

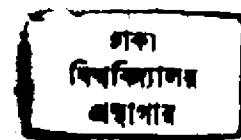
**ASSESSMENT OF INFORMATION NEEDS FOR
THE AGRICULTURAL SCIENTISTS AND
RESEARCHERS IN BANGLADESH**

By

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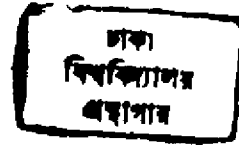


*The Thesis Submitted to the University of Dhaka in fulfillment of
the requirement for the Degree of Doctor of Philosophy in
Information Science and Library Management.*

2002

DEDICATED
TO
MY PARENTS

400583



Who tried to enrich others' knowledge and
asked me to serve the people with Humanness,
Intelligence and Truth.

Certificate

This is to certify that the research work presented in this dissertation is an original research work done by Mr. Md. Hanif Uddin and has been planned and completed under my direct supervision in the University of Dhaka for the degree of Doctor of Philosophy (Ph.D.) of the University of Dhaka.

It has not been submitted either in part or in full to any other university for any other degree or diploma or any other purpose.

Signature

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Serwar Hussain
15/12/02

Dr. Serwar Hussain

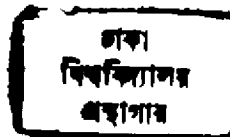
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Declaration

I declare that the dissertation titled, **“Assessment of Information Needs for the Agricultural Scientists and Researchers in Bangladesh”** submitted to the University of Dhaka, Bangladesh for the degree of Doctor of Philosophy, is entirely my own original work, completed under the supervision of Professor Serwar Hussain of the Department of Information Science and Library Management, University of Dhaka, Dhaka-1000, Bangladesh.

I further affirm that no part or whole of the dissertation has been submitted in any form to any other University or Institute for a degree or diploma.


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ABBREVIATIONS

A.D	-	After Death
AARC-2	-	Anglo-American Cataloging Rules-2
ADB	-	Asian Development Bank
AGLINET	-	Agricultural Libraries Network
AGRIS	-	International Information Systems for the Agricultural Sciences and Technology
AIBA	-	Agricultural Information Bank for Asia
AIC	-	Agricultural Information Centre
AIU	-	Association of the Indian Universities
ALA	-	American Library Association
APO	-	Asian Productivity Organization
ARB	-	Agricultural Research Board
ATI	-	Agricultural Training Institute
AVRDE	-	Asian Vegetable Research Development Centre
B.Sc.Ag.	-	Bachelor of Science in Agriculture
BADC	-	Bangladesh Agricultural Development Corporation
BADCL	-	Bangladesh Agricultural Development Corporation Library
BAIL	-	Bangladesh Agricultural Institute Library
BAIN	-	Bangladesh Agricultural Information Network
BALID	-	Bangladesh Association of Librarians, Information Scientists and Documentalists
BARC	-	Bangladesh Agricultural Research Council
BARD	-	Bangladesh Academy for Rural Development
BARI	-	Bangladesh Agricultural Research Institute
BARIL	-	Bangladesh Agriculture Research Institute Library
BAU	-	Bangladesh Agricultural University
BAUL	-	Bangladesh Agricultural University Library

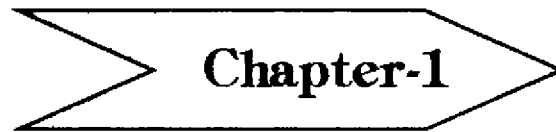
BAURES	-	Bangladesh Agricultural University Research System
BD-AGRINET-	-	Agricultural Information Networking in Bangladesh
BFRI	-	Bangladesh Forest Research Institute
BFRIL	-	Bangladesh Forest Research Institute Library
BIDS	-	Bangladesh Institute of Development Studies
BINA	-	Bangladesh Institute of Nuclear Agriculture
BINAL	-	Bangladesh Institute of Nuclear Agriculture Library
BJRI	-	Bangladesh Jute Research Institute
BJRIL	-	Bangladesh Jute Research Institute Library
BJRS	-	Bengal Jute Research Station
BLRI	-	Bangladesh Livestock Research Institute
BLRIL	-	Bangladesh Livestock Research Institute Library
BRAC	-	Bangladesh Rural Advancement Committee
BRRI	-	Bangladesh Rice Research Institute
BRRIL	-	Bangladesh Rice Research Institute Library
BSFIC	-	Bangladesh Sugar and Food Industries Corporation
BSMRAU	-	Bangabandhu Sheikh Mujibur Rahman Agricultural University
BSMRAUL	-	Bangabandhu Sheikh Mujibur Rahman Agricultural University Library
BSRI	-	Bangladesh Sugarcane Research Institute
BSRIL	-	Bangladesh Sugarcane Research Institute Library
BTRI	-	Bangladesh Tea Research Institute
BTRIL	-	Bangladesh Tea Research Institute Library
CABI	-	Commonwealth Agricultural Bureau International
CALIBNET	-	Calcutta Library Network
CARE	-	Cooperation of American Relief Everywhere
CARIS	-	Current Agricultural Research Information System
CAS	-	Current Awareness Service
CASR	-	Committee for Advance Studies and Research

CCC	-	Classified Catalogue Code
CCF	-	Common Communication Format
CD-ROM	-	Compact Disc. Read Only Memory
CDS/ISIS	-	Computerized Documentation Services/Integrated Set of Information Systems
CERDI	-	Central Extension Resources Development Institute
CFP	-	Central Focal Point
CGIAR Research	-	Consultative Group on International Agricultural Research
CIDA	-	Canadian International Development Agency
CSO	-	Chief Scientific Officer
DAC	-	Dumki Agriculture College
DAE	-	Department of Agricultural Extension
DAEL	-	Department of Agriculture Extension Library
DANIDA	-	Danish International Development Assistance
DDC	-	Dewey Decimal Classification
DELNET	-	Delhi Library Network
DLS	-	Department of Livestock Services
DOF	-	Department of Fisheries
DSSB	-	Department of Soil Survey of Bangladesh
ECNEC	-	Executive Council of National Economic Committee
FACP	-	Food and Agricultural Council of Pakistan
FAO	-	Food and Agricultural Organization
FRI	-	Fisheries Research Institute
FRILDC	-	Fisheries Research Institute Library and Documentation Centre
FSR	-	Farming Systems Research
FSRD	-	Farming Systems Research and Development
G.B	-	Governing Board
GDP	-	Gross Domestic Products

GIEWS	-	Global Information Early Warning System
GKF	-	Grameen Krishi Foundation
GoB	-	Government of Bangladesh
GSS	-	Gono Sahajjo Sangtha
GTT	-	Graduate Training Institute
HDUSTL	-	Hajee Danesh University of Science and Technology Library
HMDAC	-	Hajee Mohammad Danesh Agricultural College
HRC	-	Horticulture Research Centre
HYV	-	High Yielding Variety
IAALD	-	International Association for Agricultural Librarians and Documentalists
IARI	-	Indian Agricultural Research Institute
IASLIC	-	Indian Association for Special Libraries and Information Centres
IASRI	-	Indian Agricultural Statistics Research Institute
ICAR	-	Indian Council of Agricultural Research
ICRISAT	-	International Crop Research Institute for Semi Arid Tropics
IDRC	-	International Development Research Centre
INFLIBNET	-	Information and Library Network
INIS	-	International Nuclear Information System
INSDOC	-	Indian National Scientific Documentation Centre
IPM	-	Integrated Pest Management
IPSA	-	Institute of Post Graduate Studies in Agriculture
IRRI	-	International Rice Research Institute
IUBAT	-	International University of Business, Agricultural and Technology
JICA	-	Japan International Cooperation Association
LAB	-	Library Association of Bangladesh

LAN	-	Local Area Network
LDI	-	Library Documentation and Information
LIS	-	Library and Information Science
M.S	-	Master of Science
MCC	-	Mennonite Central Committee
MOU	-	Memorandum of Understanding
NAIS	-	National Agricultural Information System
NAISS Services	-	National Agricultural Information Systems and Services
NALDOC Centre	-	National Agricultural Library and Documentation Centre
NARS	-	National Agricultural Research System
NFP	-	National Focal Point
NGO	-	Non-Government Organization
ODA	-	Overseas Development Agency
ORC	-	Oilseed Research Centre
PETRA Assistance	-	Poverty Elimination through Rice Research Assistance
PRC	-	Pulse Research Centre
PUSTL	-	Patuakhali University of Science and Technology Library
RARS	-	Regional Agricultural Research Station
RDA	-	Rural Development Academy
RDRS	-	Rangpur Dinajpur Rural Services
S.S.	-	Support Services
SAARC	-	South Asian Association for Regional Co-operation
SAIC	-	Saarc Agricultural Information Centre
SATCRIS	-	Semi-Arid Tropical Crops Information Service
SCA	-	Seed Certified Agency
SDI	-	Selective Dissemination of Information

SDS	-	Social Development Society
SEAMEO	-	South-East Asian Ministers Education Organization
SEARCA	-	South-East Asian Centre for Graduate Study and Research in Agriculture
SRC	-	Spices Research Centre
SRDI	-	Soil Resources Development Institute
SRDIL	-	Soil Resources and Development Institute Library
T & C	-	Training and Communication
TCP	-	Technical Co-operation Programme
TCRC	-	Tuber Crops Research Centre
TRB	-	Technical Research Board
U.K	-	United Kingdom
U.S.	-	United States
UDC	-	Universal Decimal Classification
UGC	-	University Grants Commission
UNDP	-	United Nations Development Programme
UNESCO	-	United Nations Educational Scientific Organization
UNFP	-	United Nations Food Programme
UNIC	-	United Nations Information Centre
UNICEF Fund	-	United Nations International Children's Emergency
UNISIST	-	United Nations Information Systems for Science and Technology
UPL	-	University Press Limited
USAID	-	United States Agency for International Development
USIS	-	United States Information Services
WAN	-	Wide Area Network
WB	-	World Bank
WRC	-	Wheat Research Centre

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Chapter-1

1.1 Preamble

Agriculture continues to play a key role in the overall economic performance of Bangladesh. It still dominates in terms of its contribution to GDP, poverty alleviation, foreign exchange earnings and in providing employment to a large segment of the population, especially the rural poor. Consequently the nation's progress well into the next century will depend on government policies in the agricultural sector. Agriculture is also a key sector to provide export earnings as well as generating jobs not only in farming but also in the highly important agricultural manufacturing sector.¹

Our agriculture sector mainly comprises of agricultural administration and planning, agricultural extension services, education and research. In this sector various types of personnel are involved. In their work they need agricultural information resources for proper planning, management, research, education and decision- making.

So, 'it is very much necessary to emphasize the need for the procurement of adequate agricultural information for documentation, preservation, retrieval and communication.'² It is a prime requirement for a country like Bangladesh to provide information support to the agricultural scientists and researchers through the improved services so that they can play a vital role for the agricultural development.

1.2 Statement of the Problem

Information is considered as a 'vital resource in developed countries as well as developing countries. It has become an ingredient and part and parcel of every aspect of life. As a key factor to the socio-

economic progress of a country, information has gained increasing importance.’³

Information need is a ‘condition in which certain information contributes to the achievement of a genuine or legitimate information purpose. It is a relationship obtainable between information and information purpose.’⁴ It is a composite concept of different types of requirements and approaches to information. Assessment of agricultural information needs means a composite concept of assessment of different types of requirements and approaches to agricultural information by agricultural scientists and researchers.

The current topic, "Assessment of Information Needs for the Agricultural Scientists and Researchers in Bangladesh" means the measuring of the agricultural information needs of the agricultural scientists and researchers in Bangladesh. Information supply is a burning problem in our country. Without proper information supply in agriculture, it is impossible to produce more foods to meet our nation's food requirements. In this thesis, comprehensive attempts have been made to find out the present position of supply of information, necessary for the scientists and researchers for the development of agriculture in Bangladesh. At the end, valuable recommendations are made for the development of agriculture in Bangladesh.

1.3 Literature Review

A comprehensive review of related literature has become an essential part of any investigation as it identifies the new problems and gaps in the area of research. It also provides a basis for theoretical framework of the study and interpretation of findings. The present

problem is a modern one. Research works on the topic even in the developed countries, not to speak of the developing countries like Bangladesh are very limited. Most of the published literature on the topic in Europe and America are not available in Bangladesh. As such in the process of the research, the researcher heavily suffers from the dearth of literature on this subject. The available literature on the information needs of the agricultural scientists and researchers is limited. Hence, it is not possible for the research scholar to comprehensively review the related literature in the field.

Agar et al (1984) in Scotland and Northern England confirmed in his article '*Managing information to fit the need*' that respondents relied heavily on personal contacts with other advisors, specialists and farmers as that was a convenient way of obtaining information. This study also revealed a large number of topics for which concise information is needed.⁵

George Nielson (1984) reported in his article '*Agricultural information cycle in Denmark researcher to the farmer*' that in order to improve the information flow from agricultural research to extension in most instances it was necessary to do some re-packaging of the research results before they can be used by the farmers.⁶

L. Ikpaahindi submitted a doctoral thesis to the University of Pittsburgh, U.S.A. on '*Relationship between the needs for achievement affiliation and power and frequency of use of information sources and scientific productivity among Nigerian Veterinary Surgeons*'.⁷ He assessed the different types of information needs of the veterinary surgeons of Nigeria.

The information component of extension services in Nigeria constituted the doctoral thesis of L. O. Aina (1986) titled, '*An empirical analysis of the information component of agriculture extension service in Ibadan area*' which was submitted to the University of Ibadan, Nigeria.⁸ Here Mr. Aina revealed what kind of information component is required by the agricultural extension service of Ibadan area, Nigeria.

In the same year, Lupanga (1986) completed his doctoral study at Cornell University, U.S.A. on '*Linking research and extension in Tanzania: some communication behaviours of researchers and extension*'.⁹ Here Lupanga identified the linkage of research and extension and major communication behaviours of researchers and extension workers.

N. Prasad (1987) in his article '*Extension education role of the ICAR in transfer of technology*' insisted that agricultural university should serve as one of the primary sources of agricultural information and assume its role in development of effective communication media including film production and the development of prototype instruments and appliances. In the field of research, the university should primarily confine itself to the knowledge of input but every research scientist in the university should have contact with the field.¹⁰

Eswara Reddy (1987) stressed the importance of transfer of technology in increasing the agricultural production in his article '*Information services and document delivery in food and agriculture in India*'. He said that the transfer process consists of four important inter linked and interdependent operations namely the development of

information, documentation of information, dissemination of information and diffusion of information.¹¹

J. B. Ojiambo (1989) investigated communication of agricultural information among research scientists, extension personnel and farmers in Kenya. This formed the basis of his doctoral thesis titled, '*Communication of Agricultural information among research scientists, extension personnel and farmers in Kenya*' which was submitted to the University of Pittsburgh, U.S.A.¹²

A. M. Kaniki (1989) also submitted to the same university his doctoral thesis entitled, '*Agricultural information needs in Zambia: a study of a two way information flow*' in which he investigated the agricultural information needs in Zambia.¹³

French Beverlee (1990) in his paper '*User needs and library services in agricultural sciences*' depicted agricultural scientist information needs and behaviour. He reviewed the trend in agriculture and information delivery and the implications of these trends for users and for the relationship between information professional and user.¹⁴

L. O. Aina (1991) in his paper '*Provision of agricultural information to farmers and extension officers: a catalyst in agricultural production in Africa*' reported that agricultural information needs of the scientists and researchers in Africa included control of major pests, books and journals related to agricultural research, credits and co-operatives; proper handling of insecticides and marketing of agricultural products etc.¹⁵

The role of the library in the provision of information in South African agriculture was investigated by Van Niekerk (1992) and led her

to pursue a Ph.D. thesis titled, '*Information in South African agriculture: the role of the library*' which was submitted to the University of South Africa.¹⁶ Here Mrs. Niekerk measured the various roles of libraries in the development of agriculture in South Africa.

M.A. Rouf Meah (1994) wrote a paper entitled "*Agricultural Libraries in Gazipur district (Bangladesh): a survey report*", which was published in the journal of Annals of Library Science and documentation published by INSDOC (New Delhi) India, in 1994. This paper presented a picture of four agricultural libraries, their shortcomings, services and various systems followed by the libraries. In this context, the investigator proposed some suggestions for the further development of the agricultural libraries in Gazipur district.¹⁷

M.A. Wahab (1995) presented an article on '*Need for information and literature support: users expectation*'. The article highlighted the information needs of the teachers of the Bangladesh agricultural university. He identified the areas of satisfaction of the teachers and mentioned some problems, which made obstacles to provide better services to the teachers. At the end, he further recommended some suggestions for improvement of the library facilities to cater better services to the teachers of the university.¹⁸

Zhang and Cheng wrote a paper titled '*Provision of information to the rural communities in China*' which was published in the Quarterly Bulletin of IAALD, vol. 41 (1996). It was reported by them that different groups' information needs varied in terms of types, quantity, timeliness and medium of information, channels of communication and methods of information dissemination. They mentioned that, ' the

technical personnel who are directly engaged in agricultural production require reliable, accurate, practical, technical and detailed information in order to solve technical problems. They mentioned that the technical personnel usually obtain information from formal information in services and also pay attention to information channels of communication'.¹⁹

Joel Sam (1996) in his article, '*Adequacy of document collection and the satisfaction of information needs of agricultural policy makers and managers in Ghana*' revealed that in order to satisfy the diverse information needs and interests of agricultural policy makers and managers, the library collection must be adequate in terms of quantity, quality and currency. The collection must be accessible to the users. He further identified that policy makers and managers need adequate up-to-date information as a precondition to an effective decision-making and good governance.²⁰

Raman Nair and T. Francis (1996) in their paper, '*Information needs of agricultural scientists: problems and prospects*' reviewed how far the existing information systems can meet the research, education and extension needs in Agricultural sector in India. They pointed out the wrong concepts about information systems and services, put forward suggestions for improvement and recommended the establishment of a central agency to monitor the utilization of resources allotted for agricultural information services.²¹

B.S. Maheswarappa and S.N. Desai (1996) in their article, '*Information gathering habits of Indian Agricultural Scientists in a university environment*' depicted information gathering of Indian

scientists' in the field of agricultural sciences in a university environment. Further they mentioned that majority of the scientists were spending most of their time in gathering and reading of information. The university libraries in the field of agricultural sciences should plan, organize and provide the various types of information services which could save the time of scientists. The libraries should try to develop a need based collection of all types of documents.²²

The Ph.D. dissertation of Suguna Vathy (1997) was '*Information needs and sources of information of subject matter specialists in the training and visit system of agricultural extension.*' It was submitted to the Osmania University, Hyderabad, Andhra Pradesh (India). This study provides some idea of information needs of agricultural extension personnel.²³

Dr. K. Veeranjanyulu (1997) completed another study in Hyderabad (India) on the topic entitled, '*A study on agricultural information system in Andhra Pradesh (India)*'. It provided enough information that may be helpful to the present study.²⁴ He investigated and evaluated various agricultural libraries' functions, objectives and services and put many suggestions for the development of libraries so that these libraries could provide better information services to the agricultural scientists and researchers.

Md. Qumrul Islam (1998) presented a paper titled '*Agricultural information system in Bangladesh*' in the training workshop on Library, documentation, publication and audio-visuals where he explained various types of agricultural information services provided by the

agricultural libraries in Bangladesh. He suggested collection of up-to-date information for quality research.²⁵

Md. Hanif Uddin, undertook a survey entitled, '*Agricultural libraries in Mymensingh district*'. The survey report was published in the Journal of Library and Information Science, Vol. 25 (2) of Delhi University, India in 2000. He evaluated the services offered by the agricultural libraries in Mymensingh. It was found that substantive improvements in library administration, organisation and personnel were required for offering better services to the library users. In this regard, he proposed some suggestions for further development of the agricultural libraries in Mymensingh (Bangladesh).²⁶

Bangladesh is an agricultural country and it has also a very big agricultural system consisting of agricultural research sub-system; agricultural education and training and agricultural extension. More than 50,000 personnel have been working in the above sectors. But it is observed from their research activities that no research study has been done in the field of agricultural information needs of Agricultural Scientists and Researchers. So, to meet up the gap, the researcher has selected the topic, titled, "Assessment of information needs for the agricultural scientists and researchers in Bangladesh," for doctoral research in the University of Dhaka.

1.4 Importance of the Study

Agriculture is the backbone of the Bangladesh economy as it accounts for close to 33%²⁷ GDP and employs about 70%²⁸ of labour force. It provides bulk of raw materials to the agro-based industries such as sugar, food, jute, textile, tea and leather.²⁹ Agricultural development

is vital to provide food for its enormously large and growing population, to maintain a minimum level of living and to provide labour and capital to the very poorly developed industrial and service sectors of the economy.³⁰

It has the "greatest potential to provide increased production, helping to reduce food deficit as well as shortage of industrial raw-materials, and to provide employment opportunity with reasonable income for attaining better level of living of the majority of people who live in villages. Because of the increase in the productivity and income as well as self-reliance in food, a more desirable socio-economic and institutional framework could emerge as part of the development process. Thus the country's progress and prosperity primarily depends on agricultural development."³¹ If we want to develop our agriculture sector, it is very much essential to ensure supply of right information to the right agricultural scientists and researchers at the right time.

Information, in its wider and more general application is considered as the sixth basic needs of human being. It regulates the creative thoughts, sharpens the outlook, making man fit for survival in the world. It is to speak the age of information.³² The present study is an attempt to assess, evaluate and analyse the information needs of the agricultural scientists and researchers in Bangladesh and to suggest possible remedial measures for improvement of the existing library services which serve them properly.

So, for a developing country like Bangladesh it is essential to establish and operate an effective national Agricultural Information

System and Services for proper agricultural policy, planning, research and decision- making. From this study:

- i. The agricultural scientists and researchers will be able to know the present status of the individual library, documentation and information centres working for various agricultural tasks at different levels in the existing National Agricultural Information System (NAIS) of Bangladesh.
- ii. They will be able to know the present status of National Agricultural Information System of Bangladesh.
- iii. The agriculture policy makers and planners will be benefited with the results of this study for developing an effective NAIS for Bangladesh.
- iv. This study will also bring benefit for the agricultural Administrators, Managers, Planners and Policy Makers at various NARS institutes and institutional levels for the development of their LDI centres.
- v. This study will bring great benefit for the agricultural scientists and researchers in doing their works properly if the BD-AGRINET is designed according to the recommendations made by the study.
- vi. This study will also bring benefit for the library, documentation and all information personnel in playing their proper role for further development of LDI centres.
- vii. From this study the agricultural scientists and researchers will be able to know the international agricultural information systems and services of the world.

- viii. Other developing countries, which do not have effective national agricultural information networking systems will also be benefited by this study.

1.5 Objectives of the study:

1. To identify the information needs of the agricultural scientists and researchers working in various research organizations in Bangladesh.
2. To know the attitudes of Agricultural scientists and researchers towards introducing agricultural information system and use of computers in the handling of agricultural information.
3. To survey the available information sources in the agricultural libraries of Bangladesh and examine the same for bringing under networking system.
4. To evaluate the existing agricultural information resources in order to share information by the various agricultural libraries of Bangladesh.
5. To design an agricultural information network system at national level for access and effective use of agricultural information.
6. To enable policy makers and agricultural administrators of Bangladesh to understand the information needs of agricultural scientists and researchers so that the information systems are strengthened.

1.6 Scope of the study

The fundamental aim of the study is to know the information needs of the agricultural scientists and researchers and sources of information resources available in the agricultural libraries of

Bangladesh. Moreover the thesis has covered the information needs of the agricultural scientists and researchers of Bangladesh working in the NARS institutes and teaching personnel working in the agricultural colleges and universities. The present study is an elaborate, systematic and critical one supported by statistical analysis of all the responses of the information users i.e. agricultural scientists and researchers. The opinions of librarians of the surveyed agricultural libraries in Bangladesh were analysed in another chapter. This thorough study is the first of its kind in agricultural field in Bangladesh. The idea about the scope of the study will be further enlightened by the study of the organisation of the thesis stated below.

1.7 Organisation of the thesis

The text of the dissertation has been organised in a logical progression in the following seven major chapters including appendices and bibliography.

Chapter-1: It includes preamble, statement of the problem, literature review, importance of the study, objectives of the study, scope of the investigation, organisation of the thesis, methodology of the study and formulation of hypotheses.

Chapter-2: It contains an introduction of Bangladesh agriculture, consisting of climate, land, population, economy, a historical overview of Bangladesh agriculture, Agricultural education, research and extension system of Bangladesh and Role of NGO's in agriculture.

Chapter-3: It reflects the Agricultural information systems in Bangladesh: a comparative analysis of data. Here the investigator

analyses 18 agricultural libraries of Bangladesh, their objectives, services and etc.

Chapter-4: It deals with linkage of Bangladesh with the international agricultural information systems and services and their roles in agricultural development of Bangladesh.

