnaire was produced (Appendix 1).

3.5.2 Data Collection

As indicated the instrument used for data collection in this study was a self-administered questionnaire, which was constructed and distributed personally by the researcher himself among the target population. This included agricultural researchers and extension personnel. The questionnaires were distributed with two cover letters: one by the researcher (Appendix 2) and

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the other an introductory letter by his Director (Appendix 3), outlining the nature and the purpose of the study. The letter from the researcher was directed to the potential respondents soliciting their cooperation whilst the other one from the Director General was meant for the Directors of the participating institutions for the same purpose. With the exclusion of farmers in the survey, the use of self-administered questionnaires enabled the researcher to cover a reasonable number of respondents and collect a large amount of information within a relatively short period. Burton (2000: 328) argues that self-administered questionnaires cost 75% less than one administered by personal interview, and because they are cheap and quick, they provide relatively easy access to geographically dispersed subjects.

3.5.3   Method of Data Analysis

As one of the most popular and widely available statistical analysis packages within the social sciences, SPSS (Statistical Product and Service Solutions), formerly Statistical Package for the Social Sciences (Clarke, 2000) was used to analyse the quantitative results of this study. In this case, data was summarised in simple tables using simple frequencies and percentages. The content analysis method was employed to analyse open-ended questions.

3.6   Summary

The chapter deals with the methodology employed in the study. It also discusses the nature of the population, the selection of the sample and its limitations. The use of a self-administered questionnaire, as the instrument used for data collection and its pretest were also discussed. The chapter finally highlights the methods used in the data analysis aspect.

CHAPTER FOUR

PRESENTATION OF FINDINGS AND DISCUSSIONS

4.1   INTRODUCTION

The aim of this chapter is to present the analysis, interpretation and discussions of the results of the study. For the sake of convenience and because this is a mini thesis, the interpretation and discussion of the findings have been combined. As mentioned in chapter three, a self-administered questionnaire was the instrument used to collect data for this study. The chapter is divided into eight sections. The first includes the introduction, objectives and research questions. The second section deals with the demographic and background information of the respondents. The third section discusses the variety of work-related problems encountered by the respondents in carrying out their duties and in attempting to resolve farmers' problems. The fourth section presents respondents' information needs and the information providers used to meet their needs and those of farmers. The fifth section deals with the information dissemination mechanisms used by the respondents to communicate their messages (advice, ideas, opinions etc) to farmers. The sixth section highlights respondents' professional meetings and consultations with farmers. The seventh section highlights the respondents' perceptions on the current state of affairs regarding extension-research linkages and more specifically the T & V model of extension in The Gambia. The eighth section which deals with the respondents' recommendations on the type of institutional structures needed to be put in place is incorporated in chapter 5.

The main purpose of the study was to investigate the work-related needs of agricultural researchers and extension staff in addressing small-scale farmer production-related problems, which were or could be expressed in the form of information needs. In order to create a better understanding of what the study aimed to achieve, the specific objectives of the study were:

> ➤ To identify the types of farmers' production-related problems which agricultural researchers and extension agents face

➢ To determine the problems/constraints faced by researchers and extension agents in addressing farmers' production-related problems and information needs

➢ To determine the information providers that agricultural researchers and extension agents use to meet their information needs and those of farmers

➢ To determine the effectiveness of the information providers used

➢ To determine the delivery systems used by researchers and extension agents to communicate solutions or advice to farmers for their identified or expressed problems

➢ To determine the effectiveness of these delivery systems.

➢ To determine what structures, in the opinion of agricultural researchers and extension agents, should be in place to adequately address their information needs.

In an attempt to accomplish the purpose of the study the following research questions upon which the self-administered questionnaire was based, were posed:

1. What type of farmers' production-related information problems do agricultural researchers and extension agents encounter?

2. What problems/constraints do researchers and extension agents face in addressing farmers' production-related information needs?

3. What are the existing agricultural information systems and services used by researchers and extension agents to meet their information needs?

4. How effective are these information providers?

5. What types of delivery system are used to communicate solutions/advice to farmers for their identified or expressed problems?

6. How effective are these delivery systems?

7. What structures should be put in place to adequately address the information needs of agricultural researchers and extension agents?

4.2 Demographic and background information of respondents

This section presents the characteristics of the respondents, which include gender, age, languages, education, experience and workstations. The main purpose for collecting data and attempting to understand the demographic spread of populations in user studies is because demographics influence information needs and the use of information providers and information delivery systems. Poole (1985) for instance has provided a summary of assumptions about information needs, use and demographics. Particular groups, like different sexes, experts and so on may have unique needs and a particular manner in which they use information sources. Type of work and geographical location may affect needs and use of sources. Leach (1999: 78-79) for example, in his study of rural adults in KwaZulu-Natal in South Africa found that the NGOs prefer use of visual (posters, photos or slides), audio (radio or cassette tapes), audio-visual (video) and theatre (puppets and role-play) sources because they generate or serve as a focus for discussion in a workshop or group situation. For example, the use of posters was to generate questions and serve as a common point of referral during group discussions. Thus, the use of the above formats is obviously important in terms of adults with limited or no literacy skills. Alemna (1995: 71) also argued that for the diffusion process to be effective, the choice of an appropriate channel of communication is very essential. Of equal importance, he stressed, is the correct use of the right language to the right people. For instance, in the context of most farmers, information has to be communicated orally and sometimes visually by charts, figures and drawings. According to Leach (1999: 79), these instruments were viewed as effective means of providing information or assisting in creating a situation that would facilitate such provision. Therefore, this study found it imperative to get a better understanding of the demographic distribution of agricultural researchers and extension agents in the Gambia.

Table 1: Distribution of the sample by institution and division

		Regional Divisions					
Institutions	Respondents	WD	LRD	NBD	CRD	URD	Total
NARI	Researchers	13	1	0	5	1	20
DAS	Extension agents	2	3	4	4	2	15
DLS	"	1	2	2	1	0	6
AATG	"	1	0	0	2	0	3
DOF (1)	"	1	1	1	1	1	5
DOF (2)	"	3	1	0	1	0	5
Total		21	8	7	14	4	54

Key:

NARI	=	National Agricultural Research Institute
DAS	=	Department of Agricultural Services
DLS	=	Department of Livestock Services
AATG	=	ActionAid The Gambia
DOF (1)	=	Department of Fisheries
DOF (2)	=	Department of Forestry
WD	=	Western Division
LRD	=	Lower River Division
NBD	=	North Bank Division
CRD	=	Central River Division
URD	=	Upper River Division

4.2.1 Response rate

Of the 32 questionnaires distributed to agricultural researchers, 20 were completed and returned resulting in a response rate of 62.5%. With regard to the extension agents, 68 questionnaires were distributed and 34 were completed and returned, resulting in a response rate of 50% (see Table 2 below). The response rate of extension agents was primarily affected by the coincidence of the study with the annual national livestock vaccination and to a lesser extent by the absence of some respondents from their workstations. The two divisions most affected by the above study and the absence of potential respondents, were LRD and URD. However, the overall response rate (50%) of the extension staff was satisfactory because at least half of the extension agents were represented in the sample. As for the researchers, the response rate was affected by the staff being on annual leave or training abroad.

Table 2: The response rate of the respondents based on the number of questionnaires distributed

Division	No. of questionnaires		No. of respondents		Response rate (%)	
	Extension agents	Researchers	Extension agents	Researchers	Extension agents	Researchers
WD	13	19	7	13	53.8	68.4
LRD	13	1	6	1	46.4	100
NBD	12	0	7	0	58.3	0
CRD	16	10	11	5	68.8	50.0
URD	14	1	3	1	21.4	100
Total	68	32	34	20	50.0	62.5

Of the total of 54 respondents, as depicted in Table 2 above, 34 (63%) were extension agents while 20 (37.0%) represented agricultural researchers.

4.2.2 Gender distribution of agricultural researchers and extension agents

With regard to gender, 50 (92.6%) of the respondents were male of which 32 (59.3%) were extension personnel while 18 (33.3%) were their counterparts in the research sub-sector. The remaining four (7.4%) were female representing two (3.7%) in research and extension, respectively. Thus, the data in Table 3 below show that males are in the majority and occupy most of the key positions in the two sub-sectors. This preponderance of males within DOSA, emanated from the colonial era, as observed by the researcher, and still exists as a common phenomenon within similar institutions in the Gambia. There are only a few female research and extension personnel at any level of research and extension services. This is not uncommon in Africa, as indicated by similar studies. For instance, Blumberg (1992: 15) and FAO (1999: 2) reported that only seven percent of extension agents in Africa were female, and no more than 15% of the world's extension agents are women, respectively. Munyua (2000: 4) also argued that this gender inequity, coupled with poor extension packages, inadequate delivery approaches, and cultural and religious barriers, was further compounded by transportation and communication problems. The issue of gender distribution in research and especially extension services is reflected on further in the latter part of this chapter.

Table 3: Gender distribution of agricultural researchers and extension agents

N = 54

Gender	Researchers		Extension agents		Row total	
	Frequency	(%)	Frequency	(%)	Frequency	(%)
Male	18	33.3	32	59.3	50	92.6
Female	2	3.7	2	3.7	4	7.4
Total	20	37.0	34	63.0	54	100

The lack of a sufficient or proportionate number of female extension and agricultural researchers is probably due to the insufficient enrolment of girls in agricultural schools, especially at a higher level. As a result, in the majority of cases, it is the male personnel who are the decision-makers and planners, and who act in positions that affect programmes and policies even those aimed at

women. Torrence (1991: 23) intimated that, issues involving women farmers who constitute more than 50% of agricultural producers in The Gambia were not adequately addressed. This, he argued, was due to the fact that the needs of women were not reflected in agricultural research and policy. However, it is observed that, in an attempt to address the issue of female extension personnel, a number of agricultural-related non-governmental organisations (NGOs) employed more female extension agents. In 1997, the Catholic Relief Services (CRS), with donor support, established a special organisation called the National Women Farmers Association (NAWFA). This organisation does not only represent the interests of Gambian women farmers (CORAF, 1998: 33), but it is also expected to increase the number of its female extension agents in the future to offset the current gender inequity in the agricultural services sector. Also, as part of its mandate, it is expected to facilitate the dissemination of agricultural innovations and provide women farmers with better access to farm inputs and credit.

