ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

SCHOOL OF INFORMATION STUDIES FOR AFRICA

AGRICULTURAL INFORMATION NETWORK FOR ETHIOPIA : NEED, FUNCTIONS AND IMPLEMENTATION STRATEGY

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN INFORMATION SCIENCE

BY

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JUNE 1992

ADDIS ABABA UNIVERSITY

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The thesis is my original work and has not been presented for a degree in any other university.

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This thesis has been submitted for examination with my approval as a university advisor.

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ABSTRACT

The relevance and viability of cooperative approach by forming a network of existing information service units in the country to address commonly faced shortcomings in agricultural information provision was assessed and discussed. A review of literature on various aspects of information networking was made mainly to draw up a general framework and basic principles essential to assess viability, to determine possible and viable areas of cooperation and to establish the particular type of network required. A preliminary survey on problems, resource capability and attitude to networking on the existing information service units in Ethiopia using questionnaire supported by selected interview was conducted. The results revealed shortages in information sources, skilled personnel, and equipment and facility; and cumbersome organizational structures are widespread. Standardization and bibliographic control tools are also absent. Local publications are neglected areas. Financial resource limitations are major problems. The information services provided are limited to reading and lending services by large. All these are constraints in the improvements of the services immeditely. Staff willingness to approach the existing problems cooperatively was high.

Also surveyed with a different questionnaire were agricultural information users of the surveyed information service units so as to assess their reaction to and opinions about the available

services which the network could take into consideration as its ultimate goal. Although at present books are the most used, journals and local publications are reported to be in great demand. Literature search, photocopying, document delivery are also required. The majority are dissatisfied with their information service units because their information needs are not met. However, many seem to appreciate a cooperative approach to the services although at present many are less frequent users of other similar information units in the country.

Taking into consideration what is affordable by the existing units on the one hand and the need to address the pressing problems on the other, feasible areas for a network were identified ,namely, establishing union catalogues of holdings and list of local publications, limited interlibrary loan, training and standardization with focus on laying the ground for further wider cooperation leading towards meeting the expressed as well as generally required needs of users and to assist the services achieve better standards of service and resource base. Recommendations are made to initiate the network and make it operational.

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CHAPTER ONE

INTRODUCTION

1.1 STATEMENT OF THE PROBLEM AND JUSTIFICATIONS FOR THE STUDY

1.1.1 Information in Agricultural Development

Relevant and up-to-date information is a primary resource in any development endeavour. Particularly for socioeconomic development efforts it is vital in such areas as decision making, identifying needs and problems, determining prospects, planning, identifying and mobilizing resource, monitoring and evaluating performances. This has been universally recognized and intense efforts are being made to incorporate information support units in every development program as an essential component so as to provide information services necessary for socioeconomic development at all levels. It is, thus, widely accepted that availability and access to the right type of information (knowledge) at the right time is a prerequisite for any socioeconomic development and that success of a country's development plan is dependent on facilitating access to data and information (Haravu 1990, Boadi 1984).

Particularly, the contribution of information for achieving socioeconomic development goals of developing countries (dominated by agriculture) is far-reaching because information as a vital resource like capital, labour, etc. is found in

abundance and is relatively easily accessibly (Rajagopalan 1986). These countries, although have an underdeveloped scientific and technological base, can achieve the desired level of socioeconomic development using tested and accumulated scientific and technological knowledge (information) from elsewhere through effective information transfer, which can be facilitated by the present state of technological development, particularly information technology and cooperation of different types (Haravu 1990, Rajagopalan 1986). It has been asserted that the generators as well as the importers can equally exploit a given discovery (knowledge) as long as they view it from a development perspective (Atherton 1977). Furthermore, the application of scientific and technological knowledge which played a leading role in bringing about the socioeconomic development of the industrialized nations, has proved beyond doubt that socioeconomic development without adequate information and knowledge support can never succeed (Rajagopalan 1986).
The importance of generation of information (including agricultural) and its effective dissemination especially to the developing countries can also be gauged from the attention it is receiving from international donor and development organizations (Seiful 1986, Neelameghan 1991).

It can also be seen from the availability of a number of databases both in machine readable form and published form

commercially or for free (e.g. AGRIS) and the increasing participation of the developing countries in international agricultural information networks (80 out of the 90 least developing countries are reported to participate in AGRIS alone)(Haravu 1990).

As such the role of agricultural information to help bring about rapid and sustained agricultural development, especially in dominantly agricultural countries like Ethiopia, has long been recognized. Besides, information support is much more important for agricultural sector of such countries because in developing countries development in the agricultural sector is central to overcoming the problems of backwardness and low economic growth (Haravu 1990).

Information can be a vital resource only when its value as such is duly recognized, properly handled and intentionally used for the purpose. It is the users that give information its practical meaning and value. Its proper organization and efficient access are key factors in this respect. Efficiently managed information service units are essential to carry out effective information generation, acquisition, processing, storage and dissemination for all purposes. This also has been recognized and information service units are required as support units in development programs and projects. Their responsibility in providing timely and readily usable

information and " proper guidance to the direction of development " is expanding all over the world.

In this context, the availability and dissemination of agricultural information for the socioeconomic development of Ethiopia is of special significance, because the agricultural sector is the mainstay of the economy of the country and the major source of labour, supplier of raw materials to other economic sectors (eg. the industry), contributes to a significant proportion (about 50%) of the country's gross national product and foreign exchange earnings (Ethiopian Science and Technology Commission 1989, Ethiopia 1984). Since the extent of agricultural information requirement should be correlated to the activities, the importance of agricultural information in Ethiopia should definitely be high.

1.1.2 Ethiopian Scenario

In Ethiopia a number of research institutions, higher education establishments, development agencies and other agriculture-oriented organizations are engaged in agricultural research or development and related activities. Each institution usually focuses on specific areas and types of research or development activities according to its institutional mandate. When effectively used, agricultural information acquired and exchanged directs efforts of the

institution by keeping its researchers and development workers informed about what is being done, what has been done, what remains to be done, and what should be considered while carrying out their various activities. For these and related purposes, each institution maintains some kind of information service units geared towards meeting mainly specific information needs for effective and efficient performance of its statutory and public service functions (Ethiopian Science and Technology Commission 1987). These units obviously differ from each other in such aspects as size of collection, organization, financial support, services provided, etc.

However, they have one major feature in common: they are generally inadequate and are underdeveloped in terms of services rendered and infrastructural requirements (ECA 1988, Ethiopian Science and Technology Commission 1987, Michael 1984, Namponya 1988, Seetharaman 1988, Teferi 1988). From the various surveys and studies reported (as well as based on personal observation) the agricultural information service units of the country are characterized by the following major shortcomings.

1. The information needs of the agricultural research and development communities are not adequately met mainly because of inadequacy in terms of the variety, quality and number of documentary sources; shortage of equipment

and physical facilities required for documentation and information work; and shortage of professional and skilled personnel in almost all of the information service units of the agricultural related institutions of the country (ECA 1988, Ethiopian Science and Technology Commission 1987, Michael 1989, Michael 1984, Namponya 1988, Seetharaman 1988, Teferi 1988). The improvement they are making is very insignificant, and in most cases the trend is toward further deterioration of services and capacity to meet the information requirements of even their respective target clientele. Subscriptions to core agricultural journals and budget allocations for purchase of new books and documents are very minimal; acquisition of equipment, such as, for reprography, microform production, and computers or spare parts necessary for maintaining them (including consumable items such as photocopying and printing papers) is haphazard; and recruiting or keeping skilled personnel in the information field is proving difficult (Abebe 1991a, Namponya 1988). Thus, with a decline in the provision of the above critical components of these information service units vis-a-vis the ever-expanding and diverse needs of the agricultural research and development community, it has become apparent that the agricultural information services of the country are far behind the level expected of them.

2. It is usually difficult to know what sources of information are available, locally generated as well as of foreign origin, in a given subject area at any one time since the information location tools and ease of access to information resources in each of the information units are far from satisfactory. As a result

a) information sources found scattered within these institutions, particularly the indigenous agricultural information, are largely underutilized (ECA 1988, Ethiopian Science and Technology Commission 1987, Namponya 1988, Teferi 1988). For lack of mechanism to publicize and create awareness of the existence of locally documented agricultural information, because of poor organization of their content in a usable form or inadequate number of copies produced, or simply because of their inaccessibility, such valuable information sources are found in many cases untouched in various institutions or with individuals, while much effort and expenses are obviously incurred to find the information they contain, usually from foreign sources, when needed (Ethiopian Science and Technology Commission 1987, Namponya 1988, Teferi 1988). This has contributed to the present deficiency in agricultural information services costwise, as a result of the initial cost of

generating the information only to be left unused and as a result of the additional cost required to acquire the already available information but underutilized for lack of awareness of its existence.

b) Exchange physically of commercially acquired information source materials or information on their existence among these information service units, which for its economic and other benefits is widely practised technique worldwide, is virtually nonexistent, except for some informal and ad hoc mutual assistance (ECA 1988, Ethiopian Science and Technology Commission 1987, Teferi 1988). As witnessed in other countries, this state of limited communication has a direct bearing on the current poor level of performance of these agricultural information service units. The most important instance of the adverse effect of this state of being is acquisition of duplicate information sources which result in waste of resource, particularly of foreign exchange (ECA 1988, Ethiopian Science and Technology Commission 1987, Michael 1984, Namponya 1988). This has naturally hindered them from wisely using their scarce financial resources to acquire other equally or

even potentially more important information sources since the existing financial constraints allow to address only limited priority areas at a time. The common practice in acquisition of information sources by these units is simply to meet their individual collection requirement alone even if the same materials exist within the country and can possibly be used.

3. A low level of information generation by these information service units and absence of secondary information service and other functions such as Selective Dissemination of Information, Current Awareness Services have made the research and development community suffer from inadequate information supply for long. In this category is included the lack of secondary publications (abstracting and indexing) which are key to access to accumulated information.

1.1.3 Causes of the Problems

The root causes of these deficiencies are first financial constraint (i.e., for collection development, employment of skilled personnel, and acquisition of required equipment and other facilities such as computers); and second lack of mechanism to properly and efficiently use the available

information sources however scanty they may be (ECA 1988, Ethiopian Science and Technology Commission 1987, Michael 1989, Michael 1984, Namponya 1988, Abebe 1991a, Teferi 1988).

The economic constraint is not only in Ethiopia, but is almost a universal problem as a result of budgetary cuts or high rise in cost of library materials that outstripped that of the library budget by far. However, in the developing countries the situation is more serious and there seems little hope that the situation will change for better from the countries' poor economic performance(Haravu 1990). A fresh look for possible solutions to address particularly these main causes of the deficiencies in the Ethiopian context is required to save the deteriorating and weakened agricultural information services of the country.

1.1.4 Possible Solution

One possible solution often used in such circumstances (i.e. financial and other constraints) is the cooperative approach. In the industrialized countries, for example, the major reaction of the information service units against the increasing financial constraints caused by many factors, especially since the 70s, is cooperation and networking among these units to keep their users need met in the face of the constraint (De Gennaro 1979, Mishra 1986). According to many,

most of the problems now faced by developing countries can be best addressed through cooperation (networking) among the units (Soma Raju 1986, Haravu 1990). The basic objectives of information networking among information service units is to enhance the sharing of available information resources through facilitating access among participating members and to make rational use of scarce financial resources through cooperative planning. This also enhances utilization of hitherto inaccessible information resources using various mechanisms, and usually strengthens the capacity of the information service units of the participating institutions and hence enable them meet their users needs better. Since the ultimate goal of all information systems is to satisfy users needs, this has a strong appeal to any with problems of a similar nature.

The matching of information needs with what is available, especially in resource-poor developing countries, needs to be supplemented by acquiring the more frequently required materials (De Gennaro 1980). This again calls for cooperative activities among information service units of developing countries.

The cooperative approach for information provision has gained wider acceptance and support at all levels and there are quite a number of international, regional, and national information

networks covering a number of mainly specialized fields (Kamaruddin 1991). At a country level such cooperative networks allow for wider and systematic use of available information resources and also avoid duplication. Regional and international networks are primarily for the exchange of data and information of all types and experience in related areas of interest (Neelameghan 1991).

International and other donor agencies tend to support and promote cooperative activities, making it "the order of the day" (Haravu 1990). Therefore, the cooperative approach seems viable, especially among information service units that have similar goals and share problems and deficiencies.

The primary aim of networking being resource sharing so as to improve services, assessment of the current situation to find ways of exploiting the cooperative approach in the Ethiopian context is justified.

1.2 OBJECTIVES OF THE STUDY

The broad objective of this study is to make practical recommendations to remedy the prevailing shortcomings in the agricultural information service units of the country, particularly through a network approach such that cooperatively the units will be in a better position to meet

the information requirements of the research and development community satisfactorily.

The study has the following specific objectives:

- To determine the need for and viability of agricultural information network by assessing the nature and magnitude of the prevailing problems and shortcomings in the agricultural information service units of the country.

- To assess the attitude of the various agricultural information service units to participate in a cooperative scheme for mutual benefit.

- To make a preliminary survey of the resource base and infrastructure of the various agricultural information service units in the country, so as to determine the nature of their respective participation in the network and what particular form it should take.

- To determine the structure (configuration), areas of emphasis, and function of the network appropriate to overcome the problems identified and to strengthen the agricultural information service units of the country under the existing situation.

1.3 SIGNIFICANCE OF THE STUDY

The importance of the study and the contributions it can make arise from the fact that it addresses one of the important issues related to agriculture, which has a strong national bearing. As said earlier, agriculture is the backbone of the Ethiopian economy. Since the significance of information services in helping to bring about the desired development in agriculture is high, such a study aimed at finding solutions to the major problems of the services will contribute to the overall goals of agricultural development.

The study also seeks feasible and practical ways and means of strengthening and better utilization of the existing information service units in agricultural-related institutes through coordination of what is available and enhance cooperative efforts towards achieving similar goals. Considering the importance of timely and accurate information provision for agricultural development of a country, any effort to strengthen the agricultural information activity is of real importance in realizing the development plan targets.

The study will also update the information on the current status of agricultural libraries and documentation centres and brings into focus in a comprehensive manner the major problems for positive action by concerned authorities. The report of

the study will include a documented source on users evaluation of the services provided to them, and potential and actual capacities of the agricultural information service units. (The latest survey on libraries in general in Ethiopia was reported in 1987).

1.4 SCOPE AND LIMITATIONS OF THE STUDY

The scope of this study is confined to a preliminary assessment of the status of agricultural information service units and user evaluation of these for the purpose of determining relevance and viability of networking of information service units in the Ethiopian context. A plan of action to develop the network, if networking in any of its feasible forms is found appropriate and necessary under the present Ethiopian conditions, will be suggested.

For this purpose the study covered all agricultural national institutions with any level of engagement in agricultural activities in the country and that maintain functional agricultural information service units. The type of institutions included are agricultural research institutes (2), agricultural development ministries/agencies (3), agricultural higher learning establishments (6) and other agricultural-oriented institutions (3).

NGOs, private organizations, and international organizations are not included in the study on the grounds that such organizations would have different characteristics (in terms of objectives and present status of service capacity) and that they cannot be expected to commit as individual members directly in a national cooperative scheme, although they definitely have a role to play . Other important factors for excluding these organizations include the fact that the involvement of many of these organizations in the agricultural research and development activities is minimal and is on a short-term project level. Moreover, information service units to be considered as nodes in the study are absent in NGOs and privately owned organizations. However, the International Livestock Centre for Africa, which has well-developed information services and which is committed to strengthening any national effort to develop such coordinated and other schemes, is considered as having a special role that is discussed in the final chapter of this study, although not included in the survey.

1.5 METHODOLOGY

1.5.1 Data Collection

In this study the survey method employing questionnaires and interviews has been used to collect the primary data on the

current status of agricultural information service units in the country as seen both from the users stand point and by the personnel of the information service units.

The collection of a large amount of data economically, as required in this study, is more amenable to survey method; at the same time the method can accommodate situation description and sampling to make generalization without losing the level of accuracy (Busha 1980). The questionnaire method is appropriate especially with educated respondents (the user population being college graduates) and if properly designed it allows for frank responses without constraints.

Interviews with the librarians as to their willingness and commitment to cooperative activities for realization of a network of information service units and on other issues was conducted to supplement the data gathered through questionnaire, to clarify some of the questions, and to overcome some of the limitations of the questionnaire method.

Personal site visits were made to the information service units of identified institutions to observe their actual and potential service capacity and physical facilities, to supplement the data gathered through the questionnaire.

Secondary sources of data were also used to gather information on aspects of the institutes and their services which were not adequately covered by the questionnaires and the interviews or where evaluation of services from existing records was appropriate. These sources included information on agricultural information user categories in the country, problems identified, users needs and other background information used in the study.

Literature was reviewed to assess the existing principles and practices in information networking to develop a framework of activities and evaluate the Ethiopian situation in that light.