Chapter-5: This chapter reflects the information needs of the agricultural scientists and researchers in Bangladesh. This chapter gives a vivid discussion of information, its meaning, Taxonomy of information, Importance of information in agriculture of Bangladesh, current status of the agricultural information users, analysis of data and testing of hypothesis.

Chapter-6: It proposes a network of agricultural information system in Bangladesh, its objectives, functions, network topology, Hardware and software for the network and its implementation.

Chapter-7: The last chapter presents the vital findings of the investigation Here the researcher suggested some recommendations for implementation for necessary development of agriculture in Bangladesh.

1.8 Methodology of the study

The data required for the study was collected from primary as well as secondary sources. In investigating the problems the following methods have been applied.

1.8.1 Literature Search and Analysis

In order to investigate the reliable literature in connection with the present study, the various agricultural indexing and abstracting tools like AGRIS, AGRINDEX, CABI and agricultural information available on

CD-ROM related to agriculture have been consulted. Dissertation abstracts available in the British council library in Dhaka, Bangladesh and 10 years Doctoral dissertations of library and information science published by the *Association of the Indian Universities (AIU), New Delhi (India)*, have been also consulted. Besides, the investigator has systematically made a literature search from the catalogues of the well-organised Bangladeshi and Indian agricultural libraries, government publications and other official sources available in Bangladesh. The types of literature identified and located are books, monographs, periodical articles, proceedings, reports, doctoral dissertations, etc. These materials have been analysed for the research study.

1.8.2 Visit and study tour programmes

The investigator took several visits and study tour programmes to India and Bangladesh to know the activities and services of the agricultural institutions and libraries of agricultural fields in connection with this research work. Libraries of Agricultural Universities, libraries of Agricultural Colleges, NARS (National Agricultural Research System) institutes in different places in Bangladesh, Department of Agricultural Extension (DAE) library, etc. were included in this study tour programme. Out of 20 agricultural libraries in Bangladesh, the researcher personally surveyed and studied 18 libraries. Besides, the researcher visited the famous agricultural university libraries, agricultural research institute libraries in India. These are Achayaria N.G. Ranga, Agricultural University library in Hyderabad, Library of College of Agriculture (KolKata University), Library of Indian Council of Agricultural Research (ICAR), Indian Agricultural Research Institute Library (IARI), Indian Agricultural Statistics Research Institute Library

(IASRI), Bidhan Chandra Krishi Bishwabidyalaya (West Bengal) and etc.

1.8.3 Sample design

For ensuring representatives from different types of agricultural libraries (educational, research and extension) and considering the services and their usefulness to the users, eighteen agricultural libraries of the country were purposefully selected and brought under the investigation. These are shown by Table 1.

Table 1: Libraries and information centres under the survey

Sl.	Name of the library	Year of establishment	Location
1.	BD Agricultural Institute Library	1938	Dhaka
2.	BD Jute Research Institute Library	1951	Dhaka
3.	BD Forest Research Institute Library	1955	Chittagong
4.	BD Tea Forest Research Institute Library	1957	Srimongal
5.	BD Agricultural University Library	1961	Mymensingh
6.	Soil Rice Research Institute Library	1962	Dhaka
7.	BADC Library	1963	Dhaka
8.	BD Rice Research Institute Library	1970	Gazipur
9.	BD Institute of Nuclear Agriculture Library	1973	Mymensingh
10.	Agricultural Information Centre	1973	Dhaka
11.	BD Sugarcane Research Institute Library	1974	Ishurdi
12.	BD Agricultural Research Institute Library	1976	Gazipur
13.	Patuakhali University of Science and Technology Library (PUSTL)	1979	Patuakhali
14.	Bangabandhu Sheikh Mujibur Rahman Agricultural University (BSMRAU) Library	1983	Gazipur
15.	Dept. of Agriculture Extension Library	1983	Dhaka
16.	BD Livestock Research Institute Library	1986	Savar
17.	BD Fisheries Research Institute Library	1987	Mymensingh
18.	Hazee Danesh Univ. of Sc. and Technology Library (HDUSTL)	1989	Dinajpur

1.8.4 Questionnaire method

A questionnaire is essentially skilful communication of objectives into a set of questions intended to be answered in writing.³³ The researcher has made maximum efforts for collecting relevant data from agricultural scientists and researchers in Bangladesh and agricultural libraries of Bangladesh by employing the traditional method of empirical social science research i.e. questionnaire method. A structured questionnaire, with both closed and few open options, was administered to elicit both quantitative as well as qualitative information from the respondents relevant to the study in the light of their observations and experiences. The relevance and utility of each item was also carefully examined before their inclusion in the questionnaire.

After obtaining the address of the scientists and researchers from the research organisations, the said questionnaires were mailed by post to the scientists and researchers and some were delivered in person, particularly to those available within the capital city of Dhaka. A personal request was made to the respondents as and when the investigator met them for early return of the filled-in questionnaires. Some respondents desired that the investigator should sit before them to get the questionnaire filled-in, perhaps owing to the technicalities of the questionnaire from information science perspective. As it was initially decided to study around 400 agricultural scientists and researchers, 400 printed questionnaires were sent, out of which 295 filled-in questionnaires were received back by the investigators, thus having response rate of 73.75%. The data collected through questionnaires were then scrutinised and their consistency was checked before analysis.

The second set of questionnaire was designed and distributed to agricultural librarians in Bangladesh for collecting information regarding the objectives, services, resources and manpower position of their libraries.

1.8.5 Examinations of files and records

The investigator collected information from the files and records relevant to this study available in the offices of the Ministry of Agriculture, Directorate of Forests, BLRI, BRRI, BARI, BSMRAU, BAU, BINA, BSRI, SRDI, BJRI, BTRI, FRI, BFRI etc. and other related institutions of Agriculture.

1.8.6 Statistical method

In the study pie charts and bar diagrams are used to represent the data. The objectives of statistical presentation of data are to summarize clearly (with considerable visual impact) the facts and inferences drawn from the data.

1.9 Formulation of hypotheses

The following hypotheses are formulated:

- i) The existing agricultural information sources available in various agricultural libraries in Bangladesh are absolutely inadequate to meet the requirements of the agricultural scientists and researchers.
- ii) The agricultural scientists and researchers of Bangladesh are in need of computerized agricultural information

system for accessing, updating and upgrading their knowledge.

- iii) The resource sharing of agricultural information sources among the agricultural libraries in Bangladesh are not up-to the satisfaction of the agricultural scientists and researchers.
- iv) There is an urgent need for networking of agricultural information system in Bangladesh for effective and necessary information supply to the agricultural scientists and researchers in Bangladesh.
- v) There is a favourable environment for planning of agricultural information networks for Bangladesh


References

1. Rashid Faruquee (edited). *Bangladesh Agriculture in the 21st Century*. Dhaka: UPL, 1998, p xii.
2. Prasher, R.G. *Managing University Libraries*. New Delhi: Today and Tomorrow Publishers, 1991, P 1.
3. Mudhal, M.V. *Information Seeking Behaviour (ISB of Researchers in three Karnatak State Universities (Ph.D Dissertation)*. Sambalpur University (Orissa): Dept. of LIS, 1997, P 7.
4. Prasad. H.N. *Information Needs and Users*. Varanasi: IBC, 1992, P 139.
5. Agar, J.R. et al. *Managing Information to Fit the Need*. Journal of information science 8(5), 1984, PP 225-227.
6. Neilson, George. *Agricultural Information Cycle in Denmark from Research to the Farmer*. International Information Communication and Education. Vol. 3, 1984, PP 29-35.
7. Ikpaahindi, L. *The relationship between the needs for achievement affiliation and power and frequency of use of information sources and scientific productivity among Nigerian Veterinary Surgeons (Ph.D Thesis)*. University of Pittsburg: LIS dept., 1985, PP 1-10.
8. Aina, L.O. *An Empirical Analysis of the Information Component of Agriculture Extension Service in Ibadan area (Ph.D. Thesis)*. University of Ibadan: LIS dept. 1986. P vi.

9. Lupanga, I.J. *Linking Research and Extension in Tanzania: Some communication behaviours of researchers and extension workers (Ph.D. thesis)*. Cornell University: LIS Dept., 1986. P iv.
10. Prasad, C. *Extension Education role of the ICAR in Transfer of technology: A first line extension effort*. Maharashtra Journal of Extension Education. Vol. 6, 1987, PP 177-189.
11. Eswara Reddy. *Information Services and Document Delivery in Food and Agriculture in India*. Quarterly Bulletin of IAALD 32(1987), PP. 31-37.
12. Ojiambo, J.B. *Communication of Agricultural Information among research scientists, Extension personnel and farmers in Kenya. Ph.D Thesis*. University of Pittsburgh: LIS Dept., 1989,PP 1-8.
13. Kaniki, A.M. *Agricultural Information needs in Zambia: A study of A Two way Information flow (Ph.D. thesis)*. University of Pittsburgh: LIS Dept., 1989. P vii.
14. French Beverlee, A. *User needs and library services in agricultural sciences*. Library Trends. Vol. 38, no. 3, 1990, PP 415-441.
15. Aina, L.O. *Provision of agricultural information to farmers and extension officers: A catalyst in increased agricultural production in Africa*. Quarterly Bulletin of International Association of Agricultural Libraries and Documentalists. 36: 1/2, 1991, PP 20-23.

16. Van Niekerk, R.V. *Information in South African Agriculture: The role of the library (Ph.D. Thesis)*. University of South Africa: LIS dept., 1992, P iii.
17. *Annals of Library Science and Documentation*, 1994. vol. 40(3), PP 97-103.
18. Wahab, M .A. *Need for information and literature support: users expectation*. Paper presented in the National Seminar on, “ Role of libraries in attainment of higher education and research”. Mymensingh: LAB,1995,PP 1-9.
19. Zhang Qiaoqiao and Xiaolan Cheng. *Provision of Information to the Rural Communities in China*. Quarterly Bulletin of IAALD. 41(1996), PP. 109-116.
20. *INICAE*, Volume 15,no-2, 1996,PP 176-185.
21. Nair, R. R. *Information needs of agricultural scientists: problems and prospects*. Paper presented at the 17th IASLIC seminar. KolKata: IASLIC,1996,PP 121-25.
22. Kaula, P. N. (ed.). *International and comparative librarianship and information systems*. Volume II. New Delhi: B. R.publishing, 1996,PP 15-29.
23. Suguna Vathy, C. *Information needs and sources of information of subject matter specialists in the training and visit system of agricultural extension (Ph.D. Thesis)*. Osmania University: LIS Dept., 1997, P viii.

24. Veeranjanyulu, K. *A study on agricultural information system in Andra Pradesh (Ph. D. Thesis)*. Sri Venkatswara University, Tirupati: Dept. of LIS, 1997, P 7.
25. Islam, M.Q. *Agricultural Information Systems and Services in Bangladesh*. Paper presented at the workshop Training on Library, Documentation, Publication and Audio-Visual. Organized by AIC (BARC), Dhaka, June 14-18, 1998, PP 1-3.
26. *Journal of Library and Information Science*. University of Delhi, Vol. 31, No. 2, 2000, P 150.
27. Akash, M.M. *Agriculture in Bangladesh: Environment facing the 21st century*. Philip Gain (ed.). Dhaka: SEHD, 1998, P 41.
28. *The Dhaka University Studies*. Vol. 56, no. 1, 1999, P 187.
29. *World Bank 1999*, PP 100-105.
30. *The Independent Bangladesh Year Book 1999*, P 72.
31. Hassanullah, M. & Others. *Performance of Agricultural extension organizations of Bangladesh*. Dhaka: UPL, 1996, P 2.
32. Islam, M.Q. *Agricultural Information Systems and Services in Bangladesh*. Paper presented at the workshop Training on Library, Documentation, Publication and Audio-Visual. Organized by AIC (BARC), Dhaka, June 14-18, 1998, PP 3-4.
33. Krishan, Kumar. *Research Methods in Library Information Science*. 3rd edn. New Delhi: Har-Anand Publications, 1995, PP 121-133.

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Chapter-2

2.0 Introduction

Bangladesh was under the Muslim rule for over five and a half centuries from 1201 to 1757 A.D.¹ Subsequently, it was under the subjugation of the British rule after the defeat of the last sovereign ruler, Nawab Sirajuddoula at the battle of Plassey on the fateful day of June 23, 1757². The British ruled over the entire sub-continent including this territory for nearly 190 years from 1757 to 1947³. During that period, the present Bangladesh was a part of British Indian province of Bengal and Assam.⁴ With the termination of the British rule in August 1947, the subcontinent was partitioned into India and Pakistan.⁵ The eastern part of partitioned Bengal constituted a province of Pakistan. East-Pakistan snatched its independence from Pakistan on the 16th December 1971 as a result of liberation war from March to December of the same year.⁶ This country has a long historical background of agriculture. The people are descendants of various races and nationalities. Administratively, the country is divided into six divisions having 64 districts, 460 upazillas, 4405 union parishads and 68000 villages.⁷

It is north eastern part of South Asia, between 20.34' and 26.38' north latitude and 88.01' and 92.41' east longitude. It is bounded by India on the west, north and north east, Myanmar on the east and the Bay of Bengal on the south. The area of the country is 147570 sq. km.⁸

The country has some hilly regions in the north east and south and some areas of high lands in the north and north western region. Except this, the entire area consists of low, flat and fertile land. There is a good network of rivers which along with about 230 distributaries have a total

length of about 22,500 km. The alluvial soil is continuously being enriched by heavy silts deposited by rivers during the rainy season.⁹

2.1 Climate

The tropic of cancer passes almost through the middle of the country, making country's southern part fall into the tropical and the northern part into sub-tropical and even temperate zone. But the physiography of the land, which is generally low and level, the nearness to the sea, and the rainfall which is high, have made the climate generally tropical with a subtropical touch at some places in the north and hilly regions of the east and north east.¹⁰

Bangladesh has a humid, warm climate that is tropical in some regions but lacks the range of variability characteristic of rains with a more diverse terrain. Three seasons are generally recognised:-

- (i) A hot summer season of high humidity from March to June.
- (ii) A hot and humid monsoon season from June through October and
- (iii) A cool and drier winter season from November to early March.

Maximum temperature ranges between 23.88⁰C to 40⁰C and minimum between 7.22⁰C to 15⁰C.¹¹

Annual rainfall, which ranges from 55 to 140 inches on average, is a highly critical risk factor in agricultural production. Foodgrains in particular depend on the timely arrival of rains. The tenuous balance between rainfall and cereal production is a central concern to policy

makers and government officials. A delay of seven to ten days in the arrival of monsoon rains can have a dramatic impact on the total grain harvest. Floods and drought are common consequences of the extreme weather patterns found in Bangladesh. Other catastrophes can arise from the violence which sometimes occurs with cyclones, floods and other weather extremes. The level of rainfall tends to decrease from east to west. Sylhet and Chittagong region have the highest rainfall while the lowest is found in the western districts of Rajshahi and Kustia. The heaviest rains occur during the monsoon months from late May to early October.¹²

In general, the rainfall and temperatures of Bangladesh provide excellent conditions for agricultural production. Cropping cycles are closely related to the rainfall and climatic patterns. Among the major crops, aman paddy, jute, and to some extent, aus paddy have production cycles to take advantage of the monsoon rains. Boro rice on the other hand, has been developed and requires winter irrigation for optimal production. During the winter, wheat, potato, and most of the oilseeds, spices, and vegetable crops are also grown in Bangladesh. But irrigation is not widely applied to these above crops.¹³

2.2 Land

Bangladesh belongs to the delta region, periodically ravaged by devastating floods and other natural disasters.¹⁴ It enjoys a unique geographical position. Rivers and their estuaries take up 8200 sq. km. of the total area. "The surveys conducted by the Soil Resources Development Institute (SRDI) during the 1960's and early 1970's have so

far identified about 500 soil series. The soils range from the recently deposited stratified alluvium of active floodplains or nearly perennially wet, strongly gleyed and poorly developed hydromorphic soils of floodplain basin depressions to well drained, strongly and deeply oxidized well developed soils of upland terrace areas and hills.”

For the purposes of understanding the kind of agricultural activities undertaken in the country, Bangladesh can be divided into three major physiographic units: hills, terraces and floodplains.¹⁵ On the other hand, Agricultural scientists divided Bangladesh broadly "into eight agro-ecological zones with varying possibilities for agricultural development related to the availability of water and the existing cropping pattern."¹⁶ The eight agro ecological zones are described below one by one.

2.2.1 Hill Areas

The hill areas that comprise about 7000 sq. miles cover Rangamati, Khagrachari, Banderban (Chittagong Hill Tracts), parts of Chittagong district, southern and eastern parts of greater Sylhet district, some parts of northern border of Mymensingh district, some areas on eastern border of Lalmai hills in Comilla district and the north eastern border of Feni district.¹⁷ The hill soils are under the general soil type, the brown hill soils. The natural vegetative cover for this region includes trees, shrubs and poor grasses while the plantation crops consist of timber, rubber, tea and horticultural fruits. In the valleys, however some rice crops are cultivated.

2.2.2 Terrace

The terraces in Bangladesh consist of the Madhupur and the Barind tracts and the Akhaura terrace. The terraces are broadly level to dissected lands with either good or bad drainage system. The soil composition ranges from friable brown loamy or compact grey heavy clay soils.

There is an acute shortage of soil moisture in the dry season. The Madhupur tract covers some areas of Narayanganj, Dhaka, Gazipur, Narsingdi, Tangail and Mymensingh. The Barind tract extends in the north Bengal region from the districts of Rangpur, Gaibandha, Dinajpur, Naogaon, Bogra, Joypurhat, Natore and parts of Sirajgonj. The Akhaura terrace comprises the Akhaura part in Brahmanbaria district. Cultivation of rabi crops in these areas is restricted due to shortage of soil moisture. On the well drained sites of the Madhupur tracts, trees such as the jack fruit and sal are mainly grown. On the poorly drained sites in the Barind tract, single transplanted Aman or Aus, followed by transplanted aman are the major crops.¹⁸

2.2.3 Haor Areas

The Sylhet basin areas include a vast depressed area on the western part of the Surma-Kusiyara floodplain called the Haor. The haor areas are deeply flooded by the monsoon rains and the water does not drain out till late in the dry season. These areas occur in the districts of Habiganj, Sunamganj, Kishoreganj, Netrokona. and Brahmanbaria. The general soil type of this areas is Acid Basin Clay. Kharif paddy can not be grown and presence of water late in the dry season restricts cultivation of dry land rabi crops.¹⁹

2.2.4 River Charlands

Charlands are found mainly along the active river systems. The soils are coarse textured ranging from sand to silt. The river charlands are subject to inundation and burial by fresh alluvium. River erosion occurs almost every year. These charlands are found in parts of Jamalpur, Tangail, Manikgonj, Munshiganj, Rajbari, Faridpur, Madaripur, Sariatpur, Bogra, Sirajganj, Kurigram, Gaibandha, Rajshahi, Pabna, Nawabganj and Natore. Non-calcareous Alluvium and in some places calcareous Alluvium are the general soil types which occur in the river charlands. The availability of residual moisture determines cultivation of rabi crops such as sweet potatoes, ground nuts and pulses.²⁰

2.2.5 Coastal Charlands

This unit comprises the vast tracts of land within the mainland of the coastal districts as well as the off shore islands. These lands are vulnerable to severe cyclonic storm surges, tidal flooding and severe erosion. Salinity develops on the topsoil in the dry season. The coastal charlands are found in the districts of Pirojpur, Barguna, Patuakhali, Bhola, Lakshimpur, Noakhali, Feni, Chittagong and Cox's Bazar. The coastal charlands contain partly calcareous Alluvium in the general soil type. A single crop of transplanted Aman can be grown in the monsoon season. Aus is also grown by dibbling method which keeps the emerging seedlings out of contact with the surface salt crust.²¹

2.2.6 River Floodplains

The river floodplains which include the piedmont plains are classified as shallow flooded areas and deeply flooded areas. The shallow

flooded areas generally occupy the higher sites in the landscape and are inundated to a depth ranging from a few centimetres to less than one metre during the monsoon. The soil is usually friable loam and the land remains dry during the winter season. The shallowly flooded areas of the river floodplains are found in the greater districts of Chittagong, Sylhet, Mymensingh, Dhaka, Faridpur, Dinajpur, Bogra, Rajshahi, Pabna, Rangpur, Kustia, Jessore, Khulna, Patuakhali, Barisal, Comilla and Noakhali. Cropping patterns followed in above areas are: (a) Aus/Jute followed by Rabi crops (b) Aus/Jute followed by Transplanted Aman. Besides Kharif season, paddy, Boro paddy may be grown with irrigation facilities on clay soils.

The deeply flooded areas occupy the lower sites in the landscape and are inundated from one metre to three and a half metres during the monsoon season. These areas are present in the above major districts in Bangladesh.²²

2.2.7 Peat Areas

Peat areas are found in the low lying areas of the Gopalganj-Khulna bil. Thick peat and muck deposits are found in the wet basins which are deeply flooded by fresh water in the monsoon and may also be flooded by saline water in the above places. These soils are highly soggy and have very low bearing capacity. The peat areas are located in different parts of Madaripur, Gopalganj, Khulna, Bagerhat, Jessore, Narail, Pirojpur and Barisal. This soil is almost unsuitable for agricultural purposes. The general soil type is peat. With the traditional management, local boro paddy may be cultivated on the margins of the bils.²³

2.2.8 Sundarbans

The Sundarbans consist of the mangrove forests of Khulna and Chakaria in Cox's Bazar. These are "tidally flooded lands with mangrove forests. Flooding with brackish water takes place all the year round. This unit is found to occur in and around Chakaria and Khulna Sunderbans and in some parts of Satkhira, Bagerhat, Khulna, Cox's Bazar and Patia. These soils belong to the Acid sulphate soils according to the general soil type."²⁴

The major disadvantage of this soil is that "the land is subjected to regular flooding by tidal waves. The salinity is frequently strong and the soils stay wet almost throughout the year. The soil develop extreme acidity when drained. Therefore, it is best to be left in its natural condition as reserve forest and the plantation of new mangrove forests should be encouraged."²⁵ The UNESCO has declared it as world heritage.

2.3 Population

Bangladesh is a densely populated area. The population explosion began in the country in 1930s.²⁶ From 1872 to 1931, the increase was less than one percent per annum. The 1943-44 famine claimed a total of at least 2 million persons in the then Bengal. In 1947-51, there was a considerable immigration of the Hindu Community to India which was offset to some degree by immigration of Muslims to the then East Pakistan (East Bengal). In the decade (1951-61), population increased by at least 10 million. The population of Bangladesh increased enormously over the last three decades. The growth rate is shown in Table 2.

Table 2: Population growth in Bangladesh 1872-2001

Census Year	Population (in millions)	Increase over previous decade (in millions)	Percentage
1872	22.0	--	--
1881	24.0	2.0	9.09
1891	26.1	2.1	8.75
1901	28.9	2.8	10.73
1911	31.6	2.7	9.34
1921	33.3	1.7	5.38
1931	35.6	2.3	6.90
1941	42.0	6.4	17.98
1951	42.0	0.1	0.02
1961	55.2	13.1	31.12
1974	77.2	22.0	39.86
1981	89.9	12.7	17.59
1991	111.4	21.5	23.89
2001	130	18.6	16.7

Source: Geography of Bangladesh (Harun Er Rashid) and Statistical pocket book of Bangladesh 2000, p ix.

In terms of population Bangladesh ranks ninth in the world after China, India, Russia, U.S.A, Indonesia, Japan, Brazil and Pakistan. Annual growth rate is about 2.14%. The density of population is near 700 per sq. km. There are 15.1 million households distributed around 68000 villages. Literacy rate is 47% only²⁷.

2.4 Economy

The economy of Bangladesh is characterized by high population density (700 per sq. km), high population growth rate (2.14% per annum), high infant mortality (118 per 1000 life birth) with low life expectancy

(60 yrs), predominantly rural (79.9% live in rural areas and 64% labour force employed in agriculture), poor health and sanitation, high unemployment (30%) and rampant under employment, low literacy rate (47%), critical shortage of skilled manpower and entrepreneurship, low agricultural and industrial productivity, exploitative agrarian structure, wide and increasing inequality of income, wealth and opportunities severe inflationary pressures and absence of appropriate policy and institutional framework for mobilization of domestic resources for the promotion of non-farm activities.²⁸

Bangladesh is among the poorest countries in the world. The annual per capita income is US\$ 380.²⁹

Agriculture is the mainstay of the country's economy. The performance of the sector has an overwhelming impact on major macroeconomic objectives like employment generation, poverty alleviation, human resources development and food security. Meeting the nation's food requirements is a key objective of the government and in recent years there has been substantial increase in food-grain production. However loss of food and cash crops due to flood and other natural calamities is a recurring phenomenon which disrupts the entire economy of the country.³⁰

Agricultural holdings in Bangladesh are generally fragmented and small. Use of modern machinery through cooperation is gradually gaining popularity. Rice, jute, sugarcane, potato, pulses wheat, tea and tobacco are the principal crops. The crop sub-sector dominates the agriculture sector contributing about 72 percent of total production. 32% of GDP in

Bangladesh comes from agriculture sector. Fisheries, Livestock, Tea and Industry provide 39% of total GDP. But still, agriculture in Bangladesh plays the vital role in food production for the entire country, export, employment, removing poverty and in sustainable economic development.³¹

2.5 Development of Agriculture in Bangladesh

It was due to the disastrous famine, which swept over Bengal and Bihar during the period of Lord Laurence (1864-68) the Indian Government, "laid some importance on agriculture and suggested for establishment of an agricultural department in the sub-continent. A scheme was prepared for this during the period of Lord Mayo (1869-72). As a result, the department of agriculture started functioning in 1870 as one of the sections of the Department of Revenue of the Government of India."³² But this section did not come out successful.