4.2.3   Age and gender distribution of respondents

As discernible from Table 4 below, the majority of respondents 25 (46.3%) who were all male, were between the ages of 40 and 49 years, with 13 (24.1%) representing the extension agents and 12 (22.2%) researchers. In the age group 20 and 29 years, which represented 10 (18.5%) respondents, 8 (14.8%), were exclusively male and two (3.7%) female extension agents. Those between 30 and 39 years were represented by four (7.4%) male and two female (3.7%) researchers, and four (7.4%) male extension staff. Those above 50 years constituted only nine (16.7%) with two (3.7%) and seven (13.0%) male representing research and extension personnel, respectively. Overall, the 18 male and two female researchers had an average age of 43 years, while 32 male and two female extension agents had only 40 years. Researchers' ages ranged from 31 to 56 years old, while that of extension personnel ranged from 25 to 55 years. The age range of respondents in this study is similar to the results established in other studies such as Radhakrishna's and Thomson's (1996), Ojiambo's (1989) and Kaniki's (1989). For instance, Radhakrishna and Thomson (1996: 2) found that the ages of extension staff ranged from 21 to 66 years old. Kaniki also established that the ages of most of the research scientists (76.6%) ranged between 25 and 45 years, while Ojiambo found that the majority were between the ages

of 25 and 40 years. Although the actual percentages and figures may differ slightly from country to country, according to Kaniki (1995: 21), the above characteristics are common amongst African agricultural researchers as reported by other scholars like Ikpaahindi (1985) and Lupanga (1986).

4.2.4 Respondents' gender and educational qualifications

Table 4 below presents a summary of the gender and educational qualifications of researchers and extension agents. The data revealed that 19 (35.2%) of the respondents possess a diploma as highest level of education and training. Of this figure, 18 (33.3%) had higher national diplomas while only one (1.85%) had an ordinary diploma. The higher national diploma requires three years of education and training while an ordinary diploma takes only one to two years. This group, depending on their qualifications and experience, included one Research Assistant, two Community Development workers, three Senior Livestock Assistants, seven District Extension Supervisors, three Assistant Agricultural Officers, one Agricultural Officer, three Assistant Research Officers and one Assistant Technical Officer. Of this, 14 (25.9%) were male and two (3.7%) were female extension agents while only two (3.7%) were male and one (1.85%) female researchers. This was followed by 13 (24.1%) of the respondents with an MS degree of which 10 (18.5%) were male and one (1.85%) female researchers, and two (3.7%) male extension agents. This category consisted of eight Research Officers, three Assistant Research Officers, one Field Co-ordinator attached to an agricultural project called LADEP and one Divisional Agricultural Co-ordinator. Following this were nine (16.7%) male extension agents with certificates and seven (13.0%) with secondary (ordinary/advanced level) education. This group composed of one Senior Livestock Assistant, four Fisheries Field Assistants and one Forest Ranger. As obvious, only an insignificant proportion of the respondents, two (3.7%) had a PhD degree and they were both Principal Research Officers (PROs). It is therefore discernible that researchers had more qualified staff than their counterparts in the extension services. This was perhaps due to donor support, in terms of human resources development, accorded to the NARI staff by GARD before and after the transformation of DAR into NARI in 1993. The same support was also provided to NARI by the ASP in subsequent years following the transformation. In

support of this trend, it is also observed that the number of PhD students currently expected back from training abroad in the research sector in the next few years is higher than that of extension.

Table 4: Respondents' gender and educational qualifications

N = 54

Gender	Researchers		Extension agents		Total (%)
	Male (%)	Female (%)	Male (%)	Female (%)	
Secondary			7 13.0		7 13.0
Certificate			9 16.7		9 16.7
Diploma	2 3.7	1 1.85	14 25.9	2 3.7	17 31.5
BSc	4 7.4				4 7.4
Masters	10 18.5	1 1.85	2 3.7		13 24.1
PhD	2 3.7				2 3.7
Total	18. 33.3	2 3.7	32 59.3	2. 3.7	54 100

It is clear from the above data that most of the highly qualified staff (17) are within the research services. Most extension personnel are either at the higher national diploma level or below. This trend concurs with similar studies done by Kaniki (1989), Ojiambo (1995), Lupanga (1986) and Dulle (1998). For instance, Lupanga found that most extension workers in Tanzania had lower educational levels than their counterparts in research. As revealed by this study, Sonko et al (1988: 7) also reported that, in The Gambia, extension specialists and most candidates for jobs in extension have a lower level of technical education and training than their counterparts in the research service. As indicated by these scholars this may affect the linkage between research, extension and farmers. Kaniki also has argued that without high qualification and understanding of subject matter at the same level as researchers, extension staff are unlikely to "translate" and repackage all the highly sophisticated research results for the benefit of farmers. The disparity of levels of education and training between extension and research appears to be a longstanding problem. It may well be affected by the perception that research is more "glamorous" than extension. This is not a problem, however, in the U.S. where extension and research services

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within the states are located in agricultural faculties of land grant universities and include highly skilled experts. Even in the State Department of Agriculture there is little difference between research and extension.

4.2.5 Work experience of researchers and extension agents

Work experience is an essential attribute, which every employee needs to possess in order to function effectively with minimum supervision. This becomes more critical, especially at a higher level, where personnel are given more responsibilities and are also expected to take part in the decision-making process and have control of resources under their responsibility. Experience does not only provide employees with problem-solving and interactive skills within the work environment, but also helps them develop certain expertise in their areas of responsibility and specialisation. As a result, it establishes employees in a better stead not only in terms of gaining the confidence and trust of employers, but also enables them to integrate easily into the organisational structure of the organisation. It can therefore be argued that work experience does not only guarantee an employee's establishment and continuity in an organisation, but prepares him/her for future challenges and responsibilities. This is why employers nowadays are reluctant to employ potential job seekers without the minimum skills and/ or experience.

In this study the data on work experience was collected to determine the capabilities of researchers and extension agents in handling technical and work-related issues as well as farmers' information needs and constraints.

As far as work experience is concerned, as depicted in Table 5 below, 32 (59.3%) of the respondents had more than 15 years of experience, with 19 (35.2%) in extension and 13 (24.1%) in research. It is also noted that 12 (22.2%) of the respondents had between one and five years experience, which reflected the junior cadre, were all extension personnel. Of these, 10 (18.5%) were male and two (3.7%) were female. The data further revealed that 5 (9.3%) had more than 10 years experience, representing two (3.7%) female researchers and one (1.85%) male researcher, and two (3.7%) male extension agents. Only one respondent, who was a newly

employed male extension agent, had less than one year work experience. The table therefore highlights that 37 (68.5%) of the respondents, of which 21 (38.9%) were extension agents and 16 (29.6%) researchers, had more than 10 years work experience. The implication of this is that, in spite of the recent establishment of NARI in 1993 following the reorganisation of MOA in 1987, most of its senior researchers, who originated from DAS, have equally long-term experience working with farmers as their counterparts in extension and are presumably as familiar with farmers' problems, needs and expectations.

Table 5: Work experience of researchers and extension agents

N = 54

Work experience	Researchers		Extension agents		Total (%)
	Male (%)	Female (%)	Male (%)	Female (%)	
Less than 1 year			1 1.85		1 1.85
1-5 years			10 18.5	2 3.7	12 22.2
6-10 years	4 7.4				4 7.4
11-15 years	1 1.85	2 3.7	2 3.7		5 9.2
16-20 years	4 7.4		8 14.8		12 22.2
21-25 years	8 14.8		2 3.7		10 18.5
26-30 years	1 1.85		6 11.2		7 13.0
30 and over			3 5.6		3 5.6
Total	18 33.3	2 3.7	32 59.3	2 3.7	54 100

4.2.6 Means of transport provided to researchers and extension agents

The issue of transport for agricultural staff is very important, particularly for the extension agents most of whom have their workstations in the countryside. Resource-poor farmers cannot always afford the cost of meeting these agents of change at their workstations, especially during the peak period of their farming calendar. Without reliable means of mobility for both researchers and extension staff, the level of their efficiency and effectiveness in terms of conducting their field operations and resolving farmers' problems and needs, would be adversely affected. In that regard, the availability of such information to the decision-makers within the government, in general, and agricultural sector, becomes critical.

With regard to means of transport (Table 6), 23 (42.6%) of the respondents were provided with vehicles, that is to say, 20 (33.3%) researchers and only three (5.6%) extension staff, 22 (40.7%) had motorbikes, and only two (3.7%) who happened to be forest guards had bicycles. However, five (9.2%) respondents, for one reason or the other, did not respond to this question. The findings suggest that those with vehicles were senior male staff of both sub-sectors who had their

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workstations either at the directorate or divisional headquarters of their respective institutions. Those with motorbikes were the paraprofessionals who mostly had their workstations at the divisional, district or village levels to act as the link between their decision-makers and farmers.

Table 6: Means of transport provided to researchers and extension agents

N = 54

| Means of transport | Researchers | | Extension agents | |
	Male (%)	Female (%)	Male (%)	Female (%)
Motorbike			22 40.7	2 3.7
Bicycle			2 3.7	
Vehicle	18 33.3	2 3.7	3 5.6	
No response			5 9.2	
Column total	18 33.3	2 3.7	32 59.3	2 3.7 100.0

4.2.7 Workstations of extension agents and researchers

In the introduction it was stated that the Gambia is divided into five divisions. Obviously, as information needs are partly defined by the environment, the study needed to establish the distribution of staff, which may affect the processing and identification of needs. In fact, the decentralisation of staff, particularly extension personnel, has many implications. For instance, it is important not only in terms of providing easy accessibility to farmers and equitable distribution of essential resources and services to the farming community, but also as an attempt to reduce the extension-farmer ratio, which is in an alarming situation in many African countries including the Gambia.

The presentation of the data on the workstations of extension agents and researchers is given below. The figures have shown that 28 (51.8%) of the respondents had their workstations at divisional headquarters of their respective institutions. Of these 19 (35.2%) were extension agents and nine (16.7%) were researchers. Concerning those working at the directorate, these were found to be only researchers numbering 11 (20.4%) of the respondents. However, the two categories (division and directorate) composed both middle and senior level staff. With regard to the rest of the respondents, who were exclusively extension agents and stationed at the grassroots level, nine (16.7%) were in the villages, while six (11.1%) were at the district extension centres. Almost the same pattern of distribution of extension staff at workstations has been observed from the findings of Dulle's (1998: 35) study on extension agents and dairy farmers in Tanzania.

4.2.8 Language proficiency of researchers and extension agents

The importance of language proficiency among agricultural staff cannot be overemphasised given the diverse nature of their work and close interaction with farmers of different ethnic groups in the country. In order to establish effective communication between the agents of change and farmers, the former need to be fluent in the local language(s) spoken by farmers. This is crucial

because, as confirmed by similar studies by Kaniki (1989), Dulle (1998) and Leach (1999), the majority of farmers have limited or no literacy skills for effective communication in the official language(s) of most developing countries. There are different ethnic groups in the Gambia. The principal ones include Mandinka, Wollof, Fullah, Jola, Sarahulle and Serer. Many farmers in the Gambia speak more than one language and so staff distribution in various parts of the divisions is relatively easy, as they are posted in the rural areas according to the type and extent of the local languages they speak.