The preliminary assessment on the prevailing situation is warranted because adequate knowledge of the current status of agricultural information service units of Ethiopia was necessary to determine such factors as to whether there is the need for cooperative arrangement, and if so, to identify what areas and what components should be addressed on priority basis, etc. (Parker 1979, Wilcox 1981).

Two types of questionnaires (one for information users and the other for personnel of the target information service units) were used.

1.5.2 Population

Two types of population groups are considered in the study.

Information User Population : The information user population to assess users' attitude to the present status of information service units as well as network approach is the staff of agricultural-related institutions,i.e., national agricultural research institutions, agricultural development agencies, agricultural higher learning institutions, and other related institutions. These are currently engaged in agricultural related activities and generate agricultural data and information and are also users of information service units available in the respective institutions.

Further demarcation of user group was based on educational background such as holders of a diploma and above in agricultural fields, with the exception of planners and information workers who may require educational qualifications and experience in fields other than agriculture. The population was, thus, composed of researchers, teachers, planners and executives, and graduate students, which make up the core agricultural information users in Ethiopia (Michael 1984). This delineation of information users is appropriate (a) as it is not possible to cover all of the agricultural information users within the time and financial resource

available for this study; (b) they can better understand the questions and respond properly and; and (c) these groups form the major user population and tend to be involved in agricultural activities that depend on efficient information services. Selected staff of the following agricultural institutions were surveyed :

Table 1. List of institutions of staff surveyed

Agricultural high education institutes

- Ambo Junior College of Agriculture
- Awasa Junior College of Agriculture
- Debre Zeit Faculity of Veterinary Medicine
- Jima Junior College of Agriculture
- Wondo Genet College of Forestry [1]
- Alemaya University of Agriculture [2]

Research Institutions

- Institutes of Agricultural Research
- Plant Genetics Resource Centre
- Forestry Research Centre [2]
- Plant Protection Research Centre

Development Agencies

- Ministry of Agriculture Main office library and documentation centre
- Plant Protection and Regulator Dept. [2]
- Ministry of Coffee and Tea Development
- Ministry of State Farm Development

Other Related

Office of the National Committee for Central Planning

Relief and Rehabilitation Commission

[1] From the Alemaya University of Agriculture only graduate students were accessible and covered because of security problems.

[2] These institutions although are under the Ministry of Agriculture, because of their status and role within the Ministry (i.e, as main department for research as their mandate) and the fact they maintain autonomous information service units of their own like an individual establishment, they are also treated here separately.

Since the Higher Education regulation requires that all lecturers in agricultural colleges commit 25% their time to research, the lecturers are considered as researchers as well here.

Institutions: The second group of population considered in this study is the agricultural information service units units where the agricultural information users are served. From each institution only main libraries or documentation centres usually found at the headquarters were surveyed. Thus, the

information service units considered are of the institutes and establishments listed Table 1, except the Alemaya College of Agriculture, and the Plant Protection Research Centre (both for security problems) and the Office of the National Committee for Central Planning (for the library is not exclusively agricultural although planners work there). The library and documentation centre of the Ministry of Agriculture, both at the headquarters, are surveyed separately for they are treated so by the Ministry.

1.5.3 The Sample

Time and financial constraints necessitated sampling. For this survey 150 user samples were considered. A purposive sampling approach was adopted to gather the required data precisely and exclusively from actual users of information service units. Random sampling, for example, may pick up staff who are not users or who are not around during the survey.

Thus, 150 questionnaires were distributed to each identified national institution with the number of questionnaires varying proportionately to the number of users who meet the criteria. An arbitrary grouping interval of number of users was used: for 0-50, 5; 51-100, 10; and 101-150, 15; 151-200, 20; 201-250, 25; and above 250, 30 share of questionnaires. The questionnaires were distributed to users within each

institution, with the assistance of the libraries or agricultural departments so as to make sure that all types of targeted users were included. With regard to the institution population, all the agricultural information service units identified (as being national agricultural institutes with agricultural information service units) were approached, except the Alemaya University of Agriculture, the Plant Protection Research Centre and the Office of National Committee for Central Planning. The total number of information service units surveyed were 14 but all are main libraries/documentation centres. In the case of the Ministry of Agriculture three units were surveyed as indicated in earlier.

1.5.4 Data Analysis

Out of the 150 questionnaires distributed, 122 were returned within the time limit specified. The responses of the structured questions were computed for frequency distribution. The open-ended questions were also summarized. The responses on similar aspects were categorized and tabulated with respect to the required variables to assess the various aspects of the status and potential of the agricultural information service units of the country. Some questions were not answered by all respondent, making the total number of responses vary from question to question.

1.6 ORGANIZATION OF THE PAPER

The second chapter of this paper presents a brief background of the role of agriculture in the life of the Ethiopian people and in the country's economic development. In this section the role of information and required infrastructure for its provision in supporting the desired socioeconomic development are emphasized.

The third chapter reviews literature on the various aspects of information networking relevant to this paper.

Survey results on users as well as on information service units are presented and discussed in the chapter 4, identifying what is required and what is available to base the proposed agricultural information network.

The fifth chapter summarizes the major points and conclusions of the thesis and puts forward recommendations for the establishment of an agricultural information network for Ethiopia and suggests guiding principles for its operations.

1.7 DEFINITION OF TERMS

Information service units: referred in this report are libraries, documentation centres and publication units as well as information centres.

Information service: includes all the services that the information service units provide, whether the traditional library services or the modern information services.

Information network: A system integrating institutions - libraries, documentations centres, information centres, analysis centres - into a coordinated whole, to provide a community of users with relevant input data, irrespective of its origin, format or physical location. An information network can be subject- or mission oriented (Vilentchuk 1975).

CHAPTER TWO

IMPORTANCE OF AGRICULTURE IN ETHIOPIA

2.1 AGRICULTURE IN THE NATIONAL ECONOMY OF ETHIOPIA

2.1.1 Early Accounts

Agriculture is the foundation of the Ethiopian economy. This has always been true from as early as the country's recorded history. It has been indicated that the country could be even one of the places of early beginnings of agriculture. Some trace back the introduction of agriculture into Ethiopia as early as 3000 BC (Murdock 1959), while many still maintain it was around 1000 BC (Hewes 1975, Sheilla 1971).

Ethiopia has a diverse landscape and climate. The total area of the country is 122 million hectare, 65% of which is agricultural land. Its population is estimated at 55 million, with an annual average growth of 2.9%. At this rate of growth the population is estimated to reach 58.1 million by the year 1995 and 95 million by 2015. The majority of the population (87%) is rural based where agriculture is the dominant occupation.

The livestock resource of the country, believed to be the largest in Africa, also is an important part the agriculture of the country which serves as major source of draft power and

other animal products such as milk, meat, hides and skins. The country's soil and water resources have high potential, so is the fish production, which all are indicated to be not exploited fully.

Although agriculture is the dominant economic sector, only about 9% of the agricultural land is used annually for agricultural production. And, the agricultural production and productivity levels of the country are very low, due to various reasons. Natural and man-made calamities, such as soil degradation and high rate of fertile soil loss by soil erosion (about 1 billion tons of soil annually), deforestation (200,000 hectare annually), and recurring drought, are the major causes (Seme and Sentayehu, unpublished).

All the same, agriculture is deep-rooted into the life of the country by all account; and as a primary occupation of the people the country's development and survival has depended on it since from time immemorial (FAO 1961, Asefa and Eshetu 1969, Pankhurst 1957, and Westphal 1975).

In the elaborate and well-documented accounts of early travellers and missionaries, the importance given to agriculture is noted, especially after the 14th century. In these reports the cultivation of many of the present crops and existence of well-established agricultural traditions are

indicated (Crawford 1958, Westphal 1975). These accounts also indicate that the yield of the crops, the natural fertility of the soil, the variety of crops and the farms' extensiveness were much admired by Europeans and believed to be superior by all measures in all of Tropical Africa (Wylde 1901, Westphal 1975, and Poncet as cited by Pankhurst 1961). Improved agricultural practices such as irrigation, terrace farming, and use of plant residue and soil burning to improve soil fertility at these earlier times were also remarked on by some of these writers (Pankhurst 1964, Wylde 1901, Westphal 1975). It is also widely known in the scientific world that Ethiopia was a centre of origin or/and centre of diversity of a number of crop types (Vavilov 1951, Westphal 1975, Hewes 1975). In brief, agriculture has been the basis of the well being of the Ethiopian people by providing the major part of the national gross product and export goods and by employing the majority of labour force, the rural population.

2.1.2 The Decline in Productivity

Despite its good old beginnings, high potential and its being the people's tradition, concerns about the country's agricultural backwardness and growing problems as revealed in its low productivity and stagnation started to ring loud both by natives and foreign writers alike since the beginning of the 20th century. Since it is the basis of the country's

economy, the effects of its unsatisfactoriness was deeply paralysing as two Ethiopian economist expressed it : "the low rate of the economic growth [of Ethiopia] in past years is mainly due to lag in agricultural production" (Asefa and Eshetu 1969, p 19). The deficiencies of the agricultural sector became more acute as time passed, and in recent times the country is no more able to support itself in food supply and generate agricultural raw materials for the expanding industries in the country. Because the growth of agricultural production became much slower than the population growth, the country could not withstand the shock of the slightest environmental disasters and misfortunes with its poor subsistence agricultural base.

However hard the country may try to address the agricultural problems of the country on priority basis, especially since the seventies, food crises and mass hunger that hold the attention of much of the world lingered on, and the agricultural productivity of land and labour of the country have become one of the lowest in the world (Seme and Sentayehu unpublished; Ethiopia 1984). High degradation of the natural resources of the country due mainly to soil erosion, deforestation, and over cultivation, especially in the northern part of the country, is spreading at an alarming rate endangering the country's principal natural resource potential

for growth and well being (Ethiopia 1984, Seme and Sentayehu unpublished, Pankhurst 1961, FAO 1967).

2.1.3 Development Plans

Agriculture is still the backbone of the economy of the country as much as before with all its shortcomings and decline. The present figures indicate that (Ethiopia 1984, Dieci and Viezzoli 1992)

- More than 85% the labour force of the population is concentrated in agriculture and related activities
- About 90% the country's export is agricultural products, making it the major foreign exchange earner
- More than 50% of the country's gross domestic product is from the agricultural sector

In addition, the majority of the country's industries depend for raw materials on the agricultural products.

In the last three of the national development plans, including the current Ten Year Perspective Plan ending in 1995, the role of agriculture and its productivity are given top most priority. Agriculture is accorded the priority in all three phases of the plan notwithstanding the differences in ideologies that prevailed in the country during these periods. In the current plan, the importance of agriculture and the

great hope that the country puts on it for the overall development of the country is specified as follows: " Since agriculture provides employment to a large segment of the population and plays a major role in generating the financial surpluses, especially in foreign exchange, needed for financing the country's long-term industrialization programme, the broad development priorities, as laid down in the National Democratic Revolution Programme, are the development of agriculture 'as the foundation of the country's economy' ...". And also one of the major strategies to meet the target of this current Ten-Year Perspective Plan is stated to be " achieve self-sufficiency in food grains and to increase export earnings from coffee and other agricultural commodities." (Ethiopia 1984, p. 20).

The importance of the provision of agriculture information for the success of the agriculture development endeavour, which in turn can change the development direction of the country is also acknowledged in this plan (Ethiopia 1984, p.53).

Thus, the country's socioeconomic development and in turn the life of the people is much tied with agricultural progress that all development efforts of the country put major emphasis on it appropriately, as can be seen in the country's major development strategies, i.e., educational and research drives discussed in the succeeding sections.

2.2 AGRICULTURAL RESEARCH IN ETHIOPIA

2.2.1 Early Developments

Recognizing its high potential to bring about the desired socioeconomic development in the country and the need to modernize it as a precondition to support development in the other sectors as well, research in agriculture began much earlier than in the other sectors. In fact it is still the leading sector in research activities. Although the Italians in occupation were reported to have been conducting agricultural experiments during 1936-1940 and experimental plots for demonstration purposes were definitely attached with the first agricultural secondary school at Ambo even before the Italians, formal and real agricultural research started at Jima Agricultural Technical School in 1952, established as a result of an agreement between the Ethiopian and the United States governments to cooperate in agricultural fields (FAO 1961, Pankhurst 1957c, Addis Ababa University 1982). Following this, other research stations and observational plots with similar objectives were established in different parts of the country, including in Addis Ababa, Shashemene, Ambo and Holetta (FAO 1961, Pankhurst 1957a).

2.2.2 Imperial College of Agriculture and Mechanical Arts

In 1956, the Central Agricultural Research Station at Debre Zeit was opened with a plan for developing it to a national centre under the then Imperial College of Agriculture and Mechanical Arts (which was not officially inaugurated until 1957). The following year, when the college became fully operational in its own campus, it also established a number of experimental plots in its vicinity. The College also assumed responsibility for coordinating research activities as well as the extension services from its premises at Alemaya and its research centre at Debre Zeit (Tenasse 1985). The College's undertakings were among the first organized to true standards of research in the country (FAO 1961, FAO 1967).

2.2.3 Institute of Agricultural Research

The growing need for stronger and wider research support led to the establishment of a national research centre, the Institute of Agricultural Research, by the Ministry of Agricultural in 1966. With its headquarters in Addis Ababa, the new institute was mandated to coordinate agricultural research in the country, to carry out research in relevant disciplines, and to formulate national agricultural research policies (International Service for National Agricultural Research 1987).

A better organized and coordinated agricultural research effort started to take shape ever since. From the mid-seventies through the eighties, intensive research efforts were undertaken mainly by the Institute of Agricultural Research. This was also equally effected by the expansion of the agricultural higher education system resulting from raising the status of the agricultural technical schools and the agricultural college, by opening new junior colleges of agricultural, and by the emergence of a number national establishments charged with agricultural research and development.

Presently a number of research institutions, higher learning institutes, and development ministries with their research and advisory wings are engaged in agricultural research. The institutions engaged in agricultural research are the Institute of Agricultural Research, Plant Genetics Research Centre/Ethiopia, the Plant Protection Research Centre (under Ethiopian Science and Technology Commission), the Ministry of Agriculture (including under it three major research wings), Ministry of State Farm Development, Ministry of Coffee and Tea Development and the higher learning agricultural institutions, namely, the Alemaya University of Agriculture, Awasa College of Agriculture, Jima Junior College of Agriculture, Ambo Junior College of Agriculture, Wondo Genet College of Forestry, Debre Zeit Faculty of Veterinary Medicine.

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The major research areas included are crops, livestock, forestry, soil and water management, agricultural economics, agricultural engineering, fishery and food science. Each year about 400-500 new research proposals are approved by the Institute of Agricultural Research alone, making it a total of 2000-2500 research programs being carried out each year (IAR Research Directory 1987-1991, personal communication).

As of the present, a number of improved crop varieties (about 44) and agricultural practices (number unknown) have been approved for release by the National Variety Release Committee, a national committee for variety release, and by individual establishments as for the recommended practices such as fertilizer rate (National Variety Release Committee, unpublished data).

Although its capacity to address the country's problem has a long way to go, the country's major effort to bring about development in the country can be seen to depend on the agricultural research activities to a large extent.

2.3 AGRICULTURAL EDUCATION

2.3.1 Early Phase

One of the major responsibilities vested in the Ministry of Agriculture on its establishment in 1943 as an independent

ministry and which continued to be so for some time later, was the organization of the agricultural education of the country (FAO 1961, FAO 1967).

The first agricultural school to be opened in Ethiopia was the Ambo Agricultural Secondary School in 1933 (closed during 1935-41, and reopened some time in 1943) which started to give courses in agriculture at a secondary school level (Anonymous 1957, FAO 1961, FAO 1967). However, a well organized, according to many, and advanced agricultural education was initiated with the opening of the Jima Agricultural Technical School, also at a secondary school level in 1952 (Pankhurst 1957c, FAO 1961, FAO 1967).

The following year (1953), the then Imperial College of Agriculture and Mechanical Arts was established to offer four years of tertiary level agricultural education (although not in its full capacity and in its own campus). About this time agricultural training on a limited scale was being offered by other institutions as well, the main one being the Teachers Training School in Harar that started giving courses on modern agriculture, extension services, and teaching agriculture in 1954 and the Debre Zeit Agricultural Station that gave short training in extension services.

The educational training and the research and extension supports that these early educational establishments gave were the basis of the development of modern agriculture in Ethiopia.