During the period of Lord Liton (1876-80), the Government of India tried to help the affected farmers by giving supply of irrigation water, distribution of food materials, seeds and loans during draught. But this was not sufficient to cope with a lot of agricultural problems of the country.³³

Afterwards, Lord Ripon (1880-84) recognized the Agriculture Department and extended its field of activities. The actual working programme was prepared on the basis of Dr. Voelckers report published in 1893. The objective of the department was then to push up agricultural production and to increase its export. In 1901, Lord Curzon (1899-1905) recommended for the establishment of an Agricultural Department in

each province for conducting agricultural research and for adoption of scientific methods of agriculture in practical fields.³⁴ The permanent Settlement of Land remained permanent in the British regime. This was the period for the cultivation of some important industrial crops like indigo, jute, cotton, sugarcane etc. Some new crops like English vegetables (cabbage, cauliflower, tomato, potato etc.) were introduced along with some new varieties of rice. Sporadic attempts were made by the govt. of India to improve the condition of cattle as they had been deteriorated in Bengal in weight, size and strength.³⁵

Government of India approved a scheme for establishment of research laboratories in 1903 and granted a sum of Rs. 2.4 million for agricultural development work in 1905. In 1906, the department of Agriculture was granted separate entity in this province and the first Director of Agriculture was appointed in the same year. Dhaka became the centre of agricultural research for the whole of Bengal."³⁶ Since then, the department of Agriculture had been expanding and it stood as one of the most established department of the provincial government.

The agricultural department was then headed by a secretary under whom there were six directorates and one Agricultural Information Service which dealt with specific subjects. The Directorate of Agriculture which mainly aimed at increasing production of various crops through application of different improved methods, was by far the largest of all of these directorates. The sections dealing with research and extension on animal husbandry were started along with the Directorate of Agriculture.³⁷ The initiated programme of the British period suffered

greatly due to the world wars, the depression of 1930s, partition of the subcontinent in 1947.

From the year 1912 to 1951 some important events in the field of agriculture were establishment of Agricultural school, a Central cotton committee, Directorate of Agricultural Marketing (central), Bengal (Bangladesh) Agriculture Institute, Central Jute committee, Directorate of Veterinary Services and Directorate of Livestock Services, Directorate of Fisheries, Pakistan Jute Board etc.³⁸ At that time, these organizations played important parts directly or indirectly for the development of agriculture in the area, now called Bangladesh. The government of Pakistan formulated three-five year plans to develop the agriculture sector.

Before entering the 'Green Revolution', in the 1960s farmers in East Pakistan (Bangladesh) had rarely used modern agricultural inputs, like chemical fertilizer, modern varieties of seeds; irrigational implements, etc. At that time i.e. the 1950s and early 1960s, fertilizers application was limited to the tea gardens and experimental farms; and irrigation was practiced only on 7 percent of the land using labour-intensive methods.³⁹ The major constraints to application of modern agricultural inputs were flooding of land during the rainy season and scarcity of water i.e., irrigational facilities during the dry season. It was difficult to introduce modern irrigation facilities as the farmers were not likely to make indivisible investments in modern irrigation equipment because of the small farm size and the scattered and fragmented land holdings. In order to improve the situation, the government set up Water and Power Development Board⁴⁰ which was responsible for developing

the water resources of the country through multipurpose flood control, drainage and irrigation projects. The process of modernization of crop production systems was geared up by the Bangladesh Academy for Rural Development by changing the traditional concept of growing rice from the monsoon economy to winter economy with the establishment of irrigation facilities like low lift pump and deep tube well. In that period, Comilla model created a great impact on the modernization of farming systems. The East Pakistan (Bangladesh) Agricultural Development Corporation (BADC) was assigned to produce modern irrigation equipment, chemical fertilizer and improved seeds and distribute them among the farmers at highly subsidized prices. With the untiring efforts of these institutions, Bangladesh agriculture entered into the age of modern 'seed-fertilizer-water' technology, and marked a notable increase in the food grain production.⁴¹

After independence the government of Bangladesh has been trying to gear up the modernization processes for increased production of crops for attaining self sufficiency with intensification of developmental programmes. Since late 1970s with the increasing use of modern technologies like chemical fertilizers, modern varieties of crops, irrigation and pesticides along with the credit and infrastructural facilities, crop production was increased. The education, research, extension and input distributing agencies, financial institutions and other nation building organizations have been established or reorganized to accelerate the process of agricultural development for raising the living conditions of the farming community and the nation as a whole.⁴²

During Bangladesh period, the institutes like BRRI, BARI, BAU, BJRI, BINA, BTRI, BSRI, SRDI, BFRI, BLRI and FRI began to identify and solve problems of the farming community through technology generation and utilization. The research activities of the above institutes have been made interdisciplinary and the research capabilities of the individual institutions have been strengthened through increased investment, improvement of technical support services, training of scientific personnel and provision of more operational autonomy to the institutes.⁴³ Agricultural education has been expanded with the establishment of more colleges and institutes to meet up the growing need of manpower especially in crop sub-sector. 15 agricultural extension training institutes have been established to train grass-root level extension workers. Recently, efforts have been made to improve the condition of livestock through some development programmes like establishment of artificial insemination centre at Upazila for genetical improvement of cattle and cockerel exchange for poultry improvement.⁴⁴

2.6 Agricultural Education System in Bangladesh

The history of agricultural education and research in Bangladesh can not be separated from that of agriculture itself because one merges with the other. The great Mughal emperor Akbar introduced teaching of agriculture in the educational system in the middle of 16th century. He also introduced Bengali calendar⁴⁵ in 1584 on the basis of agricultural season of the land. In British India, during the period of Lord Mayo, agriculture was included in the department of Revenue, Agriculture & Commerce in 1870. Then in 1880, the Famine Commission⁴⁶ first recommended an independent department of Agriculture. Dr. John

Augustus Voelcker, consulting chemist of the Royal Agricultural Society of England was sent to India to report on Improvement of Indian agriculture. He submitted his report⁴⁷ in 1891 recommending lines on which agricultural improvement including agricultural education was possible. Ultimately Bengal Department of Agriculture was established in 1906 followed by the establishment of an Agricultural Research Laboratory at Tejgaon, Dhaka in 1908. Agricultural Education started with the establishment of an agricultural school at Tejgaon in 1922.⁴⁸ The passed out students from this school were employed as sub-ordinate officers in the department of agriculture.

Later on, during the British period the number of these schools increased under the nomenclature of Agricultural Extension Training Institutes (AETI) in the area now called Bangladesh. In the year 2000 the nomenclature was changed to Agricultural Training Institutes (ATI) and their present number is twelve. In these institutes, students are to undergo a two-year course after their school final⁴⁹ (10 years schooling). The successful students are offered Diploma in Agriculture. Besides the ATI's, there are 4 veterinary Training Institutes and one Fisheries Training Institute which offer one year course after school final. But the status, condition and environment of agricultural education at present in Bangladesh are improved in all respects. The present position of agricultural education in Bangladesh is assessed in the following pages.

2.6.1 Bangladesh Agriculture Institute (BAI)

Higher education in Agriculture started with the establishment of Bengal Agriculture Institute at Tejgaon, Dhaka. It was opened formally by the then Chief Minister of Bengal. Mr. A.K. Fazlul Haque in 1938 and started functioning in 1941. The college acted as the Faculty of Agriculture of the Dhaka University till the establishment of Bangladesh Agricultural University in 1961-62 when it became an affiliated college of that University.

Initially, BAI started a two years B.Ag. course in the Institute after passing two-years B.Sc. course in the Dhaka University. However, the course and curriculum of the Institute were changed several times. At present it has a 4 year B.Sc. (Ag.) Honours course as that of Bangladesh Agricultural University.

The academic matters of BAI are under the control of Agriculture Wing of the Ministry of Agriculture whereas the administrative matters are under direct supervision of Bangladesh Agricultural Research Institute (BARI), Gazipur. The institute has 14 academic departments with 81 teachers (Professors, Associate Professors, Asst. Professors and Lecturers), 183 officers, staff and other supporting workers. The total number of students at present is 750. 3200 students obtained B.Sc. (Ag.) degree from BAI. From 1972 to 1985, 220 students were awarded M.Sc.(Ag.) degrees from this institution. After 1985, the M.Sc. course was suspended at BAI and the Institute was confined to undergraduate status. Efforts are currently under way to reopen Masters courses in

Agriculture at BAI. On the 4th January 2001, the government declared it as Sher-e-Bangla Krishi Bishawa Bidhyalaya.⁵⁰

2.6.2 Veterinary College

With the creation of Pakistan in 1947, a veterinary college named East Pakistan College of veterinary science was established in the same year at Comilla and later shifted to Dhaka in 1951. The college used to offer 3 years Diploma course named L.V.S after school final. The college was ultimately shifted to Mymensingh in 1954-55 and started to offer Bachelor degree in veterinary science and Animal husbandry under the Dhaka University. The college flourished very soon and became an excellent centre of veterinary education in the region. It attracted students from some countries of Asia and Africa and had a sizeable number of foreign students enrolled every year. In 1961-62 when East Pakistan Agricultural University was established at Mymensingh, the existing veterinary college was used as nucleus and it was transformed into the Faculty of Veterinary Science and Faculty of Animal husbandry of the University.⁵¹ At present, four government veterinary colleges are functioning in the country. These are located at Chittagong, Sylhet, Dinazpur and Barisal. The veterinary colleges of Chittagong and Sylhet have been conducting academic programmes and the other two are yet to do the same. At present, only two colleges located at Chittagong and Sylhet have been producing graduates and the other two are not admitting students. Bangladesh is an agricultural country. More veterinary colleges should be established to meet the growing needs of country.

2.6.3 Bangladesh Agricultural University (BAU)

East Pakistan Agricultural University was established in 1961-62 under the recommendation of the National Education Commission of Pakistan in the pattern of Land Grant Colleges of the United States with financial aid from US-AID. BAU campus is situated in rural environment, 5 km south of Mymensingh town and 112 km north of Dhaka city. It has an area of nearly 1200 acres. BAU has been established with 3 objectives, namely (1) to impart teaching in all disciplines in agriculture (2) to conduct research and (3) to execute extension and teachers training. Agriculture faculty is the largest among the six faculties in the university, which has more than 50% of teachers and students. This faculty has 17 departments covering aspects of crop sciences, soils, extension education and basic sciences. The other faculties are veterinary science having 8 departments, Agricultural Engineering and Technology 4 departments, Agricultural Economics and Rural Sociology 5 departments and Fisheries having 3 departments.⁵²

The University offers Undergraduate, Masters, and Ph.D. Degrees. The undergraduate course is of 4 years duration after higher secondary course. The university has now a strong academic program with sufficient qualified teachers in all disciplines of agriculture. The undergraduate program is governed by the Faculties, but the post-graduate program including Ph.D. is administered centrally by a body called committee for Advance Studies & Research (CASR) which was established in 1963-64.⁵³

The university has also a significant research program and the BAU Research System (BAURES), established in 1984 is responsible for co-ordination and administration of project researches. Fund for research projects comes from BAU, Bangladesh Agricultural Research Council and University Grants Commission. Outside agencies which are funding research at BAU are Ford Foundation, US-AID, DANIDA, JICA, IAFA, UNICEF, CIDA and UNESCO. It is to be mentioned here that BAU has given accommodation to two national research institutes on its campus namely Bangladesh Institute of Nuclear Agriculture (BINA) and Fisheries Research Institute (FRI), Bangladesh. These Institutes have collaborative research program with BAU.

Extension and Training program of the university are handled by University Extension Project and Graduate Training Institute respectively. The extension project performs their works in the adjoining villages through farmers co-operative and farmers societies. The GTI established in 1976 provides in-service training to agricultural officers of the government, banks, co-operatives and other agencies engaged in agricultural and rural development. It also offers such training to agricultural officers of some SAARC countries.⁵⁴

2.6.4 Other Agricultural Education Institutions

Dumki Agriculture College, Patuakhali was established in 1979 on 50 acres of land nearly 170 km south of Dhaka. It is also affiliated with BAU like BAI. It offers only undergraduate course. It has 14 departments, 80 teachers and about 600 students. The college's funding comes from the revenue budget of the government. The DAC also has

some development projects under implementation. The government has declared it as the Patuakhali University of Science & Technology in the year 1999. Over the last three decades, some major infrastructural development has taken place in the agricultural education arena but no significant changes in the agricultural education system have been made. The only Post Graduate Institute in Agriculture was established at Salna, Gazipur in 1983. It was established and developed through the active collaboration and co-operation of the governments of Bangladesh, Japan and USA. It is a fully autonomous, independent and degree granting institute like universities in Bangladesh. The institute offers M.S. and Ph.D. degrees in some selected disciplines of agriculture and social sciences.⁵⁵ It was upgraded to university status in 1997 and named as Bangabandhu Sheikh Mujibur Rahman Agricultural University.⁵⁶

Established in 1988, the Hazeer Mohammad Danesh Agricultural College (HMDAC) situated at Dinajpur is under the same administration as BAI and DAC. The college also offers 4 years B.Sc. (Ag.) degrees. It has 14 departments, 80 teachers and 183 officers and other staffs. The present number of students is 600.⁵⁷ The government of Bangladesh has declared it as Hazeer Danesh University of Science & Technology in the year 1999.

In the private sector, the International University of Business, Agriculture and Technology (IUBAT) established in 1989 offers B.Sc.(Ag.) degree course under its college of Agriculture. The agricultural program at the IUBAT college of Agricultural sciences is designed to fulfill 64 credit hours, as opposed to 128 credit hours required for the Bachelor of Science in Agriculture degree of the University of

Florida. The college is expected gradually to expand to have independent degree programs in most branches of agriculture relevant to Bangladesh society.⁵⁸

A private agriculture college named Rajshahi Agriculture College has been functioning since 1994 in the northern region of Bangladesh. It offers a four year B.Sc. Ag. course under the academic affiliation of Bangladesh Agricultural University. The college is now under direct control of Rajshahi University as the faculty of Agriculture.

Higher Agricultural Education Institutions in Bangladesh are shown below in Table no. 3.

Sl. No.	Name/Year of establishment	Location	No. of faculty	Intake
01.	BAI (1938)	Dhaka	01	150
02.	BAU (1961)	Mymensingh	06	540
03.	PAC (1979)	Patuakhali	01	100
04.	BSMRAU (1983)	Gazipur	03	60
05.	HDAC (1988)	Dinajpur	01	100
06.	RAC (1994)	Rajshahi	01	100
07.	CGVC (1994)	Chittagong	01	60
08.	SGVC (1994)	Sylhet	01	60

Table-3 reveals that there are eight agriculture educational institutions in Bangladesh. Bangladesh Agricultural Institute is the first higher agriculture educational institution in the country. Bangladesh Agricultural University is the prime agriculture educational institute in Bangladesh. About 600 students are admitted in its six faculties. Six institutions were established after the independence of the country. An agricultural college named Bogra agriculture college was established in 1996 on private initiative. This college ceased its functioning from 2001. The above institutions offer four year under-graduate course leading to B.Sc. Ag. (Hons.).

The courses include wide diversification of different branches of agricultural sciences. "After successful completion of the course, students are getting jobs of executive responsibility in agro-based technical discipline like research, extension and education. Being a technical hand, agriculture graduates in some cases are unable to prove their expected performance in the field situation. It is a point of criticism about the professional status as well as the dignity of the degree."⁵⁹

Shortcomings of agriculturists are mainly due to inadequate use of different teaching methods like demonstration, frequent field visit, repeated farm and laboratory exercise, study tour and group discussions. The syllabi of B.Sc.Ag. are mostly theoretical and inadequate. The emphasis is given to the practices of the field works. The teaching methodologies practised in B.Sc.Ag. and M.Sc.Ag. levels need improvement. The agricultural education in Bangladesh has been suffering from lack of feed back. It is not properly based on knowledge of farm and laboratory work of researchers. We think that there should be a

farm based teaching programme for the students, so that they can overcome the weakness of their practical knowledge. The government should give more emphasis to establish more agricultural education institutions in the country.

2.7 Major Agricultural Products in Bangladesh

The agriculture sector in Bangladesh comprises crops, forests, fisheries and livestock. Of the agricultural GDP the crop sub-sector contributes 71%; forests 10%; fisheries 10% and livestock 9.1%. The total cropped area is 13698600 hectare while the net cropped area is about 8.85 million hectare of which 4.33, 3.75 and 0.77 million hectares represent single, double and triple cropped areas, respectively.⁶⁰

15 million households live in rural areas and their occupation is mainly agriculture. More than 70% of the farming household in Bangladesh have less than one hectare of land. About 28.3% of the total farm households are landless. Bangladesh has a humid, subtropical monsoon climate and fertile land which are suitable for growing a wide variety of crops. Its principal crops are rice, wheat, jute, sugarcane, oil seeds, pulses, potato etc. Bangladesh annually produces about 808 thousand metric tons of superior quality jute and 16% of the export earning comes from raw jute and jute products.⁶¹

Rice is the major cereal in Bangladesh followed by wheat. With the introduction of modern varieties, the production of rice has increased from 10,967 thousand mt (metric tons) in 1974 to 18876 thousand mt in 1998. Although the production of rice has increased during the last 3 decades, the per ha production of rice is still too low at only 1.8 mt/ha. In

comparison, Japan produces four mt./ha, Egypt 3.8 mt./ha.; and some provinces of India 2.5 mt/ha. The total cereal production was 19.83 million mt. in 1990 and the projected physiological demand for cereals for the year 2000 is 22.35 million mt.⁶²

2.7(a) Agriculture Related Sub-sectors

The livestock sub-sector represents a major component of the national economy. Cattle and buffaloes are the primary sources of draft power for farming. The leather industry is one of the foreign exchange earners and contributes over 200 million US\$ to the economy. The livestock population in Bangladesh is estimated to be over 54 million heads.⁶³

Livestock management in Bangladesh has yet to be well organized. The cattle population plays a vital role in the country's economy in terms of agricultural power, protein and leather yields. However, it has not been increasing at par with the country's requirements. In fact cattle and buffaloes are raised by farmers mainly for cultivation while goats and sheep are domesticated by poor families, for economic gain. With the government's encouragement some small dairy farms have been established in the private sector in recent years. These are expected to contribute to the development of the sub-sector.⁶⁴

Another important sub-sector is forests. The forest resources, apart from their economic benefit, are useful for promoting balanced agro-ecological development and natural growth. The state of forest resources in Bangladesh is a matter of serious concern. Only 14% of the total land of Bangladesh is considered forest land. The total reserve forests area is

1323200 ha. At present, the government has given extra emphasis on the development of forest resources through the launching of home and agro forestry programmes such as tree plantation, social forestry programme.⁶⁵

2.8 Agricultural Research System in Bangladesh

Agricultural research in Bangladesh has a long history. Formal agricultural research in the sub-continent had its beginning in 1880. The Indian Department of Agriculture was established in 1905. A nucleus Agricultural Research Laboratory was established at Tejgoan, Dhaka in 1908 to serve the researchers of the then provinces of Bengal and Assam. This was the predecessor of the Bangladesh Agricultural Research Institute (BARI). Another important step was the formation of the Imperial Council of Agricultural Research in Delhi and 'Pusa Institute' in Pusa (Bihar) in 1929.⁶⁶ The end of the British colonial period in 1947 caused the division of the ICAR into the Indian Council for Agricultural Research (ICAR) and the Food and Agricultural Council of Pakistan (FACP). Both the councils had similar purposes to undertake, aid, promote and coordinate agricultural research in their respective countries. In 1964, Pakistan Agricultural Research Council (PARC) was formed. In 1970, the then East Pakistan Accelerated Rice Research Institute was established with major supports from International Rice Research Institute (IRRI). This became the Bangladesh Rice Research Institute (BRRI) with the independence of Bangladesh in 1971.⁶⁷

Bangladesh Agricultural Research Council (BARC) is at the apex of the National Agricultural Research System of the country. The Council was established in 1973 with the mandate to plan, support, coordinate,

implement and evaluate agricultural research activities in Bangladesh. A national coordinating organisation, BARC identifies problems and gaps in the different sub-sectors of agricultural research including crops, livestock, forestry, fisheries and socio-economic aspects. BARC prepares and ensures implementation of the national plans on agricultural research within the framework of national needs and goals.⁶⁸

Bangladesh agricultural research system constitutes ten primary research organizations and they work under BARC's supervision. National Agricultural Research System (NARS) of Bangladesh is currently composed of the following research institutes.

2.8.1 Bangladesh Agricultural Research Institute (BARI), Gazipur

Bangladesh Agricultural Research Institute (BARI) was established in 1976 after dissolving the directorate of Agriculture (Research and Education) with the responsibility of undertaking research and studies on various crops except Rice, Jute, Sugarcane and Tea. The crops include cereals (wheat, maize, millets and barley), oil seed (mustard, rape, groundnut, sunflower, safflower, linseeds etc.) pulses (grass pea, lentil, chickpea, mungbean, blackgram, cow pea, pigeon pea etc.), tuber crops (potato, sweet potato, avoirds etc.), horticulture crops (fruits and vegetables) and spices and condiments.⁶⁹

The institute functions with three of its major components: (a) research wing consisting of eleven research divisions, six research centres, six regional stations and 24 substations located at different agro-ecological zones of the country, (b) an education wing consisting of three colleges of agriculture offering graduate degrees and (c) a training and

communication wing offering training to the scientists and extension workers and disseminating information to the users.⁷⁰

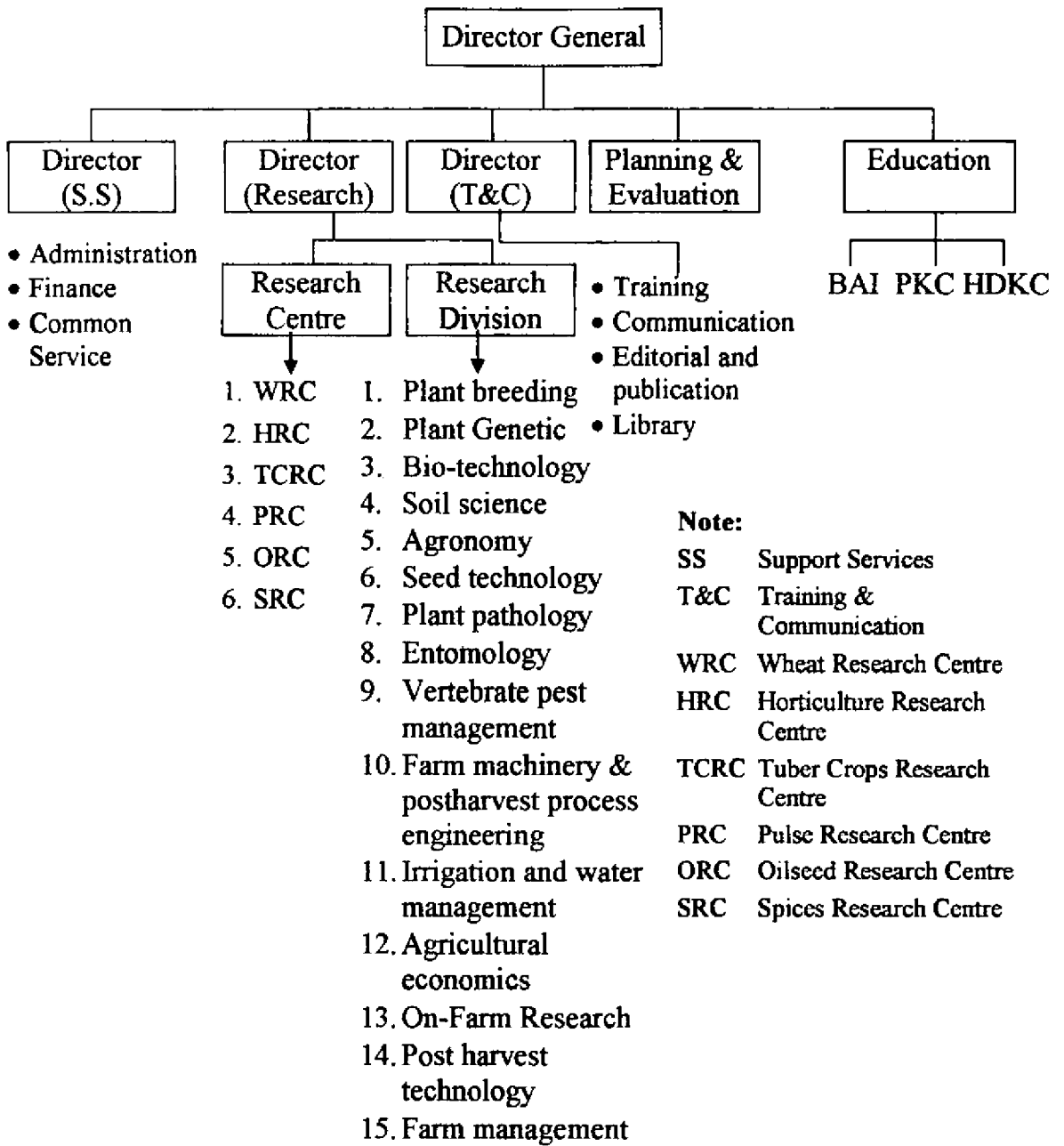
Objectives of BARI

- i) To identify and develop improved varieties of crops and recommend their adoption after rigorous evaluation.
- ii) To improve and develop cultural practices and water management for higher yields.
- iii) To investigate plant nutrient requirements, evaluate the capacity of soils to meet them and develop fertilization practices.
- iv) To develop and improve cropping systems to optimize crop yields and farmers' income.
- v) To investigate, develop appropriate tools and machinery that will contribute to greater productivity of farm labour.
- vi) To investigate the profitability of competitive crops and cropping systems, determine resource use efficiency and identify constraints to adoption of improved technology.
- vii) To develop a coordinated system of on-farm testing to disseminate and evaluate packages of new technology.
- viii) To develop and improve techniques of post harvest handling, processing and preservation of crops.⁷¹

Administration of BARI

It is a multi-crop research institute in Bangladesh. It is one of the important organisations of National Agricultural Research System (NARS). The BARI Board of Management Consists of 14 members from different organizations. The Director General (ex-officio) acts as the Chairman of the Board of Management. The Board of Management formulates policies, planning of research programmes, and etc. The Director-in-charge of administration acts as the Secretary of the Board. There are five Regional Agricultural Research Stations (RARS) in Bangladesh, each headed by a Chief Scientific Officer. The Director General is assisted by three directors namely: Director (S.S), Director (Research) and Director (T&C). Under BARI there are also six research centres. These are (1) Wheat Research Centre, (2) Horticulture Research Centre, ((3) Tuber Crops Research Centre, (4) Pulse Research Centre, (5) Oilseed Research Centre and (6) Spices Research Centre. Each research centre is headed by a Director. The Research wing of BARI consists of eleven research divisions. Each research division is headed by a Chief Scientific Officer (C.S.O.). The LDI Centre is under the Director (T&C). The organogram⁷² of the institute is stated on the next page.