This section presents the language skills (i.e. reading, writing, comprehension and speaking) of extension agents and researchers regarding various national and international languages spoken or used as a medium of communication between themselves, the farmers, as well as their peers in the sub-region. As language proficiency is an important element in interactive communication, the researcher was interested in establishing the linguistic abilities of the respondents for effective communication with local farmers as well as their peers in the sub-region.

The findings indicate that all the 54 (100%) respondents could read, write and speak English (irrespective of their proficiency in other languages), being the official language in the country. Of this number, only one respondent (a British citizen) was not proficient in other languages. This was followed by 16.7% who could only read and write French well in addition to English, but could not speak it fluently. The results further indicated that 16 (29.6%) of the respondents could not read and write French well, but they could speak it fluently in addition to English. However, it is noted that, of the 16 respondents who were fluent in both English and French (see Table 7), 11 (20.4%) also spoke two local languages (Mandinka and Fullah or Wollof and Mandinka), two (3.7%) spoke four (Wollof, Mandinka, Fullah and Serer) and three (Wollof, Mandinka & Jola) local languages, respectively. Only one (1.85%) spoke two local languages (Wollof and Mandinka) and Arabic. As for English and Arabic, three (5.6%) could read both languages, but only two of them could write Arabic in addition to English.

Table 7: Languages spoken by extension agents and researchers

N = 54

	Extension agent	Researcher	Total
English		1	1
English, Wollof, Mandinka & Fullah	11	3	14
English, Wollof, Mandinka & Jola	2		2
English, Mandinka & Jola	3		3
English, French, Wollof, Mandinka & Jola	1	1	2
English, Wollof & Mandinka	10	2	12
English, Wollof, Mandinka & Manjago	1		1
English, Wollof, Mandinka, Fullah & Sarahule	1		1
English, French, Wollof, Mandinka, Fullah & Serer	2		2
English & Mandinka	2		2
English, Wollof, Mandinka & Sarahule	1		1
English, French, Mandinka & Fullah		8	8
English, French, Wollof & Mandinka		3	3
English, French, Wollof, Mandinka & Arabic		1	1
English & Wollof		1	1
Total	34	20	54

4.2.9 Attachment of extension agents and researchers to agricultural projects

Attachment to a project simply means relieving a given staff member of his/her duties within the parent institution and allowing him/her to assume the same or other duties in a newly established project. The reasons behind such attachments may vary from project to project, depending on the nature and purpose of the project as well as the expertise of the staff member in question. However, in most cases, staff members are attached to projects in order to acquire certain critical skills, knowledge or experience (managerial or technical) from their expatriate counterparts so that they can take over comfortably when the latter's tour of duty ends. Sometimes the staff members are lucky to be sent abroad for further education and training in order to prepare them for more responsible positions in the future.

According to the findings of the study, the majority of the respondents, 45 (83.3%) were not attached to any national project whatsoever, but remained working with their parent institutions. Only a small proportion (nine or 16.7%) was found to be attached to various agricultural-related projects in the country of which seven (13%) were extension staff and two (3.7%) were

researchers. The seven extension agents included: two Forest Rangers, one Village Extension Worker, one Senior Livestock Assistant, one Livestock Assistant, one Animation Team member, one Implementation Area Head, one Field Co-ordinator, and two Subject Matter Specialists. The remaining two researchers were a Technical Officer and Assistant Research Officer. The findings revealed that the project work experience of these staff ranged from four months to two and a quarter years, and that five (55.5%) of them (one livestock Assistant, two Forest Rangers, and two Village Extension Workers) had certificates, three (33.3%) had higher national diplomas (one Senior Livestock Assistant and two Subject Matter Specialists) and only one (1.85%) had an MS degree (Field Co-ordinator).

Five different projects to which the above-mentioned personnel were attached have been identified by the study. These included: the Gambia-German Forestry project (1995-2005); African Swine Fever Eradication project (2000-2001); Rural Finance and Community Initiative Project (1998-2004); Lowland Agricultural Development Programme (1997-2017); and Mushroom Cultivation Project (1999-2002). It is noted that, four (80%) of these projects were established in the late 1990's and only one (1.85%) came into being in the year 2000. The duration of the projects ranged from one to twenty years. The purpose of each project is listed below:

❖ Gambia-German Forestry Project (GGFP):
   ➢ Establishment of a sound, environmentally friendly and sustainable community-based forestry management systems in the rural areas;

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❖ African Swine Fever Eradication Project (ASFE):

> ➤ Eradication of African swine fever from the country through serological tests which entailed the collection of blood sample from pigs in certain key locations of the country;

❖ Rural Finance Community Initiative Project (RFCIP):

> ➤ Improvement of household food security and income generation capacities of Gambian farmers;

❖ Lowland Agricultural Development Programme (LADEP):

> ➤ Improvement of the traditional lowland ecologies for sustainable rice production using community-based demand-driven approach;

❖ Mushroom Cultivation Project (MCP):

> ➤ Introduction of improved varieties of mushroom for income generation and as a source of protein to the Gambian population.

4.3   Work-related problems faced by respondents

The respondents were asked to give details of their work-related problems because one of the bases of their information needs is that they manifest themselves in the form of problems, questions and so on in the work situations of researchers and extension agents in dealing with the agricultural problems of farmers. Because of the weak linkage between research and extension, as indicated in similar studies, feedback from extension is one of the major problems which researchers have to grapple with. Therefore, an understanding of these problems, which are translatable into information needs, should enable agricultural information professionals or managers to repackage the right information in the right format to meet their needs. Also, the policy makers and planners of various agricultural programmes would have a comprehensive picture of the factors adversely affecting the work of researchers and extension personnel in trying

to resolve farmers' problems. For instance, Ozowa (1997: 1) argued that if the approaches to agricultural development programmes are to work, African governments need to take new approaches to information dissemination and management that emanate from a clear understanding of what farmers' information needs are. These needs are indirectly reflected in the problems and information needs of researchers and extension staff.

The findings on the different work-related problems faced by the extension agents and researchers are given in Table 8 below. The responses total more than 54 because the respondents could indicate more than one option. The data showed that the majority, 29 (53.7%) of the respondents had perceived "paucity of resources or facilities" (financial, material, skilled staff) as a major or critical problem to the efficient operation of their planned research and extension activities. However, as can be seen from the table below, this was more a problem of the researchers than the extension agents. This weakness in human resources, according to FAO (1997), represents a significant impediment to broadening research activities and improving the relationship between research and development. This was confirmed by Sonko et al (1988: 8) that the physical resources and facilities - including mobility – were desperately lacking, impairing work atmosphere and work effectiveness of the extension agents. Eponou (1996: 7) also opined that inter-institutional struggles might exist between research and extension because of serious resource constraints. For instance both extension and research staff need to run on-station and on-farm trials, which are heavily dependent on the availability and costs of the above variables, for their success. Farmers also need the same inputs to enhance their productivity. Ozowa (1997: 4) argued that without adequate funding, facilities and logistics support coupled with bureaucratic and institutional barriers, well-intentioned agricultural programmes could be marred by poor implementation. This is a fact and as it is evident from the data in Table 8, this could be a reflection of the current situation in The Gambia. For instance, the agricultural staff may have the goodwill to do a good job and come up with recommendations that would boost farmers' production, but without adequate support in terms of the problems outlined in the table below, would definitely result in poor implementation. Added to this was the "lack of reliable means of transport" (including cost of fuel and maintenance) for frequent on-farm visits (19 or 35.2%) and

effective interaction with peers and farmers. Another worrying aspect of their interactions with farmers, as indicated by 14 (26.0%) of the respondents, was the former's "conservativeness toward the adoption of new technologies", followed by "poor research/extension linkage resulting in a poor information flow and weak interaction" (8 or 14.8%).

This situation was confirmed by seven (13%) of the respondents (exclusively researchers) who complained about "lack of feedback from extension/farmers" as a critical problem affecting their work. Other limiting factors expressed as a concern by both extension and research staff were "poor information flow between the office and field staff" and "lack of motivation for self-development" or its inadequacy (five or 9.3%). Jordan (1995: 118) in quoting Fraser, defines motivation as "the way in which the individual applies his/her abilities in practical situations, and to what extent he/she achieves effective results". It is also observed that three (5.6%) of the respondents considered "poor marketing outlets" with frequent gluts and low prices, and "low adoption rate of certain technologies perceived by farmers to be risky" as problems that need to be addressed by policy makers and planners. The data in Table 8 below is similar to the findings of Ojiambo's study (1989). For example, he reported poor communication linkage between the three agricultural subsystems (research scientists, extension personnel and farmers); farmers' resistance to adopting new farming methods; research conducted not being farmer oriented; inadequate information dissemination facilities; and inadequate resources. Alemna (1995: 75) also reported that farmers are the most conservative group in the society, and because of their high level of illiteracy, it is often difficult to teach them any scientific ideas, much more to get them to adopt innovations.

Table 8: Problems faced by extension agents and researchers

N = 54

Expressed problems	Extension Agents	Researchers	Total %
1. Paucity of resources/facilities (i.e. financial, material, trained staff) for efficient operation of planned activities	8	21	29 (53.7)
2. Lack of reliable means of transport (including cost of fuel and maintenance to make frequent on-farm visits	15	4	19 (35.2)
3. Conservativeness of farmers toward adoption of new technologies/low adoption rate of certain technologies perceived by farmers to be risky	11	3	14 (26.0)
4. Poor research/extension linkage resulting in poor/weak information flow and interaction	3	5	8 (14.8)
5. Lack of feedback from extension/farmers		7	7 (13)
6. Poor information flow between office and field staff	4	1	5 (9.3)
7. Lack of motivation for self-development	3	2	5 (9.3)
8. Poor marketing outlets	2	1	3 (5.6)
11. Lack of appropriate technologies to enhance farmers' productivity	2		2 (3.7)
12. Too much workload/too many farmers to handle with poor transport facilities	1	1	2 (3.7)
13. Conflict resolution (particularly between foreign and national fishermen) and establishment of associations of fishermen, fish mongers and fish processors	2		2 (3.7)
14. Lack of enough extension education	2		2 (3.7)
15. Inappropriate agricultural policies		2	2 (3.7)
16. Difficulty in accessing some relevant information due to poor documentation of past and present research findings		2	2 (3.7)
17. Inadequate in-house professional training sessions for continuous improvement of knowledge and skills	1		1 (1.85)
18. Late payment of wage labourers	1		1 (1.85)
19. Minimal sectoral co-ordination and collaboration		1	1 (1.85)
20. Lack of access to current electronic journal articles for update and resolution of research-related problems		1	1 (1.85)
21. Low participation of farmers in the sheep fattening programmes	1		1 (1.85)
22. Unwillingness of farmers to take responsibility for the protection of their forest due to fear of being prosecuted in the event of a fire outbreak	1		1 (1.85)
23. Land dispute	1		1 (1.85)
24. Lack of incentives such as allowances	1		1 (1.85)
25. Low literacy level of farmers	1		1 (1.85)
26. Lack of efficient and viable technology transfer mechanism	1		1 (1.85)
27. Lack of interest in research by extension agents		1	1 (1.85)

4.3.1 Feedback from extension agents

Feedback from extension agents to researchers is very important because it is used as a yardstick by the latter to gauge the appropriateness, adoption rate and effectiveness of technologies disseminated to farmers. Although this study established the provision of feedback by some extension staff, the situation is far from being satisfactory due to the weakness of the linkage between research and extension services. For example, the results of CORAF study given below, alluded to the existence of the problem of feedback between the two entities, at the divisional level. This question was asked because the researcher believes that it would be useful to decision makers in order to rectify the situation and enable researchers to make the necessary adjustments in the design, generation and dissemination of technologies and information appropriate to farmers.