2.3.2 Progress since the Seventies

Since the mid-seventies, the educational system of the country witnessed a marked boost, with major emphasis on agricultural education. In addition to raising the agricultural technical schools to junior college level (1978) and the agricultural college to an independent university level (1985), a number of new agricultural institutes of tertiary level education were opened in Awasa (1976), Asmara (?), Wondo Genet under the Ministry of Agriculture (1978), Debre Zeit (1978) and Arba Minch under the Water Resources Development Commission (1986), taking into consideration the growing demands for trained work force for the development of the country's agriculture (Higher Education Main Department 1991; Addis Ababa University 1982). The Alemaya University of Agriculture now offers courses on a number of agricultural disciplines at a diploma, bachelor, and masters degrees level. Although the need for adequately trained workforce has not yet been met, the country has now a larger number of agricultural higher educational institutes, with one of the highest number of enrolment and graduates of the regular Ethiopian college students, close to

20% and 25% of the total number respectively (Higher Education Main Department 1991). These schools not only produce trained manpower, but also contribute significantly to research and extension efforts of the country, since the teaching staff is also required to spend some time on research and have important research centres under them (Seme and Sentayehu unpublished, Addis Ababa University 1982).

Thus, education at various levels in agriculture were among the first important measures considered to enhance the country's agricultural capacity. This has continued with the recognition of the importance of agriculture for the country's development.

2.4 AGRICULTURAL EXTENSION

Research results have little developmental value unless communicated to the end users. Therefore, extension services in Ethiopia is reported to have started some two years later (1954) after the research activities commenced (FAO 1961). (this excludes any such efforts by the Italians during the occupation). Formal trainings in extension were also started, including one at the Teachers Training School at Harar in 1954 and short duration training abroad (since 1957) (FAO 1961, FAO 1967).

The present extension activity to transfer agricultural technologies (agricultural information and practices) to the farming community is carried out by the three development ministries, i.e, the Ministry of Agriculture, the Ministry of State Farm Development, and the Ministry of Coffee and Tea Development, each to its own defined target group.

The Ministry of Agriculture covers peasant associations and peasant cooperatives of all areas that are not within the major coffee-growing regions at regional and woreda levels. The Ministry follows a training and visit (T&V) extension system in some areas (in high-potential areas) and regular extension system in others (in low-potential areas) according to the strategy, under Peasant Association Development Project.

The Ministry of Coffee and Tea Development covers peasant associations and peasant cooperatives in the major coffee-growing areas of the country, where it supplies improved inputs and advisory services. The Ministry of State Farm Development, attends to the state farms through one of its agricultural development corporations.

The agricultural technologies from the research establishments are made available to the extension workers through extension bulletins and other publications, training by subject matter

specialists, seminars and workshops, advisory services, and pre-extension demonstrations. There is also a Research Extension Liaison Committee composed of staff of the Ministry of Agriculture, the Institute of Agricultural Research, Alemaya University of Agriculture, Awasa College of Agriculture, and the Plant Protection Research Centre as found appropriate at zonal level that coordinates research extension needs in each zone. The Institute of Agricultural Research and the two agricultural colleges also have Research-Extension Coordination units that conduct the pre-extension demonstrations to the agents and do other extension workers (Seme and Sentayehu, unpublished).

2.5 AGRICULTURAL INFORMATION SERVICES

2.5.1 The Beginnings and Development

Information on exact beginning of agricultural information service units, composed of libraries and documentation centres as a major points of collecting, organizing and disseminating agricultural information sources of printed as well as non-printed items and services to agricultural and related information users, is lacking. However, by scrutinizing the beginnings of institutions that usually support such units, it may be possible to trace the early emergence of agricultural information services in Ethiopia.

The earliest institution that appear to have maintained an agricultural library was the Ambo Agricultural School established first in 1933.[Before this the only libraries recorded to exist in the country were a public library started in 1930 and a vaguely known school library at Teferi Mekonen School opened in 1925 (Kebreab 1973, Pankhurst 1978)]. However, there is no indication of the availability of a library facility or services at Ambo. Such a facility is mentioned in connection to this school only after the school was reorganized in 1954 with the assistance of the Government of Federal German Republic (FAO 1961, FAO 1967, Anonymous 1957).

The next institution with the possibility of supporting an agricultural library was the Ministry of Agriculture. Here as well no adequate information is available on the library facility or any other information services unit, except the fact that on its establishment Agricultural Information was one of the three special divisions of the Ministry (FAO 1961). No information as to whether this division was in fact established or not is available. But in both cases there was a high possibility that such units existed.

The first mention of an agricultural library relates to a sort of public agricultural library reported to have been established in Addis Ababa immediately after the end of the

Ethio-Italian war (Pankhurst 1957a). Except for a passing remark on its existence and major objective, no further information on its structure, function, affiliation, etc. is available.

When Jima Agricultural Technical School was opened in 1952, a librarian, named Marcia G. Turner, was among the expatriates (Pankhurst 1957c). Although nothing much is said about the facility and its services, it is very likely that with a librarian available, an actual library was organized in that school.

The country saw a well-organized and managed agricultural library with the starting of the then Imperial College of Agriculture and Mechanical Arts on its own premises at Alemaya in 1957 (FAO 1961). This was credited with a librarian, and quite a good collection and services. The College was the first to have a purposely built modern library facility in the country later in 1959 (Danton 1962).

Thus, it can safely be said that agricultural information services began in the fifties with the establishment of agricultural educational establishment; and developed gradually side by side with the educational establishments.

Since its establishment, the Institute of Agricultural Research has maintained libraries (at Holetta since 1966), which have grown tremendously, especially in the past few years in collection, facilities, and services.

With the emergence of a number of agricultural research, higher education institutions, and development ministries since the mid-seventies, a marked growth in the number of libraries and information services has been observed.

At present, although not to the required level, all agricultural higher education establishments, research institutes and development ministries maintain a library unit at least at their headquarters. Usually these units are small undertakings organized primarily to suit the needs of the parent organization alone. Some of them are already showing improvements and have embarked on providing modern agricultural information services (computer based) irrespective of the general grim situation (Abebe 1991a)

2.5.2 Agricultural Information Generating Institutions (National)

Agricultural information generated by the national institutes examined here is the indigenous agricultural information,

produced and distributed or accumulated by these institutions and which is not commercially available.

All agricultural research and higher learning institutions and development ministries generate agricultural information, although it is not possible to estimate exactly the quantity, types and form of publications. The majority of these publications are memeographic and are usually for limited circulation (Ethiopian Science and Technology Commission 1987), or in many cases no circulation at all. Standardized form for the publications are not followed and describing similar publications as different are not uncommon. Their editorial standard is also very low, because proper techniques and management of scientific publications are not widely adopted (Abebe 1991b).

In addition to the agricultural establishments discussed above, other institutions are also engaged in producing agricultural information for various purposes. These include the National Committee for Central Planning, Central Statistical Office, the National Meteotological Services Agency and commercial institutions such as the Ethiopian Seed Corporation and financial institutions such as the National Bank of Ethiopia. Agricultural professional bodies also are to be cited here as involved in producing agricultural information.

Although it is difficult to categorize them as such, mainly because of lack of standard format, the major types of agricultural publications produced in the country are research reports, progress reports, working documents, extension bulletins, directories, bibliographies, proceedings of conference and workshops, newsletters, and annual reports (Abebe 1991b). Usually agricultural information is produced in report form (textual) and some in numeric data form, especially by the Central Statistical Office.

It is also reported that these indigenous publications form 20%-40% of the citations of the scientific publications produced in the country, and in recent times the trend is increasing (Abebe 1991a). Among these institutions, the Institute of Agricultural Research currently produces a majority of the publications.

The biannual journal, the *Ethiopian Journal of Agricultural Sciences*, is jointly sponsored by the Institute of Agricultural Research, Alemaya University of Agriculture, Addis Ababa University, since 1979 .

2.5.3 Users of Agricultural Information

There has been no comprehensive agricultural information user study conducted in Ethiopia. From information gathered within

the country and literature survey, a fair picture may, however, be re-constructed.

We may start with Metcalfe's (1984) list of agricultural information users that holds true to all developed and developing countries alike. However, as a result of the country's low level of development and the current agricultural development direction (socialist oriented) some of the user groups mentioned in the list are not found in Ethiopia. In one such report specific to Ethiopia a brief list of the following agricultural information users are presented: " ... policy and planning decision makers, the State Council; Ministry of Planing, Foreign and Domestic Trade; educational, research, and development institutions (researchers, extension agents, farmers, trainers, students, etc.); sources of financial support (international funding organizations, etc.); sources of science, technological and business information; regional and international agricultural systems; the private sector; and the nongovernmental organizations (NGOs)(Abebe 1991a). Rather a summarized list of agricultural information users in the country is also discussed by another writer which consisted of only "decision makers and planners, researchers, extension workers, educators and students, and farmers and pastoralist" (Michael 1984). In this report also is discussed the needs of each identified group in brief.

Since information supported by explicit user study is not available, the above can be taken as an acceptable list of agricultural information users in the country.

CHAPTER 3

INFORMATION NETWORKS: LITERATURE REVIEW

3.1 THE NEED FOR INFORMATION NETWORKS

In much of the literature on networking, four major concerns are discussed as the major driving factors that call for information networking. These four major factors are presented as pointing to the general constraints on information service units to meet their primary objective of providing timely, precise and comprehensive information services to their customers.

The first factor, and in fact the primary according to many, is the growth of recorded knowledge at a rate that libraries and information centres can no more keep pace with (roughly 60 million pages annually in more than 60 languages, doubling every 7-10 years) (Mishra 1986, De Gennaro 1979, Bhargava 1986). This situation, known as "information explosion", has left the channels through which documentary and other sources of information reach end users far behind and led to the emergence of many other media and strategies to record, organize and distribute the ever-increasing information sources (information brokers, clearing houses, information analysis centres, etc.) (Sewell 1981). The growth continues at an exponential rate (Mishra 1986, De Gennaro 1979) and it was

expected to reach 12-14 millions of items per year with a total stock of 120-150 millions by early 1990s (Bhargava 1986).

The diminishing library budget that started in almost all libraries and information centres throughout the world, especially since the beginning of the seventies is the other factor that widens the gap between what is available and necessary and what is acquired (Barakatullah 1991). This handicapped many of the libraries and the information centres and made it difficult even to continue to survive as the impact of other factors that use up the remaining little financial resource widened (eg. rising costs and change in user needs). Development of collections, expansion of services, and exploring new technologies and techniques in information provision area increasingly became difficult while the demand for these grew at a rapid pace.

The cost of published materials, through which most of information is made available, that kept rising at a rate that even the relatively better endowed centres could not cope with is another factor contributing to the general incapability of the present information service units (Boadi 1984). In the majority of the libraries it is reported that the highest proportion of the budget is used for the purchase of documentary sources (Soma Raju 1986). Because of the rising

cost of learned materials, cancellation of subscriptions to periodicals and curtailing book purchases have become a common practice all over.

The fourth contributing factor is the ever-changing and expanding information need of users (Soma Raju 1986) in the face of the libraries and information centre's growing incapability to meet even the minimum requirement of timely and comprehensive information. Besides, users also demand the information to be made available in the shortest time possible and in digested form exactly to suit their convenience. As the information explosion grows, users dependence on libraries and information centres to relieve them from the difficult and time-consuming task of locating relevant materials on time also increased. Obviously these demands of users could not be ignored until such time the situation improved because the basic functions of libraries and information centres is meeting such expressed users' needs satisfactorily.

The gap between what is being offered by the libraries and information centres and what is required by their users keeps widening as a result of these and other developments. Information in one library or information centre or country or even region has become inadequate and call for all means and types of cooperation, including international cooperation (Boadi 1984).

Thus, it is now widely recognized and accepted that no library (country or region for that matter) is able to acquire all relevant documentary and other information sources as required and to provide all desired services by itself (Rajagopalan 1986, Boadi 1984, De Gennaro 1987a, Barakatullah 1991, Kent 1974, as cited by Soma Raju 1986, Neelameghan 1980). It may even seem that there is growth in the general collection of these units, in relation to the growth of user demand and what is available in information market the growth became insignificant (De Gennaro 1975). This directed the concentration of the development efforts of information service units towards "access and services instead of size and collection" since the early seventies in many countries(De Gennaro 1975).

Thus, as a result of these pressing problems and further need to enhance utilization of the available of information sources, cooperation has become a necessity (De Gennaro 1979).

Cooperative approach among information service units took different forms, such as, library cooperation, resource sharing, and networking (Jordan 1979), but all with the basic objective of increasing the availability of information sources and services to users irrespective of the constraints and the problems plaguing libraries and other information

service units (Barakatullah 1991, De Gennaro 1987a, Kent 1974 as cited by Soma Raju 1986, Creech 1982).

Cooperative approach has become significant at national, regional, and international levels. At the national level the cooperative approach (networking) in information is stated to be mainly to exploit maximally the country's information resources to meet the national information requirements by bringing together information sources and services within the country as well as outside of it (Creech 1982, Boadi 1984).

The cooperative approach has broader implications to developing countries where the financial and other constraints are more pronounced and mechanisms to fully utilize existing information resources are lacking. In these countries, the governments do not often recognize the value of information for socioeconomic development on a par with other resources and, therefore, information infrastructure development programmes do not receive adequate support. As a result, efforts of the libraries and information centres and their services may be minimal to have made any significant impact on the activities of decision makers, planners and development executives (Neelameghan 1991, Haravu 1990).

Increasingly cooperation among countries of a region or those belonging to a regional/alliance is seen as a possible means

of sharing information resources, expertise, etc. especially where common areas of interest and concern are identical (Neelameghan 1991).

In summary, because these countries lack many of the major requirements for efficient information services, such as adequate financial resources, skilled personnel, and other supporting elements such as standardization, bibliographic control, information marketing capability, etc., cooperation is perceived as an appropriate approach to meet the challenges.

At the international level, making knowledge universal and enabling developing countries have improved access to accumulated knowledge, especially in science and technology to hasten socioeconomic development, are central to the achievement of objectives of international organizations concerned with development (Seiful 1989). Here again cooperative networking of information systems is seen, and experiences confirm, as an effective approach.

There are also other potential advantages that call for networking of information systems and service units like the ones listed by Akhtar (1990) and others, namely, " better utilization of existing scarce resources, capacity to reach greater number of users, and greater economy and efficiency of

operation." He also indicates other activities that networking are aimed at: "improve exchange of information and communication between researchers or specialists in a given area; compile and disseminate information produced in a particular region on a given area of knowledge; provide integrated information for different economic sectors, and create a wider base of information for poorly defined sectors."

Thus, mainly in response to the challenging problems of information provision and to increasing user demands, cooperative approach (networking) which has "appeals because of its potential for greatly improving services and reduce costs", has become "the order of the day".

3.2 AIMS AND OBJECTIVES (OVERVIEW)

Besides addressing many of the problems that libraries and information centres face today, networking also has other aims and objectives either envisaged or as experienced by those who have already participated in one. Review of selected literature in this connection shows various facets as found in different context, in addition to the commonly expressed ones as a general framework, i.e., increasing the total resource available to users within the existing constraints and shortcomings.

From the early voices on the importance and aims of cooperative approach to information provision, the following is stated by Richardson: (cited by De Gennaro 1979)

> *...direct encouragement of scientific research, a very large national economy in removing unnecessary duplication of purchases, and an improvement of existing libraries by removing the strain of competition and of effort to cover the whole ground.*

The same article enumerates the advantages of entering cooperative schemes aimed at, among the common ones, as follows: " ... enable individual libraries to be more selective in acquisitions, enable local libraries to increase duplication of high demand materials, limit space and processing costs to important and demand materials."

Creech (1982) also includes the following among the principal objectives of a network, although specifically refers to it as between public and academic libraries.

- meeting increasing expectations of users in an information sophisticated society.
- identifying all resources among libraries for intelligent referral.
- improving document delivery to the users.

- expanding the number of services to the users.
- instructing the users in efficient library use.

As a result of entering a cooperative arrangement with such objectives, Creech envisages the following gains to accrue to the libraries, in addition to "minimizing the rising cost without sacrificing users satisfaction."

- provision of communication lines among libraries;
- confrontation of universal problems affecting libraries, such as standards of services;
- long range planning for development of libraries as information resources and information packagers; and
- provision of political and ideological base for libraries in the community.

Soma Raju (1986) states that information networking (resource sharing) arrangement would enable libraries to achieve the highest function by providing required information - current, accurate, etc.

Rajagopalan (1986) also puts the aim of information networking narrowly as "... to provide access to information available in documents located in various types of institutions and also to provide hard copies whenever needed."

To Pride *et. al* (1983) networking at a national level is to promote "... cost effective use of resource sharing agreements" while making accessible the total body of information in the country, with emphasis on cooperation in technical processing, cooperative acquisition, union list production, and interlibrary loan.

According to Akhtar (1990) networking is "one effective way of exchanging, transferring and delivering" information which will result in, among other things, " better utilization of existing scarce resources, a larger base of knowledge available to serve local needs, ... and greater economy and efficiency of operations".

De Gennaro (1975) also noted that information networking "...would extend resource base of all libraries by permitting them to be more selective and to extend their resources on materials which are of particular interest in the local environment." He also indicates that network participation " consolidates their [libraries] technological capabilities" and "improve their dissemination tools."