Organogram of Bangladesh Agricultural Research Institute



Role of BARI in Crops Development

BARI has been playing an important role in crops development in Bangladesh. Since inception, BARI has been successfully contributing to national agriculture by evolving technologies that are suitable for the country's climate and appropriate for the farmers' condition. As a multicrop research institute, BARI has developed one hundred thirty five crop varieties both major and minor. Mention may be made of such crops as wheat, pulses, oilseeds, maize and minor cereals, vegetables, fruits, tubers etc. Besides crop variety development, appropriate technologies on disease and pest management, cultural management, soil and water management, socio-economics study and post-harvest processing and handling of various crops have also been developed.⁷³

The institute has so far developed 17 modern varieties of wheat, four varieties of maize, two varieties of millets, two varieties of barley, 21 varieties of pulses, 25 varieties of oilseeds, 24 varieties of vegetables, five varieties of spices, 16 varieties of fruits and 19 varieties of tuber crops. In addition to developing new varieties, BARI has made remarkable research progress on cropping patterns, farming system research, agro-forestry and homestead farming systems of crops, fruits and vegetables. It has also developed a self contained gene-bank where germplasms and cultivars of pulses, oilseeds, fruits, vegetables and tuber crops are preserved collecting from home & abroad. BARI has been able to make automatic and manually operated agricultural machinery and equipment, plough, harvester, seed drill etc. which are being successfully used by the commercial farms and progressive farmers.⁷⁴

The Farming Systems Research and Development (FSRD) Programme of BARI has achieved considerable success in generating/packaging of technology suitable for disseminating to farmers of the different agro-ecological zones. Sometimes farming system research technology can not provide success due to lack of its proper utilization. The current volume of on-farm research activities in BARI is big which is difficult to manage efficiently by the existing number and quality of scientific personnel available in BARI. It is observed that there is little scope for promotion of the personnel working in BARI. The moral strength of some of the professionals has degraded due to unbelievable delay in promotion.

There is lack of co-operation and coordination among various divisions of BARI and it has no mentionable connection with Department of Agricultural Extension (DAE). Farmers' participation is not satisfactory in the agricultural development programmes particularly in problem identification and evaluation of technologies. The pest control activities of BARI is not also satisfactory in the environment of Bangladesh.

Farming Systems Research and Development (FSRD) activities need more attention on the transfer of technology, particularly at the existing FSRD sites. It is suggested that activities in some of the existing sites be reduced but at the same time new sites be initiated in neglected and risk-prone areas like the saline, haor and char areas. BARI authority should seriously consider developing leadership among the FSRD practitioners so that future activities can be run more efficiently.

2.8.2 Bangladesh Rice Research Institute

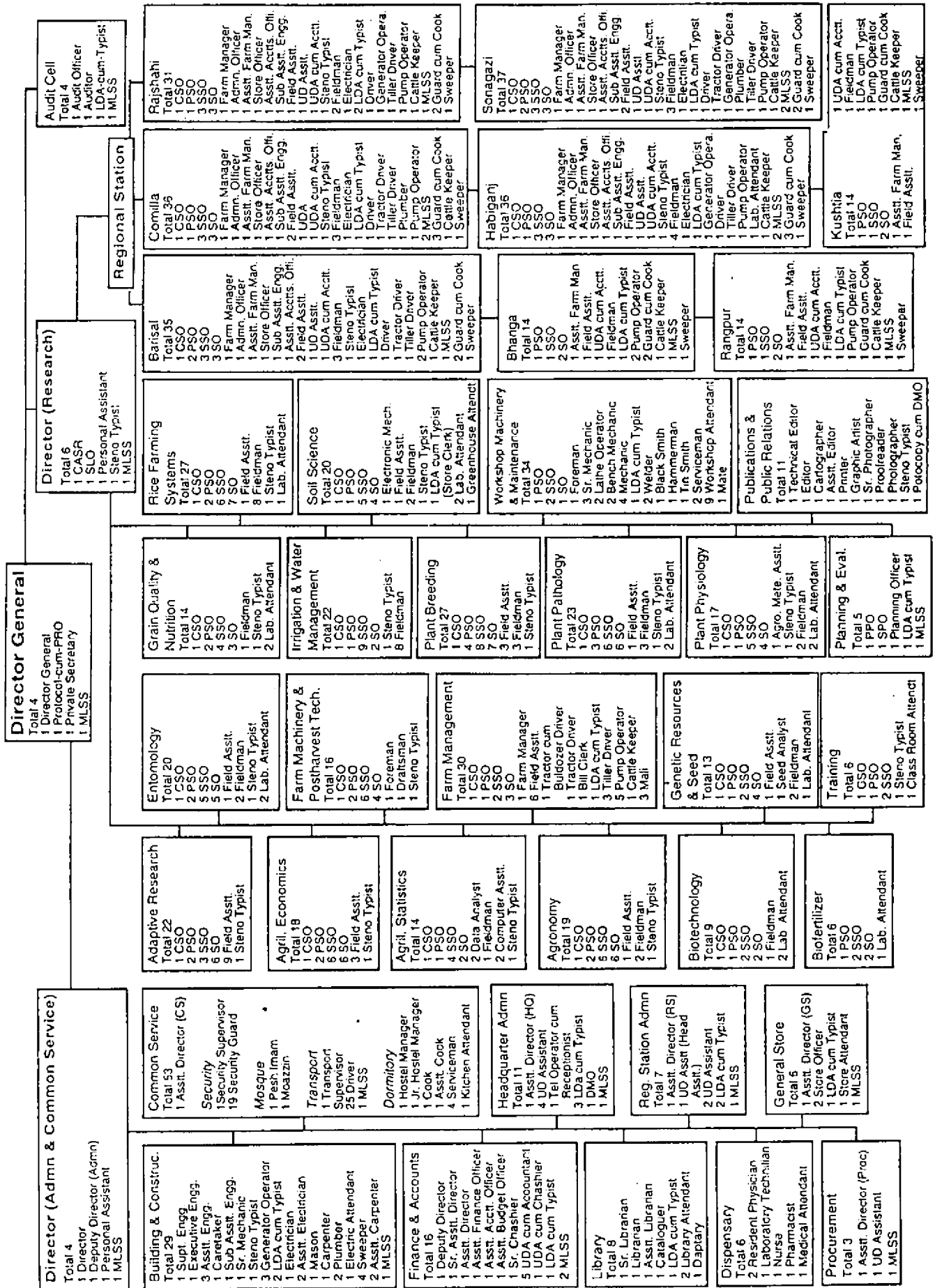
The Bangladesh Rice Research Institute (BRRI) was established in 1970 at Gazipur, a small township 35 km. to the north of the capital city Dhaka.

The objectives of the institute are given below:

- (i) To conduct research on all aspects of rice plant including development of new varieties.
- (ii) To develop appropriate farm machinery and post-harvest technologies.
- (iii) To develop package of agricultural programmes and disseminate those through training activities and other mass media for the benefit of growers.
- (iv) To develop facilities in locating the specific research products and suitable cropping systems through various types of publications.
- (v) To develop collaboration with other national and international organizations and institutes to broaden and strengthen role of rice research.
- (vi) To train extension personnel on rice production technologies and publish books, bulletins, newsletters etc.⁷⁵

Administration of BRRI

Bangladesh Rice Research Institute is the prime institution in Bangladesh mandated to do rice research. There is a Board of Governors to manage the institute. The honorable Minister for Agriculture, Government of the People's Republic of Bangladesh Acts as the Chairman of Board of Governors. The Board of Governors consists of 14 Members taking from various organizations.⁷⁶ The Director General of BRRI works as the Member Secretary. The Board formulates policies, programmes and objectives. There are three directors in BRRI. They are director for Research, Director for administration and director for training and communication. There are 17 research divisions at BRRI, Each division is headed by a Chief Scientific Officer. There are seven regional stations of BRRI scattered allover the country. Each Regional Research Station (RRS) is also headed by a chief scientific officer. All the research divisions and RRS are under the direct control of Director General. The organogram⁷⁷ of BRRI is appended to the next page.



At present the institute has 17 research divisions, 10 support service divisions and sections and 9 regional stations with a total manpower of 662, of whom 228 are scientists.⁷⁸

The Institute has so far developed 38 rice varieties of which 11 are for Boro and Transplanted Aus, 7 for only Boro, 4 for only Transplanted Aus, 1 for only Broadcast Aus and 15 for Transplanted Aman. BRRI developed such varieties of crops which are widely grown in 80% of the HYV area of Bangladesh. Some of these varieties are also grown in other countries like Sri Lanka, India, Nepal, Vietnam, Myanmar, China, Kenya, Iraq, Ghana, Burundi, Bhutan and Sierra Leone. Rice production in Bangladesh has doubled since the establishment of BRRI.⁷⁹ Considering the export potentials and high market value of fine grain aromatic rice, BRRI initiated a programme to evaluate traditional and exotic aromatic rice in 1992. This programme has led to the development of BRRI Dhan 34.⁸⁰

Role of BRRI

The role of BRRI in the development of rice varieties is very much essential because rice is our staple food. BRRI developed high yielding varieties of rice, shown by table-4.

Table 4: BRRRI Developed Modern HYV of Rice

Variety	Year of release	Growing season	Growth duration days	Rough rice yield (t/ha)
BR 1 (Chandina)	1970	T. Aus	120	4.0
BR 2 (Mala)	1971	T. Aus	125	4.0
BR 3 (Biplab)	1973	T. Aus	130	4.0
BR 4 (Brrisail)	1975	T. Aman	145	5.0
BR 5 (Dulhabhog)	1976	T. Aman	150	3.0
BR 6	1977	T. Aus	110	3.5
BR 7 (Brribatam)	1977	T. Aus	130	4.5
BR 8 (Asha)	1978	T. Aus	125	5.0
BR 9 (Sufala)	1978	T. Aus	120	5.0
BR 10 (Progoti)	1980	T. Aman	150	6.5
BR 11 (Mukta)	1980	T. Aman	145	6.5
BR 12 (Moyna)	1983	T. Aus	130	4.5
BR 14 (Gazi)	1983	T. Aus	120	5.5
BR 15 (Mohini)	1983	T. Aus	125	5.0
BR 16 (Shahibalam)	1983	T. Aus	130	5.0
BR 17 (Hashi)	1985	Boro	155	6.0
BR 18 (Shahjalal)	1985	Boro	170	6.0
BR 19 (Mangol)	1985	Boro	170	6.0
BR 20 (Nizami)	1986	DS Aus	115	3.5
BR 21 (Niamat)	1986	DS Aus	110	3.0
BR 22 (Kiron)	1988	T. Aman	150	5.0
BR 23 (Dishari)	1988	T. Aman	150	5.5

BR 24 (Rahmat)	1992	DS. Aus	105	3.5
BR 25 (Naya Pajam)	1992	T. Aman	135	4.5
BR 26 (Srabori)	1993	T. Aus	115	3.5
BRR I dhan 27	1994	DS Aus	115	3.5
BRR I dhan 28	1994	Boro	140	5.0
BRR I dhan 29	1994	Boro	160	7.5
BRR I dhan 30	1994	T. Aman	145	5.0
BRR I dhan 31	1994	T. Aman	140	5.0
BRR I dhan 32	1994	T. Aman	130	5.0
BRR I dhan 33	1997	T. Aman	118	5.5
BRR I dhan 34	1997	T. Aman	135	3.5
BRR I dhan 35	1998	Boro	150	5.0
BRR I dhan 36	1998	Boro	140	5.0
BRR I dhan 37	1998	T. Aman	140	3.5
BRR I dhan 38	1998	T. Aman	140	3.5
BRR I dhan 39	1999	T. Aman	122	4.0
BRR I dhan 40	2001	Aman	145	4.5
BRR I dhan 41	2001	Aman	148	4.5

Note: There is no variety named BR 13. T. Aus-Transplanted Aus, DS Aus = Direct seeded Aus. T. Aman-Transplanted Aman.

The contribution of BRR I in producing high yielding varieties of rice are commendable. Before the establishment of BRR I in 1970 the present area now called Bangladesh was deficient in rice production in feeding the people of the area. At that time rice was imported from abroad to meet the deficiency. But at present due to the contributions of BRR I, Bangladesh is now in a position to export rice abroad. In order to

feed the increasing population at the current rate of per capita consumption, Bangladesh is to produce at least 22 million tons of food grain annually.⁸¹

Production and supply of quality of hybrid rice seed to the farmers is not satisfactory. Present seed laws are inadequate for effective quality control of seed. At present, most of the personnel of Seed Certified Agency (SCA) are not properly qualified for providing certificate of hybrid rice seed.

It has been observed that many of the rice production technologies developed by BRRI have not been supplied to the farmers, As a result farmer's performances have so far remained less than optimum. While small and marginal farmers are constrained by shortage of operating capital in the production of Modern Varieties (MV) of rice, many farmers are reluctant to produce a profitable variety because of the fact that the farmer and/or members of his family do not like the taste of variety. This situation calls for policy intervention in respect of research on two fronts. On the one hand, production of the technically sound varieties need to be made less costly and on the other, more profitable varieties need to be made tasty or nutritionally more attractive. Now it may be stated that the BRRI is not without pitfalls. From the consumers point of view nutrition value and taste of high yielding varieties of rice are questionable. The authority advertised the quantity of rice produced per hectars but not the quality. The elite group of the country is not at all interested to purchase some varieties of rice because the variety is coarse. They don't like that type of rice. There is necessity of continuous evaluation of rice varieties. So there exists a gap in the production of quality rice. They (scientists and

researchers) should give more attention on quality control through research.

2.8.3 Bangladesh Jute Research Institute (BJRI)

Systematic research on jute was started by the Bengal Govt. in 1901. Indian department of agriculture was established in 1905 under which the fibre section was created in 1906. Under the leadership of the fibre expert of the government of East Bengal, considerable progress was made on jute plants and its culture. The varieties D-154 in *C. capsularis* and chinsura green in *C. olitorious*, developed at that time are still cultivated in the country as standard varieties.⁸²

Imperial Council of Agricultural Research was created in 1929 and upon the recommendations of the Royal Commission on Agriculture, Indian Central Jute Committee came into being in 1936 with its headquarters in Kolkata. Jute research laboratory was established under Indian Central Jute Committee in Dhaka in 1939. It supervised all aspects of jute and jute industries till the partition of India in 1947. Research on jute was transferred from the department of agriculture in Bengal to the laboratories. After partition, Pakistan central Jute committee was formed, which was managed by the board of 24 members. For more diversified work on jute, establishment of a regular jute research institute was felt in Pakistan. Thus a full-fledged jute research institute was established in Dhaka in 1951 for research on jute. Bangladesh Jute Research Institute became autonomous after the Parliamentary Act of 1973. The institute functions with 125 scientists over 8 sub-stations.⁸³

The objectives of BJRI are given below:

- a) To control and promote technological and economical aspects of agricultural research on jute and allied fibres.
- b) To ensure required quality of jute in Bangladesh and abroad.
- c) To conduct research for innovating high yielding variety (HYV) seeds including pesticide and harbicide required for HYV of jute.
- d) To carry research to combat alarming challenge offered by the synthetic fibres.
- e) To exchange researchers, scientists and experts as demanded by other organizations.⁸⁴

The institute adapted HYV of jute shown by table 5.

Table 5: BJRI Adapted HYV Jute

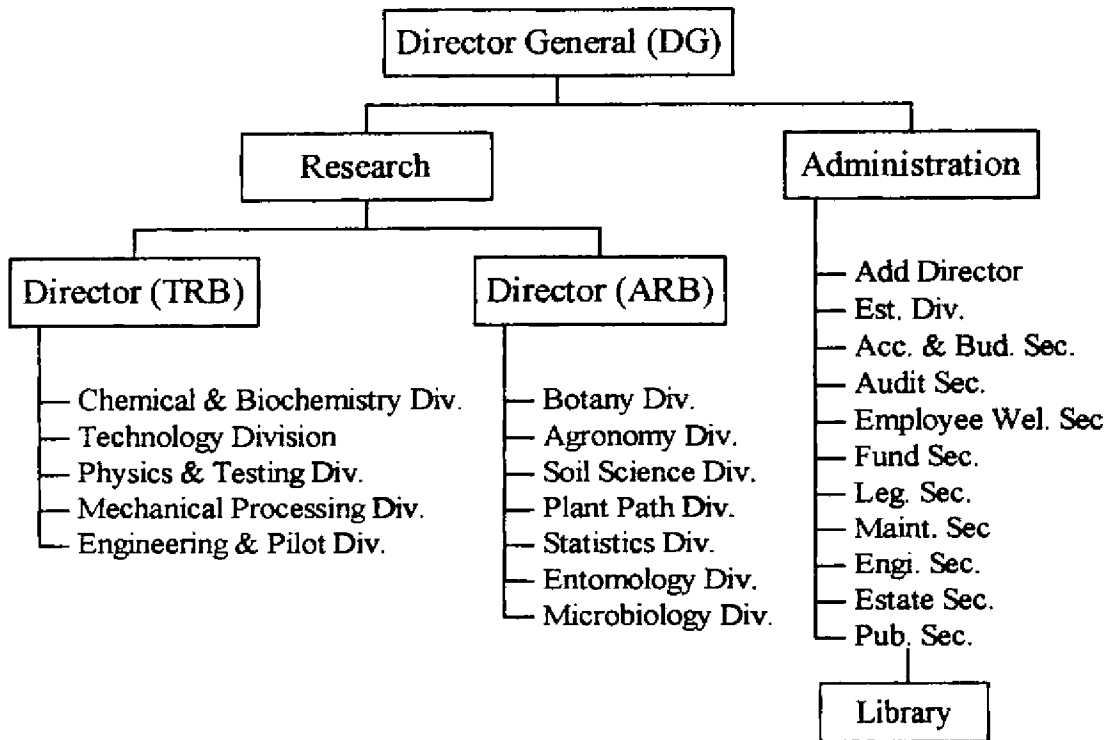
Variety		Year of release	Developing institute
Jute	CVE-3	1977	BJRI
	CVL-1	1977	BJRI
	CC-45	1979	BJRI
	O-4	-	BJRI
	Falgoni Tosha	1987	BJRI
Mesta	Joli Kenaf-1	1977	BJRI
	Tani Mesta-1	1976	BJRI

Source: DAE, 1987.

Administration of BJRI

BJRI is a specialized research organization in agricultural field for Agro-industrial sector with autonomous status. It is administered by an Act of Bangladesh National Assembly. The act provides for a Board of Governors consisting of 14 members. Honourable minister in charge of Jute Ministry is the chairman of the Board. The other 13 members are nominated by government from officials and non-officials having expertise knowledge in respect of jute. The Director General of the Institute works as the Member-Secretary of the Board of Governors. The "Board" formulate policies, programmes and objectives. The Jute Research Institute has two wings, namely (1) Agricultural Research Board (ARB) headed by a director, is responsible for carrying researches for increasing yield of better quality of jute fibre per acre. The Technical Research Board (TRB) headed by a director is responsible for carrying out researches for finding ways and means of different profitable uses of jute fibres and thus to combat foreign synthetic fibres. There are twelve divisions in the institute. Each division is headed by the Chief Scientific Officer. The administration is headed by an additional director. The library of BJRI is under publication section of administration. The organogram⁸⁵ of the institute is given to the next page.

Organizational Structure of BJRI



Jute, the golden fibre of Bangladesh has lost its importance with the production of substitute of jute in western country specially in U.K. and U.S.A. But still, jute is produced in Bangladesh in plenty but its marketing is limited.

The present volume of on-farm research activities in BJRI is not up-to-the mark. This should be strengthened. As jute poses to be the major cash crop of Bangladesh, new FSR sites may be opened for assessing and solving the emerging problems of jute in different agro-ecological zones. The existing linkages among FSR scientists and other researchers of BJRI are not satisfactory. It should be strengthened for the greater interest of research of jute. Farmers' participation should be improved in respect of problem identification and evaluation of technologies. Farmers' training workshops are to be arranged frequently

to keep the users informed about the new development and findings. Due to fund constraints BJRI is not carrying out research activities properly. Adequate fund is to be ensured in time. Production cost of jute is higher than any other crops. But the farmers are not getting real price of jute. For this reason, they are becoming disinterested to cultivate jute. Due to organizational structure and recruitment rules, BJRI recruited academicians. As a result, they are unable to develop a farmer friendly technology. The jute marketing mechanism should not be controlled by the government. It should be controlled by the private sector. The institute should organise training programmes for farmers to introduce production technologies of jute and mesta (one species of jute) in collaboration with Ministry of Jute, GOB. The government of Bangladesh closed the world famous Adamjee Jute Mills on the 30th June, 2002.⁸⁶

2.8.4 Bangladesh Institute of Nuclear Agriculture (BINA)

Bangladesh Institute of Nuclear Agriculture, established in 1972 is a national agricultural research institute and has got the mandate to use nuclear tools in agricultural research. By using these tools the institute has been doing research in agricultural disciplines with major emphasis on varieties improvement of crops, management of soils, fertilizers and water; development of appropriate technology to improve quality and quantity of crops and development of methods for controlling diseases and insect pests.⁸⁷

The objectives of BINA are as follows:

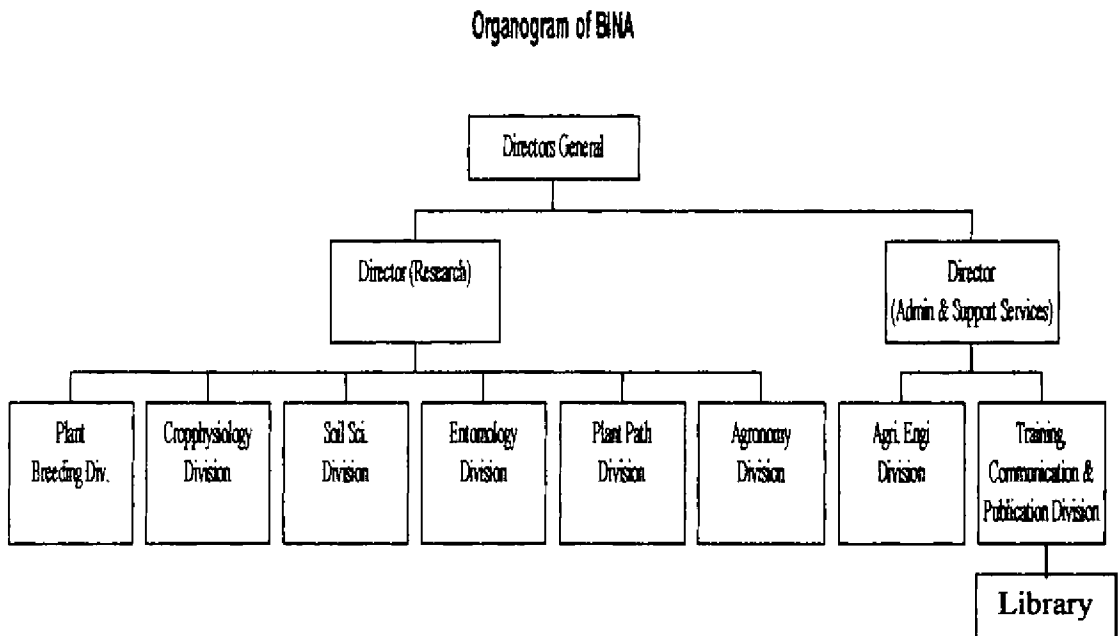
- i) To develop high yielding and better quality crop varieties using both mutation and conventional techniques.