Although the weak linkages between extension and research personnel in The Gambia have been supported by the findings of this study (Table 8), and by Torrence (1991) and Trent (1989), 13 (65%) of the researchers reported to have received "feedback" from the extension agents. It is further highlighted that such feedback, which was received either during the extension agents' annual planning and evaluation workshops or through personal contact, usually reflected the following issues: "farmers' reactions to and or perceptions of technologies demonstrated on their fields"; "rate of adoption"; "reasons for or against adoption"; "suitability or otherwise of improved crop varieties in given ecologies"; "performance rate of given crop varieties for potential diffusion or further multiplication"; and "environmental constraints" for example, levels of salinity, iron toxicity, soil fertility and others affecting the effectiveness of the technologies or farmers' rate of adoption. Only a small proportion (seven or 35%) indicated that they did not receive such feedback. When asked how they ascertained the use or rejection of their research results by farmers, the researchers concerned reported that they did so only through observation and/or direct discussions with farmers during the establishment of their on-farm trials. However, CORAF's findings highlighted that there appeared to be problems of feedback between research and extension at the divisional level (CORAF, 1998: 61). Eponou (1996: 8) also supported this

view by indicating that an effective flow of information in the other direction is lacking and that feedback from extension agents and farmers - the key to the relevance of future technologies - is weak. He argued that mechanisms such as joint trials or surveys, which would allow for an effective exchange of information between research and technology transfer, were not fully exploited by researchers in obtaining information from extension agents and farmers. Furthermore, he said farmers have a consultative role but researchers are not always open to their suggestions and ideas.

4.4   Information needs and information providers used

This section discusses the variety of information needs experienced by the respondents and the information providers they used to satisfy their needs. This information is essential because unless the information seeking situations (ISSs) experienced by this subcategory of agricultural information user population and the various information providers used to satisfy them is well understood, information specialists cannot effectively cater for their needs. For instance, given their common purpose of fighting to alleviate and/or reduce farmers' problems, Aina (1991: 21) argued that providing information only to the research scientists without providing the same to agricultural extension Officers, will negate the desirability of integration. On that note, it is equally imperative that research and extension workers have assistance in being informed of the current state of scientific investigations all over the world in order to benefit from the incentives which can be obtained from the knowledge of the results of other research investigations.

4.4.1 Information needs

Regarding the information needs of extension agents and researchers, 45 cases have been identified by this study (see Table 9) using the content analysis technique. As content analysis highlights repetition as a mark of significance (Burton, 2000: 334), 163 responses were identified. Kaniki (1989) and Dulle (1998) also used the same technique to analyse open-ended questions. However, only the most important cases are discussed in the text. Thus, the most important information need of the respondents centred around "availability and costs of agricultural inputs" in different varieties and forms was indicated by 19 (35.2%). This need pervaded the entire country, as the above variables were considered as very critical factors, which affect, in no small measure, both the change agents and farmers in different ways. This is in line with the data available in Table 8, which highlights the problems facing the agents of change. Some previous studies have revealed that extension officers and farmers need a variety of information just as the research scientists and policy makers (Russell, 1983; Aina, 1985; Nampoya, 1986; Ojiambo, 1995). It is therefore apparent, as argued by Ozowa (1997:2) that an examination of the factors influencing the adoption and continued use of these inputs will show that information dissemination is a very important factor. He said that it is a factor that requires more attention than it is currently receiving. Kaniki (1993: 574) also concluded that the identification of an information need is the first part of the whole process of solving a person's problem.

Table 9: Information needs of extension agents and researchers by division

N = 54

Information needs	Extension agents					Researchers					Total (%)
	0	1	2	3	4	0	1	2	3	4	
A. Agricultural inputs: 1. availability and cost of inputs such as fertilisers, insecticides, pesticides, herbicides, seeds, implements, fishing equipment, animal feeds etc	3	1	3	4	1	2	1	1	3		19 (35.2)
B. Extension education: 1. sound and effective community forestry management		1		1							2 (3.7)
2. better transplanting techniques of fruit trees (e.g. mangoes)	1		1								2 (3.7)
3. better integrated pest management (IMP) techniques			1	1	1	1			1	1	6 (11.1)
4. better livestock husbandry, especially small ruminants		1		1	1						3 (5.6)
5. effective treatment of animal diseases such as lack of appetite, worm infestation, trypanosomiasis, respiratory problems etc		2	2								4 (7.4)
6. better management techniques of community-based organisations				3							3 (5.6)
7. Efficient prevention/control of pests and diseases outbreaks	1	1		2							4 (7.4)
8. efficient methods of establishing sheep fattening schemes among farmers	1	1	1								3 (5.6)
9. better resources management including finance	1	1	1	2						1	6 (11.1)
10. better soil erosion prevention/control	1										1 (1.85)
11. weather forecast to be able to alert farmers on time		1	1								2 (3.7)
12. better farm management methods	1	1	1	1	1	1	1	4			11 (20.4)
13. effective control of post-harvest losses	1								1		2 (3.7)
14. safety precautions at sea/river	4	1	1	1							7 (13.0)
15. efficient management and processing of seafood products	1										1 (1.85)
16. chemical calibration			1								1 (1.85)
17. efficient data collection methods	1										1 (1.85)
18. characteristics of farmers' environment – both biophysical (climate, soil, water, etc) and socio-economics	2			2		1			2		7 (13.0)
19. Other available support services to farmers in the country						1					1 (1.85)
20. previous studies on major farmer production constraints identification and solution education, income levels, etc)	2			1	1	1					5 (9.3)
21. farm family statistics (i.e. size, education, income levels, etc)						3			1		4 (7.4)
22.availability of land, crops cultivated (subsistence vs commercial farmers)						2			1		3 (5.6)
23. marketing opportunities	1	1	3	1	1	2					9 (16.7)
24. livestock production levels and ownership of farm implements and draft animals		1				1					2 (3.7)
25. membership of various farmer organisations in the country (e.g. maize growers association, sesame growers association etc)						1					1 (1.85)
26. better water management techniques	1										1 (1.85)
27. crop production economics	1					1					2 (3.7)
28. disadvantages of technologies used by farmers									1		1 (1.85)
29. farming systems/cropping systems						1			1		2 (3.7)
30. Sub-regional Networking						1			1		2 (3.7)
31. farmers' creditworthiness & economic activities						2	1				3 (5.6)
32. land tenure						1					1 (1.85)
33. Research results/feedback from extension agents and farmers		2		1		3				1	6 11.1)
34. better technology transfer methods and rural development			1			1					2 (3.7)
35. varietal preferences of farmers	1		1			1					3 (5.6)
36. seed quality and requirement for various crops			1			1			2		4 (7.4)
37. varietal tolerance to ecological constraints			1			1					5 (9.3)
38. acquisition of farm loans, mode of repayment and interest rates		1	1								3 (5.6)
39. legal issues (e.g. bush fires, felling of trees, conflict etc)	1		1	1							3 (5.6)
40. use of sophisticated communication technologies	1		1								2 (3.7)
41. social norms and taboos		1				1	2				4 (7.4)
C. Agricultural technology: 1. improved and early maturing crop varieties			1	1		1					3 (5.6)
2. better farming technologies for crop improvement and post-harvest labour-saving devices (e.g. milling machines)	1	1	1	1	2	1					7 (13.0)

3. time and better agronomic practices (e.g. planting, spacing, weeding & harvesting)		1				1					2 (3.7)
Total	26	17	21	29	11	34	3	5	14	3	163

Key:

0	'	Western Division .
1	'	Lower River Division
2	'	North Bank Division
3	'	Central River Division
4	'	Upper River Division

As observed from Table 9 above, in spite of the differences in environmental and socio-economic factors which existed between the agro-ecological zones (Divisions) mentioned in chapter 1, no significant differences have been found in the information needs of the respondents. The differences existed though but only in terms of the level of needs. However small these differences may be, bringing them to the attention of the decision-makers could effect a change in the resource allocation paradigm, in order to adequately cater for the needs of the agents and farmers alike.

4.4.2 Information providers used

In an attempt to establish the variety of information providers used by extension agents and research scientists for current and relevant information, in addition to the frequency and effectiveness of the use of such sources, the respondents were asked to indicate such from a list of eight potential sources provided in the questionnaire. Respondents could indicate more than one source used. The summaries of these findings are provided in Tables 10, 11 & 12 below, respectively. Of the above information providers (see Table 10 below), the majority of the respondents had used "meetings", "seminars", "workshops", and "conferences" (52 or 96.3%), followed by "personal sources" (books, files lecture notes, etc) (44 or 81.5%), "reading newspapers/agricultural bulletins/magazines" (40 or 74.1%) "informal channels" (personal or telephone contact with colleagues) (34 or 63%) , "agricultural libraries" (24 or 44.4%), "networking with colleagues in the sub-region" (22 or 40.7%), and "Internet" (13 or 24.1%). This is in line with Torrence's argument that in order for the NARI research scientists to effectively resolve farmers' constraints and information needs, they should continue to interact

closely with their peers in the sub-region and adapt the existing information and technologies to the Gambian situation. Networking with counterparts in other countries, as indicated by Munyua (2000: 13), has a lot of potential to enhance access to critical agricultural information and to improve the production levels of farmers in particular and agricultural development in general. Networking brings together researchers and extension agents to meet their peers and share professional experiences and expertise.