S.S. Murthy and V.K. Rangra (1986) also view information networking as an organizational set up that "regulates information flow among various constituents of the system."

According to Kent (1974, as cited by Soma Raju 1986) the purpose of information networking (resource sharing) is "...to make the greatest amount of best information available to the most users at the most reasonable cost possible."

Pond and Burlingame (1984) use cooperation in library context as essentially "...to work together for a common objective or to unite in producing a desired effect."

Specifically in the context of agriculture, Thomas (1989) presents us the goals and objectives of an agricultural information network (unfortunately in the context of an advanced and rich country - the USA, although the same principle could hold true elsewhere) as "...fostering and advancing access to agricultural information through cooperation of agricultural librarians and information specialists," basically " to assist all potential users in accessing and utilizing agriculturally-related information, through the provision of comprehensive, effective, and efficient library and information services, and useful information products, while minimizing wasteful duplication of effort and resources."

The purpose of the review of these statements is to show how information networking (cooperation or resource sharing) is viewed and presented. And also it is to show for what purposes

(although related in one way or another) the concept is applied according to the specific emphasis each attaches to it or to the different requirements and benefits it is used for. However, some of these could be somewhat exaggerated and/or narrowly specified.

3.3 FORMAL DEFINITIONS OF THE NETWORK CONCEPT

There are also a number of formal definitions of information networking, emphasizing particular aspects while not diverging from the basic underlying principles of the concept. The emphasis, it seems, is based on what is particularly required of the network to achieve or its environment, such as, in the current trend of use of the concept where it almost means computer information networking. All the same, in general the following basic concepts of information networking are emphasized: for exchange of data and information, for sharing of information resources, and for promoting cooperation generally, as the following definitions reveal.

Exchange of data and information emphasized:

According to Kamaruddin (1991) Information networking is defined as:

a network is coming together of institutions or individuals with common interest for mutual benefit with possibility of regular communication and exchange of information to further the progress of their objectives.

In this framework, closer work to achieve the common interest of "resource sharing among participants as a dynamic support for their development effort" and where access to and input of information are effectively carried out are reflected.

In De Gennaro's (1987) definition computer is the central focus where computer-based information structuring, storage, and processing and access and exchange of it using telecommunication systems are the main features.

In a regional context Neelameghan (1991) used a definition of information networks as "... any arrangement for facilitating access to and exchange or sharing information and data and for providing mutual assistance".

Another definition, by Barakatullah (1991), presents information networking as an establishment to effect communication of ideas and experience among institutions working in the same area, which also indicates "cohesiveness, efficiency and equitable sharing of resources and information are essential elements."

Sharing of resource emphasized:

According to Soma Raju's (1986) definition of only resource sharing, (but which encompasses a wide range of activities of networking arrangement) "... a sharing of library resources by participating libraries among themselves on the basis of the principles of cooperation," is pinpointed as a major activity as well.

Akhtar (1990) summarizes and defines information networking to "consist of independently administered units which have formed operational links either for the purpose of maximizing resources or improving the efficiency of their internal procedure." He also puts computer-based networks as "interconnected collection of autonomous computers...capable of exchanging information through any transmission medium including copper wire, fibre optics, lasers, microwaves and satellites."

General cooperation emphasized:

In Mishra's (1986) definition of information networks, relationships of all kind at all levels are emphasized: " ... the concept [networking] implies connectedness, cooperation, and other types of relationships at different levels, be it individuals, a group or institutions." He also emphasizes

that resource sharing is a central objective of networking by presenting it as "...a need-based concept founded on sound principle of give and take policy" among the participants.

Although not put in the form of a definition, Global Information Network (GIN) of the United Nations is presented as constituting three links: the national information systems and services and information systems and services at the regional, and the international levels (Seiful 1986).

In Atherton's (1977) definition, the focus is expanded to include "interconnecting information systems and services as well as library operations" to improve services and reduce costs.

The Unesco-UNISIST definition also puts information networks as "a system integrating institutions" (Valentchuk 1975).

All these definitions of information networks also reveal the core importance given to user's satisfaction in the present day information provision activities and the need for collective effort at institutional, national, regional, and international levels.

3.4 HISTORICAL PERSPECTIVES

Cooperative existence or network of related entities for common goal are innate to human society. Information networks as they mean a network for information exchange and sharing have been taking place in various forms without being formally labelled as such in meetings, conferences, seminars, publications, etc. (Mishra 1986).

It is also argued that the information provision activity always functions in a network mode where "information stores and service points" serving as nodes, linked by whatever communication channel that always exists to keep the exchange and flow among them (Meadow 1986).

It is reported that the term network as meaning a "cooperative activity between individuals or institutions" dates back to 1560 (Akhtar 1990). However, in its present meaning of the coming together of individuals or institutions or countries voluntarily for the purpose of sharing of information and information resources to achieve a common goal of serving users and improvement in services can be said a recent development (Akhtar 1990).

The more practical existence of cooperative activity in this line is reported to be in the form of union catalogues and interlibrary loans since the late 19th or the early 20th century (Atherton 1977, Sewell 1981).

In the United States, one of the earliest places where the concept is believed to have taken shape in its current meaning, resource sharing is said to have started "at the beginning of American Librarianship in 1876." According to De Gennaro (1979) "the idea of interlibrary loan was first proposed by Samuel S. Green of Worcester in 1876, and that of national lending library by Ernest C. Richardson in 1899." It was then, in 1876, that the American Library Association was founded, pressed much by the need for cooperative work and standardization for better service. Informally, an agricultural information network among the Land Grant Universities libraries is reported to have existed from as early as 1900 in the US (Thomas 1989).

In Great Britain, expressed urges for cooperation among libraries is evident since the early 20th century, although it is believed that similar needs that led to the establishment of the American Library Association in the US was also felt in Britain even earlier. According to Jefferson (1977), in response to the need, a short-lived exchange of printed catalogues and books among some public libraries was reported

in 1907. The effort for centralized library that started in 1913 at an official meeting resulted in the creation of Central Library for Students in 1916. These developments contributed to the creation of ASLIB in 1924, and National Central Library in 1930 and many more regional cooperative ventures.

After World War II, when the growth of scholarly publishing became too much for any one library to acquire all of them, two major developments, according to De Gennaro, started to take shape, namely, development of organizational arrangements, intended to share existing resources as well as costs among libraries and use of new technologies to reproduce publications in suitable form to overcome the prevailing constraint (De Gennaro 1979).

In the late 1960s and early 1970s, the higher growth of recorded knowledge was coupled by rising cost of publications and declining of financial resources in support of libraries, which made it impossible even for the best endowed library to be self-sufficient in its collections and services to meet its clients requirements. This created a universal consensus that more effective mechanism be developed that would allow for adequate access to available information resources and guarantee the comprehensive acquisition of new materials, within the limited financial capability. This made resource

sharing through information networking of various types and at different levels to be a predominant concern of the development of information provision activities and centre of discussion at various forums ever since.

The application of computers and telecommunication systems opened the door for more and extensive cooperation among libraries, mainly for holdings' location and transmission of information and data online, since the early 70s (De Gennaro 1979). This enhanced and gave resource sharing through networking a larger dimension where it means simultaneous joint use of computer facilities where fast and virtually oneness is felt and almost all required information being available as it were at the finger tip are achieved (Haravu 1990).

However, although it would appear that the current development of information networks is based on computer and telecommunication systems, basically it could still be totally manual or semi-computerized as situations allow (Neelameghan 1991).

3.5 POSSIBLE AREAS OF COOPERATION

Theoretically it seems possible to initiate cooperative arrangements in any area of endeavour, provided that there is

a felt need for it by all participants. However, there are also factors which could affect the outcome and operationality of the cooperative scheme. Selecting, primarily, achievable areas of cooperation (or objectives) makes cooperation possible and successful (Boadi 1984, Pond and Burlingame 1984). The viability of cooperation and timeliness of a given area, therefore, should be a basis. The feasibility factors include economic feasibility, geographical, philosophical (view), technical, legal, operational, etc. and/or a combination of these. A group, for example, cannot agree to promote resource sharing while there is practically nothing to be shared or when geographically (distance) impossible or legally not allowed. The area selected for cooperation could be a new one, that is, not already existing, providing it would benefit the participants (eg. cooperative storage). Thus, selection of an appropriate area in terms of its feasibility and being worthwhile to all participants is the critical initial consideration for it determines, among other factors, the viability of the whole scheme.

In the literature, a number of cooperative activity areas in an information network environment are discussed. The basic areas covered are "acquisition, processing, storage, and use" of documentary sources (Boadi 1984). Within this general framework of area for joint activities, a number of authors discuss specifics.

Since the various existing network activities take only particular aspects or a modified form of them as appropriate for each situation, one cannot find an exhaustive list of all possible areas of cooperation or find a consistent description of even of identical activities. The commonly discussed areas of cooperation and which are adopted by this paper are cooperative acquisition, processing, storage, and resource sharing and these are discussed below.

3.5.1 Cooperative Acquisition: basically takes place in the form of joint purchase of required documentary sources or collection specialization, where participants are assigned the responsibility of collecting materials in specific subject area or type of documentary source. Central purchase where one member of the cooperating group or centrally designated body conducts the ordering and acquisition of all the participants is also one form of cooperative acquisition practised.

Basic requirement in cooperative acquisition is substantial funding from "reliable and on regular basis" for each participant either to make direct contributions in the joint purchase or to fulfil responsibility of building collections and services in assigned speciality area. Skilled personnel to develop and operate mechanisms to ensure exhaustive coverage and to perform other responsibilities are also required (Harrison 1979, Newa 1979).

Major purposes include comprehensive national coverage, to avoid wasteful multiplication of information sources, and rational use financial resources in a national scope (Loveday 1979, Rydings 1979).

3.5.2 Cooperative Processing : covers wide range of technical processing activities such as ordering, accessioning, cataloguing, (with catalog cards prepared), classification, subject analysis (Broome 1979). Some also included others in the list of activities for cooperative processing, such as, preparation of bibliographies, holding lists, production of indexes and abstracts (Soltani 1979, Bowden 1979).

Major purposes include fostering standardized technical processing and making available the professional librarians' time for other purposes, which would have been wasted in technical processing in each library through duplication of effort.

Basic requirements are separately maintained highly professional staff, facilities and funding.

3.5.3 Cooperative Storage: where central or selected housings are used to keep common collections, jointly owned or used, or collection of less used and back issues, for various reasons.

The major purpose is to overcome space problems, usually if the collection exceeds the available space. For purpose of facilitating easy usage of frequently used and useful materials, those less wanted or duplicates may be removed to central locations.

Required are storage facility and other resources required for its operation.

3.5.4 Resource Sharing: Although resource sharing is treated as encompassing networking (Bowden 1979, Jordan 1979), it is taken here to mean the sharing of existing information resources by the participants of a network or through formal cooperation (Rydings 1979). It is indicated that 70-80% self-sufficiency is ideal for a library to enter into meaningful resource sharing (Line 1979, Rydings 1979). And also in developing countries resource sharing has been indicated to be approached cautiously because in such resource-poor countries sharing of the limited resources could have adverse effect and led to nowhere (Parker 1979).

In such cooperative agreement information source materials, equipments and facilities, and professional staff may be shared for mutual benefit among the participants, and the availability of these is a prerequisite. Other requirements include a minimum level of infrastructural development among

the participants, since it "depends on the strengths of the existing collection" and "the capability to keep it enriched." (Rydings 1979, De Gennaro 1979, Line 1979, Harrison 1979).

The major purposes of resource sharing include access to others to supplement one's capability, to reduce duplication of acquisitions of identical materials, and to promote rational utilization of the existing resources (Harrison 1979, Line 1979)

These constitute the major areas of cooperation or activities of an information network of information service units for the purpose of this discussion. As indicated earlier, this review is intended to show that each area of cooperation has particular relevance to different network requirements.

3.6 GENERAL REQUIREMENTS FOR ESTABLISHMENT OF AN INFORMATION NETWORK

Different conditions need to exist prior to establishment and operation of any meaningful information network. Although most may be too obvious or applicable to only specific situations, the basic ones believed essential by many are discussed here to give proper dimension of what are required on the part of the participants or what situations have to be met first.

3.6.1 Need for Cooperation

The essential element for establishment of a successful network is the need for cooperation and the recognition of it by potential participants (Boadi 1984, Pond and Burlingame 1984). This factor determines the willingness and commitment of the participants to a large extent. Where there is no commonly felt and recognized problem in need of solution, it would be difficult to clearly define objectives which will be instrumental to bind participants towards achieving it (Pond and Burlingame 1984). The cost and time and other resources needed to be committed will have no grounds and justification for the participants to sacrifice.

3.6.2 Funding

Although the main driving force for cooperation is to reduce financial constraints, networking has its own costs to be borne by the participants. Many argue the critical importance of financial resource for the network to establish, because a substantial amount of money is required to initiate as to operate (Rydings 1979, Boadi 1984, Yocklunn 1979, Newa 1979). In most information networking among institutions (national context) each is expected to cover its own expenses (e.g. for interlibrary loan and photocopying) related to its own use of the network services and to share costs of joint activities

(e.g. in training) (De Gennaro 1980). Although some are government funded, most such networks are established on willing institutions, usually with a leading role by one relatively well positioned, implying sharing of all responsibility (Rydings 1979, De Gennaro 1980).

Most regional networks have donor financial support, usually at the initial phases (Neelameghan 1991, Akhtar 1990). But as in the case of institutions, member countries participate in sharing the operational costs, each covering its own share.

At an international level the networks are donor supported by the UN and other international bodies (AGRIS, DEVSIS, GIN).

In all these cases, however, the ultimate goal is to make the networks self-supporting financially, and this is to show that without these financial inputs none would have existed.

3.6.3 Skilled Personnel

Capable workforce to support the network with technical skill needed to establish and execute its activities at the required level is another critical precondition (Yocklunn 1979, Boadi 1984). To develop standards and procedures, to give managerial and professional guidance, and to conduct supervisory and educational (training) service, experienced and committed

workforce is a prerequisite (Boadi 1984).

3.6.4 Infrastructure and Technology

Physical facilities, equipment, and communication systems are needed to meet the networks minimum infrastructural requirements, either separately housed or at one of the participating member institution. For computer-based information network especially, adequate availability of computer facilities (both hardware and software aspects) with all the participants and a level of development of computer technology and related areas, such as in telecommunications, is required. Well trained personnel in the computer and related fields in adequate number is also critical.

Information sources also form part of the required essentials.

At this point it would be of interest to just mention broadly summarized requirements that should be met for reaching cooperative objectives by Pond and Burlingame (1984):

- Coordination of beliefs, attitude and actions
- A correct understanding of the cooperative situation
- Selection of objectives that are desirable and obtainable
- Development and implementation of an appropriate method, procedure, or course of action that is instrumental toward reaching the selected cooperative objective.

All the requirements discussed in this section are too important to be ignored if successful information network is to be established.

3.7 INHERENT LIMITATIONS

It is to be noted that establishing an information network is not an easy matter. Besides the actual challenge it initially aims to overcome (whatever problem is to be tackled as an objective), other pitfalls, usually inevitable, are bound to occur that add to seriousness of the commitment. Two basic groups of commonly occurring pitfalls or obstacles are discussed here.

The first type occurs from wrong expectations that participants attach in participating in a network arrangement. For some, networking (or cooperative participation) is taken as a panacea for all library problems. As a result they expect the benefit overnight or they believe their problems are solved once and for all once they participate in a network. This usually ends up with further frustrations for there is no such effect from network participation, as De Gennaro (1980) succinctly points out:

By itself the network creates no new resources. It merely facilitates, the sharing of existing resources, but we must husband those existing resources and increase them in the future.... Resource sharing will permit us to do more with less by pooling our resources, but only if we all keep the pool replenished.

In general it is indicated that the effects of networking are rather long-term, although there are also shorter term effects (Haravu 1990, Sewell 1981). Experience show that it takes quite sometime before an agreement is implemented, let alone to experience the end results in a short time (Rydings 1979).

Participants need to be well prepared for what to expect and weigh the prices to be paid against whatever is to be gained. Even for experienced and motivated participants, it takes unqualified effort and resource commitment for full realization of successful information networks.

Another instance of wrong expectations is rather a self-centred interest exhibited by some in that all they want is only to gain but not to share what they have. Such attitudes are not uncommon where reluctancy is observed under one pretext or another when reciprocal returns are due, while on the other hand using the full benefits of being a member of a given network (Soma Raju 1986).

The other type of rather inherent obstacles in a network environment encompasses all technical difficulties that pop up as a result of unavoidable factors. The common ones are as follows.

Some find it difficult to fulfil their commitments to a resource sharing agreement because they find themselves in the end net lenders, which also consumes much of their other resource (staff time, etc.). Under certain circumstances this may be unavoidable if one or two participants are relatively better off in terms of resources. While this is rather a difficult situation, the same problems are faced by the larger and better libraries among the participants because most of the participants find it convenient to make their requests directly where it will be met with high probability, without being aware of overburdening them (De Gennaro 1980, Mishra 1986, Moody 1982). It is also reported that those with small collections also equally find themselves in a difficult position to freely share whatever little resource they have, even though they find participation mostly to their benefit.