- ii) To assess the fertility status of the soils of Bangladesh and efficiency of utilization of applied nutrients by crop plants using radio-isotopic techniques.
- iii) To develop means of water use efficiency for optimization of crop yields through radioisotopes and radiation techniques.
- iv) To evolve measures against major pests and diseases of crop plants.
- v) To assist national and international research programmes through co-operative support.
- vi) To provide facilities to students of the Bangladesh Agricultural University for carrying out research leading to Masters degree in agriculture.
- vii) To sponsor training programmes for the research scientists in the peaceful use of atomic energy in agriculture.⁸⁸

Administration of BINA

The policy directions of BINA are set up by a management board called 'The Board for BINA' constituted by the government with 14 members. The Director General of BINA acts as member secretary of the 'Board'. General policies regarding the overall administrations of the institute are formulated and approved by the board. The board normally meets once in every quarter of the year. The Director General convenes the meeting of the Board in consultation with the chairman. The honorable minister for Agriculture is the chairman of the Board for BINA. The Director General is responsible for overall administration,

finance, development and execution of the programmes of the institute. He is assisted by two directors: Director (Research) and Director (Administration and support services). Director (Research) is responsible for programme planning, monitoring, evaluation and co-ordination of research activities. He is assisted by the chief research coordinator. There are research planning, evaluation and co-ordination cell comprising of the chief scientific officers. Chief research coordinator and heads of research divisions is headed by the Directors (Research), Director (administration and support services). Director research is responsible for programme planning, monitoring, evaluation and co-ordination of research activities. He is assisted by the chief research coordinator. There are eight research divisions of BINA, headed by Chief Scientific Officers. The organogram⁸⁹ of BINA is stated below.



After the inception of BINA two mutants of summer tomato, SLT-1, SLT-3, two mutants of mungbean, MC-18 and MC-99, two mutants of mustard, MM-19 and MM-43 and one mutant of Deshi Jute C-278 have been identified as elite lines and it is expected that they will be released as commercial varieties in the course of time. In addition, several mutants of rice, groundnut, mustard, chickpea, grasspea, lentil and blackgram are in advanced stage of release.

Activities of Bangladesh Institute of Nuclear Agriculture (BINA) are concentrated in developing agricultural technologies for agricultural production using nuclear techniques. So far BINA has developed 11 modern varieties of different crops which includes two rice varieties (Iratom 24 and Binasail), two varieties of mustard (Safal and Agrani), one jute (Atompat 38), two mungbean (Binamoog-1 and Binamoog-2) two chickpea (Hyprosola and Binasola) and two summer tomato. BINA has created a market demand in producing summer tomato in Bangladesh. Tomatoes are needed in both summer and winter. But before the establishment of BINA tomatoes were available in the country only in the winter. But now with the valuable research of BINA, tomatoes are also available in the summer. But the researcher thinks that production and supply of summer tomato is inadequate in the country.

2.8.5 Bangladesh Sugarcane Research Institute (BSRI)

Sugarcane research in the Indian sub-continent started in 1912 with the establishment of sugarcane institute at Coimbatore in Madras (Chennai), India. Seedling testing station was established at Dhaka in 1931. This station used to collect higher stages of Coimbatore – breed

clones for selection for whole of Bengal. This seedling testing station was financed by the Imperial Council of Agriculture in India and run by a limited manpower which continued its activities till 1944.

Research activities again started in 1951 with the establishment of sugarcane research station at Ishurdi, under the department of agriculture by the then government of East Pakistan. This was taken over by the food and agriculture research council of the central government of the then Pakistan in 1960 with a view to bringing improvement in working condition. But no improvement was apparent, and it was transferred to the provincial government in 1965. Subsequently Bangladesh Sugar and Food Industries Corporation submitted a scheme for the establishment of Sugarcane Research Institute at Ishurdi. During the first five year plan SRI scheme was approved with only one regional station at Thakurgaon in 1974.⁹⁰

During the second five year plan, ECNEC approved staff training institute, which was merged with SRI and the institute was renamed as Sugarcane Research and Training Institute. Since 1974, the institute started vigorous research activities through the divisions namely: Breeding, Agronomy and Soil, Physiology and Nutrition, Entomology, Pathology and Agricultural economics divisions.⁹¹ It has only one sub-station and 74 scientists are working there at present.

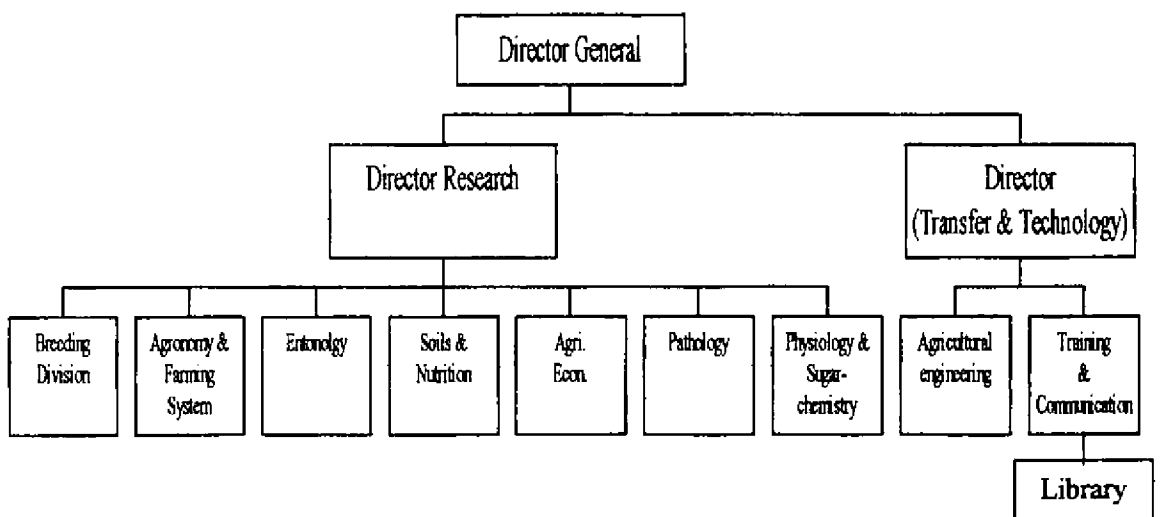
The objectives of BSRI

- i) To prepare production programme of sugar, gur (coarse form of sugar) and syrup-producing carbohydrate enriched crops/plants.
- ii) To evolve other technologies pertaining to production of sugar, gur and syrup.
- iii) To conduct research on sugarcane based farming and to identify its economic advantages.
- iv) To take measures for utilisation of technologies regarding sugar, gur, and syrup producing crops/plants.
- v) To develop and maintain germplasm bank through collection of different sugarcane varieties.
- vi) To undertake sugarcane related collaborative programmes of research, education and training with foreign and international organisations.
- vii) To extend co-operation to any individual or organisation working in the field of sugarcane development through research.
- viii) To publish journal/periodicals and reports on the basis of research results.
- ix) To help govt. in sugarcane policy formulation and also to advise the govt., local authority or any institution in matters related to sugarcane.
- x) To organize education and training programmes for sugarcane farmers.⁹²

Administration of BSRI

Bangladesh Sugarcane Research Institute is mandated for sugarcane research. A Board of Governors with 15 members manages the institute. The honourable Minister of the Ministry of Agriculture chairs the board meeting. The Director General (DG) of the institute acts as member secretary. The Board of Governors formulates policies, programmes and objectives of the institute. The institute has eight research divisions. Each division is headed by chief scientific officer. There are two directors in the institute namely (1) Director (Research) and (2) Director (Training and Transfer). There are two regional sugarcane research stations in Bangladesh. One is situated at Thakurgaon and another is at Gazipur. The director of research coordinates almost all the research activities of the institute. There are six sub-stations of BSRI in the country. Each sub-station is headed by a scientific officer. Audit cell, planning cell, accounts division, engineering division, central administration and two directors are under the direct supervision of the Director General. The organisational structure⁹³ of BSRI is given below:

Organizational Structure of BSRI



The Bangladesh Sugarcane Research Institute is playing an important role in the development of sugarcane varieties. Sugarcane is the prime crop in Bangladesh from which we get sugar. The institute has introduced 16 high yielding and pest resistant sugarcane varieties. But it is a matter of great regret that in spite of the production of High Yielding Varieties of sugarcane Bangladesh has been suffering from shortage of sugar since 1973. The temporary nature of FSRD programme creates a dampening effect on the moral of scientists. The publication and documentation section should be strengthened with qualified personnel and logistic supports. Finally, there is a need for improving linkages with DAE, BSFIC, NGOs and other research organizations for effective dissemination of technologies developed through FSRD programme. The government should allot more funds in achieving self-sufficiency in sugar in the country.

2.8.6 Bangladesh Fisheries Research Institute (BFRI)

Fisheries Research Institute of Bangladesh, established in 1984 has been charged with the national responsibility of planning and conducting fisheries research aiming to increase country's fish production through aquaculture development and better management and utilization of living aquatic resources.

Fisheries research in the meantime has made a significant contribution through generating a number of economically viable, socially acceptable and environmentally compatible breeding, culture and management technologies suitable for farmers and entrepreneurs.⁹⁴

Aims and Objectives of BFRI

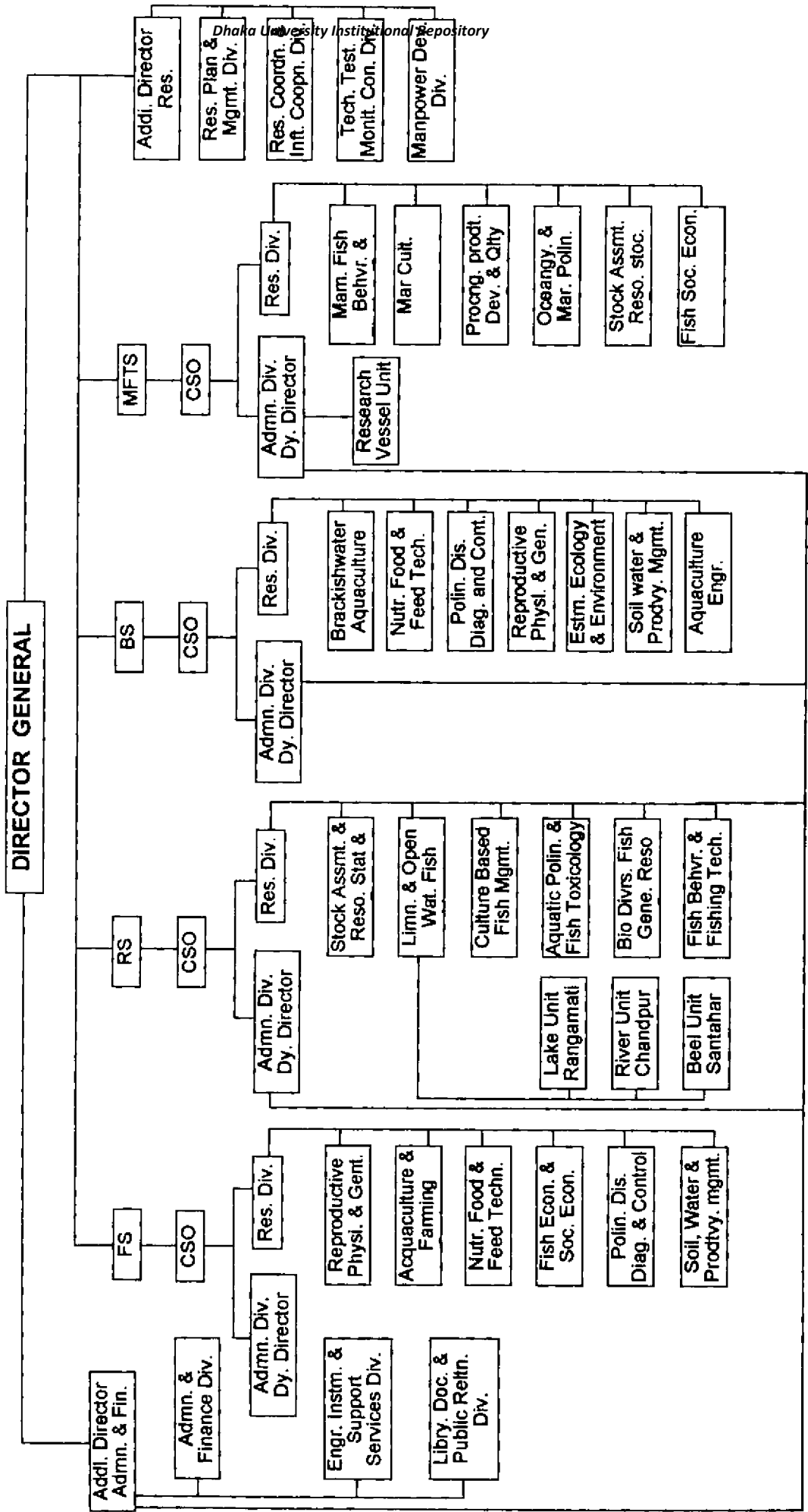
- i) To carryout and coordinate basic and adaptive research for development and optimum utilization of all living aquatic resources.
- ii) To develop low cost, less labour intensive friendly improved fish culture and management technologies, keeping in view the prevailing socio-economic conditions of the rural poor.
- iii) To carryout research on diversified fishery products for development and popularization of aqua-business like processing, quality control and marketing.
- iv) To conduct farming system research for maximum utilization of limited land resources.
- v) To develop technologies for commercially important aquatic products including shrimp.
- vi) To develop skilled technical manpower through training and also dissemination of information on fish related developed technologies to the farmers.
- vii) To advise government in all matters relating to planning, management and implementation of fisheries research in the country.⁹⁵

Administration of BFRI

The institute is an autonomous research organization and is linked up administratively with the Ministry of Fisheries and Livestock, Government of the Peoples Republic of Bangladesh. The general direction, administration and supervision of the affairs of the institute have been vested in a Board of Governors consisting of 14 members. The honourable Minister, Ministry of Fisheries and Livestock acts as the chairman of the Board of Governors of BFRI. The Director General of BFRI works as the member secretary of the Board of Governors. There are four stations of BFRI in Bangladesh. Each station is headed by a chief scientific officer. The four stations are under the direct control of Director General of BFRI.

The Board of Governors may appoint such committees as it may consider necessary to assist it in the performance of its functions. As the chief executive of the institute, the director general takes appropriate steps in implementing its programmes in the light of policies and directives formulated by the Board of Governors. Its organogram⁹⁶ is stated to the next page.

BANGLADESH FISHERIES RESEARCH INSTITUTE ORGANGRAM



The institution has achieved the following:

- i) Breeding and hatchery management of carps.
- ii) Improved nursery management of carps.
- iii) Collection and preservation techniques of pituitary gland for induced breeding.
- iv) Poly culture of carps.
- v) Artificial propagation and culture techniques of pangasius.
- vi) Pond culture of pangasius.
- vii) Culture of tilapia in seasonal ponds.
- viii) Culture of Thai silver barb.
- ix) Integrated fish poultry farming.
- x) Integrated rice-fish farming.
- xi) Integrated fish-duck farming.
- xii) Improved catfish hybrid production techniques.
- xiii) Artificial propagation and culture of *Ompok Pabda*.
- xiv) Artificial propagation and culture of *Mystus Vittatus*.
- xv) Development of low-cost fish feed from indigenous ingredients.
- xvi) Backyard prawn hatchery technologies.
- xvii) Poly and mono culture of fresh water prawn.
- xviii) Control of fish diseases.
- xix) Hilsha fisheries management and development.
- xx) Management and development of floodplain fisheries.⁹⁷

The institute has been assisting in technology transfer, training and publications to the fish farmers. But upon proper scrutiny and examination, it is found that its achievement in many cases is not satisfactory as they should be. Supply of fish in the consumers market is going to be limited. The purchasing of fish due to high price is beyond the limitation of many consumers, specially middle class people.

BFRI has been planning and conducting fisheries research to increase country's fish production. The institute has introduced various techniques which are very much essential and socially accepted by the farmers and entrepreneurs. It has developed low-cost fish feed from indigenous ingredients. The developed types of fishes by the institute are very much suitable for more growth of fishes in Bangladesh.

Technology developed by FRI is not followed properly by the farmers. Farmers practiced mono culture of fishes technology, Practice of poly-culture technology is seasonal. It is a great disadvantage of fish production. Fertilization and feeding are not properly cultured in the ponds. As it is obvious that fish seed is the basic input of all the selected aquaculture technologies, steps should, therefore, immediately be taken by the DOF/FRI to increase the supply of quality seeds to the doorsteps of the fish farmers. Government initiative to FRI and the training facility of it to the farmers are inadequate. It is hampering fish production. The government and NGO's should initiate support programmes to create employment opportunities for fishermen and their family members so that they can earn throughout the year and not depend entirely on seasonal fishing.

In spite of all the research activities of the institution, the supply of fish in the country is going to be very limited. The price of fish is very high due to scarcity of fishes. So the institution should not be proud of its research activities.

2.8.7 Bangladesh Forest Research Institute (BFRI)

During the British rule, in this sub-continent, education and research on forestry were centrally administered while the management of forests were under the provinces. Before partition of India, there was no forest research institute/college in this area. After the partition of 1947, an institute was established in the western zone of the then Pakistan. In 1955, a Forest Research Laboratory was set up in Chittagong by the then central government. At the preliminary stage, emphasis was given to the research and development of forest products in this laboratory. After a decade the FRL was expanded to include other disciplines dealing with silviculture, botany and economics of forests and it was renamed as the Forest Research Institute (FRI). In the later part of 1985, FRI was put under the direct administrative control of the ministry of agriculture, but the financial control remained under the forest department of Government of Bangladesh (GoB). FRI is organized into 18 divisions including 16 research divisions and several other sections or units like wildlife, library, photography etc.⁹⁸

In late 1986 decisions were taken to bring the FRI under the direct control of the Ministry of Agriculture in all respects including the financial matters with the ultimate aim of making it an autonomous body and to develop it to the status of other national research institutes like

BARI, BRRI, BJRI etc. It was further decided to rename it as Bangladesh Forest Research Institute (BFRI).⁹⁹

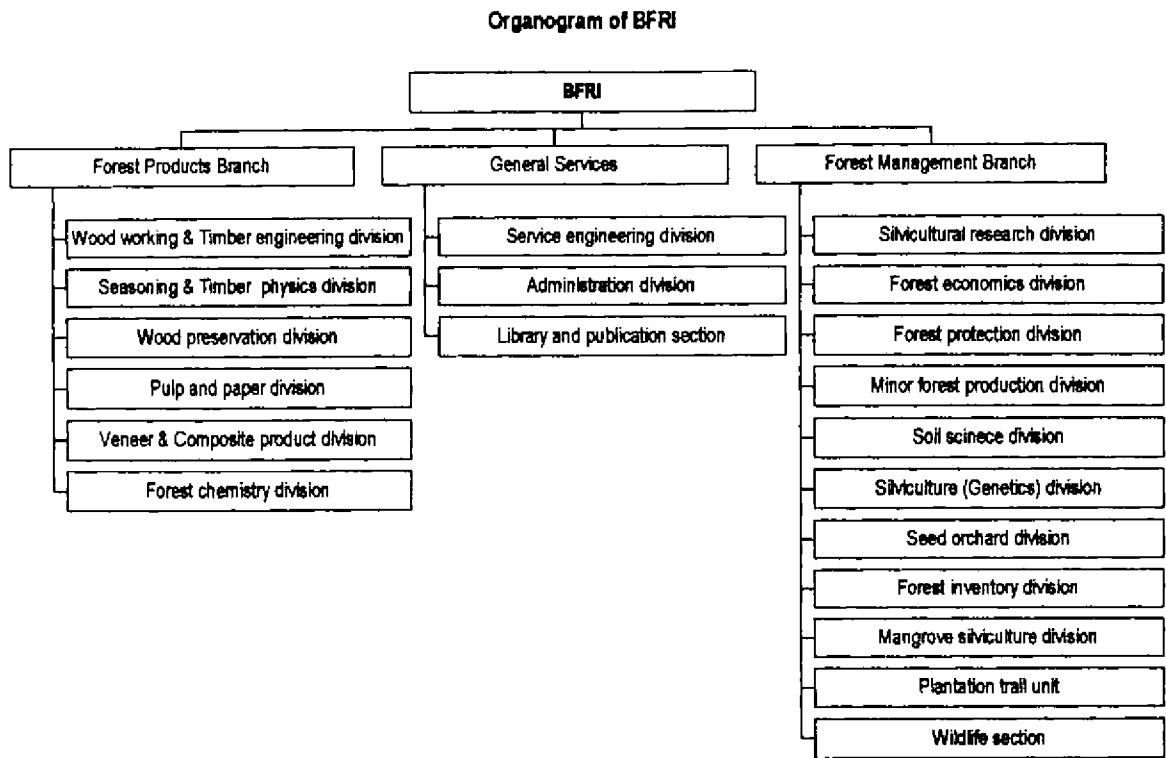
Objectives of BFRI

- i. To develop a sustainable land use system of hill farming for optimising the yield of food crops, fuel-wood, fodder, timber, bamboo, cane, medicinal plants etc.
- ii. To provide continued and incremental income to the hill farmers with the participation of underemployed family members through intensive farm practices.
- iii. To establish links among farmers, researchers, extension workers, social organizations and financial institutions for long term sustainability of the FSRD technologies and their dissemination.
- iv. To develop a resource management base and ensure judicious use of resources, especially through recycling of natural resources within the farming system.¹⁰⁰

Administration of BFRI

BFRI being a government organization works directly under MOFE. It does not have any governing board or committee. However, it has a research advisory committee which sits at least twice in a year for prioritization of research problems. This research advisory committee consists of twelve members. The secretary, Ministry of Environment and Forest acts as the chairman of the above committee. The Director of

BFRI works as the member secretary. The organisational¹⁰¹ structure of BFRI is stated below:



Bangladesh Forest Research Institute is situated to the south-east side of the country. Its activities are not seen all over the country. There is communication gap among the forest related institutes in Bangladesh. The institute has not finished so many mentionable programme to popularise social forestry and agro-forestry. Afforestation programme of the institute is not strong. As a result, we see that many trees are being cut not implanting single one. The Sundarbans mangrove forest, one of the largest such forests in the world (14,00,000 hectare) is formed at the delta of the Ganges, Brahmaputra and Meghna rivers on the Bay of Bengal. It is located adjacent to the border of India's Sundarbans World Heritage-site. The site is intersected by a complex network of tidal waterways, mudflats and small islands of salt-tolerant mangrove forests and presents

an excellent example of on-going ecological processes. The UNESCO has declared the Sundarbans as World Heritage in the year 1997.¹⁰² From the year 2002 West Bengal Government and Bangladesh Government have been jointly implementing the World Heritage Programme of the UNESCO. The institute should take initiative to popularize social forestry and agro-forestry. BRFI needs a complete suite of short term and long term initiatives fused into a single package or programme. Trees are our best friends. For this reason, the government should provide more funds for the development of forest and forestry.