It is, however, interesting to note from the data presented here that, although the respondents are aware of access to electronic information via the Internet, given Gambia's connectivity in 1999, only a small proportion of the respondents (13 or 24.1%) actually accessed this important source. However, it is not surprising to see that it was only the agricultural researchers who used the Internet to retrieve current and quality information in order to keep abreast of developments in their areas of specialisation and to help resolve farmers' problems. This was perhaps due to NARI's earlier connectivity to the Internet through the West Africa Rice Development Association (WARDA) in 1997 compared with its partners in the government service. Another reason, as given by Alemna (1995: 69), is that the essential social and institutional mechanisms and infrastructural facilities are not yet sufficiently developed in the country, to foster the generation, storage, preservation, repackaging, retrieval, dissemination and utilisation of information. Although the findings of Andrew's study (1991: 34) reported the increased access to electronic data sources by the agents of change, Stoker & Cook (1996: 197) revealed that extension professionals are not always retrieving the most current information available because they do not receive the training needed to use the information technologies.

Table 10: Information providers used by extension agents and researchers

N = 54

Information providers	Extension agents (%)		Researchers (%)		Total (%)	
Meetings, seminars, workshops & conferences	33	61.1	19	35.2	52	96.3
Personal sources (books, files, lecture notes etc.)	27	50.0	17	31.5	44	81.5
Reading newspapers/agricultural bulletins/ magazines	24	42.6	16	27.8	40	74.1
Informal channels (personal or telephone contact with colleagues)	17	31.5	17	31.5	34	63.0
Agricultural libraries	10	18.5	14	25.9	24	44.4
Networking with colleagues in the sub-region	6	11.1	16	29.6	22	40.7
Internet			13	24.1	13	24.1
Indigenous knowledge & experience	3	5.6	1	1.85	4	7.4
Radio & T.V. programmes	2	3.7			2	3.7
PRA survey data	1	1.85			1	1.85
Personal experience	1	1.85			1	1.85

Like the previous studies (Aina, 1991, Mundy, 1992, Kaniki, 1989, Dulle, 1998, Ojiambo, 1995), this study revealed that Gambian agricultural researchers and extension agents also use more than two information providers to meet their information needs. In this study they used 11 providers when faced with 44 varieties of information needs. In the same vein, Kaniki (1995: 28) stated that in African countries, similar to the developed countries, there are a variety of information providers which agricultural information user populations use or which are potentially useful for meeting their information needs.

4.4.3   Frequency of use of information providers

As given in Table 11 below, the frequency of use of these information providers leaned heavily towards "often" and "sometimes". Of the 54 respondents, 49 (90.7%) "often" and "sometimes" used meetings, seminars, workshops, and conferences to meet their information needs. Concerning the use of personal sources, 40 (74.1%) reported they did that "often" and "sometimes". In respect to reading newspapers/agricultural bulletins/magazines for the same purpose, 38 (70.4%) of the respondents "often" and "sometimes" did so. As for informal channels, 27 (50%) said they had "often" and "sometimes" employed them. For agricultural libraries, 18 (33.3%) indicated that they had used them "often" and "sometimes". Regarding networking with colleagues in the sub-region for the purpose of cross fertilisation of ideas and experiences, 16 (29.6%) stated that they did so "sometimes" and "often".

Radhakrishna and Thomson (1996: 1) argued that what, when, and how information is gathered and used by extension agents or [researchers] is of critical importance in meeting the information needs of such agents and the clientele they serve. They further stated that the identification and understanding of their search and use of information sources/[providers] would go a long way in improving delivery methods for extension. Several studies have been conducted regarding information use by extension agents and researchers (Aina (1991); Kaniki (1989); Burns & Anderson (1973); Dulle (1998); and Shih & Evans 1991). Of these studies, it is apparent in Dulle's (1998: 38) and Kaniki's (1989: 132) findings that "personal sources" ranked highest, both in frequency and percentage among the agriculturists to meet their information needs. This is slightly different from the results of this study, as "professional forums" emerged as the most important sources of relevant information for the respondents. However, according to the data in Table 11 below, "personal sources" ranked the second most important information provider for the above users. But the outcome of the study by Mundy (1992: 4) is more in line with the findings of this study. For example, in that study the researcher reported that the most important sources of information for the extension personnel were research headquarters, informal discussions with colleagues and the scientific literature.

Table 11: Frequency of use of information providers by extension agents and researchers

N = 54

Information providers	Often		Sometimes		Seldom		Never	
	EA	R	EA	R	EA	R	EA	R
Meetings, seminars, workshops, & conferences	17	11	13	8	3		1	1
Personal sources (books, files, lecture notes)	22	14	2	2	3	1	7	3
Reading newspapers/agricultural bulletins/magazines	10	6	13	9	1	1	10	4
Informal channels (personal or telephone contact with colleagues)	5	2	8	12	4	3	17	3
Agricultural libraries	4	5	3	6	3	3	24	6
Networking with colleagues in the sub-region	1	1	1	13	4	2	28	4
Internet		4		6		3	34	7
Indigenous knowledge & experience			3	1			31	19
Radio & T.V. programmes			2				32	20
PRA survey data				1			34	19
Personal experience			1	1			33	19

Key:

EA = Extension agents

R = Researchers

4.4.4 Effectiveness of information providers

As different factors will affect different users' perceptions of the quality of an information provider, there can be no definitive determination of the quality level of an information provider because there are so many potential users of information of a particular information provider (Cook, 1999: 13). Kaniki (1995: 28-29) also confirmed that there are a variety of factors, which affect the use and non-use, satisfaction and dissatisfaction with information providers in meeting information needs. It can therefore be argued that one of the determining factors of the effectiveness of an information provider is somewhat reflected in the level of satisfaction experienced by the users. Thus, an understanding of the disparate information providers used by the above agents would provide the information managers a better idea of which providers are frequently used and which are potential the ones that are missed in the process by the information seekers.

While Tables 10 & 11 above present the findings on the type of "information providers" and the "frequency of their use" by the respondents. Table 12 below summarises the degree of their effectiveness to the above users in meeting their information needs and those of their clients – farmers. From the above tables (10 & 11), it can be seen that the 52 (96.3%) respondents who were reported to have used professional forums, that is, meetings, seminars and so on to meet their information needs, had all (100%) considered these sources as being "very effective" and "effective". All (100%) of the 44 (81.5%) respondents who often used their personal sources indicated that such sources were "very effective" and "effective". However, of the 40 (74.1%) respondents who often used print media such as newspapers, agricultural bulletins and so on, 36 (90%) said they were "very effective" and effective. With regard to the 34 (63%) users of the informal channels, 30 (88.2%) regarded them as "very effective" and "effective". This is followed by the 24 (44.4%) users of agricultural libraries in their quest for up-to-date and quality information. Of this number, 20 (83.3%) rated the source as "very effective" and "effective". Of those 22 (40.7%)) respondents who had used networking with peers in the sub-region as an information sharing and exchange mechanism, 21(95.5%) rated the source in question as "very

effective" and "effective". As far as access to the Internet is concerned, of the 13 (24.1%) respondents, (exclusively researchers), 11 (84.5%) were satisfied and rated the source as "very effective" and "effective".

Table 12: Effectiveness of use of information providers by extension agents and researchers

N = 54

Information providers	Very effective EA R	Effective EA R	Not effective EA R
Meetings, seminars, workshops, & conferences	18 14	14 6	
Personal sources (books, files, lecture notes	20 10	8 6	
Reading newspapers/agricultural bulletins/magazines	14 13	7 2	2 2
Informal channels (personal or telephone contact with colleagues)	2 5	11 12	2 2
Agricultural libraries	4 6	6 4	2 2
Networking with colleagues in the sub-region	3 8	4 6	1
Internet	11		2
Indigenous knowledge & experience		3 1	
Radio & T.V. programmes		2	
PRA survey data		1	
Personal experience		1 1	

Key:

EA = Extension agents

R = Researchers

Even though Table 11 indicates a high percentage of use of professional forums (96.3%) as the main sources of information for the majority of the respondents, the long interval between these brainstorming sessions, if not immediately addressed, might end up in an "information blackout" for most respondents in the short term. In that regard, personal sources, the second highest information provider (81.5%) might not be sufficient to provide ready and reliable access to quality information on a timely basis, as much of the information might be out of date, irrelevant and not applicable to farmers' needs. The most affected in that kind of scenario, as observed by the researcher, would be the extension agents because of their low level of accessibility to the Internet as opposed to their counterparts in research. Also, in spite of the fact that a good number of respondents reported to have used informal channels (including telephone contact) to update themselves on issues reflecting their work, the reality on the ground was that telephone communication between the agents of change at the village level was an exception rather than the norm. This was because, despite an impressive improvement in the provision of a nationwide telecommunication services, many villages in which the extension agents were posted, still remained without such services.

4.5 Information delivery systems or channels and their effectiveness

This section presents the discussion on the information dissemination mechanisms used as well as their effectiveness for the respondents in their quest for current and quality information to resolve both their work-related and farmers' problems.

4.5.1 Information delivery systems

The findings show that the most common dissemination mechanism employed to deliver advice or information to farmers by the respondents was "personal contact" (44 or 81.5%). This is the system or channel, which they perceived as the most reliable and credible approach to the discussions and identification of solutions to the variety of production-related problems always faced by farmers. This is, however, in contrast with the increased use of telecommunication as

the mode of delivery to farmers in the developed countries (Andrew, 1991: 34). The remaining two systems - "field days/agricultural shows" and "village meetings/ARREV" with 5 (9.2%), respectively, were not used on a regular basis, as such sessions were periodic events.

4.5.2 Effectiveness of information delivery systems

Table 13 below shows the most effective delivery system [s] used to disseminate information or advice to the farmers, as perceived or rated by the respondents. Apart from "personal contact" which again scored the highest percentage (29 or 53.7%) in Table 13, "village meetings" chosen by nine (16.7%) of the respondents, became the second "most effective" delivery system/channel used. This was followed by "agricultural demonstrations", seven (13%), "field days/agricultural shows", five (9.2%), and "radio programmes", four (7.4%). The implication of this is that since lack of a reliable means of transport was highlighted by the extension agents as critical to their work, coupled with the current extension-farmer ratio of 1: 6296, many problems of the farmers were likely to remain unresolved for a long time with the resultant negative impact on their production levels. One of the problems associated with a lack of reliable means of transport in light of the above alarming extension-farmer ratio was "poor coverage of farmers by extension agents", as highlighted by the CORAF (1998: 41) study. In a similar study by Ozowa (1997: 4), the findings referred to the extension-farmer (1: 3000) as one of the impeding factors for effective agricultural information diffusion in Nigeria.