Loss of autonomy is also another common difficult aspect of a network environment (Creech 1982, De Gennaro 1987b). Although it is accepted that network commitments should be in line with that of the parent organization, committed participants are increasingly forced to think and plan their own library

activities in relation to their network obligation to the point of being dictated by it. For example, in subject specialization in collection development, participants' collection would be more of what the network requires them to be. Mechanisms to decrease any possible conflict between institute's interest and network obligations has to be developed.

Other undesirable factors commonly encountered include uncooperative librarians or parent organizations that would not take a firm stand and show inconsistencies; disparity in level of development among participants, which usually pushes away the better ones which see no benefits from cooperation; distance (communications barriers); inconsistency in capability of even the willing participants that will be reflected in performing network obligations and duties (e.g. funding); and possible rivalries among participant institutions (Boadi 1984, Creech 1982, De Gennaro 1987a, Rydings 1979, Parker 1979).

3.8 TYPES OF NETWORKS

Various types of networks with distinct features and objectives exist. Network type implies the description of the structural design or configuration that each network adopts in general. In any network configuration it is the position

(status and role) that each participant assumes (as a node or a focal point) and how each participant is interconnected (pattern of communication or flow of information) that is discussed (Sison 1990). Within this possible links fall communications among participants directly or indirectly through intermediaries or stepwise. Links among networks of independently functioning and other specialized centres are also possible interconnections (Sison 1990, Atherton 1977).

There seems to be no hard and fast criteria that could readily be used for selecting a given type of network configuration in all situations. The determining factor generally, however, is the particular need that binds participants and which usually lends itself best to one type or another, for approaching the identified problem (Sison 1990, Harrison 1979). Other factors involved in determining the adoption of a given structure include the distribution of the available resources and the relative strengths of participants (to assume central leadership or distributed responsibilities, for example) and the communication facility and proximity of participants (for hierarchical or direct communication).

Three basic types of networks are known (Rajagopalan 1986, Akhtar 1990, Sison 1990, Atherton 1979, Lee 1979).

3.8.1 Centralized Network (directed or star network as it also referred to commonly): is a type of network that follows a centralized structure where the major portion of the resources and the processing activities are concentrated at one participant of the network as a focal point for the other members (nodes) to contribute to and access from it. The focal point usually assumes the coordination responsibility as well. Individual members communicate for their official business through the focal point, as they will need the central unit as intermediary to facilitate interaction.

Such a network type is commonly adopted when one member has substantially better resources enough for the others to share or when the participants are in favour of building a centralized resource for all to access on an equal basis.

In a computer-based network, participants in such type share a central computer facility that acts as a switching centre for communication and access to resources and other purposes.

3.8.2 Decentralized Network (distributed or non-directed as it is sometimes called): is a type of network structure where resources and major activities are distributed among the participating members, with no specified focal point. This could be adopted as a result of participants capability to make near-equal contribution in resource and services to the

network, usually with different resources to complement one another. Or as a result of agreement that each participant take different responsibility of facilitating specified type of services or sources for network members. Individual members are directly interconnected with each other, without the necessity of an intermediary.

3.8.3 Hierarchical Network: is a type where network members are organized in a hierarchical mode such that requests and communications are contained primarily within specified limited circle, each unmet requirements being passed over to the next higher level. The levels of the hierarchy could be based on size of the participants or on geographical location and boundary.

In addition, a variety of these three basic types of networks exist. These include a centralized-decentralized type where input of the network system are from the decentralized members while the coordination and processing being carried out at a central point, and the output distributed back to the decentralized members. (Most of the international voluntary cooperative networks are of this type, e.g. AGRIS)

Composite network type, where two or more independent networks cooperate with each other, could follow one of the basic types discussed above.

Governance of networks of any kind is varying, although literature on this particular aspect was difficult to acquire during the preparation of this thesis. However, the most common experience, from what is available, is that in many of the cases a coordinating body usually composed of representatives of participating units govern the activities. Common functions of these bodies include development of policies and procedures, formulation of common standards within a network, conduct training, supporting public relations through publications, assigning responsibilities, supervising financial and other funding matters, and executing administrative and managerial tasks.

Functions of networks also are as different as their objectives, although common traits might be identified.

3.9 THE ROLE OF INFORMATION TECHNOLOGY

As a result of technological developments the recording and dissemination of human knowledge has increased at a high rate, especially since the World War II (De Gennaro 1979, Bhargava 1986). At the heart of these developments is information technology. With widespread application of computers, information activities saw a revolution of major consequence since the early 1960s in some of the industrialized countries. Now it has become increasingly easy to achieve speedy and

accurate processing, storage and retrieval of large amount and varieties of data and information. With the merging of telecommunications technology and computer technology, the distance barrier has been overcome for communication, and access to virtually unlimited amount of data and information from all parts of the world a reality. Efficient and high capacity storage media that require minimum space but can contain large amounts of data in different forms (textual, numeric, graphic, picture and sound) are now available at economical and affordable costs. Thus, information technology provides high capacity and efficient means for processing, storing, accessing and timely dissemination of reliable and quality data and information.

In the network environment, information technology plays a prominent role. Access to remote sources of data (data bases) online, allowing powerful search and creating a network of users from all parts of the world, has become possible thanks to information technology. Because of the possibility of connecting individual computers, direct transmission of information online within an office environment has become a simple matter (LAN and WAN applications). Location of holdings is effectively controlled through the use of computerized union catalogues and lists. Interlibrary loan is reported to be carried out efficiently and cost effectively with direct transmission of textual data and "information on information"

on line among participants (De Gennaro 1979). The trend of the publishing industry is also towards more use of computerized medium, increasing the role of information technology rapidly (computerized journal are now making their way to even developing countries like Ethiopia and CD-ROM as a publishing medium is common in many parts of the world (Haravu 1990, De Gennaro 1987a).

A sophisticated computer knowledge is no more a critical prerequisite to exploit and interact with the universe of knowledge even by nontechnical users because of the developments and use of friendly and powerful softwares (Haravu 1990).

In general the effectiveness and efficiency of networking activities are highly supported and improved with proper applications of information technology.

However, information technology is capital intensive and requires the availability of a whole range of related technological developments for its full utilization by any country (Haravu 1990). In most of the developing countries most of the related technologies (reliable telecommunications systems, trained work force and in general technological bases for computer advancement) and the required capital, usually in foreign currency for it involves importation of equipments,

are largely lacking (De Gennaro 1979, De Gennaro 1987a). This drastically discourages any attempt for full utilization of information technology by these countries. Thus, until such time that these infrastructural developments are achieved the high potential and promise that networking using information technology may remain unattainable in developing countries.

CHAPTER FOUR

FINDINGS OF THE SURVEY AND DISCUSSION OF THE CURRENT STATUS OF AGRICULTURAL INFORMATION SERVICES IN ETHIOPIA

INTRODUCTION

As a prerequisite for the planning and development of an information network, users' characteristics and information requirements and existing services and capabilities were surveyed such that the gap between what is provided and what is required could be identified. As indicated in chapter 1 the major objectives of the survey are

- To determine the need for and viability of agricultural information network by assessing the nature and magnitude of the prevailing problems and shortcomings in the agricultural information services of the country.

- To assess the attitude of the various agricultural information service units to participate in a cooperative scheme for mutual benefit.

- To make a preliminary survey of the resource base and infrastructure of the various agricultural information service units in the country, so as to determine the nature of their respective participation in the network and what particular form it should take.

Questionnaire survey and interviews were undertaken on agricultural information service units and their users in the country. The particular factors emphasized in the questionnaires and the interviews were those considered relevant to the pre-network development assessment. Although the survey was not exhaustive, as some of the factors could be more widely and more comprehensively covered in another context, the findings provided sufficient indicators for the purpose of this work, namely, what is lacking according to users and what is available (potential and actual). Related questions from the questionnaire and the interviews are grouped to assess each factor as applicable. The collected data were computed and the following are the major findings.

4.1 AGRICULTURAL INFORMATION USERS

4.1.1 Use Pattern of Agricultural Information Services

The major information sources used at the present are books (45%), followed by journals (41%) according to the 112 users who responded on this topic. Among the least used information sources are local publications (less than 10%) (Table 2, attached at the end of this chapter). A large number of users of books also indicated that their second major favourite were journals (probably seeking journals cited in the books). Primary and frequent use of books was high with instructors/researchers of agricultural colleges,

probably resulting from their frequent use of them for reference in their teaching.

Library and information services more frequently used by all users are reading and lending services, closely followed by reference service and query service. Current awareness service in its different forms such as new additions and current contents is also used by a fair proportion of users. The least known and used services are document delivery and photocopying (extracts) services.

More than 55% of the 119 respondents indicated to be moderate users of their respective information service units (as opposed to rarely or frequently). A few indicated that they rarely used the service units (10%) while quite a substantial portion, about 34%, said that they were frequent users (at least once a day) (Table 3). Of the same number of respondents, 12% indicated that they mostly found what they wanted from their libraries, 30% rarely, and 58% sometimes (Table 4).

Further, only 4% of the 120 respondents indicated that they frequently used libraries of other similar institutions. The majority indicated that they were either rare visitors (31%) or not at all (29%). A similar number of users also indicated that they sometimes visited other information service units (about 36%) (Table 5). The primary reason for infrequent use of other units appears to be lack of

convenient transport to the relatively distant centres (64%). The second major reason in this connection is the lack of awareness of what information sources are available (27%) and the services provided in other institutions/units (Table 6). It was also indicated that inconvenience of the opening hours, i.e., all are open during working hours of their own institution, except in the colleges, was another commonly cited factor. Whether it is the need for access to more information sources and services or the convenience of use that some users are visiting others units more frequently is not clear.

Regarding what they would prefer (if given the chance) from the available information sources and services in one of the agricultural information service units, journals (28%) followed by other documentary sources containing local agricultural information (26%) came on top among 92 who responded to this particular question, (local publications being deemed as useful as journals). Among the services, literature search (32%) mainly on external databases and other sources and photocopy services (30%) were the first two top preferences, among the same respondents. Since choices upto three were possible, the number choices by respondents taken together was more than the total number of respondents (Tables 7a and 7b).

4.1.2 Local Publications

The use and importance of local publications, which include research reports, conference and workshops proceedings, survey reports, consultancy reports, government publications, etc. is as follows.

About 52% of 120 respondents indicated that they were informed of local publications only in relation to their areas of interest (apparently due more to their own efforts rather than due to easy access to the publications), while a small number (4%) reported that they were well informed (Table 8). Less than 10% indicated they were not even informed of such publications in their area of interest. Over 80% of the 117 respondents indicated that they had problems in actually getting local publications for use, which could indicate that even those reporting as being informed meant they only knew about the existence of the publications, which reduces drastically their effective utilization level. About 79% of the 117 respondents indicated the importance of these indigenous publications as very important to their work, while the remaining (21%) believed that they were not so crucial (Table 9).

Access to such publications (as well as to other works of compatriots in other institutions) is indicated to be through informal means by 118 respondents (58%), usually personal contacts and to a limited extent in formal ways

(through publications of national conferences and other meetings (about 37%)(Table 10).

4.1.3 Limiting Factors and Users Evaluation of the Services

The large majority of the 118 respondents indicated that their information service units were inadequate (69%), while about 24% believed that some improvements were being made, and hoped for the better (Table 11). About 7% of these indicated that their units were satisfactory. In relation to others, 12% of 113 respondents rated their libraries as better, 27% worse, and 29% no difference, while about 32% could not judge (Table 12). Availability of journals (as primary sources) was indicated to be inadequate (42%), followed by books (30%) among 118 respondents on most lacking sources or services in their libraries (Table 13). As to service 10% of these indicated lack of photocopy services while about 8% literature search (Table 13). According to 117 respondents, inadequacy of journals and books meant that they were either not available (57%) or that what was available was outdated (21%). Some users also indicated availability of materials in insufficient number of copies as a deficiency (11%), while some others pointed to inaccessibility to required materials (10%) (Table 14).

Over 70% of 120 respondents mentioned that apart from providing the usual library services (reading and lending and reference) the librarians were not helpful in facilitating access to materials and services from other institutions or in providing information on whatever was available.

4.2 AGRICULTURAL INFORMATION SERVICE UNITS

A total of 14 agricultural information service units were surveyed. The present status, organization, services rendered and other activities, resource available, and future plans of these information service units based on the survey are outlined.

4.2.1 Organizational Structure

The 14 agricultural information service units surveyed are located in research institutes (2), higher education establishments (5), development ministries (6) and related commission (1). These information service units are organized under different main departments within the hierarchy of each parent organization. The majority of these information service units are composed of libraries only, with only a few having documentation units, and still fewer maintained a publication or information centre.

The Ministry of Agriculture has its headquarters (main) library under the Information and Public Relations Department; its documentation centre under the Planning and Programming Department; and another of its rather autonomous library in Plant Protection and Regulatory Department, under Agricultural Development Unit. The Forestry Research Centre, another centre under the Ministry, has a library and documentation unit of its own that coordinates the library, the documentation and publications activities of that centre.

The Ministry of State Farm Development and the Ministry of Coffee and Tea Development have their libraries under Public Relations and Public Affairs respectively, both of which have similar functions. Although not surveyed for problems mentioned in chapter one, the library of the Plant Protection Research Centre under the Ethiopian Science and Technology Commission, is directly under the National Science and Technology Documentation and Information Centre of the Commission.

The Relief and Rehabilitation Commission has its main library under the Public Relations and Information Services, while a number of departmental mini-libraries (with useful agricultural reports in them) are functioning under the various agriculture-related departments. The Commission's documentation centre is under the Early Warning Department.

The Institute of Agricultural Research has an Information service that comprises a Library and Documentation Unit, Publications Unit, and Graphics Unit. The Information services is among the main departments of the Institute. The Plant Genetic Resource Centre of Ethiopia has a Documentation Division that consists of a library, publication, and documentation units. The division is one among the major divisions of the centre.

The higher agricultural education establishments have their libraries directly under the Dean's office as an independent department.

The various organizational structure discussed have a direct relevance to information network development. For instance, those organized under public relations units are attached to such units that usually have another primary departmental objective (or a number of equally distracting engagements) and run by people of different professions other than of library and information area. These definitely have contributed to the units' slow pace of development, lack of clear professional guidance, and in general for very little attention and recognition that libraries and documentation units receive. Participation and promotion of use of norms and standards in information handling and services throughout the information service units in the network environment obviously depends on the main departments appreciation of the existing problems and

benefits of cooperation to satisfy users' needs. Thus, the general development of information services as well as the network approach is affected by the organizational structure.

4.2.2 Services Provided

In all of these information service units reading (on the spot and on loan) service is the major function. Similar regulations on the materials for reading are exercised; reference and rare materials and journals are for on the spot reading only, except in exceptional cases; staff members are eligible to borrow selected materials, usually for an unspecified number of days. External readers of similar institutions are allowed, provided that they make proper requests, usually through one's institute. Except the college libraries, the rest are open during working hours and days only.

Referral service and query service are usually available, formally or informally. Current awareness service on current acquisition and other additions is also practised in the same way.

Database search on CD-ROM is just starting in the Institute of Agricultural Research and the Forestry Research Centre. Actually, only the Institute of Agricultural Research is actively providing CD-ROM search service at present. The

Ethiopian Science and Technology Commission as a national centre for science and technology and as a parent organization for the Plant Protection Research Centre also provides such searches. However, the service is not at the research centre.

Photocopying (extract) service is provided by the Institute of Agricultural Research, the Plant Genetic Resource Centre of Ethiopia, Wondo Genet College of Forestry and Awassa College of Agriculture where journal articles and pages of other published sources are photocopied for the staff. However, in all institutions where photocopy machines are available the staff can get documents photocopied through departmental and other arrangements.

Document delivery service from overseas is available at the Institute of Agricultural Research only. Selective dissemination of information is in the future plan of some of the information service units.

4.2.3 Information Resources

4.2.3.1 Information Sources

The major documentary source in all of these information service units is books. Technical reports (both of domestic and foreign origin) and government publications rank as the second and the third major sources, respectively (in some of the units these are counted as documents) in most of the

units. Current journals on subscription are to be found in a few units only - the Institute of Agricultural Research, with 70 titles, the Forestry Research Center with 50 titles and Wondo Genet College of Forestry with about 30 titles. One current title is available at the Plant Protection and Regulatory Department. Other periodicals, usually as gift and some on subscription are found in all, including news magazines.

Microfiche documents are available in the Institute of Agricultural Research, the Documentation Center of the Ministry of Agriculture, and Awasa College of Agriculture.