2.8.8 Bangladesh Livestock Research Institute (BLRI)

Bangladesh Livestock Research Institute came into being in 1984 by an ordinance promulgated by the Honourable President of the People's Republic of Bangladesh. This is the only institute of its kind in Bangladesh entrusted to generate and adopt technologies to solve livestock problems at the national and farm levels and also to train up scientists in the appropriate field of research. The mandate is to take care of the livestock problems of small farmers through multi-and inter-disciplinary and inter-institutional research. The institute practically became functional from mid-1985.

The institute has developed minimum infrastructure to organize research and planning in the context of immediate and long-term necessity. Meanwhile, the institute has been able to generate and adopt few appropriate technologies through a number of completed projects and organize specialized training for scientists at home and abroad under its manpower development programme. At the same time, steps have been

taken for strengthening the farming system research and establishing extension research linkage. The BLRI has a modest beginning with significant research programmes on animal health, animal production, poultry production and socio-economic aspects of livestock development. Favourable response made by the Ministry of Fisheries and Livestock and the concerned donor agencies would help the institute to sustain its research and development efforts, and respond quickly to the needs of the livestock sector.¹⁰³

The objectives of BLRI are given below:

- a) To identify microbial organisms for effective diagnosis.
- b) To determine the magnitude of parasitism in the country, its relationship to agro-ecological system of husbandry methods and socio-economic stratification of livestock raising.
- c) To endeavour for innovating or adopting rapid diagnostic methods using sero-diagnostic procedures and improve proficiency or potency testing of vaccines/sera both at laboratory and field level.
- d) To strengthen design and experimentation to develop disease control models for use by the extension department for effective control of the diseases.
- f) To conduct research to improve quality of biological products and organize effective disease control programmes.¹⁰⁴

Administration of BLRI

Bangladesh Livestock Research Institute is managed by a board of governors. Honorable minister of the Ministry of Fisheries and Livestock is the chairman of the Board of Governors. The Board of Governors consists of 12 members. The directors general of the institute acts as the member secretary of the Board. There are six divisions and one planning cell in the institute. Each division is headed by a chief scientific officer. Administration and Supervision of the affairs of the institute are vested in the board of governors. Moreover, two researchers, engaged in research activities of the institute are nominated by the government to the Board of governors for a period of two years. The organogram¹⁰⁵ of the institute is stated to the next page.

Organizational Structure of BLRI

Board of Directors



Director General



Administrative division	Socio-economic Research division	Poultry Prod. Research div.	Animal Prod. Research div.	Animal Helath Research div.	System Research div.	Research Planning cell
Administration	Economics deptt.	Poultry Nutrition deptt.	Genetics & breeding deptt.	Epidemiology deptt.	FSR deptt.	Training cell
Finance	Marketing deptt.	Poultry breeding deptt.	Forage prod. deptt.	Bacteriology deptt.	System Modeling/Statistics deptt.	Research Forms
Documentation	Sociology deptt.		Ruminant Nutrition deptt.	Virology deptt.	Regional Station Baghabari	Draft power cell
Engineering				Parasitology deptt.	Regional Station Naikhongchari	
Library				Pathology/Toxicology deptt.		
Stores & Procurement						
Securities						
Transport						

Source: Brochure of BLRI, 1991

The livestock subsystem is the second major component of farming system in Bangladesh providing power, food, hides, wool, manure, fuel and fertilizer, income and social status. Due to mobility of animals, their longer life span than crops and their multiple outputs, research approaches with livestock are much different from those employed in the crop sub system. Bangladesh Livestock Research Institute is the only institute of its kind in Bangladesh. It is entrusted to generate and adopt technologies to solve livestock problems at national and farm levels and also provide training to the scientists in the appropriate research. The BLRI has been playing significant role in research programmes on animal health, animal production, poultry production and socio-economic aspects of livestock development.¹⁰⁶

FSR activities of livestock institute are very limited. Although upto-date research accomplishment is not so much spectacular, it is anticipated that in the near future extensive research and development activities will be undertaken in the FSR site. There is lack of more sustainable system based technologies which are very much essential to augment income and welfare of the small holder rural farming communities of Bangladesh. Crop and agro-forestry components are not included in the BLRI's FSR programme. The above sectors should be included in its FSR system without any delay. Emerging issues such as sustainability, agri-business, marketing, gender linkages etc. need to be adequately addressed in the FSRD plan. To implement the proposed programme encompassing all components and issues the existing staff positions should be increased and physical and other support services facilities should be strengthened. The current methodology need to be

modified and refined in realistic framework. The institute should have minimum infrastructural facilities to do research at optimum level. As an important sector for the development of the country, the government should allocate more budgets for livestock research and development.

2.8.9 Soil Resources Development Institute (SRDI)

Research on soil and different aspects of agriculture in this region was started in the central station known as Dhaka Farm of the then British India. After 1947, this research station became an important part of the department of Agriculture of the then Pakistan. In 1961 Soil Survey Project of Pakistan (SSPP) was established with the assistance of FAO, under the Ministry of Agriculture and Works. It was formed to make quick inventory of the soil of the country for assessing the amount, prospects, problems and solutions of the soil resources for farming and other uses. Thereafter, SSPP went through a number of changes towards development till 1971.¹⁰⁷

After the emergence of Bangladesh in 1971, SSPP was internally reconstructed and renamed as Department of Soil Survey of Bangladesh (DSSB) under the Ministry of Agriculture. Finally in 1983, the present SRDI was created by internal and external reorganization of the former DSSB for rendering more quality services as an important national organization under the direct control of the agricultural ministry. However, SRDI is popularly known as "Soil Science Research."¹⁰⁸

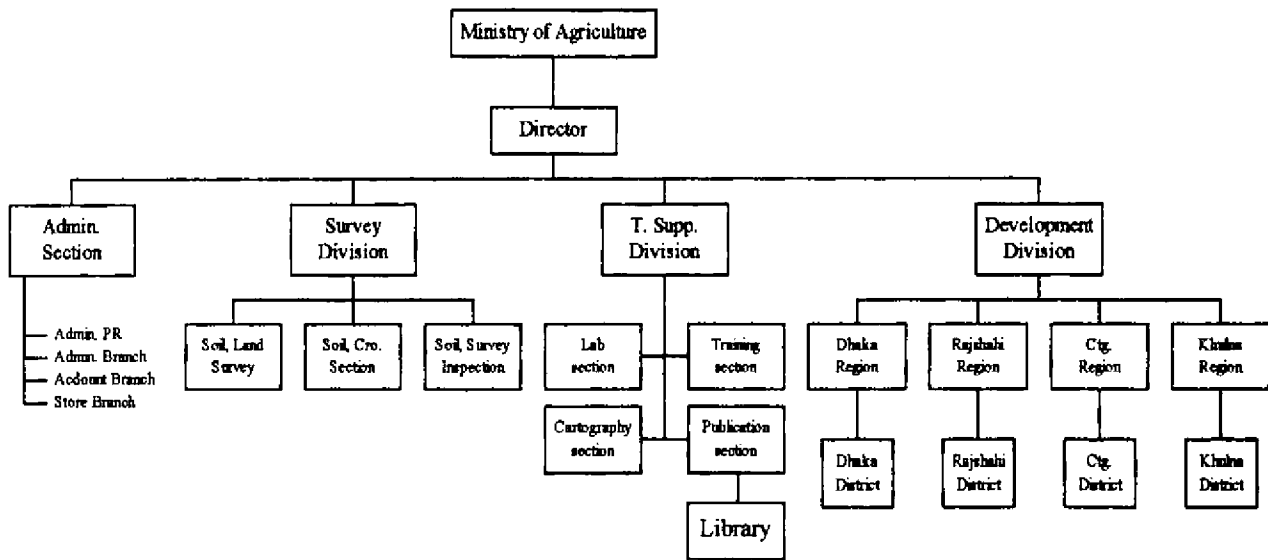
Soil Resources Development Institute was formed to fulfill the following objectives:

- i) To assess the total amount of soil resources of Bangladesh.
- ii) To find out the various attributes of soil and land within Bangladesh territory.
- iii) To find out and suggest various ways and means for conservation of soil.
- iv) To find out the prospect and problem of particular soil with remedial steps.¹⁰⁹

Administration of the SRDI

SRDI is a specialized research organization under direct control and supervision of the govt. of Bangladesh. For the management of all affairs, SRDI has one director in the head office, who acts as the administrator and coordinators of all the research programmes and supervises the financial aspects of SRDI. Under the director, there are two Divisional Heads with the status of Principal Scientific Officer (PSO). These divisions are: Survey division and Technical support service division. The organogram¹¹⁰ of SRDI is given to the next page.

Organogram of SRDI



SRDI is basically a service rendering agency. The scientists are also to conduct soil survey for the whole country. In addition SRDI helps farmers with soil analysis to formulate crop fertilization programme and develop crop rotation sequence to maintain soil fertility with higher profitable crop yields.

SRDI is involved in an Inter-institutional programme named preparation and implementation of Thana Nirdeshika (instruction for soil and its fertility) for the 460 thanas (police station) of the country in which most of the Research Institutes like BARI, BRRI and BINA and the dept. of Agricultural Extension actively participated and the programme is being run and implemented under the overall coordination/supervision of BARC. The active role of different participatory institutes including BARC must be maintained and improved in order to minimize the existing weaknesses. This will facilitate proper identification and dissemination of specific agro-technology for quick adoption by the farmers.

2.8.10 Bangladesh Tea Research Institute (BTRI)

Tea is an important cash crop of Bangladesh. It is one of the largest agro-based industry in the country. There are 158 tea gardens having 48.3 thousands ha of land under tea plantation producing about 55.6 million kg. of processed tea. Roughly half of this production is consumed at home while the rest half is exported from which Bangladesh earns a substantial amount of foreign exchange amounting to the tune of 1500 million taka. Tea sector contributes 0.81% of GDP and about 1.5 million people are employed in this industry which is about 3.3% of the country's total industrial employment.¹¹¹

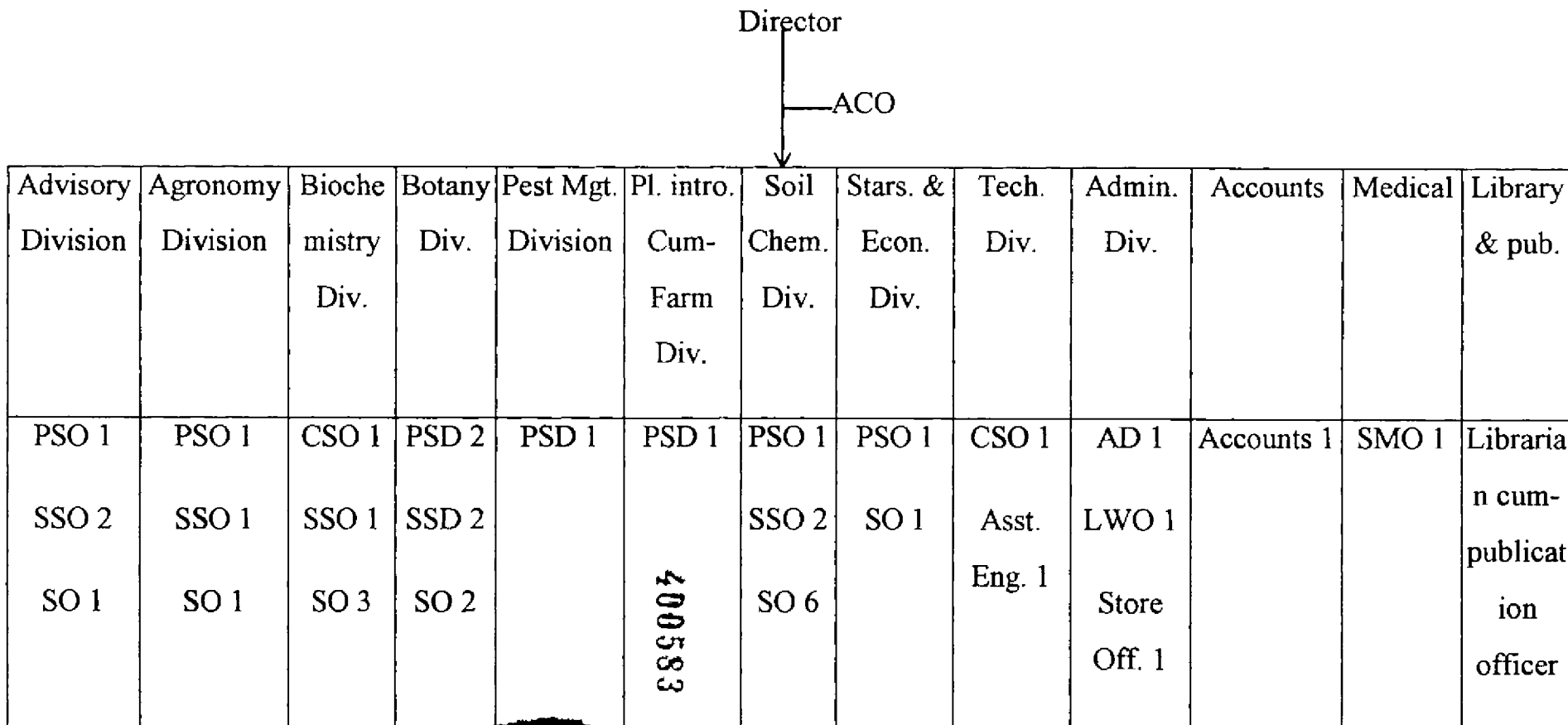
The availability of proven technology for the tea industry immediately after partition of India in 1947 was very limited. To solve the various problems of growing and manufacturing of tea and to continue the inherited industry on sound scientific footing, the then Pakistan Tea Board in a resolution in 1952 decided to establish a tea research station of its own. As a result, the Pakistan Tea Research Station came into being at its present location at Srimongal in 1957. After the liberation, the research station was raised to the status of an institute naming as Bangladesh Tea Research Institute (BTRI) in 1973. Now BTRI is one of the 10 National Agricultural Research System (NARS) institutes in Bangladesh.¹¹²

Objectives of BTRI

- a) To increase yield and improve quality of Bangladesh tea through research results.
- b) To render advisory service to tea estates.
- c) To transfer innovated technologies to the tea industry.
- d) To process tea to provide good colour and aroma.
- e) To improve tea plant for profitable commercial use and
- f) To improve the socio-economic conditions of tea garden labourers.¹¹³

The organogram¹¹³ is stated to the next page.

Organizational Structure of BTRI



Source: Brochure of BTRI, 1999.



The Role of BTRI in Tea Research

Outstanding high yielding and quality clones namely BT 1, BT 2, BT 3, BT 4, BT 5, BT 6, BT 7, BT 8, BT 9 and BT 10 have been introduced by the institute. Among them BT 2 has got persistent touch of flavour reminiscent of "Darjeeling Character" which is a unique characteristic for low grown area like ours. Some achievements¹¹⁵ of BTRI are as follows:

- Development of three bi-clonal and one polyclonal-seed stocks.
- Standardisation and upgradation of fertilizer policy on the basis of soil characteristics and of yield profile.
- Introduction of Urea in place of traditional sulphate of ammonia used for ages having adverse effect on soil properties as nitrogenous fertilizer for tea.
- Introduction of rock phosphate instead of TSP as a cheaper source of phosphatic fertilizer for tea.
- Introduction of Integrated Pest Management (IPM) to protect tea from the maladies of pests, diseases and weeds.

The major weakness of the present setup of BTRI is imbalance in the ratio of scientists and supporting staff. Thus, there are needs to create more scientific posts at different levels with equal importance to the sub-stations. There is enough land in Bangladesh for producing high quality tea. But there is no any sort of attempt or research to introduce tea plantation in these areas.

Tea, an important cash crop of Bangladesh, has been playing a vital role in earning foreign currency, providing employment of manpower and high contribution in GDP. So, we should give more emphasis for the development of tea by extending the tea gardens in all hilly regions of Bangladesh and also should make appropriate training facilities for the personnel working in tea sector, specially in library and documentation.

In the above, the establishment, objectives and functions of 10 research organisations are elaborated. In each case, we observed objectives, say lofty objectives which are timely and praise worthy. In the preparations of objectives, there is no any shortcoming with any of the above institutions. But the question is where the institutions materialized the objectives or not. Thorough examination, evaluation and analysis will reveal that their success without exception is not complete and comprehensive.

2.9 Agricultural Extension System in Bangladesh

Agriculture department during the undivided India was created as back as in 1906. At that time, concept of agricultural extension as a discipline was not even conceived of. Based on the recommendation of the Royal Commission for Agriculture, the Department of Agriculture was created in a nucleus form with primary emphasis on off setting food crisis situation.

The department of agriculture passed through the following number of phases in order to flourish as the national organisation for agricultural development with the name as Department of Agricultural Extension (DAE)¹¹⁶:

- Initiation phase (1906-1950)
- Trial and Adoption phase (1950's and 1960's)
- Fragmentation phase (1970-1976)
- Phase of Consolidation (1977-1983) – This is the latest phase of evolution process of agriculture that records two distinct metamorphosis viz.

(1) Introduction of Training and Visit system of extension services, at first in pilot form in Bogra and then in trial form in all the districts of Rajshahi division in the year 1977 and 1978 respectively and (ii) Unification of the monocrop extension services and reorganization of the extension services into DAE.¹¹⁷

The role of the department of agricultural extension is to assist farmers through education in improving farming methods and techniques, increasing production efficiency and income and thus enhancing their quality of life. It attempts to make scientific and factual information available to farmers and provides training and guidance in the application of agricultural information to the solution of their problems. Therefore, agricultural extension acts as a bridge between "research" on one hand and the "farmer" on the other.¹¹⁸

The functions of the DAE are as follows:

- i) To provide the farmers with the latest results of research and scientific farm techniques for their socio-economic betterment.
- ii) To motivate the farmers to adopt improved production practices which would increase their farm production and their by meet national consumption requirements, maximize export and minimize import.
- iii) To assist the farmers to arrive at the most promising course of action for maximizing production and income keeping in view of their own needs, resource and abilities.
- iv) To help develop self-reliance and cooperation by training local leadership for organized group action.
- v) To provide channels for service and information from the Ministry of Agriculture and its different departments to the farm people, and in turn relay the problems and needs of the farmers that require national intervention.
- vi) To provide an efficient linkage between the various research institutions and the farmers so that along with the flow of technology to the farmers, the farmer's level problems are also brought to the relevant research institutes for investigation and solution.
- vii) To provide educational opportunities in agriculture especially for front-line extension workers, all rural masses, adults and youth.

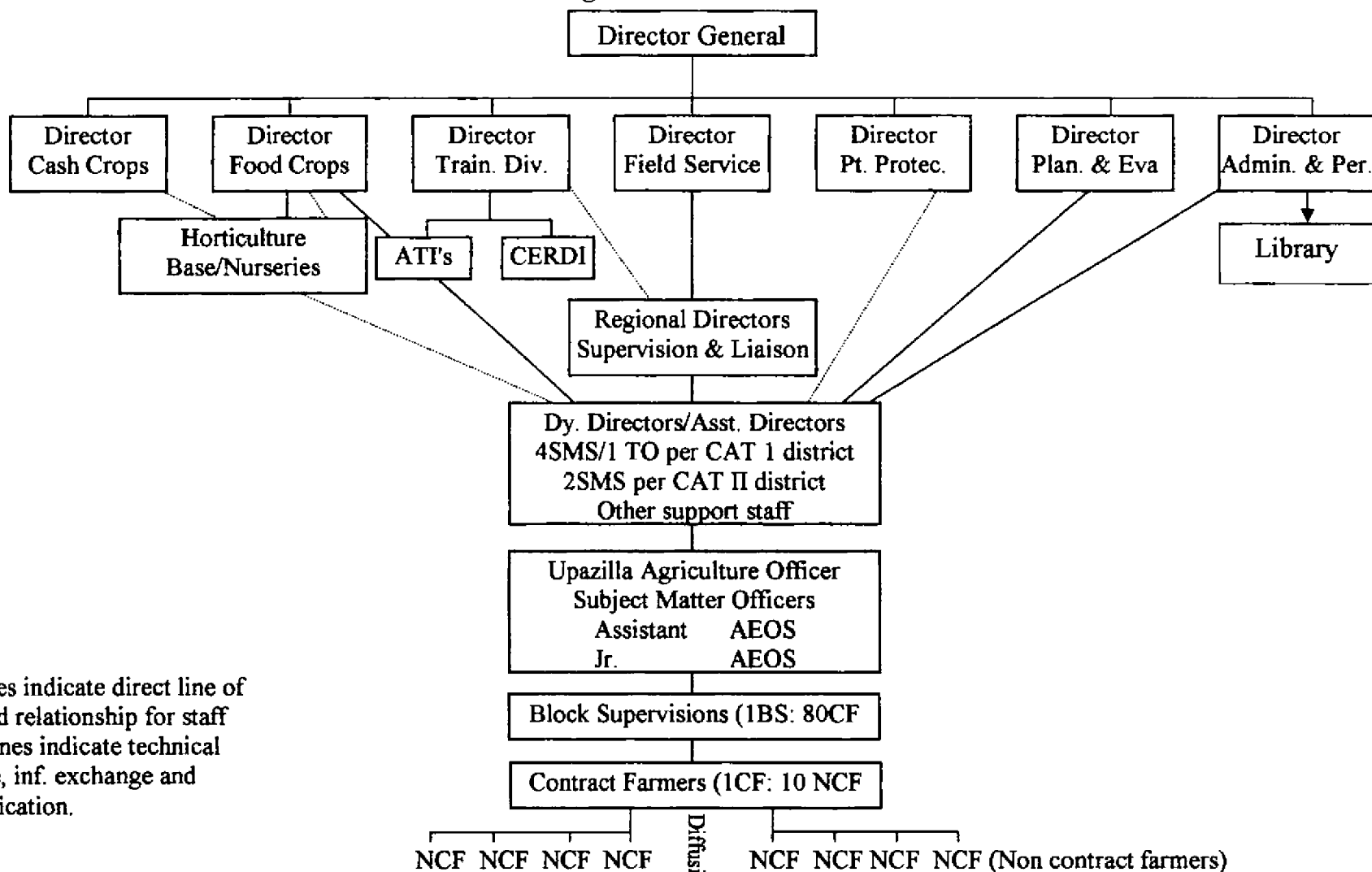
- viii) To serve as liaison agency between farmers and other organisations (both public and private) including local administration at different tiers, the credit giving and input supply agencies.
- ix) To help and promote storage and fair price for agricultural products in co-operation with concerned agencies. and
- x) To monitor condition of standing crops and forecast the production prospects.¹¹⁹

2.9.1 Administration of DAE

The institutional foci for the management of extension services according to DAE, are the block (Union), Unit (Upazilla), Zone (District) and the Headquarters (National level). At the national level the DAE is headed by a Director General (DG), assisted by seven Directors of each of the Divisions as it is shown in the attached organogram.¹²⁰

Organizational Chart

National Level



Note:

1. Solid lines indicate direct line of command relationship for staff
2. Dotted lines indicate technical guidance, inf. exchange and communication.

The government of Bangladesh approved the Agriculture Extension Policy in 1996, which is being implemented in the country. The broad objective of the policy is to facilitate and accelerate technological transformation with a view to becoming self-sufficient in food production. It also aims to improve the nutritional status of the population, generate income and employment for the rural people and reduce environmental degradation.¹²¹

There are many agencies which provide extension support to the farmers of Bangladesh. These include government agencies such as the Department of Agricultural Extension, Bangladesh Water Development Board, Bangladesh Agricultural Development Corporation, Forest Department, Department of Livestock Services and the Department of Fisheries. Many NGOs (namely BRAC, GSS, ASHA, SDS, GKF etc.) have been operating many programmes in rural areas throughout the country for development of extension activities.¹²²

Department of Agricultural Extension (DAE) is the main extension agency of the government performing extension work throughout the country. The basic features of the department's extension approach are decentralized decision-making, responsiveness to farmer's information needs, working with groups, targeting of extension support and the use of appropriate methods of communication at all levels.

Extension is based on an efficient flow of useful information. Farmers provide extension staff with information about their farming systems and production problems. Scientists and researchers pass information to extension staff about new varieties and practices.

Extension staff supplies information to one another to help them in their work.¹²³

Department of Agricultural Extension (DAE) is one of the most important departments in agriculture sector of Bangladesh because it has linkages with the rural farmers. Farmers are getting valuable information by the help of DAE. New varieties of crops and their practices are supplied to the farmers by extension staff (block supervisor). Though the DAE is doing much for the betterment of agricultural development but there are some difficulties. The spirit of co-operation and co-ordination among NARS institutes and DAE is not satisfactory. This gap should be overcome as soon as possible. Training and visit system of DAE is not strong. DAE does not provide effective technology transfer activities through demonstrations and training. It should have technology transfer activities through demonstrations and training on the reuse of hybrid seeds to the farmers and its effect on yield and subsequent crop. Weaknesses in research-extension linkages limited the full potentialities of technology transfer.