Table 13: Most effective delivery system(s) used by extension agents and researchers

N = 54

	Most effective delivery system	Extension agent	Researcher	Total
	Personal contact	21	8	29
	During field-days/agricultural shows	1	4	5
	Village meetings/ARREV	7	2	9
	Agricultural demonstrations	2	5	7
	Radio programmes	3	1	4
Total		34	20	54

4.6 Respondents' frequency of attendance of professional meetings and consultation with farmers

This section presents the variety of professional forums attended by the respondents in an attempt to meet their information needs as well as the frequency of their consultation with farmers to provide solution or advice to farmers.

4.6.1 Frequency of attendance of professional meetings

The summary here portrays the real situation regarding professional interactions between Research and Extension for the discussion of issues of common interest, information exchange and sharing. The data revealed that although meetings between the two entities were convened, they were done on an irregular basis. For instance, a sizeable proportion of the respondents, 30 (55.5%) reported that meetings (whether planned or ad hoc) did take place but only "occasionally" or to be more precise, on an "annual" basis.

However, 18 (33.3%) intimated that planned meetings between research and extension were held either on "monthly" or "bi-monthly" basis. Of the remaining respondents, four (7.4%) revealed that the meetings were held "weekly" while two (3.7%) highlighted that they had never attended such meetings before. However, the responses of the last two respondents are not surprising, as they were both junior staff and might have been represented in such meetings by their superiors.

4.6.2 Consultation with the respondents

In spite of the difficulties faced by extension agents and researchers in terms of means of transport and costs of maintenance, the researcher wanted to ascertain if farmers were in constant contact with their technical advisors and facilitators. Respondents were therefore asked to indicate if they were consulted by farmers on various aspects of agricultural production for advice and problem resolution, and the frequency of such visits.

Table 14: Frequency of farmers' consultation with extension agents and researchers

N = 54

		Extension agents	Researchers	Total
	No contact		6	6
	Weekly	14	2	16
	Bi-weekly		1	1
	Monthly	1	3	4
	Daily	17	2	19
	Every two-three days	2		2
	Seasonally		6	6
Total		34	20	54

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As given in Table 14 above, the majority or 48 (88.9%) of the respondents indicated that they were consulted by farmers of which 34 (63%) were extension agents and 14 (25.9%) researchers. Of this figure, 19 (35.1%) were consulted on a "daily" and 16 (29.6%) "weekly", four (7.4%) "monthly", two (3.7%) "2-3 days" interval, and one (1.85%) "bi-weekly" basis. As regards last contact with farmers, 30 (55.6%) reported "1-6 days" ago, nine (16.7%) "today", five (9.2%) 'a month ago", two (3.7%) "1-2 weeks ago" and 2-3 weeks ago", respectively. Only the 6 (11.1%) respondents, who were exclusively researchers, responded in the negative (or had "no contact") with farmers. This situation could mean that, although the cost of consultation (transport and the like) was borne by the farmers, the quality of advice or information received from the respondents was worth the trouble. Therefore, the findings underpin the universally held notion that small-scale farmers in developing countries, particularly in Africa, rely heavily on the extension staff for information and advice. However, it must be borne in mind that, unless the above trend or mode of contact with extension agents by farmers is offset by a reasonable extension-farmer ratio, the frequency of the latter's visit to the former might reduce considerably in the future due to financial and a host of other related constraints.

4.7   Respondents' perceptions on T & V systems and extension-research linkages

This section deals with the respondents' perceptions of the T & V model of extension and the status of the extension-research linkages in the country. The need for a strong linkage between extension and research cannot be overemphasised as it forms the basis or common platform for better information exchange and a multidisciplinary approach to finding solutions to farmers' problems. The data on this was collected with a view to understanding the status quo and bringing it to the attention of the policy makers for redress.

4.7.1 T & V model of extension

Presentations of the findings on the existence or non-existence of the T & V system, and the status of research-extension linkage in the country are given below. As mentioned earlier in chapter 1, the introduction of the T & V system by the FAO significantly increased the effectiveness of extension by expanding farmer contacts and accelerating the adoption of improved husbandry practices in a number of developing countries. For instance, it has considerably strengthened and improved extension/research/farmer linkages in India, Kenya, and Burkina Faso (Evenson and Mwabu, 1998: 3-4) but almost failed in the Gambia. This model of extension was in fact introduced by FAO in The Gambia in 1986 (Sonko et al, 1988: 10). Following its introduction, the system introduced bimonthly workshops as the main extension-research linkage mechanism for discussions of research results, and training sessions on impact points (Sonko et al, 1988: 10-11). However, the authors lamented that not only were the researchers' attendance and participation at the above workshops sporadic, but their contributions were also minimal during the previous season.

To respond to this question, respondents were asked to indicate whether or not the T & V system was still existing in the country. The findings show that 33 (61.1%) perceived the "T & V system" to be non-existent even though less than half of the respondents believed otherwise. The rest of the respondents (four or 7.4%) reported that they had "no idea" whatsoever about the existence of the system. If the views of this last group are taken together as representing the wider opinion of the respondents, then it would mean that 37 (68.5%) believed in the non-existence of the system in the country, as its intended purpose has already been defeated by the weak linkages between research and extension. Even by looking at the issue from another perspective, considering the viewpoints of those who believed otherwise, it would still mean that the system was perhaps existing only as a "management tool", as put by one of the respondents. It appeared to be dormant due largely to lack of donor support and perhaps, to a lesser extent, commitment from all the stakeholders including the government. The findings of a recent study by CORAF (1998: 33-34) indicated that, research, extension and farmers' organisations were generally weak

in The Gambia. It was further revealed that the existing minimal linkages were dependent on internationally-funded agricultural projects like LADEP and ASP. Due to the high costs of meetings, according to the authors, projects were required to provide funds for transport and fuel for the agents to meet and discuss issues of common interest. However, the authors further argued that, given the severe limits on the availability of government funds, it would seem that if project-related funding ceased, the quality and frequency of linkages would rapidly deteriorate to the detriment of the technology generation and dissemination process (CORAF, 1998: 34).

When asked why they believed in the non-existence of the T & V system in the country, the majority of the respondents attributed this to the conclusion of the ASP project in 1999. This project, according to the respondents, provided them with all the logistical support needed for efficient field performances, effective interaction and information sharing or exchange. But with the closure of the ASP project, the monthly training and review meetings (MTRMs) became less frequent. This view apparently confirms the findings of both this study and those of CORAF.

The "almost" non-existence scenario of the T & V system in The Gambia has also been confirmed by the high percentage (43 or 79.6%) of respondents attesting to the current weakness of the extension-research linkages in the country. Only a small proportion (9 or 16.7%) said it was "strong".

The weakness between research and extension services in the country has been a long standing problem. However, attempts had been made by the GARD project to narrow linkage gap between the two, but no sooner did the project end than things started to revert to pre-project days. One of the major factors this scenario was the lack of strong financial and institutional support. Thus, the findings of this study have confirmed the views expressed by Sonko et al (1988: 8) that "the liaison between research and extension was rather weak and not institutionalised".

The most common dissemination mechanism employed by the respondents was "personal contact" (44 or 81.5%). This was the system or channel that the majority of the respondents believed to be the most reliable and credible approach for discussions and identification of solutions to the variety of production-related problems always faced by farmers. Apart from "personal contact" which again scored the highest percentage (29 or 53.7%), "village meetings" representing 9 (16.7%) of the respondents, became the second "most effective" delivery system/channel used. This was followed by "agricultural demonstrations" (6 or 11.1%), "field days/agricultural shows" (5 or 9.2%), and "radio programmes" (4 or 7.4%). The implication of this is that, since the lack of a reliable means of transport was highlighted by the extension agents as critical to their work, coupled with the current extension-farmer ratio of 1: 6296, many problems of the farmers are likely to remain unresolved for a long time with the resultant negative impact on their production levels.

The data also indicate that although meetings between research and extension were convened, they were done on an irregular basis. For instance, the respondents reported that meetings (whether planned or ad hoc) did take place but only "occasionally" or to be more precise, on an "annual" basis. However, apart from the two annual sessions (ARREV and evaluation of extension activities), it is indicated that meetings did take place between the two entities, but only on "monthly" or "bimonthly" basis. The majority of the respondents, who were all extension agents, reported to have been consulted by farmers. The frequency of most of those contacted were consulted either on a "daily", "weekly", "monthly", "two to three days" interval, and "biweekly" basis. As regards last contact with farmers, these ranged from one to six days to one month ago.

With regard to the T & V model of extension in the country, findings reveal mixed feelings/opinions of the respondents. However, the majority believed it is non-existent, because its intended purpose, that is, establishing an effective linkage between research and extension, has already been defeated by the weak linkages between the two. This situation has been confirmed by a high percentage (79.6%) of respondents attesting to the current weakness of the

extension-research linkage, which is the spill over effect of either the dormancy or non-existence of the T & V system in the country. The main cause of this state of affairs, as opined by the respondents, is the lack of adequate financial and material support accorded to both research and extension services.

In answering to research question 7, respondents' opinions/perceptions were sought on the types of structures they would like to see put in place, which would effectively address their information needs. To this effect, the findings indicate that 18 (33.3%) of the respondents would like to see "regular extension-research meetings/workshops/seminars/conferences for effective sharing of knowledge and experience", whilst 16 (29.6%) wanted the "re-institution of the Research-Extension Liaison Office (RELO) to ensure proper co-ordination of agricultural programmes and projects". In addition to the above, 12 (22.2%) respondents had suggested the "establishment of divisional agricultural libraries with online facilities for easy access to current and relevant information by all the stakeholders", whilst 7 (13%) had recommended "regular field-days for both extension and farmers in order to give the latter better opportunities to learn more from the former and incorporate this into their farming practices. However, 6 (11.1%) of the respondents would like to see a framework in place for "regular in-service training sessions for all extension workers to enhance their technical knowledge and expertise, and to develop better skills, such as analytical, problem-solving and persuasive skills". With regard to the mobility problem, 5 (9.3%) opined that, "this should be resolved by the authorities to enable extension agents to visit farmers on a regular basis". Only 2 (3.7%) suggested the "re-establishment of block demonstration plots on farmers' fields as opposed to micro-plots, which most farmers were no longer pleased with, and that "regular feedback from extension to research should be encouraged to ensure that farmers' production-related problems, which cannot be addressed by the extension staff, are given immediate attention by the researchers, respectively.