Databases of agricultural information are used only in the Institute of Agricultural Research (on CD-ROM), in the Plant Genetic Resource Centre of Ethiopia (in-house database), and the Ethiopian Science and Technology Commission (CD-ROM and in-house developed). The Forestry Research Center has initiated a project to develop a database on Ethiopian agroforestry, and the Institute of Agricultural Research has initiated developing a database (catalog) of its collections.

Reference materials of different type, including dictionaries, year books, encyclopedias, different catalogues are available, though few in number in most of the units.

4.2.3.2 Physical Facilities and Equipment

Among those found in Addis Ababa only the Ministry of Agriculture and the Institute of Agricultural Research, both of which have good library buildings, none have purposely built, spacious and well furnished library facilities.

The Relief and Rehabilitation Commission, the Ministry of State Farm Development, the Forestry Research Center, the Plant Protection and Regulatory Department, and the Plant Genetic Resource Centre of Ethiopia all have one-room, not satisfactorily furnished and somewhat crowded libraries. The Ministry of Coffee and Tea Development has a medium sized and better furnished and organized library.

Among the surveyed agricultural colleges some are to have purposely built library units (under construction at Ambo and Jima) and most have space limitations to serve the growing number of students as well as staff.

Reprographic equipment in general are inadequate. The Institute of Agricultural Research and the Plant Genetic Resource Centre of Ethiopia have photocopiers (which do not work all the time, however) and duplication and binding equipment in their departments, but the equipments are used by other departments of the parent organization as well. The Ministry of Agriculture documentation centre, Awasa

College of Agriculture and Wondo Genet College of Forestry also have photocopiers of their own. The rest share such facilities available with other departments within their respective parent organizations.

Microfiche reader/printers are available at the Institute of Agricultural Research, the Forestry Research Center, the Ministry of Agriculture Documentation Centre, and Awasa College of Agriculture.

Computers (hardware) of different capacity used primarily for information processing and retrieval purposes or other purposes of the information service units are available only in the Institute of Agricultural Research, the Plant Genetic Resource Centre, the Forestry Research Center, and the Ministry of Agriculture documentation centre. The computers in these information service units are all micros, IBM compatible, all with printers, secondary storage medium, etc. In the Ministry of State Farm Development, the Ministry of Coffee and Tea Development, the Plant Protection and Regulatory Department, Wondo Genet College of Forestry, and Jima Junior College of Agriculture computers are available at least in one other department or centrally in the parent organization.

CD-ROM readers are available at the Institute of Agricultural Research and the Forestry Research Center only, with actual use being made only in the former. The Ethiopian Science and Technology Commission also has one which can be used by the Plant Protection Research Center staff and since recently by any interested scholar.

The softwares used include Word Perfect 5.0 and 5.1 and WordStar for word processing, and predominantly CDS/ISIS for database management (bibliographic data). Others of various types for different applications are available but used very little currently.

4.2.3.3 Human Resources

In general the number and quantity of trained information professionals are inadequate. The majority of the professional staff are locally educated diploma holders. Most of the libraries in Addis Ababa have one such staff at most, except those with branch libraries, such as, the Institute of Agricultural Research which has two at the headquarters and one each at its various main centers and the Ministry of Agriculture documentation center. The majority of the staff are nonprofessionals, usually 12th grade completed, with years of experience only. The agricultural college libraries have at least two diploma holder librarians, and some nonprofessionals with long years of experiences.

Very few trained personnel with university level education (bachelor or above) are holding senior positions.

Staff members of some of the information service units have had short term training of different types, especially on different aspects of modern information management. Some are trained in literature search on CD-ROM and related aspects of database management. More are familiar with micro CDS/ISIS than with any other database management softwares.

4.2.3.4 Financial Resources

A small budget, usually through the main departments, are provided to all of the information service units. Most of the budget is used up for staff salary. A few, such as the Institute of Agricultural Research, the Plant Genetic Resource Center, and the agricultural college libraries have a separate annual budget, including for library acquisitions and other related activities.

A few units also have a limited annual allocation especially for library acquisitions, for example, the Ministry of Agriculture library and the Ministry of Coffee and Tea Development and the agricultural colleges. Some units receive aid or donor supported project assistance for the major part of their acquisition and some specific activities, for example the Forestry Research Center from

the Food and Agriculture Organization.

4.2.3.5 Technical Processing

The majority of the information service units use the Dewey Decimal Classification scheme (five in Addis Ababa and all the agricultural colleges). The libraries of the Relief and Rehabilitation Commission and the Plant Protection and Regulatory Department use inhouse agreed upon classification schemes (although both plan to adopt one of the more widely used classification schemes in the future). The Plant Genetic Resource Center/Ethiopia uses Agrovoc (FAO) both for classification and as subject heading list. Sear's Subject Headings List and AACR are also commonly used, particularly in the institutions that use the DDC scheme.

4.2.3.6 Interactions with Users

There is little formal interaction of information staff with users to follow up on the latter's needs. Acquisition of materials based on staff and departmental requests is a recent development in almost all of the service units. But mostly due to lack of sufficient foreign exchange, the materials acquired are only those available in the local market, which rarely are users' choice or requests.

4.2.3.7 Publications

It is not possible for most of the information service units to provide a comprehensive picture of the production of agricultural literature in their parent organizations. No formal mechanisms have been developed to enable them track and make sure that they have copies of the materials produced. Only those documents produced in large numbers are usually accessible to them. Consultancy reports, field trip reports, experts reports, departmental reports, etc. are usually found with individuals or with the issuing departments.

Publications of information service units themselves are not many. The Institute of Agricultural Research has a quarterly *IAR literature update*; the Ministry of Agriculture documentation center has produced a *bibliography of new additions* (1989) and *list of articles on Ethiopian agriculture*. Others also use informal ways of making known of their current activities and acquisitions (e.g. using internal memos or posting on permanent notice boards). Some of the libraries and documentation units are directly responsible for the newsletters and bulletins and other periodicals of their parent organizations, even though they have no publication unit proper (the Plant Genetic Resource Center of Ethiopia and the Forestry Research Center, for instance). Those with publication units have better access to all of relevant agricultural

literature of their parent organizations because they have a major role in the preparation and production of the publications and their distribution (the Institute of Agricultural Research is an example).

Thus, for lack of established regulations and mechanisms to ensure that all locally produced agricultural literature find their way into the collections of these information service units, such publications are not adequately publicized, little used, and in general little useful to the agricultural development of the country. Because they are produced at the convenience of the authors (individuals or departments) the publication standard of each, which is important to promote their utilization and the organization of their content, also is diverse, and usually of low quality. As these materials are less known and found scattered, the possibility of duplication of effort in every sense, is high in the country.

4.2.3.7 Application of Information Technology

None of the information service units has automated any of its library systems. However, as indicated earlier computers of different capacity are available in the information service units of the Institute of Agricultural Research, the Ministry of Agriculture, the Plant Genetic Research Center of Ethiopia, and the Forestry Research Center. But most of them use the computers mainly for word

processing purposes, and only a few also use them for limited information processing and retrieval. As mentioned earlier, the Institute of Agricultural Research has initiated the development of a bibliographic database of its collection with CDS/ISIS. The Forestry Research Center is also to develop a forestry database especially on Ethiopia. The Plant Genetic Resource Center already has a database of genetic resources of Ethiopia for some time, and it is being used by domestic as well as foreign users extensively. And a computerized literature search on CD-ROM at the Institute of Agricultural Research mentioned earlier is operational since 1990.

The use of computers for publication purposes (DTP) is now expanding in the above mentioned institutions, especially in the Institute of Agricultural Research.

4.2.3.8 Recent Developments and Future Plans

In many of the information service units (5 out of 14) no significant developments have been reported (according to the survey responses) during the past three years, while others (5 out of 14) indicated to have been engaged in facility building with some success. Personnel development was also given attention in one of the responding units. An overall development effort is also reported by three units. In general, there has been very little improvements achieved for various reasons.

Almost all the information service units have plans to develop mainly their collections and personnel. Few also have plans for facility building. However, for most of these plans no concrete measures have been taken so far or to secure the required resources to support the plan. Training, mostly short term, of staff is one such plan indicated by all.

4.2.3.9 Cooperation

At present cooperation is mainly in the area of exchange of locally produced publications. This excercise is mainly based on the goodwill of the institutions involved. Formal interlibrary loan arrangements/agreements among the agricultural information service units do not exist nor has there been any attempt made in this regard so far. However, any interinstitutional request is usually respected. The Institute of Agricultural Research has an interlibrary loan agreement with the International Livestock Center for Africa and the Addis Ababa University libraries.

On the other hand, the Institute of Agricultural Research is a nationally designated center for food and agriculture R&D information, and also serves as a national AGRIS/CARIS input center. This could mean better opportunity for more literature to be collected/received at the Institute, although at present there seems to be little participation by others. The majority of the input documents are the

institutes' publications, mainly proceedings articles and research reports.

The Plant Genetic Resource Center also is a United Nations Environmental Programme Biodiversity Genetic Resource Regional Center since the beginning of this year. The Ministry of Agriculture's documentation center is also a national center for Technical Center for Agricultural and Rural Cooperation. Except these three, none participates in any type of network or have assumed the role of a national center.

The common communication mechanism employed for whatever little interaction exists among these units is visits in person and through correspondence. No formal (national) common forum, such as meetings, workshops or publications purposely designed to develop interaction among them exist.

4.2.3.10 Limiting Factors

Almost all of the staff in charge of the surveyed information service units agree with the seriousness of the shortcomings of the units in general. The majority indicated that the primary shortcoming is inadequate collection of documentary sources, mainly current journals as interviews also indicated (60%). Lack of external and domestic databases is another deficiency indicated by some (20%).

Budgetary constraint, including hard currency, is pointed out as a primary cause to all prevailing deficiencies (75%). Inadequacy of skilled personnel at a higher level and in modern information work in the country is also mentioned as a contributing factor (17%). The college librarians also indicated, during interview, that the major causes for the problems they face to be the low attention given to libraries by the concerned college authorities.

4.2.3.11 Attitudes to Network Arrangement

All showed willingness and the majority believed it will be to their benefit. The major area of interest indicated by many is the possibility of resource sharing, of information sources and facilities such as computers. Professional consultancy is also indicated as important aspect by the college librarians. Although the final decision as to the actual participation and to what extent has to be made by decision makers in the higher management levels, such strong enthusiasm and appreciation by the staff is one important asset for the successful development, implementation, and operation of the information network.

4.3 DISCUSSION ON THE FINDINGS

The following possible conclusions could be drawn from some of the survey findings.

- The relatively high book usage at present could be probably because of better availability and traditional orientation to the use of books in the country.

- The relatively close position of use of journals, despite the deficiencies noted and the users' expressed need for them, indicate that journals could become the primary information source of the agricultural information in the country. And this could be achieved if provision was made for better access to them.

- The major handicap of all the information service units is very low financial allocation. In addition, the conditions in which finances are made available are not conducive to support information services development but only to keep them at mere survival. In many cases units' budget is included in the total allocation with other units of the main departments.

- The organizational structure of the departments to which most of the information service units are attached offers little room for autonomy of desicion making and actions or for professional leadership and commitment to information service units to meet users needs. This is very likely because of the low attention and traditional view prevailing among the

majority of decision makers regarding libraries. Strong sensitization and coordinated effort at a national level by the units is required to change the situation.

- With regard to local publications, one of the major deficiencies in the information sources, the information service units in general do not seem to concentrate on collecting and making them available as they do on books, journals and other commercially available documentary sources. Almost all of the local publications now at the disposal of these units came through publications exchanges and free copy distribution by the producing agents, and not through the purposive efforts of the units. It should be easier to collect and make these publications available for use since the publications are produced in the respective parent organization and at low cost. However, facilities to their access and utilization is inadequate. Cooperation and coordination in collecting such publications, their proper notification, and productive utilization by the services is indispensable. One can estimate the number of local publications by just reviewing the number and areas of research covered in the major research institutes.

- The low level of document delivery and photocopy services are because of the poor provision made for

such services. These services could have a potential particularly to increase access to and availability of journal papers which are in short supply by making the extracts from those available in the country or by having delivered from oversees.

At present making a concerted effort to meet the users need simply can be equated with these units struggle for existence. What is necessary is to make a practical effort by all concerned to face the common problem as a unified body.

Past experiences of many countries indicate that almost all of the above shortcomings and drawbacks can be addressed by establishing a network of these units by coordinating their resources and activities.

Table 2. Current use of information sources

Sources	RANK 1	2	3	4	5	6	0
Books	50(45%)	26	16	11	1	2	6
Journals	47(42%)	43	14	1	-	-	7
Other per.	7(6%)	24	26	19	6	7	23
Local pub.	8(7%)	9	25	26	19	1	20
Total	112(100%)	106	81	59	26	10	56

Table 3. Use of one's library

State	Frequency	%
Frequently	41	34
Rarely	12	10
Sometimes	65	55
Not at all	1	1
Total	119	100

Table 4. Rate of finding what is required in one's library

	Frequency	%
Mostly	14	12
Rarely	36	30
Sometimes	69	58
Total	119	100

Table 5. Use of other's libraries

	Frequency	%
Frequently	5	4
Rarely	37	31
Sometimes	43	36
Not at all	35	29
Total	120	100

Table 6. Causes for not or rarely using other's libraries

	Frequency	%
Not allowed	3	4
Not relevant	4	5
Lack of awareness	21	27
Transport / access difficulties	51	64
Total	79	100

Table 7a. Information sources needed primarily

	Frequency	%
Journal	45	28
Local publication	41	26
Book	38	24
Other periodicals	19	12
Abstract	10	6
Others	5	3
Total	152	99

Table 7b. Information services needed primarily

	Frequency	%
Literature search	29	32
Photocopy	27	30
Document delivery	21	23
Quick reference	7	8
Current awareness	6	7
Total	90	100

Table 8. Awareness of local publications

	Frequency	%
Well informed	4	3
Only in my area	56	52
Not much	44	37
Not at all	9	8
Total	120	100

Table 9. Importance of local publications

	Frequency	%
Very important	93	79
Not important	0	0
Not crucial	24	21
Total	117	100

Table 10. Information seeking pattern of users local publications

	Frequency	%
Formally	44	37
Informally	69	58
None	5	4
Total	118	99

Table 11. General assessment of ones' library

	Frequency	%
Satisfactory	8	7
Inadequate	81	69
Improving	29	24
Total	118	100

Table 12. Users' rate of ones' library

	Frequency	%
Better	13	12
Worse	31	27
Similar	33	29
Not aware	36	32
Total	113	100

Table 13. Most lacking information source or services

	Frequency	%
Sources		
Journal	50	42
Books	33	30
Local publication	8	6
Services		
Photocopying	12	10
Literature search	10	8
Document delivery	5	4
Total	118	100

Table 14. Nature of deficiency of information sources

	Rank			
	1	2	3	4
Outdated	25(21%)	31	19	11
Not in stock	67(57%)	17	6	4
Few in number	13(11%)	32	22	6
Inaccessible	12(10%)	11	9	12
Total	117(99%)			

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY AND CONCLUSION

Agriculture is the top most priority economic sector in Ethiopia, where the socioeconomic development of the country largely depends on it. At present, however, the production and productivity level of agriculture in the country is at a very low level and needs all possible attention and immediate support.

The role of information as a critical resource is recognized. For socioeconomic development, its planning, programming and implementation, the country needs efficient and effective agricultural information provision mechanisms. Improving the efficiency and effectiveness of the existing agricultural libraries and documentation centres, the major information service units in the country, is the main focus of this activity.

However, the general level of development and services provided by the agricultural libraries and documentation units in Ethiopia is very low and discouraging. Information resources (information sources, skilled personnel, equipment and physical facilities ,etc) and services rendered are quite

inadequate to meet the requirements of information of the agricultural information user community.

The main reason for almost all of these inadequacies is indicated to be financial constraints, which is a common problem of developing countries. Besides, lack of well established and effective mechanisms to exploit fully the existing information resources, which could have alleviated the problem, is another serious constraint.

The world over, such inadequacies (insufficient financial resources and inadequate utilization of available information resources) in the information sector are addressed through cooperative mechanisms by which similar and related units in the country or of the region pool their resources and efforts voluntarily for achieving better satisfaction of their users. To this end, networks of information services and systems at institutional, national, regional and international levels have been developed.

In line with these developments, a survey was conducted to assess the status of the current agricultural information service in Ethiopia, particularly to identify information and service needs and problems and to determine the feasibility of establishing an agricultural information network for Ethiopia. The assessments, reviews and findings showed the following.

Agricultural Information user community surveyed is composed of researchers, instructors and students, development agents, planners and policy makers.

5.1.1 Current Characteristics of Users

The majority of the users surveyed frequently use books, and journals coming next. Among the information services provided the overwhelming majority use reading and lending services and reference service, the most commonly found and long-established information services in libraries and documentation units surveyed.