The programme is highly beneficial for the development of agriculture in Bangladesh. But to speak openly, if the researcher is permitted, the programme is not yet playing vital roles in the development of agriculture and the condition of rural people. The rural people require more and more services/information from this programme (extension activities). But the programme due to various factors can not satisfy all the needs of the farmers. As such the extension activities should be more intensified.

2.10 Non Government Organisations (NGO's) in Agriculture

A large number of NGOs- national and international, big and small have been working in Bangladesh. They have introduced many interventions covering various fields of developmental activities such as agriculture, credit and savings, livestock, fisheries and forestry etc.

The origin of the NGOs in Bangladesh goes back to early 1970s just before the birth of Bangladesh. In late 1970 there was a big cyclone in the southern part of Bangladesh, near the Bay of Bengal and many people died. Many philanthropic organizations of home and abroad came forward to help these distressed people. The NGOs who started working in the southern areas a few months ago were continuing their works in the respective areas. And after independence in the early part of 1972, they started to organize themselves to help the newborn nation in different locations of the country. There are about 20,000 NGOs now working in the country and about 400 of them are directly involved in agriculture.¹²⁴ Activities of some leading NGOs in Agriculture are given below:

- I. **Bangladesh Rural Advancement Committee (BRAC):** BRAC is a national development agency, which started its activities in early 1972 after the independence of Bangladesh to provide relief to the needed people. Although initially it started relief and rehabilitation works for the refugees in Sulla area of Sylhet district, but gradually it has expanded 'its' activities with multi faceted programs with accumulated experiences. The main goal of BRAC is to alleviate poverty by increasing the employment opportunity and income of their beneficiaries. The rural people are provided functional

education and skill development training at the local level by the help of BRAC, which is followed by credit for small trading, agriculture, livestock, food processing, rural industries and rural transport. Rice cum fish culture, poultry raising, livestock raising, vegetables raising and homestead gardening are some of the important agricultural program of BRAC¹²⁵.

II. Rangpur Dinajpur Rural Services (RDRS): RDRS like many other NGOs was started as a refugee assistance organization during the liberation movement of Bangladesh in 1971. Immediately after liberation of the country RDRS became engaged in relief, rehabilitation, reconstruction, repaying of infrastructure, houses and also providing medical services in the northern districts of newly born Bangladesh. Since 1976, the emphasis has also been given for employment generation for the rural poor and agricultural development (improvement) of the locality. Recently, the agricultural section of BDRS established linkages with DAE, BRRI, BAU, BARI, DLS, DOF and other agencies to conduct joint extension activities for agricultural development in the northern districts of the country. The school vegetables raising programme, integrated farming, livestock and poultry rising are some of the important agricultural field activities of RDRS¹²⁶.

III. Sawmirvar Bangladesh : BARD initiated the Sawmirvar Bangladesh Program in 1974 as flood recovery operations. Sawmirvar credit programme was introduced in 1977 on easy terms for the rural poor. Some leading banks of the country were associated with this program. The Sawmirvar movement suffered

from many ups and downs during the last 25 years. Yet it has been running many agricultural and rural development activities successfully through out Bangladesh in collaboration with other GOs and NGOs.¹²⁷

- IV. Cooperation of American Relief Everywhere (CARE):** CARE has been functioning in the then East Pakistan since 1953. CARE like other organisations, has its own mandate and functions for total development of the different sections of people, mostly the rural ones. Agriculture is the biggest section of CARE. CARE's new options for pest management (NOPEST), integrated rice-fish culture (INTERFISH), poultry and livestock raising, vegetables raising, homestead gardening, school vegetable raising are the important agricultural activities.¹²⁸
- V. PROSHIKA:** PROSHIKA was established in 1976 as a national NGO. Agriculture is one of the activities of Proshika. The target groups of this organization are (i) landless agricultural labourers (ii) the landless poor, small and marginal farmers (iii) the occupational rural professional working people as fishermen, weavers, rickshaw pullers, petty traders and others and (iv) women of all social classes and occupational function. Proshika also has achieved experiences in minor irrigation through its irrigation programme. Many national and international donor agencies have been supporting this NGO since beginning.¹²⁹
- VI. Mennonite Central Committee (MCC):** The Mennonite Central Committee (MCC) came to Bangladesh in late 1970 to provide

relief to the victims of the severe cyclone. By 1973 the main focus of the programme efforts shifted from relief and rehabilitation to agricultural development. The goal of MCC's agriculture programme is to improve the incomes, productivity, nutritional status and living conditions of the rural women, marginal farmers and the landless.¹³⁰

A very brief introduction of the above few leading NGOs shows their nature of involvement in agricultural extension activities. Most of the leading NGOs have established formal linkages with several Government Organisations to share the resources. But most of the NGOs in Bangladesh deal with micro credit. Distribution and realization of credit have become their major programmes. The monitoring and supervision system of NGOs are highly structured to get the loan money back on time from the loaners. NGOs (CARE, BRAC, RDRS, MCC and others) help promote farmer's participatory approach in identification and dissemination of appropriate technology in various fields of agriculture in cooperation with government organisations.

References

1. Mazumder, R.C. *The History of Bengal*, Vol. II, fifth edn. Calcutta: World press, 1954, P 5.
2. Rahim, M.A. & others. *History of Bangladesh*. 2nd edn. Dhaka: Nowroze, 1981, P 389-391.
3. Islam, M.S (ed.). *History of Bangladesh*. Dhaka: ASB, 1995, P 8
4. Molla. M.K.U. The new province 81, P 1.
5. Majumder, R.C. *History of Bangladesh*. Vol. IV (1905-1947). Calcutta: General Publishers, 1975, P 401.
6. GOB. Ministry of Planning. Statistics Division. *Statistical Yearbook of Bangladesh 1997*. Dhaka: BBS, 1998, P XXIII.
7. Ministry of Planning. Statistics Division. *Statistical Yearbook of Bangladesh 1998*. Dhaka : BBS, 1999, P VIII.
8. Ahmed, K.U. *Bangladesh Agriculture and Field Crops*. Dhaka : Mumtaz, 1980, P 1
9. Asian Productivity Organization (APO). *Development of Information Systems for Agriculture*. Tokyo : APO, 1993, P 137.
10. Ahmad, K. *Bangladesh Agriculture and Field Crops*. Dhaka: Mumtaz, 1980, P 6.
11. Hossain, M. *Agriculture in Bangladesh: Performance Problems and Prospects*. Dhaka : UPL, 1991, P 13.
12. *Ibid*, P 14.
13. Bangladesh Agricultural Research Council. *Bangladesh Agriculture and its development*. Dhaka: BARC, 1991, P 22.

14. Hossain, M and others. *Floods in Bangladesh: Natural Disasters and People's Survival*. Dhaka : Universities Research Institute, 1987, P 130.
15. Hossain, M. *Agriculture in Bangladesh: Performance Problems and Prospects*. Dhaka : UPL, 1991, P 18.
16. *Ibid*, P 10.
17. Ahmad, K.U. *Bangladesh Agriculture and Field Crops*. Dhaka: Mumtaj, 1980, P 1.
18. Hossain, M. *Agriculture in Bangladesh: Performance Problems and Prospects*. Dhaka : UPL, 1991, P 19.
19. *Ibid*, P 20.
20. *Ibid*, P 21.
21. Rashid, H.E. *Geography of Bangladesh*. 2nd rev. edn. Dhaka : UPL, 1991, P 40.
22. Ahmed, K.U. *Agriculture in Bangladesh*. Dhaka : Ahmed, 1987, P 9.
23. Hossain, M. *Agriculture in Bangladesh: Performance Problems and Prospects*. Dhaka : UPL, 1991, P 23.
24. Rashid, H.E. *Geography of Bangladesh*. 2nd rev. edn. Dhaka : UPL, 1991, PP 59-62.
25. *Ibid*, P 63.
26. Rashid, H.E. *Geography of Bangladesh*. 2nd rev. edn. Dhaka : UPL, 1991, P 429.

27. Bangladesh Bureau of Statistics (BBS). *Statistical Pocketbook of Bangladesh 2000*. Dhaka: BBS, 2001, P 112.
28. Hassanullah, M. et al. *Performance of Agricultural Extension Organization of Bangladesh*. Dhaka: UPL, 2000, P 1.
29. The Independent. *The Independent Bangladesh Yearbook 1999*. Dhaka: Beximco Media, 2000, P 17.
30. Brammer, Hugh. *Agro-ecological Aspects of Agricultural Research in Bangladesh*. Dhaka: UPL, 2000, PP 54-58.
31. The Independent. *The Independent Bangladesh Yearbook 1999*. Dhaka: Beximco Media, 2000, P 18.
32. Fatema, Begum. *Bangladesh Agricultural Development Corporation Library: A Case Study (Unpublished Masters Dissertation)*. Dhaka University : Dept. of LIS, 1979, P IV.
33. Randhawa, M.S. *A History of the Indian Council of Agricultural Research*. New Delhi : ICAR, 1979, PP 12-13.
34. Fatema Begum, *op.cited*. P IX..
35. *Food and Agriculture Commission Report of Pakistan, 1959*, P 17.
36. Fatema Begum, *op.cited*. P X.
37. Kaida, Y. (ed.). *Agricultural and Rural Development in Bangladesh: A Review of Related Studies*. Dhaka : JICA, 1990, P 14.
38. Ahmed, N. *Development Agriculture of Bangladesh*. Dhaka: Bangladesh Books Int., 1976. PP 5-10.

39. Brammer, Hugh. *Agro-ecological Aspects of Agricultural Research in Bangladesh*. Dhaka: UPL, 2000, P IX.
40. Asian Productivity Organization (APO). *Trends and perspectives in Agricultural Education in Asia-Pacific*. Tokyo : APO, 1999, P 180.
41. *The Statistical Yearbook 2000*, P XXXV.
42. Asian Productivity Organization (APO). *Trends and perspectives in Agricultural Education in Asia-Pacific*. Tokyo : APO, 1999, PP 18-19.
43. *Ibid*, PP 20-22.
44. *Ibid*, PP 16-17.
45. Jaim, W.H.M (ed.). *Agricultural and Rural Development in Bangladesh*. Dhaka: JICA, 1995, P 86.
46. Randhawa, M.S. *A history of the Indian Council of Agricultural Research*. New Delhi: ICAR, 1979, P 8.
47. *Ibid*, P 9.
48. Ahmad, Kalimuddin. *Hundred years of agricultural education in Bangladesh*. Papers published in the Souvenir of BAI. Dhaka: BAI, 1989, P 96.
49. Khan, A.A. *Agricultural Education in Bangladesh: Some Historical Highlights*. Articles in Agricultural and Rural Development in Bangladesh. Kaida, Y. (edited). Dhaka : JICA, 1990, PP 141-142.
50. *The Bangladesh Observer*, January 4, 2001, P 1.

51. *50 Years of BAI. Souvenir*, 1989, P 110.
52. *Official Records of BAI*, 1994. P 17.
53. *Annual Report of BAU, 1964-65*. P 19.
54. Kaida, Y. (ed.). *Agricultural and Rural Development in Bangladesh: A Review of Related Studies*. Dhaka : JICA, 1990, P 143.
55. *IPSA Brochure*, 1996, P 6.
56. *Prime Minister's inaugural ceremony of Bangabandhu Sheikh Mujibur Rahman Agricultural University*. Salna: BSMRAU, 1997, P 2.
57. *Hazee Danesh Agriculture College Magazine*, 1997. P 12.
58. Asian Productivity Organization (APO). *Trends and perspectives in Agricultural Education in Asia-Pacific*. Tokyo : APO, 1999, P 187.
59. Nizamuddin, M. and Others. *A conceptual idea to make farm and laboratory teaching of agricultural education more effective in Bangladesh*. Papers published in Bangladesh Journal of Training and Development. 6(2), 1993, P 105.
60. Ministry of Planning, Statistics Division. *1998 Statistical Yearbook of Bangladesh*. Dhaka : BBS, 1999, P XXIV.
61. Ministry of Planning. Planning Commission. *The Fifth Five Year Plan 1997-2002*. Dhaka : Planning Commission, 1998, P 127.
62. *The Independent Bangladesh Yearbook*, 1999, 50.
63. *Bangladesh Livestock Research Institute Brochure*, 2000, P 10.

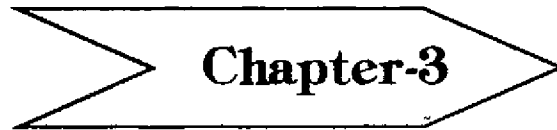
64. Asian Productivity Organization (APO). *Trends and perspectives in Agricultural Education in Asia-Pacific*. Tokyo : APO, 1999, P 181.
65. Karim, M.R. *Communication Patterns in Farm Information Development and Dissemination Systems Related to Rice Technology (Unpublished Ph.D Thesis)*. BAU : Dept. of Agri. Extension Education, 1994, PP 10-11.
66. *The Royal Commission Report on Agriculture, 1929*, PP 1-15
67. Razzaque, M.A. & others (edited). *Farming System Research and Development Programmes in Bangladesh*. Dhaka: BARC, 1993, PP 1-2.
68. *BARC Annual Report 1999-2000*. Dhaka: BARC, PP 1-3.
69. Bangladesh Agricultural Research Institute. *Annual Report 1999-2000*. Gazipur: BARI, 2000, P IV.
70. *BARI Brochure 1998*, P 3.
71. *BARI Annual Report 1996-97*, P VI.
72. *Official Document of BARI, 2000*, P 6.
73. *BARI at a Glance 1998 (Brochure)*, P 16.
74. *Ibid*, P 17.
75. *Annual Report of BRRI, 2000*. P 5.
76. *Official Sources of BRRI, 1999*. P 11.
77. Bangladesh Rice Research Institute. *Rice & Media Seminar, 1999*. P 21.
78. *Ibid*, P 6.

79. *Ibid*, P 7.
80. Bangladesh Rice Research Institute (BRRI). *Research Highlights for 1997*. Gazipur: BRRI, 1999, P V.
81. Bangladesh Rice Research Institute (BRRI). *Master Plan of 5 Year Research Programmes (1995-2000)*. Gazipur: BRRI, 1996, P I
82. Nyogi, B. *Information needs in jute and allied industries in India (Ph.D Thesis)*. Jadavpur University: Dept. of LIS, 1994, P IV.
83. Graduate Training Institute (GTI). *Agricultural Research Management: a Training Manual*. Mymensingh: GTI, 1993, P 12.
84. Hamida Begum. *Bangladesh Jute Research Institute Library and Soil Resources Development Institute Library: a Comparative Study (Masters Dissertation)*. Dhaka University: Dept. of LIS, 1990, P 15.
85. *Ibid*, P 17.
86. *Bangladesh Observer*, June 29, 2002, P 1.
87. Bangladesh Institute of Nuclear Agriculture (BINA). *Annual Report of 1999-2000*. Mymensingh: BINA, 2001, P V.
88. *BINA Brochure*, 2000. P 12.
89. Bangladesh Institute of Nuclear Agriculture (BINA). *BINA: A profile*. Mymensingh: BINA, 2001, P 47.
90. Graduate Training Institute (GTI). *Agricultural Research Management: a Training Manual*. Compiled and edited by Amin Hossain & others. Mymensingh: GTI, 1993, P 14.

91. Bangladesh Sugarcane Research Institute (BSRI). *Annual Report 1998-99*. Ishurdi: BSRI, 2000, P VII.
92. Bangladesh Sugarcane Research Institute (BSRI). *Annual Report of 2000-01*. Ishurdi: BSRI, 1999, P VI.
93. *Official Documents of BSRI*, 2001. P 70.
94. Fisheries Research Institute (FRI). *Research Progress 1994-97*. Mymensingh: FRI, 1998, P 3.
95. *Annual Report of FRI, 1997-98 and 1998-99*. Mymensingh: BFRI, 2002, P 2.
96. Fisheries Research Institute (FRI). *Research Progress 1994-97*. Mymensingh: FRI, 1998, P 2.
97. *Ibid*, PP 3-4.
98. Bangladesh Forest Research Institute (BFRI). *BFRI: An Information Brochure*. Chittagong: BFRI, 1999, P 2.
99. *Ibid*, P 4.
100. *Ibid*, PP 5-6
101. Razzaque, M.A. & others (edited). *Farming System Research and Development Programmes in Bangladesh*. Dhaka: BARC, 1993, PP 7-8.
102. UNESCO. *Brief Description of Sites Inscribed on the World Heritage List*. UNESCO: World Heritage Centre, 1999, P 3.
103. Bangladesh Livestock Research Institute. *About BLRI*, Savar: BLRI, 1991, P I.

104. Bangladesh Livestock Research Institute. *Annual Report of BLRI from 1992-93 to 1997-98*. Savar: BLRI, 2002, P 3.
105. *Ibid*, P 6.
106. Bangladesh Livestock Research Institute. *Progress Report 1985-91*, Savar: BLRI, 1993, P II.
107. Hamida Begum. *Bangladesh Jute Research Institute Library and Soil Resources Development Institute Library: a Comparative Study (Masters Dissertation)*. Dhaka University: Dept. of LIS, 1990, P 20
108. *Ibid*, P 21.
109. *Brochure of SRDI*, 1998. P 5.
110. *Official Report of SRDI*, 2001. P 11.
111. *Annual Report of BTRI*, 1997. P 3.
112. Bangladesh Tea Research Institute (BTRI). *Glimpses on Bangladesh Tea and BTRI*. Srimongal: BTRI, 1999, P I.
113. *Ibid*, P 2.
114. *Official Document of BTRI*, 2000. P 12.
115. *Ibid*, P 14.
116. *Department of Agricultural Extension Report*, 1983. P 1.
117. *Ibid*, PP 12-13.
118. *Department of Agricultural Extension Report*. Dhaka : DAE, 1985. P 14.

119. Bhuiyan, A.K.M.H. *An Analysis of the Role of Contract Farmers in the Training and Visit System of Extension in Comilla District of Bangladesh (Unpublished Ph.D. Thesis)*. Los Banos : Univ. of Philippines, 1987, P 31.
120. *Ibid*, P 32.
121. GOB. *The agriculture extension policy 1996*. Dhaka: BG Press, 1996, PP 14-18.
122. *BARI at a Glance 1998 (Brochure)*, P 17.
123. Asian Productivity Organization (APO). *Trends and perspectives in Agricultural Education in Asia-Pacific*. Tokyo : APO, 1999, PP 181-182.
124. Halim, A. and Kaida, Y. *Agricultural Extension in South and South-East Asia: A comparative historical review*. Kyoto University: Centre for South-East Asian Studies, 2001, P 24.
125. *Ibid*, P 25.
126. *Ibid*, P 26.
127. Halim, A. and Kaida, Y. *op. cited*. P 26.
128. Faruquee, Rashid (ed.). *Bangladesh Agriculture in the 21st Century*. Dhaka: UPL, 1995, P 244.
129. Halim, A. and Kaida, Y. *op. cited*. P 27.
130. University Press Limited (UPL). *Rural Poverty in Bangladesh: A Report to the like minded group*. Dhaka : UPL, 1990, P 192.

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Chapter-3

3.0 Introduction

The present chapter of the thesis is intended to study the existing state of affairs relating to Agricultural Information Systems in Bangladesh. A good number of agricultural libraries and information centres are available for the study.¹ A critical study of their objectives, information sources & services and financial position are paramount and essential for arriving at valid inferences for studying its effectiveness in agricultural information dissemination to the users.² The researcher has identified eighteen agricultural libraries and information centres for the study and all these constitute Bangladesh Agricultural Information System (BAIS).

3.1 Bangladesh Agricultural Institute Library (BAIL), Dhaka

This institute was the first agricultural institute in the then British Bengal. The library of BAI was established in the year 1938.³ It is also the first agricultural library in the area now called Bangladesh. The library is open from 9 a.m. to 4 p.m. The area of the library is 4500 sq.ft⁴.

It has a good collection of 28000 books and 5000 (with back issues) journals. From the very beginning, the library has been serving teachers, students and employees of the institute. The library has been playing an important role for the development of agricultural education in Bangladesh. Library services are (i) Readers services (ii) Circulation services (iii) Reference services (iv) Reprographic services. There are two committees for the development of library namely Library development committee and Publication & book purchase committee. Annual addition of the library is 500⁵ (books and journals).

From the inception of the library, it has been playing vital role in the development of research and extension services. Its services are not upto the satisfaction of the library users. It is not providing SDI services, computerized library services and inter-library loan services. This library requires three more library personnel. The library is situated in the academic building of the institute. The library should be separated and it should have its own building. As an academic library it should follow classified catalogue. As soon as possible the library authority should introduce Internet facilities. Being the first of its kind in agricultural field in 1938, its services though limited in scope deserve appreciation or praise even though its objectives have not yet been framed.

3.2 Bangladesh Jute Research Institute Library (BJRIL)

Bengal Jute Research Station (BJRS) was established in 1939 as a part of Indian Central Jute Committee. Later on BJRS was restructured and renamed in the year 1951 as East Pakistan Jute Research Institute⁶. East Pakistan Jute Research Institute Library was established in the same year (1951). After the independence of Bangladesh the name of the library was changed to 'Bangladesh Jute Research Institute Library'. The library hour is 9 a.m. to 4 p.m. Its area is 2000sq.ft.⁷ The library is situated in the main building of the institute.

Bangladesh Jute Research Institute Library is a special library. In order to meet the needs of jute researchers at national level, the library has the following objectives:

- (a) To improve the procurement of jute related books, journals, periodical and other publications and allied materials.

- (b) To collect the important publications from various regional and international agencies.
- (c) To store and disseminate up-to-date information, research reports, proceedings etc.
- (d) To circulate the important findings of researchers on High Yielding Varieties (HYV).
- (e) To render more effective information services to the scientists and researchers.⁸

Its important services are: (i) Readers advisory services (ii) Reference services (iii) Reprographic services (iv) Indexing and abstracting services and (v) Current awareness services.

The library is the prime library in the field of jute and jute related matters. As a special library it should render all important library services to the scientists and researchers. But it is not providing SDI, Inter library loan and computerized library services. Library operations are done manually. With the decline of importance and use of jute, jute industries including the jute research institute are losing importance and interest. On the 1st July 2002, the government of Bangladesh closed the world famous Adamjee Jute Mills for variety of reasons. The govt. also did not pay due attention for the development of jute libraries. The scientists and researches also suffers from frustration as they do not get required jute materials. As such they developed disinterest to consult the library materials.

3.3 Bangladesh Forest Research Institute Library, Chittagong

Bangladesh Forest Research Institute was established in 1955 to help the country with the objectives of determining the optimum uses of timber and also to develop management practices. The library was established in the same year.⁹ It is situated at the main building of the institute. The library is open from 9 a.m. to 4. p.m. Its area is 1900 sq.ft.

Objectives of the Library

- (i) To improve the procurement of forest related books, journals and other allied materials.
- (ii) To collect the important publications from various regional and international agencies.
- (iii) To disseminate up-to-date information, research reports, proceedings etc. to the scientists and researchers.
- (iv) To render more effective information services to the scientists and researchers.¹⁰

Bangladesh Forest Research Institute Library started its functioning after the inception of the institute. The library has a collection of 20,000 books and 1000 back volumes of journals, reports, proceedings etc. The library also possesses special reference materials like AGRIS, AGRINDEX, AGRICOLA etc.¹¹

It renders the following services:

- (i) Reference Services
- (ii) Current awareness services
- (iii) Selective Dissemination of Information services
- (iv) Circulation services
- and (v) Reprographic services.

Forest Research Institute Library is a special one. It helps the researchers and scientists in various ways. Though the library was established in the mid sixties, its progress is not satisfactory. There is lack of trained manpower, adequate finance and modern equipment in the library. The library is not rendering interlibrary loan, indexing and abstracting services to the scientists and researchers. Library operations are fully done manually. The library should introduce modern electronic devices to render effective and efficient information services to the scientists and researchers.

3.4 Bangladesh Tea Research Institute Library (BTRIL)

Each research institute should have one library. Without library it is impossible to do research. This type of library is very much helpful to the scientists and researchers. East Pakistan (Bangladesh) Tea Research Institute Library came into existence in 1957. After independence of Bangladesh, the name of the library was changed to Bangladesh Tea Research Institute Library (BTRIL). Its area is 2000 sq. ft. Library hour is 9 a.m. to 4 p.m.¹²

Objectives of the library

- (1) To improve the procurement system of tea related books, journals and allied materials.
- (2) To collect various tea related publications from the country and abroad.
- (3) To provide up-to-date information, research reports, proceedings etc. to the scientists and researchers.
- (4) To compile organizational journals and reports.¹³

BTRI library is a research library on tea in Bangladesh. The library possesses 4040 books and 200 volumes of journals, Reports, proceedings etc. Librarian-cum-publication officer has a great responsibility in publishing journals, annual reports etc. The library has audio-visual materials. The library helps the tea scientists in various ways.