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER RESEARCH

5.1   Introduction

The main purpose of this study was to identify the work-related needs of agricultural researchers and extension staff in addressing small-scale farmer production problems, which are or can be expressed in the form of information needs. The study attempted to establish the extent to which the existing agricultural information systems and services such as radio programmes, agricultural libraries, agricultural shows, extension bulletins, research-extension bimonthly meetings, agricultural research review (ARREV) meetings, farmer field-days and others meet or do not meet these needs. It also aimed to establish the problems that inhibit the operations of these information systems and services and which information sources are perceived more significant and reliable by researchers and extension staff in meeting these needs. Specifically, the study attempted to:

* ❖ Identify the types of farmers' production-related problems which agricultural researchers and extension agents face

* ❖ Determine the problems/constraints faced by researchers and extension agents in addressing farmers' production-related problems and information needs

* ❖ Determine the information providers that agricultural researchers and extension agents use to meet their information needs and those of farmers

* ❖ Determine the effectiveness of the information providers used

* ❖ Determine the delivery systems used by researchers and extension agents to communicate solutions/advice to the identified/expressed problems to the farmers

* ❖ Determine the effectiveness of these delivery systems.

* ❖ Determine what structures, in the opinion of agricultural researchers and extension agents, should be in place to adequately address their information needs.

The following research questions were asked in a bid to serve the purpose of the study. They included:

1. What type of farmers' production-related problems do agricultural researchers and extension agents encounter?

2. What problems/constraints do researchers and extension agents face in addressing farmers' production-related information needs?

3. What are the existing agricultural information systems and services used by researchers and extension agents to meet their information needs?

4. How effective are these information providers?

5. What types of delivery system are used to communicate information or diffuse improved technologies to the farmers?

6. How effective are these delivery systems?

7. What structures should be in place to adequately address the information needs of agricultural researchers and extension agents?

5.2. Summary of findings

This section presents a summary of the findings with regard to the characteristics of the respondents and answers to the above research questions.

5.2.1 Characteristics of respondents

The findings showed that out of the 54 respondents, 63% represented extension agents while 37% were researchers. Of the respondents, 92.6% were male while only 7.4% were female. The majority of respondents (46.3%) were between the ages of 40 and 49 years. Researchers' ages ranged from 31 to 56 years, whilst those of extension agents were between 25 and 55 years. Regarding educational qualifications, researchers' ranged from diploma to PhD levels while their counterparts in extension ranged from secondary to master's levels. The data also indicated that 59.3% of respondents had more than 15 years of work experience with 35.2% of the total being in extension and 24.1% in research. With regard to means of transport, 42.6% had vehicles of which 33.3% were researchers and 5.6% were extension staff. Those with motorcycles and bicycles were all extension staff with 40.7% and 3.7%, respectively. The majority of respondents (51.8%) had their workstations at divisional headquarters of which 35.2% were extension staff and only 16.7% were researchers. All the respondents (100%) could read, write and speak English, as it is the official language. In addition to English, 16.7% could only read and write French, while 29.6% could only speak it. With the exception of one British citizen, all the respondents (98.1%) could speak more than one local language, ranging from two to four languages. Only 16.7% of respondents were attached to various agricultural projects of which 13% were from extension and 3.7% from research.

5.3   Research questions

This subsection deals or presents answers to the above research questions posed to the respondents.

Question 1

The findings established 45 cases of information needs which researchers and extension agents experience in their attempt to find solutions to farmers' production problems. The most critical ones include:

- Availability and costs of agricultural inputs;
- Better management methods;
- Marketing opportunities;
- Safety precautions at sea/river;
- Characteristics of farmers' environment (climate, soil, water and so on) and socio-economics; and
- Better farming technologies for crop improvement and post-harvest labour-saving devices.

Question 2

It is evident from the data that researchers and extension agents encounter a variety of work-related problems which impact negatively on the process of implementing their programmes. These include:

- Paucity of resources or facilities;
- Lack of reliable means of transport;
- Farmers' conservativeness towards the adoption of new technologies; and
- Poor research-extension linkage resulting in poor information flow and weak interaction.

However, with regard to feedback, only a small proportion of researchers reported it as a problem, but the majority indicated that it was not a problem to them.

Questions 3 and 4

The most important information providers, ranked for their level of use and effectiveness by the respondents, are as follows:

- Professional forums;
- Personal sources;
- Reading newspapers/agricultural bulletins/magazines;
- Informal channels;
- Agricultural libraries;
- Networking with colleagues in the sub-region; and
- Internet.

Questions 5 and 6

Similarly, the most common dissemination mechanism employed by the respondents was personal contact. This was the system or channel that the majority of the respondents believed to be the most reliable. It allowed for a credible approach to discussions and the identification of solutions to the variety of production-related problems frequently faced by farmers. Apart from personal contact, which again scored the highest percentage, village meetings, which represented a fairly large percentage of the respondents, became the second most effective delivery system/channel used. This was followed by agricultural demonstrations, field days/agricultural shows and radio programmes. The implication of this is that, since the lack of a reliable means of transport was highlighted by the extension agents as critical to their work, coupled with the current extension-farmer ratio of 1: 6296, many problems of the farmers are likely to remain unresolved for a long time with the resultant negative impact on the latter's production levels.

The data also indicate that although meetings were convened between research and extension, they were done on an irregular basis. For instance, a high percentage of the respondents reported that meetings (whether planned or ad hoc) did take place but only occasionally or to be more precise, on an annual basis. However, it is evident from the data that, apart from the annual meetings, some meetings do take place, but only on a "monthly" or "bi-monthly" basis.

The majority of the respondents, primarily the extension agents, indicated that, they were consulted by farmers. These consultations were made on a daily, 2-3 days interval, weekly, biweekly and monthly basis. As regards last contact with farmers, a large number had their last contact with farmers just 1-6 days ago, 1-2 weeks ago, 2-3 weeks ago, or a month ago.

With regard to the T & V model of extension in the country, findings reveal mixed feelings/opinions of the respondents. However, the majority believed it is non-existent, because its intended purpose, that is, establishing effective co-ordination, collaboration and communication between researchers and extension staff, are at their lowest ebb due to the weak linkage between the two entities. The prevalence of this kind of situation has been confirmed by a high percentage of respondents attesting to the current weakness of the extension-research linkage which is the spill over effect of either the dormancy or non-existence of the T & V system in the country. The main cause of this state of affairs, as opined by the respondents, is the lack of adequate financial and material support accorded to both research and extension services.

Question 7:   Respondents' recommendations

- ❑ Regular extension/research meetings/workshops/seminars/conferences for effective sharing of knowledge and experiences;
- ❑ Re-institution of the Research-Extension Liaison Office (RELO) to ensure proper co-ordination of agricultural programmes and projects;
- ❑ Regular in-service training sessions for all extension workers to enhance their technical knowledge and expertise, and to develop better skills, such as analytical, problem-solving and persuasive skills;

- Establishment of divisional agricultural libraries with online facilities for easy access to current and relevant information by all the stakeholders;

- Regular field-days for both extension and farmers in order to give the latter better opportunities to learn more from the former and incorporate this into their farming practices;

- Re-establishment of block demonstration plots as most farmers have now grown tired of seeing micro-plots on their fields;

- Mobility problem should be resolved to enable extension agents to visit farmers on a regular basis;

- Regular feedback from extension to research should be encouraged to ensure that farmers' production-related problems, which cannot be addressed by the extension staff, are given immediate by the researchers.

5.4   Conclusions

This descriptive study attempted to establish and highlight some of the major constraints generally experienced by researchers and extension staff in The Gambia as well as other developing countries in addressing farmers' production-related problems and information needs.

It is a fact that the ability of the respondents to obtain relevant information to meet their own needs and those of farmers were limited by a number of factors. For instance, acquiring information involves costs in terms of time and resources, which can limit the amount of information that an individual can obtain, especially when operating in constrained circumstances. The following conclusions, which are based on the findings of this study, are a reflection of what occurs in The Gambia regarding the efforts made by the respondents in resolving their information needs and those of farmers.

The findings indicate that agricultural researchers and extension personnel face different types of work-related problems, information seeking situations or information needs in an attempt to resolve farmers' problems and information needs. As professional forums featured prominently as

the most reliable and effective information providers for the respondents, it can be argued that a lack of appropriate information can be identified as one of their major constraints. This is why the researchers and extension staff are constantly in search of current information not only for their own needs, but also to meet the information needs of farmers. However, these needs of the respondents vary according to their demographic profile, and the results of this study are in agreement with the findings of some of the previous studies such as those by Dulle (1998), Ojiambo (1995), Aina (1991), Andrew (1991), Kaniki (1989) and Radhakrishna & Thompson (1996). For instance, the T-tests and ANOVA results of Radhakrishna and Thomson's study indicated significant differences between frequency of use of information sources and respondents' age, gender, highest education level, and primary area of programme responsibility. Another important constraint, which impacts negatively on the work of the respondents, is the lack of adequate resources and facilities that would enable them to operate efficiently and disseminate appropriate information to farmers effectively. With regard to the use of information providers, the findings reveal that the majority of respondents relied heavily on professional forums to access current and quality information relevant to their varying circumstances. However, a significant proportion also chose personal sources as their most reliable information providers. The non-use of the Internet by the extension staff, as opposed to their counterparts, the researchers, was attributed to the lack of access to such facilities in most of the institutions involved in the study, hence their heavy reliance on personal-related information providers. The low level of use of agricultural libraries was attributed to the inadequate provision of such services in the country. Furthermore, there is no policy on how agricultural libraries and information services should network to make information resources accessible to the agricultural user population in the country.

In spite of the fact that a significant proportion of the researchers reported to have received feedback from their counterparts in extension, this is far from satisfactory, given the lack of co-ordination and effective communication between the two staffs. This situation, as observed, prevails as a result of the weak linkage between the two services. Furthermore, the T & V model

of extension introduced by the FAO is currently in the doldrums, as it relies heavily on donor support without which it is unsustainable.

It should be recognised that even though research and extension services are operating as separate entities, they are designed to be part of a single system and that the mission of this system is to make relevant technologies available to farmers.

5.5   Researcher's recommendations

Based on the above conclusions, the following recommendations are made:

- ❖ A well-equipped Research-Extension Liaison Office (RELO) which includes adequate physical facilities and competent human resources should be re-instituted to carry out the following:

    - ❑ strengthen the linkages and facilitate a two-way communication between research and extension;

    - ❑ establish effective communication between headquarters and the field level staff;

    - ❑ foster and encourage co-operation with other agricultural research and extension services in other countries, particularly those in the sub-region;

    - ❑ organise regular workshops, seminars and conferences to encourage regular sharing of technical knowledge and experiences;

    - ❑ conduct regular in-service training sessions to enhance efficiency and facilitate the development of other essential skills needed in dealing with farmers' problems;

    - ❑ seek donor support through government to revive and strengthen the T & V system in the country in order to address the real needs of the farmers in an effective manner;

    - ❑ encourage the training of both research and extension staff in information literacy and use of information technology and communication facilities.