The majority of the users of the surveyed institutions are less inclined to using libraries and documentation units of other similar institutions, mainly because of inconvenience and lack of awareness about other institutions.

Journals are indicated as most lacking information sources as well as primarily preferred source by users if given the chance. Despite their deficiencies, however, journals are reported to be the second most used information sources.

There is substantial interest in publications containing local agricultural data and information, while their availability and distribution is very low, partly because the libraries and

documentation units do not make adequate efforts in their acquisitions and partly because of low attention given to their production and distribution in the country.

In general the agricultural information users are less than fully satisfied by their libraries and documentation units, mainly because the latter have little information sources, much of which are outdated.

Among the services, much more improved literature search (database), photocopying, and document delivery are highly demanded. The preference of users seems to have been narrowed/affected because of the users little knowledge of all possible range of information services that could be provided.

5.1.2 Current Status of Agricultural Libraries and Documentation Units

These are the two most commonly found information service units in the country. The range of services rendered by these units is limited. The main services are reading and lending, reference service, with a rather unsystematic current awareness services. Very limited photocopy service, document delivery service, and database searches are available.

The available information sources are inadequate in quantity and quality (outdated), with improper balance of availability in information source type (journals, for example, extremely limited).

Their financial position in general is extremely difficult and unreliable, (foreign exchange which is much needed for the purchase of resources from outside in particular). Also, skilled personnel is inadequate.

Their organizational structure is cumbersome in most of the cases which resulted in very limited developments in the past and less utilization of them as information provision points.

Equipment and physical facilities are very poorly developed or are absent. Application of information technology particularly for information storage and retrieval is a remote hope for the majority of the surveyed units.

Standard technical processing is practised in the majority of them.

Cooperation among them is on an *ad hoc* basis and of a very limited scope and extent. It lacks proper and formal coordination, direction and vision.

Bibliographic control tools, at national level, are absent, and therefore holdings information and referral are nonexistent. Communication among the units on a formal basis is also lacking.

5.1.3 Needs of Agricultural Information Services

Thus, based on both expressed users' needs and their evaluation of the services of the agricultural libraries and documentation units and the problems and needs expressed by agricultural libraries and documentation units, the following are the basic requirements to concentrate on:

- Adequate documentary sources in number and quality, especially journals and local publications.
- Upgraded and expanded information services, including current awareness, SDI, information analysis and consolidation, referral, retrospective search, technical enquiry services, photocopying, document delivery, etc.
- Adequately trained informational professional in modern information handling and information management.
- Provision for information personnel development especially in agricultural information services
- Status and renumeration for agricultural information

workers on a par with R and D personnel in the field.

- Appropriate equipment and physical facilities for users, for information and documentation work, storage space, materials movement and display, staff working space, etc.
- Provision of photocopying equipment and at least one microcomputer, IBM compatible (PT/AC with 20-80 MB storage)
- Adoption of appropriate documentation and information norms, standards and guidelines
- Comprehensive national bibliographic control in the area of agriculture.
- Improved organizational set up that allows for individual libraries and documentation units a level of professional and technical autonomy, separate budget, managerial and administrative flexibility.
- Strong cooperation on a regular and formal basis to improve communication, standardization, sharing of problems and coordination of efforts.
- Consistent and adequate funding, in local as well as foreign currencies.
- Overall policy to coordinate information activities and development of information infrastructure to support the agricultural sector within the framework of a national information system.

5.1.4 Feasible Areas of Cooperation in Ethiopia

Elsewhere and in this paper it has been pointed out that most of the above requirements could be addressed by coordination of the existing information resources and development efforts among the agricultural libraries and documentation units. However, taking into consideration the primary and critical inputs required in the various areas of cooperation against what could possibly be made available under the present (and in the foreseeable future for that matter) situation in the country, the following limitations and possibilities can be identified as areas of networking activity. Since the main objective of this study is to assess the viability and establishment of an agricultural information network in Ethiopia, analysis of the range of possibilities vis-a-vis the available resources to meet the requirements is the framework to make decision as to its possibility and to select a starting point. The possible areas of cooperation, thus, constitute the activities of the network at least for the initial phases.

Cooperative Acquisition: Although the need for it is high as a means of improving rational collection building and preventing wasteful duplication of expensive and less used items, except for coordinated acquisition of local publications, other areas of cooperative acquisition are

impossible to be carried out. The obvious reasons for this is the currently available meagre financial resources of the libraries and documentation units, which is not even made separately, that is critically needed for such a scheme. The main feature that the coordinated acquisition of the local publications would be to promote their comprehensive collection and full utilization.

Cooperative Processing: Again for the lack of skilled and adequate personnel to be maintained at a separate and central unit for technical processing, cooperative processing activity at the present state of shortage of skilled personnel in libraries and documentation units, is not possible. However, there are aspects of cooperative processing that are feasible within the present constraints (and probably which are the most essential elements for any practical cooperation) to take place, namely,

1. Preparation of union catalogues of holdings (of serials, non-book materials, and audiovisual materials) and list of local publications (catalogues).
2. Directory of agricultural libraries and documentation units, with descriptions of services provided, areas of specialization, technical processing used, etc.

3. Fostering a certain level of standardized technical processing procedures to be conformed to by each member participant.
4. Profiles of experts in information in the country.

Cooperative Storage: Storage space for documentary materials is not yet a problem for most institutions. Therefore, cooperative storage is not justified.

Resource Sharing: Although the common reasons for resource sharing are present in the country, namely, very little resource available, big disparity in the level of development and resource capabilities among the libraries and documentation units, and generally poor prevailing environment, such as, lack of awareness and support by parent organizations, the nature of these factors have a restricting effect on full resource sharing at present. For example, if unrestricted interlibrary lending is to be adopted, one or two of the libraries will find themselves net lenders or overburdened by interlibrary lending activities. It is also very likely that the more frequently required materials which are in short supply will be sought after by all at once to the extent that nobody makes much use of them. It should also be noted that the perception of the better endowed information service units will be to receive immediate returns to their agreeing to share their resources. However, since it is the

most desired and primary goal in cooperation among information service units, measures that could pave way for full resource sharing should be carefully considered starting from the very beginning of the network establishment. Such measures, based on experience, includes that each participant has to agree to build at least core collection in the area of specialization of its parent organization, so that each may need to borrow minimum number of materials and decrease heavy dependence on others' resources. Thus, at this point rather than embarking on scheme of sharing of resources fully, it is necessary that measures to realize it are to be concentrated on.

In this line, limited areas of resource sharing are possible in the present working environment which could be considered as a starting point. The areas for resource sharing are limited interlibrary loan and photocopying services, which should be regulated on the basis of priorities formulated by the owning library. The interlibrary loan could include materials available in several copies and materials that have limited number of users (less frequently used) and back issues of serials. Difficult-to-borrow materials, especially journals which are critically needed by most, could be photocopied at the expense of the borrowing library or any such similar arrangement. An interlibrary loan code and standard procedures should be drawn up and agreed upon. Sharing of professional staff can also be arranged.

Training: Training, although not discussed as an independent area of cooperation, under the Ethiopian conditions seems to deserve special consideration. As a major way of upgrading the professional skill and introducing modern information management methods and techniques, a well planned and organized training component on a continuous basis for the overall improvement of the services is mandatory. Furthermore, it is a priority option for coordinating the network activities, and as a means to ensure a level of standardization and efficiency for the network functions. Therefore, training as an area of major focus of the network is important as well as feasible. Areas of cooperation for training include provision of experts (to a large extent trainers would be among the staff of the participants) and facilities and sharing costs for training materials and expenses related to trainees or trainers.

Thus, from experience the above identified areas of cooperation for Ethiopia are adequate enough to make appreciable progress in the agricultural information service of the country. In addition to their potential for success, cooperation in these areas will lay the ground for more comprehensive and fully productive cooperative schemes that the service requires. This implies a phased approach to cooperative networking.

5.2. RECOMMENDATIONS

Introduction

Agricultural information network for Ethiopia can be initiated (based on the existing resources and situation), with selected areas of activities, basically to address selected areas relevant to bring about overall improvement of the agricultural information services of the country and to prepare the ground for more and wider cooperative activities.

The establishment of the network calls for a phase-by-phase approach. The first area that need a phase-by-phase approach should be the selection of network activities, that is, identification of possible areas of cooperation in network environment, which is already done, and the areas to be added on in due course, each step facilitating the next (e.g. cooperative acquisition to build sufficient and relevant resources first, followed by cooperative processing schemes, which will thus facilitate for full efficient and effective resource sharing).

The second area for phase-by-phase consideration should be the identification of participants, the selection being based on criteria that have proved workable in the past. Cooperative schemes need strong leadership, unrelenting effort and capability to initiate and move forward. It is, therefore,

recommended to begin with a few capable and willing institutions and individuals, taking the lead, and putting the initial energy and resource into the scheme. Common criteria used and relevant in Ethiopian condition as well could be, in addition to capability, geographical location, and similarity of specific needs. In this connection, starting with the agricultural libraries and documentation units located in Addis Ababa will be practical, because

- proximity of those in Addis Ababa, where communication is better and more convenient.

- those selected have common areas to work with than with those outside of the capital, which are entirely composed of higher learning institutions. (The specific subject emphasis could also show slight variances; development and research and academic oriented).

Again among those in Addis Ababa, those willing to participate and share responsibility and at least have a level of capability to meet the required commitment consistently over a period of time will make the final group. Within the group, one or more institutions willing to take the initiative will be of primary and decisive importance to the network establishment. One such institution is the Institute of

Agricultural Research. The Ministry of Agriculture can be another capable enough with proper sensitization of the management. And the initial group of the potential participants in phase one, thus, will be the Institute of Agricultural Research, The Ministry of Agriculture, The Ministry of State Farm Development, The Ministry of Coffee and Tea Development, The Forestry Research Centre, The Crop Protection Regulator Department, and The Relief and Rehabilitation Commission.

5.2.1 Scope and Coverage

The scope of the network activities is confined to information provision of agricultural information to users of any one of the existing agricultural institutions at any one of the agricultural libraries and documentation units participating in the network. Subject coverage is agriculture and related fields.

5.2.2 Objectives of the Network

General objectives of the agricultural information network will be:

1. To improve the provision of reliable and up-to-date agricultural information to user community.
2. To improve the library and documentation units' resources and to upgrade the level of agricultural information services in Ethiopia.
3. To promote coordination of activities and cooperation among the agricultural libraries and documentation units in handling problems and shortcomings prevailing in the country.

The network will have the following specific objectives:

- To promote utilization and flow of existing information resources in support of the agricultural activities of the country.
- To assist in developing the existing information sources into reliable and comprehensive sources of information and data.
- To raise the level of agricultural information services.
- To promote standardization of working norms and procedures to an accepted level.
- To promote productive and convenient use of information sources.
- To establish a national agricultural bibliographic control mechanism.
- To promote rational financial resource utilization and seek ways of improving the situation.

- To improve the professional skill level.
- To prepare the conditions that pave way for a larger scale cooperative scheme among the libraries.

5.2.3 Strategies for the Development of the Network

Measures to be taken to realize the agricultural information network in their order should include.

- Initiative has to be taken by one institution probably the Institute of Agricultural Research, or the Ministry of Agriculture to prepare the necessary ground to initiate the cooperation in this line.
- Formation of a coordinating body composed of representatives of potential participating institutions in Addis Ababa, with the major goal of coordination of activities and device on and implement an interim plan of action which should include:

  . Formal sensitization of parent organizations' decision making bodies on the problem and on the need for cooperation, and about the benefits to be gained provided that full support from them is granted, in such areas as financial support, permission for staff unrestricted participation, organizational recognition, provision of meeting places, etc.

- Creating awareness and motivation of the staff of libraries, mainly the professionals, to coordinate their willing and conscious participation to realize the objectives of the network. In general the staff should be well aware of the benefit of cooperation and develop an attitude that improvement of the whole service would have more impact than what can be produced by each unit acting individually. This may need a seminar on the general objectives, efforts being made, participants' role, outcome, etc., with resource persons, from among those available in the country.

- Formation of a Steering Committee, either by endorsing the Coordinating Committee already existing or call for new members, possibly during the seminar.

5.2.4 Functions of the Steering Committee

To realize the stated objectives, the Steering Committee will have the following functions:

- Coordinates network activities, and gives administrative and technical guidance.

- Formulates and designs standards, working procedures, principles, policies required to strengthen the performances of the network participants, by constituting small working groups as may be necessary. (Designs and coordinates preparation of manuals, worksheets (data input sheets) and forms for common use of network participants to enhance compatibility and consistency.)
- Prepares the condition for further expansion of the network activities.
- Coordinates, plans and helps in conducting training and workshops for staff of participant institutions on general information work and on particulars relevant to the network operations (on network worksheet preparation and data entry, for example).
- Evaluates performance and achievements of network activities, and identifies what is required to introduce wider cooperative schemes, desired and feasible.
- Improves working procedures and network objectives based on experiences gained.
- Assigns responsibilities to participating institutions whenever need arises.
- Advices, when requested, on purchase of new items by participating institutions to reduce duplication and other wasteful expenditure.

- Communicates with external bodies on behalf of the network participants on matters of network activities and others.
- Assesses ways to meet priority information sources and services needed, concentrating on improving the availability of journals and local publications and their accessibility primarily by devising easy and acceptable mechanisms to use those at the Institute of Agricultural Research and Forestry Research Centre, without no added inconvenience and cost on the owning institutions.
- Identifies areas of problems (through regular need studies) that hinder the performance of agricultural information service units (one possible area is assisting researchers and other workers find suitable publication media in the country).
- Organizes and supports the organization of users orientation (end users) and user sensitization (decision makers) programmes
- Evaluates and improves developed standards at intervals to ensure uniformity and enhancement of services, organization, and others.
- Coordinates and follows-up preparation of national bibliographies and union catalogue of holdings and union list of national publications in agriculture, and ensures their continual updating and dissemination in hard copies.

- Encourages information efforts by participating organizations
- Seeks ways of securing funding to ensure continuity of operation of the network, and exploration of new areas of services/acquisitions and activities.
- Develops sectoral information policy which will be in conformity and integrable to the broader national scientific and technological policy of the country.

5.2.5 Composition of the Steering Committee

Representatives of the six institutions in Addis Ababa, if they qualify for the additional criteria of willingness and capability, will make up the membership. Composition of representatives is recommended to enhance effective participation, to assure all voices are heard, to make sure each abides by their commitments, etc.

Internal organization : Within the Steering Committee a group functions as executive body while three working groups actually are charged with executing the various functions of the Committee.

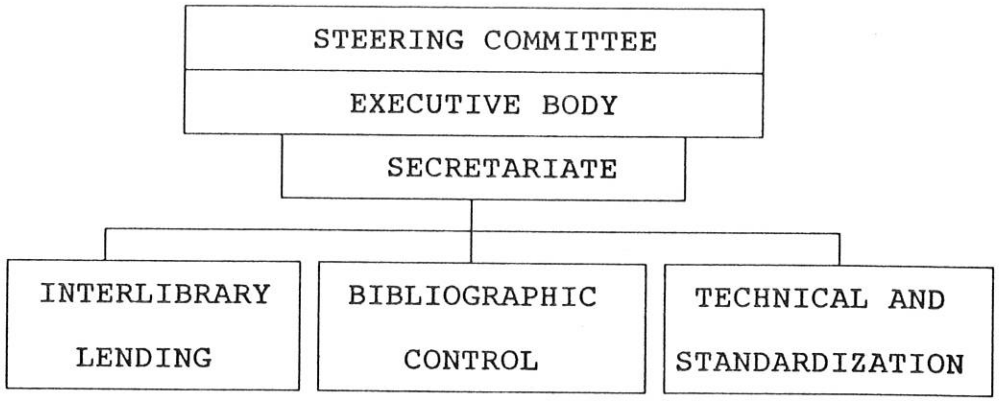
Interlibrary loan and document delivery ad hoc working group in charge of coordinating, facilitating, and follow up of the interlibrary and document delivery, including the photocopying, aspects and activities.

Bibliographic control ad hoc working group in charge of coordinating implementing and follow up of preparing, maintaining and distributing the national bibliography on agriculture, union list of holdings, and union list of domestic publications.

Technical processing and standardization ad hoc working group in charge of coordinating and implementing and follow up of technical processing and other standardization activities. Technical advice and preparation of standard tools by the network will be the responsibility of this group.

The executive body functions as coordinating others and concentrates on overall planning and policy of the network, identifying future direction and evaluation and monitoring the activities of the groups.

The organizational structure may be as shown in the following figure.



Terms of work, position and duty of each member within the Committee, relation with other similar national or international bodies, name, etc. are to be dealt with on a primary basis by the committee members.

5.2.6 Location

Unless a permanent place is made available, the location of the committee for meeting will be by rotation at each member institute in turn.

5.2.7 Funding

With the aim of keeping costs of the coordination at a minimum, expenses are to be covered by all the participants by sharing common expenditures equally, while expenses in relation to each participant is taken care by the participant

alone. New areas and expensive ventures are to be mainly dependent on external funding sources.