- ❖ The RELO should also have a built-in feedback mechanism/process in place to keep researchers informed of the impact of or farmers' perceptions of their technologies;

❖ The policy directives and mechanisms for implementation and adequate financial, skilled human and material resources, should guide planning and implementation of research and extension activities.

❖ To tackle the linkage problem, it is suggested that the number of Subject Matter Specialists (SMSs) should be increased to help the RELO in bridging the gap between the two institutions.

❖ There is an urgent need for the government to find funds that will take care of the recurrent costs of maintaining the linkages between research and extension services.

❖ As the paucity of resources/facilities featured prominently as the most critical factor that hampers the progress of work of the respondents, this situation calls for immediate redress by the policy makers and planners to ensure efficiency and cost-effectiveness. Thus timely availability of the right information on "what", "when", "where" and "how" to get agricultural inputs becomes critical for the change agents to be able to deliver better advice to farmers.

❖ A cost-effective means for the delivery of scientific and technical knowledge to farmers should be developed.

❖ As the number of agricultural libraries is far from adequate, government should establish a national agricultural information system (NAIS) whose function should be to:

♦ Coordinate and manage agricultural information and documentation centres throughout the country;
♦ Acquire, organise, process, store, retrieve and disseminate agricultural information nation-wide;
♦ Repackage information from local and international research findings; and

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♦ Network with agricultural information services and systems in the sub-region as well as in the developed countries.

5.6   Suggestions for further study

Further studies of a similar nature are needed so as to get a better understanding of the following:

❖ The critical times when information is most needed by researchers and extension staff

❖ To assess the impact of the information, solutions or advice provided by researchers and extension agents on farmers' socioeconomic status, such as production, income levels, standard of living and so on

❖ To assess the type, quality and effectiveness of information provided by agricultural libraries in the country

❖ To determine the literacy levels of the farmers, their eligibility for the use of agricultural libraries and in what format they prefer to receive information for use in their farming practices.

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Appendix 1

Questionnaire for Agricultural Researchers and Extension Agents in The Gambia, West Africa

(1)   DEMOGRAPHIC DATA

Please inset "X" in the appropriate spaces.

1.   Male-------?   Female-------?

2.   When were you born or how old are you? ---------------------

3.   What is the highest level of your professional and/or educational qualifications?

    ----

4.   What is your current position or job title?--

5.   Where do you currently work or where is your workplace?

(Please indicate the name of your Dept or institution or NGO or Project and where your workstation is currently situated.)

6.   How long have you been involved in research or extension work? (Please check the appropriate answer with an "X")

    Less than 1 year   [   ]
    1-5   years   [   ]
    5-10   "   [   ]
    10-15   "   [   ]
    15-20   "   [   ]
    20-25   "   [   ]
    25-30   "   [   ]
    30 and over   [   ]

7. What language/languages can you read well?

8. What language/languages can you write well?

9. What language/languages can you speak and able to understand when someone is speaking?

10. Are you currently attached to any agricultural-related project Y/N?

    If yes, (Answer Q10-Q12). If no, (Go to Q13)

    1. Name of the project--

        ----

    2. Number of months/years working with it---

11. What is the purpose of the project?--

12.   What position do you hold in this project?--

13.   When was this project established and how long will it last?-------------------------------

       ----

14.   What problems do you face in executing your duties?
       (Please place an "X" in the appropriates spaces that apply to you)

       i   lack of transport by Dept/Employer etc.   [   ]
       ii   lack of resources/facilities   [   ] Please specify-----------------

                ----

       iii   low salary   [   ]
       iv   allowances   [   ]
       iv   too many farmers to handle   [   ]
       v   too much work   [   ]
       vi   poor accommodation   [   ]
       vii   access to relevant information   [   ]
       viii   lack of motivation   [   ]
       ix   Other (please specify below)

15.   Please describe or list some of the critical or pressing problems you face in resolving or
       assisting farmer with their production-related problems?

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16.	Does the Dept/organisation you work for provide you with (official) transport to carry out your tasks?

(a) If no - (Go to Q17)

(b) If yes, please indicate the nature of the means of transport by placing a cross "X" in the appropriate spaces)

1.	Motor bike	[ ]
2.	Bicycle	[ ]
3.	Vehicle	[ ]
4.	Other (e.g. transport allowance)	[ ] Please specify----------------------------

----

17.	Are you directly consulted by farmers Y/N?-----

18.	How often do farmers consult you for assistance?

1.	Weekly	[ ]
2.	Bi-weekly	[ ]
3.	Monthly	[ ]
4.	Bi-monthly	[ ]
5.	Other (specify)	[ ]Please specify---

19.	When was the last time you were consulted by a farmer for help?

1.	1-6 days ago	[ ]
2.	1-2 weeks ago	[ ]
3.	2-3 week ago	[ ]
4.	a month ago	[ ]
5.	Other (specify)	[ ]Please specify------------------------------------

| 6. | Cannot remember | [ ] |

(2)   INFORMATION NEEDS

(Question 20 is meant for extension agents only. (Please go to Q22 if Q20 does not apply to you)

20.   As an extension agent what are the common problems brought to you by farmers for assistance? Please describe in very precise terms below.

(Please note that question 21 is meant for researchers only) (Please go to Q22 if Q21 does not apply to you)

21.   As a researcher, do you receive feedback from extension regarding the improved technologies/information you generate for farmers use Y/N?

(1)   If yes, please briefly explain.

(2)   If no, how do you ascertain that the result of your work/research has been used by farmers?

22.   What types of information do you normally need or seek in order to address farmers' production-related problems? Please list them below.

23.   What information providers do you normally use to resolve your work-related problems or those of farmers? (You may choose as many as appropriate by placing an "X" in the appropriate spaces)

1.   Personal reference sources (books, files, lecture notes etc.)   [   ]

2.	Meetings, seminars, workshops, conferences	[ ]
3.	Informal channels (personal or telephone contact with colleagues)	[ ]
4.	Agricultural libraries	[ ]
5.	Internet	[ ]
6.	Networking with colleagues in the sub-region	[ ]
7.	Reading newspapers/agricultural bulletins/magazines	[ ]

8. Other [ ] Please specify--

24. How often do you use the above information sources mentioned in Q23? (Indicate one of the following rank order: 1= seldom use; 2 = never use; 3 = sometimes use; and 4 = often use, against each of the spaces provided below.

1.	Personal reference sources (books, files, lecture notes etc.)	[ ]
2.	Meetings, seminars, workshops, conferences	[ ]
3.	Informal channels (personal or telephone contact with colleagues)	[ ]
4.	Agricultural libraries	[ ]
5.	Internet	[ ]
6.	Networking with colleagues in the sub-region	[ ]
7.	Reading newspapers/agricultural bulletins/magazines	[ ]

8. Other [ ] Please specify--

25. How effective are the above sources? (Please indicate one of the following rank order: 1 = very effective; 2 = effective and 3 = not effective against each answer.

1.	Personal reference sources (books, files, lecture notes etc.)	[ ]
2.	Meetings, seminars, workshops, conferences	[ ]
3.	Informal channels (personal or telephone contact with colleagues)	[ ]
4.	Agricultural libraries	[ ]
5.	Internet	[ ]
6.	Networking with colleagues in the sub-region	[ ]
7.	Reading newspapers/agricultural bulletins/magazines	[ ]

8. Other [ ] Please specify---

26. What method do you use to give feedback to farmers after you have found solution(s)/information to their problems?

      1. Personal contact   [ ]
      2. Telephone   [ ]
      3. During field-days/agricultural shows   [ ]
      4. Village meetings/ARREV   [ ]
      5. Agricultural demonstrations   [ ]
      6. Radio programmes   [ ]

      7. Other   [ ]Please specify--

27. In your opinion, which of the delivery systems in Q26 above is the most effective.

      (1) why?

28. How often do you attend meetings with research/extension personnel to discuss work-related problems/issues or problems facing farmers?

1 Weekly [ ]
2 Biweekly [ ]
3 Monthly [ ]
4 Bimonthly [ ]
5 Other [ ] Please specify--

29. Is the Training & Visit (T &V) system still being used in the country Y/N?

(1) If yes, please give some examples of T & V system's achievements.

(2) If no, why not?

30. What would you like to see done or put in place which will effectively address the information needs of both researchers and extension agents in the country, and who, in your opinion, should be responsible for that? (Please explain)

31. In your opinion, is the linkage between research and extension weak or strong?

   a   If strong, please give some examples contributing to that effect.

   b   If weak, why?

Once again, thank you for your invaluable time and effort.

Appendix 2

 23 January 2001

Dear Colleague,

I am conducting a study on **"The information needs of agricultural researchers and extension agents in addressing farmers' production-related problems and information needs in The Gambia"**, as part of the requirements for a master's degree in Information Studies (MIS).

As a key player of the above units of analysis, your invaluable input is being solicited for the success of the study. Thus, you are kindly requested to spare part of your precious time to answer, as carefully and fully as possible, all the pertinent questions in this questionnaire. Please rest assured that all your answers will be kept confidential and anonymous.

Thanks in advance for your time and effort in completing the questionnaire.

Yours sincerely,

Falankoi M.S. Janneh

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Appendix 3

National Agricultural Research Institute (NARI)
PMB 526, Serrekunda, The Gambia, West Africa
Tel: (220) 484928/484931 (Office) or (220) 48 49 25 (Director General)

Ref: NARI/EDU. 3/(39)   January 9, 2001

Addressees

Dear Sirs/Madames,

Re: **Request for Staff List (Research & Extension) to complete sampling frame**
for Master's in Information Studies (MIS)

Mr. Falankoi Janneh, Documentalist at the National Agricultural Research Institute (NARI), has recently returned home from the University of Natal in South Africa to conduct a field study for a Master's degree in Information Studies (MIS). His thesis will be on the information needs of agricultural researchers and extension agents in addressing Gambian farmers' production-related problems.

Mr. Janneh has identified your institution as a key player in agricultural research and extension in this country and would like to arrange a visit that would allow him to review a list of your staff together with their respective functions. The information collected will in turn be used to complete a sampling frame and to select a number of staff to complete self-administered questionnaires.

Grateful if you could identify someone within your institution that could be put at his disposal for a few days to

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Dear Sirs/Madames,

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Grateful if you could identify someone within your institution that could be put at his disposal for a few days to enable him to collect the data he would require.

Yours truly,

Dr. Samuel Bruce-Oliver
Director-General

Fax (220) 484 921 (NARI) or 484 927 (NARB-TS) E-Mail: nari@qanet.gm