5.2.8 Activities of the Network

As areas of joint interest and responsibilities, based on the feasibility assessment made earlier, the following are major activities to be performed by network participants.

- Compilation of national bibliographies on agriculture, union catalogues of holdings of serials and non-book materials, and union list of locally produced publications on the country's agriculture. In supporting this activity

  . Each participant will complete bibliographic worksheet of all types of documents in their holdings on separate data entry worksheets designed for the purpose and distributed by the Steering Committee.

  . Each participant will have one or more members trained in preparing the worksheet before entering the scheme.

- Each participant is expected to develop mechanism to ensure all locally produced agricultural literature within its institution are reported (including that comes across its attention or holding for that matter) .

- The worksheet for bibliographic data entry will be of international standard for promoting compatibility of the networks products and activities at all levels.

- All the bibliographic data from each participant will be submitted to the Steering Committee where these will be processed and compiled by assigned participants with the capability (Institute of Agricultural Research or Ministry of Agriculture).

- A compiled hard copy of the national bibliography, union catalogue of holdings, and union list of locally generated publications will be distributed to each member in adequate quantity for wider use.The costs of preparation and distribution will be shared by the participants.

- Updating frequency will be decided by the Steering Committee.

- Interlibrary lending of documentary sources for fixed number of days (to be agreed upon) in accordance with the regulation and convenience of the owing library. For documents that may not be made available for interlibrary loan or are rare, photocopying services support at the convenience of the owning institute is to be arranged. Especially with respect to journals which are the top priority source required, the owing institutions should be supported to provide photocopying service in such ways that the requesting institute covers the cost, including supplies and other costs. A fixed price could be agreed upon among the participants. (or decided by the committee)

- Document delivery services will be introduced by centrally issuing coupons that are provided by donor agencies, especially by the International Agricultural Research Centres (IARCs),FAO, and UNESCO, located at one of the assigned members. (location preferably central and with space and other service capability and willingness).

- Training, mainly in-country training on basic skills and on aspects of modern information handling and promotion on a continuous basis and on technical aspects of network activities such as in data entry, should be conducted.

- Type of training and coverage, duration, participants requirements, etc. are to be planned and developed by the committee based on what is required, and preferable using already established course from elsewhere.

- Trainers from among the staff of the participant as well as non-participants who qualify for such level of training will be invited by the Steering Committee for cooperation. Any higher training,

  such as by expert from abroad, would be exploited if the opportunity arises. In-service training where experiences are exchanged by working at one of the member institutions for particular area is also a possibility.

- Expenses: cost involved in each training is to be covered by participating member parent organization, although every effort is to be made to keep costs to a minimum.

- Place of conducting training should be arranged on each occasion between the institution with suitable facility and the committee in advance.

- Collection development effort with regard to local publications to (1) improve their standardized publication (2) to strengthen their central collection at the Institute of Agricultural Research (already a designated national centre) with much more efficient mechanisms, will be a major focus of collection development activity .

- Sharing professional consultancy mainly aiming at fostering high level of service, and improving professional guidance on organization of collections, technical processing, and on acquisitions by staff of the participants whenever requested should be granted. To those libraries and documentation units who lack technical processing services, such consultancy is the primary area, by capable librarians on assignment.

- Standardization of services by adopting a relevant international guidelines to achieve a level of minimum requirement and uniformity through continues assessment and support, which includes technical processing, organization of collections and services provided.

- Communications to coordinate "beliefs, attitudes and actions", to exchange experience, and to promote the objectives of the network, regular meetings, publication

(newsletter), working visits and demonstration are to be carried out. Cost again are to be covered jointly. Assignment for organizing and planning the different general meeting and workshops will be made by the committee by competent staff in participating institutions. Editors and production of the newsletter assignments will also be made by the committee in the same manner to able and willing participants. This newsletter could include a portion where duplicates and exchangeable documents are regularly announced by each participating institute.

5.2.9 Structure

Although it may be too early and unclear to talk on the structure of the network as such, based on the possible interconnection of participants as nodes and based on what is to be achieved, the emerging structural configuration can be described as decentralized distributed structure. By this each will be expected to improve self-sufficiency in service provision of all kind and sources of all type through strengthening its position and capability to serve its users more efficiently with the support of cooperation among existing other units. Data required for common use is input separately from individual to be processed centrally and again distributed back .

This will also allow for required expansion and adding of new participants without significant shift in the existing network organization and interconnection.

Interlibrary lending, the major communication of participants, is carried out between participant without intermediary as the need arises.

In this set up no central unit or focal point emerges unless the need leads that way. The Committee itself is a mere facilitating machinery and coordinator of activities. As in other situations with established networks, possible structural changes are likely with the change of participant number, network objective, participant role, and other developments.

The Committee conducts all external relationships in connection to the network interest. Each participant node is to assign time and staff for network responsibility.

Users' interest profiles should be maintained to promote the services, to attend to and meet their needs even as these changes. Priorities are to be given, especially in collection improvement, in line with user's need.

5.2.10 Output of the Network and Immediate Benefits

- National bibliography of agricultural materials, union catalogues and union list of special collections (local publications) in hard copy.
- Newsletter, various manuals (for training, procedures).
- Directories of institutions, experts in the field, etc.

Benefits include

- Promotion of and utilization of local publication
- Establishment of national agricultural bibliographic control.
- Standardization of services and working procedures.
- Development of modern information management and techniques.
- Maximize utilization of information resources.
- Easy and coordinated flow of information and information resources and experience between agricultural information service units.
- Control of duplication and improve rational use of financial resources.
- Development of combined front against possible problems.

5.2.11 Relation with Other Bodies

All efforts to build strong relation between the network and other higher related bodies and international organizations found in the country will be made. In this line Ethiopian Science and Technology Commission and International Livestock Centre for Africa are the primary ones already targeted. Based on the open services these two provide to national institutions, extra and special association could be arranged to strengthen the objectives of the network. Possible areas of interest to the network include training, resources such as donation of duplicate and not frequently required documentary sources, but of value to network participants, and other modern information services from these two to network participants.

5.2.12 Basic requirements based on experience include participant with initiative, drive and commitment, formal agreement and strong support from parent organization, financial input, awareness and appreciation of the particular needs, and cooperation of a high level.

Annex 1. Questionnaire used to survey the information service units

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

SCHOOL OF INFORMATION STUDIES FOR AFRICA

QUESTIONNAIRE FOR A SURVEY ON THE PRESENT STATUS OF AGRICULTURAL INFORMATION SERVICES IN ETHIOPIA

PURPOSE : *The response to this questionnaire will be used to assess the prevailing status of the agricultural information services in Ethiopia*

QUESTIONNAIRE FOR THE ORGANIZATIONS

PLEASE RETURN THE COMPLETED QUESTIONNAIRE IN ONE WEEK TIME TO THE INSTITUTE OF AGRICULTURAL RESEARCH, P.O.BOX 2003, ADDIS ABABA

Mark " x " against your choice when appropriate.

PART I. ON THE PARENT ORGANIZATION OF THE LIBRARY / DOCUMENTATION CENTER / INFORMATION CENTER

1. Name of institution.....
2. Parent organization under which the institution is, if any, ...
3. Date of establishment of the institute .....
4. Type of institution
   Research .....
   Higher learning institution .....
   Government ministry .....
   Other (specify).....

5. Nature of work
   Agricultural research only .....
   Agricultural research partially .....
   Agricultural research as support to the major occupation of the institute .....
   Teaching / academic ..... Commercial .....
   Consultancy ..... Extension services .....
   Others .....

6. Major fields of specialization
   1.
   2.
   3.
   4.
   5.
7. Total number of technical / professional staff .....
8. Ongoing projects (please attach or list titles of project)
   a)
   b)

c)
d)
e)
f)
g)
h)

PART II. ON THE LIBRARY / DOCUMENTATION / INFORMATION CENTER

9. Name of the library /documentation/information center .....

10. Main department under which the library / documentation / information center is .....

11. Name of contact person .....

12. Date of establishment .....

13. Total number of staff .....
    Technical / professional staff .....
    Others .....

14. Types of information facilities available
    a) Library .....
    b) Documentation center .....
    c) Information center .....
    d) Publication unit .....
    e) Others (specify) .....

15. What are the services you provide ?
    Reference services ..... E-mail .....
    Current awareness ..... interlibrary loan .....
    SDI ..... Reprography .....
    Database search ..... Reading and loan .....
    Others .....

16. Information resources available and processing

a) **Collection:** Total ..... Volumes .....
    Books and monographs (% or no.) .....
    Back volumes of serials (% or no.) .....
    Current serials title (no.).....
    Technical reports (%) .....
    Government publications (%) .....
    Microfilms (ft) .....
    Microfiche (no.) .....
    Others (% or no.) .....

b) **Equipment :** **Type / No.**
    Binding equipment .....
    Computers
    (micro, mini, or mainframe) .....
    Microfiche reader/printer .....
    CD-ROM reader .....
    Reprography equipment .....
    .....

Others (specify) .....
.....
.....

c) Software used Purpose Name

Word processing .....
Database management .....
Others .....

d) Technical processing and vocabulary control

Classification scheme (name) .....
Catalog code (name) .....
Agrovoc .....
Thesaurus .....
Subject heading list .....

17. Are your library / documentation / information services computerized ? If yes , which services ?

Cataloging ..... Databases .....
Acquisition ..... Serials .....
On-line services of remote databases .....
Search services of databases of outside origin .....
Totally automated .....
Others .....

18. Do you charge users for any of your services ? If yes, list these services and the group of users charged

Services	Internal users	External users
1.	.....	.....
2.	.....	.....
3.	.....	.....
4.	.....	.....

19. Arrange / rank group of users of your services in relative priority ?

Researchers ..... Administrative staff .....
Management ..... External readers .....
Instructors/students ..... Others (specify) .....

20. Do you have any mechanism for comprehensively acquiring or accessing locally published materials ?

Yes ..... No .....

21. Do you have any published output? If yes, list titles indicating their frequency (if serials), when started, number of copies distributed free of charge and sold per issue.

Title	Frequency	Starting date	Distributed free	sold

			(no.)	(no.)
1.	.....	.....	.....	.....
2.	.....	.....	.....	.....
3.	.....	.....	.....	.....
4.	.....	.....	.....	.....

22. What was your budgetary allocation for the following resources in the past three years (1989,1990,1991) ?

Collection :	**1989**	**1990**	**1991**
Books	.....	.....	.....
Serials	.....	.....	.....
Other documents	.....	.....	.....
On inter-library loan	.....	.....	.....
Other	.....	.....	.....
Equipment :			
Computers	.....	.....	.....
Reprography	.....	.....	.....
Microfiche reader	.....	.....	.....
CD-ROM reader	.....	.....	.....

23. Do you follow up your users' needs, opinions, and comments? If yes, how ?

1.
2.

24. Do you plan your acquisition in collaboration with the users?

Yes ..... No .....

25. Is your library / documentation / information center designated as a national center for any specialized area ? If yes, in what area ?

1.
2.

26. Do you participate in national, regional, or international networks? If yes list the names of the networks and indicate the ways of cooperation (eg. input, on-line retrieval,etc.)?

	Name of network	**Ways of cooperation**
1.	.....	.....
2.	.....	.....
3.	.....	.....

27. Please indicate any shortcomings in your services (either from users comments or self-realization) in a ascending order ?

Inadequate general collection of books, journals ,etc. .....
Lack of current journals, books, and other documents .....
Poor physical facility for users as well as staff .....
Lack of processing equipment and other information technology (for example CD-ROM reader) .....
Poor information management and handling .....
Absence of external databases available / accessible .....
Others (specify) .....

28. What do you think are the causes for the shortcomings (indicate in a ascending order) ?

Poorly motivated staff .....
Shortage of skilled workforce .....
Poor management .....
Budgetary constraint .....
Foreign exchange constraint to purchase required items from abroad .....

29. In what areas have your library / documentation / information center made any significant improvement in the last three years? (if you have more than one choices, rank them accordingly)

Collection development .....
Services expansion .....
Facility building .....
Workforce development .....
Overall improvement .....
No significant improvement .....

30. Do you have plans to improve / enhance your information services ? If yes, please list the main features of the plan.

1.
2.
3.

31. Do you have staff training / development program ? List its main features (in-service training, long-term training, short-term workshops, etc.)

1.
2.
3.

32. In what areas do you interact with information services of other institutions (if in more than rank them in a ascending order)?

Interlibrary loan .....
Exchange of publication .....
Professional staff consultancy .....
Training .....
Provision of photocopies of extracts and other documents from your collection .....

33. What are the communication methods you use most frequently (if in more than one rank them in a ascending order) ?

Mailing .....
Visits in person .....
Telephone .....
E-mail .....
Computer network .....

34. Do you think cooperative activities with other information services will benefit your information services ? If yes, in what ways (indicate in a ascending order)

Sharing the existing resources (including using information technology) .....

Access to wider information sources (including to national and international databases) .....

Training for your staff .....

Professional consultancy .....

Acquisition of required information sources and equipment .....

Others (specify) .....

Annex 2. Questionnaire used to survey the agricultural information users

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

SCHOOL OF INFORMATION STUDIES FOR AFRICA

QUESTIONNAIRE FOR A SURVEY ON THE PRESENT STATUS OF AGRICULTURAL INFORMATION SERVICES IN ETHIOPIA

PURPOSE : *The responses to this questionnaire will be used to assess the prevailing status of the agricultural information services , especially of problems, in Ethiopia.*

QUESTIONNAIRE FOR LIBRARY / DOCUMENTATION / INFORMATION CENTER USERS

Mark 'X' against your choice (s) .

1. Position of respondent :.....

   Area of specialization :.....

   Years with the institution :.....

   Affiliation :.....

2. How often do you use your library/ documentation center ?

   Frequently ☐ Sometimes ☐

   (At least once a day)

   Rarely ☐ Not at all ☐

3. What types of materials do you require from these units ? (if more than one choice ,rank them 1-6 according to your priority)

   Books ☐ Periodicals ☐

   Journals ☐ Extracts (photocopy) ☐

   Local publications ☐ Others (specify) ☐

4. What types of services do you use from these units ? (if more than one choice rank them 1-6 according to your priority)

Reprography services ☐ Literature search ☐

Quick reference services ☐ Others (specify) ☐

Current awareness services ☐

Document delivery services ☐

5. Do you find what you require from these units ?

Mostly ☐ Sometimes ☐

Rarely ☐

6. What are the materials / services you find lacking? (if more than one choice rank them 1-6 according to your priority)

Books ☐ Literature search ☐

Journals ☐ Local publications ☐

Reprography services ☐ Document delivery ☐

7. What are the deficiencies ? (if more than more choice, rank them 1-4 according to your priority)

Poor collection ☐ Poor staffing ☐

Lack of resources (eg. reprography) ☐ Bad resource management ☐

8. What is the nature of deficiency of the materials or inadequacy? (if more than one choice rank them 1-4 according to your priority)

Outdated ☐ Very few in number ☐

Not in stock ☐ restricted access ☐

9. List three most important journals needed for your work ?

1.

2.

3.

10. List abstracting journals useful for your work ?

1.

2.

3.

11. How much aware you are of publications by other local institutions ?

Well informed ☐ Not much ☐

Only in my area of interest ☐ Not at all ☐

12. How important are such publications to your work ?

Very important ☐ Not so crucial ☐

Not important ☐

13. How do you come across the information on such publications?

Formally through established ways ☐

Informally through your personal contacts ☐

Not informed ☐

14. Do you have problems in actually getting these publications ?

Yes ☐ No ☐

15. Does your library / documentation center facilitate your access to such materials ?

Yes ☐ No ☐

16. If yes, how is it facilitated ?

1.

2.

3.

17. How do you come in contact with researchers of other institutions and their work ?

Personal contacts ☐

Their publications ☐

From formal sources (databases) ☐

Not informed at all ☐

18. Does your library / documentation center inform you of source materials and services provided by other institutions ?

Yes ☐ No ☐

19. How often do you use library/ documentation centers of other institutions ?

Frequently ☐ Sometimes ☐

(at least once a day)

Rarely ☐ Not at all ☐

20. If not at all or rarely, why ?

Not allowed to ☐ Do not know what is available ☐

Not relevant ☐ Do not have transport or easy access ☐

21. How do you rate your library/ documentation center's services in relation to others ?

Better ☐ Not much difference ☐

Worse ☐ Not aware ☐

22. Which institutions' library /documentation centers do you find better ? (list their names)

1.

2.

3.

23. Do you think free access to the information resources and services of other institutions would benefit you ?

Yes ☐ No ☐

24. What information resources / services that you require most is another institution providing ? (List them)

1.

2.

3.

4.

25. What is you general assessment of the services of your information services ?

Satisfactory ☐ Improving ☐

Inadequate ☐

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