The services of the library are ((i) Reference service (ii) Current awareness service (iii) Selective Dissemination of Information service (iv) Indexing and abstracting service (v) Reprographic service and etc. The library helps the scientists by providing journals, research reports, proceedings etc. It collects foreign tea journals also. Though the library is old one, the development of the library is not satisfactory. The library has no library committee and it has no mechanisms to review the activities of the library. The library has inadequate staff. The library should have separate building and the personnel should be properly trained up. The library should be automated with modern technology.

3.5 Bangladesh Agricultural University Library (BAUL)

The objectives of the university are to make provision for education in Agriculture and to promote research, extension programmes in agriculture and thereby increase agricultural production. BAU, besides producing technical manpower, envisages a strong integration of teaching, research and extension through their balanced development.¹⁴ Bangladesh Agricultural University is concerned with

(i) Conservation of knowledge and ideas (ii) Teaching (iii) Research (iv) Publications (v) Extension services and (vi) Interpretation in the field of agriculture and allied disciplines.

Bangladesh Agricultural University Library came into existence as East Pakistan Agricultural University Library in 1961.¹⁵ The library has the following objectives:

- (1) To improve the procurement of books, journals and other library materials related to various branches of agriculture.
- (2) To collect the important publications from various regional and international agencies.
- (3) To provide better library and information services to the teachers, students, employees, researchers and others.
- (4) To serve the agricultural information needs of the teachers, students, researchers, scientists and other persons working in agricultural sector.
- (5) To render more effective information services to the library users.¹⁶

With a view to cater the information needs of teachers and students as well as extension personnel of the country, the library has been providing various services. Library facilities are open to students, teachers, officers and others associated with the University. Scientists and researchers engaged in agricultural education and researches are allowed to use the library facilities on permission. The library is open from 8 a.m. to 8 p.m. Its area is 44000 sq. ft. It is the biggest library in the agricultural field in Bangladesh according to its speciality of collection, etc.

It is being gradually provided with all modern library facilities. The library functions under the over all control of the University librarian who is one of the statutory officers of the University directly responsible to the

Vice-Chancellor. The library committee consists of the Deans of faculties, the Vice-Chancellor being the chairman and the University librarian as the member secretary.¹⁷ It renders: (1) Reference services (2) CAS (Current Awareness services) (3) SDI (Selective Dissemination of Information) Services (4) Inter library loan services (5) Indexing and abstracting services (6) Reprographic services (7) Document delivery services (8) CD Rom search services and etc. The library has been providing computer search services from CD-ROM & floppy diskette. Audio-visual and Documentation services are being provided. Programme has been undertaken to create databases for current holdings. The scientists and researchers of different agricultural research institute have not been provided with current awareness services by circulating the contents pages of latest journals received in the library.

3.6 Soil Resources Development Institute Library (SRDIL)

The very name of Soil Resources Development Institute (SRDI) clearly indicates that it is a specialized scientific research organization connected with soil researches. The present SRDIL was established in the year 1962. It is located at the main building of SRDI at Farmgate, Dhaka¹⁸. The area of the library is 600 sq.ft. It is open from 9 a.m. to 4 p.m.

Objectives of SRDIL

The broad objectives of SRDIL are to supply necessary data on soil to the researchers, surveyors and scientists for proper conducting of soil survey research. Moreover, it has to fulfill the needs of the researchers/surveyors by supplying reference materials. The objectives of the library are as follows:-

- (i) To supply necessary data, information, references materials, relating to soil research for the development of soil resources of Bangladesh.
- (ii) To collect the recent publications and references related to soil resources survey, research and development.
- (iii) To improve the procurement of books, journals, periodicals, other printed and non-print materials.
- (iv) To compile a comprehensive bibliography with full details to enable the users to study the required materials.
- (v) To preserve and protect collected books, journals, periodicals, reports, research findings and other printed materials as well as the regular, periodic and special publications of SRDI.
- (vi) To develop and employ suitable system of classification, filing, indexing and other technical services related to SRDI publications.¹⁹

SRDIL is a research oriented specialized and scientific library. It has a collection of 3000 books and 500 back volumes of periodicals. This library contains 141000 Thana Nirdeshika (guide). The library renders the following services:

- (i) Readers Advisory Services
- (ii) Information services to the Divisional Scientific Officer
- (iii) Reference services and
- (iv) Circulation services

SRDIL is the only specialized library in the country for the research of soil. The area of the library is very small. One big table and some chairs are available in the library room. The infrastructural facilities in the library are insufficient. The library is not providing all kinds of library services to the users. No library catalogue is maintained in the library. There is lack of information technology. Books and journals available in the library are out-dated. Since last five years no reading materials are being collected. It may be due to the lack of funds for purchase of reading materials and also lack of interest on the part of authorities in developing the library. As a result, though the library is specialized one, its proper utilization is far from satisfaction. The authority should take initiative for the collection development of the library. The services and environment within the library are not at all upto the standard of research library to attract the scientists and researchers to use it. The executive authority of the institution does not pay proportionate attention for the development of the library visa-vis other departments of the institute. As a pioneer institution in the field of soil research the government also should take measures for further improvement of the library.

3.7 Bangladesh Agricultural Development Corporation Library (BADCL)

East Pakistan Agricultural Development Corporation library was established in 1963.²⁰ Then its collection was limited to some reference books, encyclopedias, feasibility study reports etc. After that, some books of agricultural sciences were imported from abroad. After the liberation war, the name of the library was changed to Bangladesh Agricultural

Development Corporation Library.²¹ The area of the library is 3000 sq. ft. Library hour is 9 a.m. to 4 p.m.

The objectives of the library are as follows:-

- (i) To provide books, journals and instructional materials in support of developmental programmes of the Corporation and to enable the library users to prosecute their further studies and to acquire knowledge for efficient implementation of the BADC'S programmes for the development of agriculture.
- (ii) To help the agricultural research workers to explore ways and means for improvement of methods of cultivation of land, crop production and harvesting.
- (iii) To collect published print and non-print materials in varieties of forms on agriculture and its allied subjects to keep its users abreast with the latest development in the field.
- (iv) To provide necessary reference books and journals on agriculture to the field officers of BADC to replenish their knowledge with the latest development on various agricultural aspects.
- (v) To provide services to the employees of the corporation with a limited number of books for their recreational reading.²²

The BADC library has a rich collection of books and other library materials. In the past it accepted donations from the Asia Foundation and the British Council. The collection of books of this library is 22 thousand. The library also collects proceedings, reports of conferences and seminars. The library has 7000 back volumes of periodicals on various subjects.

The library renders Readers' services, Circulation services, Reference services and Reprographic services. BADC library played a significant role for research and development of agriculture. Now-a-days, BADC is engaged in seed research. The library is not rendering CAS computerized library services to the users. Library operations are done manually. The library is not compiling bibliography. Though the library was established in the early 60's but its development is very slow. In the past many scientists used the library. To develop agriculture sector of the country, such kind of library is very much essential.

3.8 Bangladesh Rice Research Institute Library (BRRI)

Bangladesh Rice Research Institute (BRRIL) was established at Joydebpur (Gazipur) in the year 1970 with the financial assistance of Ford foundation for accelerating rice research in the erstwhile state of Pakistan. After the emergence the institute was renamed as Bangladesh Rice Research Institute.²³ The library was also established in the same year. The area of the library is 2500 sq. ft. It is open for the scientists and researchers from 9 a.m. to 5 p.m. The librarian is a qualified person. She has taken higher training in electronic librarianship from Thailand.

It is one of the important mono-crop agricultural libraries in Bangladesh. Rice is the staple food of our people. This library is playing an important role for the development of rice production in Bangladesh.

Objectives of the library

BRRI library is an institutional special library. Every institutional library is established to fulfill its aims and objectives. The objectives are stated below:

- (i) To improve procurement of rice related books, journals and allied materials.
- (ii) To collect various publications related to rice research from national and international agencies.
- (iii) To disseminate up-to-date information, research reports, proceedings etc. to the scientists and researchers of the institute.
- (iv) To render more effective and efficient information to the rice scientists and researchers by the help of information technology and
- (v) To compile organizational reports.²⁴

It provides: (i) Reference services (ii) Circulation services (iii) Reprographic Services (iv) Current awareness services (v) Indexing and abstracting services (vi) Bibliographic services and (vii) Periodical indexing services.

BRRI library possesses a rich collection of books, periodicals and reference materials. It has a collection of 14000 books. The library subscribes 150 titles of journals and gets 250 complimentary journals. This library also possesses proceedings, reports and theses. It has some mentionable audio-visual materials.

BIRRI library is the most important library in rice field. Its collection almost covered rice field area. This library is playing vigorous role in rice development of the country. Almost all important library services are provided by BIRRI library. Dictionary catalogue is maintained in the library. All the scientists of the institute are playing vital role in rice production. The institute has introduced 41 high yielding varieties of rice. These varieties are suitable for more growth of rice production. As such the authority should give more attention for the development of the library so that it can render more effective services to the scientists and researchers.

3.9 Bangladesh Institute of Nuclear Agriculture Library (BINAL)

Bangladesh Institute of Nuclear Agriculture library was established in 1972.²⁵ Prior name of BINA was INA (Institute of Nuclear Agriculture). The BINA library is a special library. The library has an area of 2000 sft. Library hour is 9 a.m. to 4 p.m. The library is located in the main building of the institute.

Objectives of the Library

- (i) To improve the procurement of Nuclear agriculture related books, journals and allied materials.
- (ii) To collect various publications related to Nuclear agriculture from various National and International agencies.
- (iii) To provide up-to-date information, research reports, proceedings, etc. to the scientists and researchers of the institute and
- (iv) To render more effective information services to the scientists and researchers.²⁶

From the very beginning of the library, it has been playing important roles in the field of nuclear agriculture. It has 5000 volumes of books on the subjects of agriculture, agricultural development, agricultural economics, agricultural engineering, biotechnology, crops, extension, farming, food sciences, horticulture, plant pathology, soils and water resources. The following services are provided by the library:-

- (a) Reference services
- (b) Circulation services
- (c) Current awareness services
- (d) Reprographic services and
- (e) SDI services

It is an important library in the field of nuclear techniques of agriculture but the library has no internet facility. Library should be computerized as soon as possible.

Linkages: The institute keeps close contact with allied national and international institutions. Linkages with national agricultural institutions are maintained to avoid duplication of research. The major collaborative international organizations are FAO/IAEA, ICARDA, AVRDC, NIFTAL, PPIC etc.²⁷

3.10 Agricultural Information Centre (AIC)

To modernize the country's agricultural sector, the Bangladesh Agricultural Research Council (BARC), Dhaka, as the apex body of agricultural research organizations in Bangladesh, coordinates the research activities of different research institutions in related fields. For supporting its activities, the BARC initiated to establish an institute named the National Agricultural Library and Documentation Centre

(NALDOC) in 1980 under a development project of 1980-85 and it was revised as three-year project in 1984.²⁸

At the end of the project period in June 1987, it (NALDOC) was renamed as Agricultural Information Centre (AIC) of the BARC under the Ministry of Agriculture. The mission of the AIC is to develop a national information system for effective promotion of co-operation and co-ordination in generation, dissemination and exchange of information in agriculture and allied sciences among the member institutes under the National Agricultural Research System (NARS).²⁹

Objectives of the AIC

- (i) The main objective of AIC is to serve as an Agricultural Information resources centre to make information available to the scientists, policy makers, teachers and research students in agriculture.
- (ii) To serve the agricultural information needs of the NARS institutions and individual scientists in their literature search.
- (iii) To promote new and appropriate techniques, including training for handling and disseminating agricultural information.
- (iv) To train NARS personnel on computerized information processing, technical writing and editing etc.
- (v) To act as the focal point of NARS information system and to strengthen and co-ordinate the activities of NAIS and
- (vi) To consolidate participation in the regional and International Agricultural Information System like AGRIS.³⁰

Agricultural information centre renders the following services:

- a) Technical services
- b) User services
- c) Information services
- d) Document supply services
- e) Newspaper indexing services
- f) Audio-visual services
- g) SDI services and
- h) CD-Rom search services

The AIC has a collection of 15000 books, 2500 bound journals and also receives 250 current journals and also a number of non-book materials. It (AIC) has been applying computer technology in preparing databases and also in official works. The AIC's databases are: database on AIC holdings; databases on National Agriculture System; database on periodicals available at AIC; database on newspaper articles of major newspaper of Bangladesh and database on periodicals collection of NARS institutes library.³¹ The Agricultural Information Centre should provide the latest data and information through computerization under broad-based programmes. Dissemination of information among the NARS institutes helps develop fisheries, forestry, livestock, crop multiplication programmes and transfer of technology among them and to the grass-root level users.

3.11 Bangladesh Sugarcane Research Institute Library (BSRIL) Ishurdi

There was a sugarcane research station at Ishurdi in the then East Pakistan (present Bangladesh). After the liberation of Bangladesh, the research station was upgraded as a research institute in 1974.³² Bangladesh Sugarcane Research Institute Library was established also in the same year.

Library and Documentation Services

Sugarcane Research Institute Library started functioning with the establishment of Sugarcane Research Station in 1951. The library activities were expanded when the sugarcane research station was upgraded as BSRI in 1974. As the institute deals with mono-crop so its library to be called special one. BSRI is discharging the responsibilities in fulfilling the demand of the researchers of this institute. The objectives of the Library are: (a) To enrich the collection of books, periodicals and other library materials. (b) To maintain special subject references, files and indices. (c) To disseminate currently published information through journals, annual reports, technical reports & others. (d) To maintain reference services. (e) To compile organizational reports. (f) To procure required publications which are not available in the country.³³

The library provides (i) Readers services (ii) Current awareness services (iii) Reprographic services (iv) Reference Services and (v) Lending services.

BSRI is the premier institution for the research of sugarcane development. The library is a special library but it is not rendering important library services, namely SDI, Inter library loan, Indexing and abstracting and computerized library services to the scientists. Library operations are manually done. Modern journals and books are not enough to meet the needs of the scientists and researchers. Internet services are lacking. To give better services to the scientists and researchers, the authority should procure up-to-date books and periodicals. The authority should take initiative to introduce internet facility.

3.12 Bangladesh Agricultural Research Institute Library (BARIL), Gazipur

Bangladesh Agricultural Research Institute was established in 1976 after dissolving the directorate of Agriculture (Research and Education) with the responsibility of undertaking research and studies on various crop except Rice, Jute and Sugarcane. This institute takes initiative for the development of wheat, potato, vegetables, oil seeds, horticulture and other crops.³⁴ BARI Library was established after the inception of the institute in 1976. The area of the library is 2000 sq. ft. It is open from 9 a.m. to 5 p.m.

Objectives of BARI library

- (a) To improve the procurement of Agriculture related books, journals and allied materials.
- (b) To collect various publications related to agricultural research from national and international agencies.
- (c) To disseminate up-to-date information, research reports, proceedings etc. to the scientists and researchers of the institute.
- (d) To render more effective information services to the scientists and researchers by the help of information technology.
- (e) To maintain special subject references, files and indices.
- (f) To compile organizational reports.³⁵

The library of BARI possesses a rich collection of 22100 books, monographs, periodicals and reference materials. It also contains reports, proceedings, newsletters, bulletins, archival materials and etc.

BARI library is a special library. It provides services to the scientists and researchers. The services provided by the library are: (i) Reference services (ii) Circulation services (iii) Reprographic services (iv) Indexing services (v) Current awareness services (vi) Abstracting and bibliographic services and (vii) Periodical indexing services.

The library is not providing SDI services. It is applying Dewey Decimal Classification (DDC) in classifying library materials. The library compiles subject bibliographies.

Bangladesh Agricultural Research Institute Library is one of the most important agricultural libraries in Bangladesh. About 800 scientists and researchers have been using the library in their research programmes. To give better services to the scientists, the library should be computerized as far as possible and should have Internet facility.

3.13 Patuakhali University of Science and Technology Library (PUSTL)

According to the recommendations of the Bangladesh Agricultural University experts, the government of Bangladesh decided to establish an agricultural college at Patuakhali to produce agricultural graduates in the year 1979. It is the second agricultural college of Bangladesh.³⁶ The library was established in 1979.

Objectives of the Library

PUSTL is an academic library. Its prime objective is to serve teachers and students of the university.

Library services are (i) Readers services (ii) Circulation services (iii) Lending services (iv) Current awareness services and (v) Reprographic services.

The library is not rendering indexing and abstracting services, computerized library services and inter library loan services. The library lacks modern equipment. Library operations are done manually. The government declared it as the Patuakhali University of Science and Technology in 2000. But the caretaker government in 2001 suspended all its activities as university. The present government has withdrawn the order of suspension.

It should be developed as a modern agricultural library, as a result of which students, teachers, scientists and researchers will get better information services. To give better services to the users the university authority should introduce latest information technology in the library.

3.14 Bangabandhu Sheikh Mujibur Rahman Agricultural University Library (BSMRAUL), Salna (Gazipur)

To provide highly skilled technical manpower in agricultural sector of the country, the govt. of Bangladesh decided to establish Bangladesh College of Agricultural Sciences (BCAS) in 1980³⁷ with the help of Government of Japan.

The Government of Bangladesh decided to convert BCAS to a postgraduate institute to meet the urgent needs for improved higher agricultural education in Bangladesh in October 1983. Its name was changed to "Institute of Postgraduate Studies in Agriculture (IPSA)" with a view to offer postgraduate education leading to M.S and Ph.D. degrees

in selected disciplines of agricultural and social sciences.³⁸ The library was established in 1983. Its area is 14500 sq. ft. The library is open from 9 a.m. to 8.30 p.m.

The main objectives of the library are: (i) to serve as a 'centre of excellence' for the postgraduate students and teachers of the university (ii) to help in conducting basic and applied researches, to support and complement the national agricultural research system in Bangladesh and (iii) to provide effective information services to the teachers and students.

The library houses a comprehensive and current collection of local and international journals relating to the agricultural and social sciences. The library possesses 11 thousand books. In addition to its books and journal collections, the library has provision of inter-library loan service, computerized database of research titles and abstracts, photocopy services, microfilm and microfiche facilities. Some group study rooms are also available in the library. The university library is playing a vigorous role in some selected fields of agriculture and social sciences. But yet the needs of the research scholar of M.S and Ph.D. degrees are not fully met by it. The library is not rendering indexing and abstracting services and SDI services. The library should use modern information technologies to render information services to the end users. But still the library personnel consider it "well organized and well decorated." It is no doubt well lighted and well furnished. In 1997, the government renamed it as Bangabandhu Sheikh Mujibur Rahman Agricultural University.³⁹

3.15 Department of Agricultural Extension Library (DAEL)

In Bangladesh, the recognized Department of Agricultural Extension (DAE) started functioning, when six other agencies/organizations namely, (1) Directorate of Agriculture (extension) (2) Directorate of Agriculture (Jute production) (3) Directorate of Plant Protection (4) Horticulture Development Board (5) Tobacco Development Board (6) Central Extension Resources Development Institute (CERDI) were merged together by the govt. in September 1982.⁴⁰ The library was established in 1983. The area of the library is 400 sq. ft. It is open from 9 a.m. to 4 p.m.

Objectives of the library

- (i) To serve as a strong extension information centre.
- (ii) To collect the extension related materials published in the country.
- (iii) To disseminate up-to-date information, proceedings, research reports to the extension personnel and
- (iv) To render effective information services to the extension personnel of the country.⁴¹

DAE library is a departmental library. The development of the library is slow. The library possesses a collection of 6500 books, 100 journals, reports and proceedings etc. The reading habits of extension personnel are not satisfactory. The person who is interested in extension work may utilize the resources of the library. It is the central extension library of the country. The library only provides reference and reprographic services. The library is suffering from various problems

such as manpower problems, fund constraints, scarcity of periodical and etc. The government and the agriculture policy makers should take initiative to develop the library so that the library can play an important role in extension activities of Bangladesh. The library should be developed in the light of other developed agricultural libraries in the world.

3.16 Bangladesh Livestock Research Institute Library (BLRIL)

Livestock sector is one of the most important sectors of agriculture. Bangladesh Livestock Research Institute was established in 1986 by the financial help of Asian Development Bank (ADB)⁴² This institute is now under the ministry of livestock and fisheries, government of Bangladesh. It is engaged in the various fields of livestock research. The library was established in 1986 and started with a small collection. But at present BLRIL is the largest library in the field of livestock.⁴³ The area of the library is 1700 sq. ft. The library hour is 9 a.m. to 4 p.m.

Objectives of the Library

- i) To serve as a livestock information centre.
- ii) To collect and preserve the livestock publications published with in and outside the country and to keep scientists and researchers aware of latest information in the field of livestock.
- iii) To provide CAS and SDI services to the scientists.⁴⁴

The following services are rendered by the library.

- (a) Readers services
- (b) Reprographic service
- (c) Current awareness services
- (d) Selective Dissemination of Information services
- (e) Indexing and abstracting services.

It is the most important library in the field of livestock. The library possesses 3100 books and 2000 volumes of periodicals (with back issues). It has been preserving indigenous and foreign journals. The library is situated in the main building of the institute. It is not rendering inter library loan services and computerized library services. There is manpower shortage in the library. Library operations are done conventionally. The development of the library is very slow. Physical facilities of the library are not good.

Livestock information service is the life-blood of its development. A developing country like ours should be rich first in its information service, if it intends to be developed in livestock and other agricultural sectors. As a pioneer library in Bangladesh, BLRI should be developed in the light of other developed livestock libraries in the world.

3.17 Fisheries Research Institute Library and Documentation Centre, Bangladesh (FRILDC, BD)

Fishery is an important sub-sector of agriculture.⁴⁵ By ordinance no. XLV of 1984, entitled "The Fisheries Research Institute Ordinance", the Fisheries Research Institute was established on July 11, 1984.⁴⁶ Fisheries research institute library and documentation centre was

established in the same year.⁴⁷ The library is situated near Bangladesh Agricultural University. The area of the library is 3000 sq. ft. The library is open from 9 a.m. to 4 p.m. FRILDC is a specialized library. It is the largest library in the field of fish research. It has a special collection of books, journals, reports and proceedings.

Objectives of the library

- (i) To collect important publications related to fisheries, aquaculture and shrimp culture from various national and international organizations.
- (ii) To improve the procurement system of fish related books, journals and other allied materials.
- (iii) To disseminate up-to-date information to the fisheries' scientists and researchers in the country.
- (iv) To render effective information services to the scientists and researchers of the institute.⁴⁸

The collection of the library covers the subjects of fisheries, zoology, fish disease, fish culture, agriculture, environment and shrimp.

The library renders the following services:

- (i) Reference services
- (ii) Current awareness services
- (iii) Selective Dissemination of Information services and
- (iv) Reprographic services

It is not rendering indexing and abstracting services to the scientists and researchers. Dictionary catalogue is maintained in the

library. It is not compiling any bibliography. The library should be computerized and it should have internet connection. The authority should take initiative for the further development of the library.

3.18 Hajee Danesh University of Science and Technology Library (HDUSTL), Dinajpur

Hajee Mohammad Danesh Agricultural College, the third agricultural college of the country was established in the year 1989.⁴⁹ Recognising the potentialities of the library, the authority established this college library in the year 1989. The government of Bangladesh has upgraded the college as Hajee Danesh University of Science and Technology in 2000. But the caretaker government in 2001 suspended its activities as university. The present government has withdrawn the suspension.

The library was established after the inception of the college. The main objective of the college library is to serve teachers, students and others. One of the most important objectives of the library is to provide books and journals for study of students and teachers. As a young library of agricultural college, this library is very rich in agriculture and allied subjects. The library has a collection of 10000 books and 600 volumes of periodicals. On March 20, 1997 the library was shifted in a three-storied library building. There is a library development committee to look after the development of library and its services.

Services Provided by the Library

- (a) Readers services
- (b) Circulation services
- (c) Current awareness services
- (d) Lending services and
- (e) Reprographic services

The library is not providing indexing and abstracting services, Inter library loan services and computerized library services. The library operations are being rendered conventionally. To give better information services to the students and teachers, the library should introduce computers as soon as possible.

Analysis of data

Triumph of any user study (of a given library and information system) primarily depends on a well controlled and well represented sample and a well defined methodology of collecting data. The crucial task before the researcher is, therefore, to determine the size of the sample to be investigated and the methodology to be employed for collecting data.⁵⁰ The survey of the libraries in the present investigation exclusively covers eighteen agricultural libraries representing different organizations.

Table 3.1: Agricultural Libraries in Bangladesh

Sl. No.	Name of the Library	Year of Establishment	Users
1.	BAIL (Dhaka)	1938	1200
2.	BJRIL (Dhaka)	1951	300
3.	BFRIL (Chittagong)	1955	250
4.	BTRIL (Srimongal)	1957	1175
5.	BAUL (Mymensingh)	1961	5600
6.	SRDIL (Dhaka)	1962	150
7.	BADCL (Dhaka)	1963	700
8.	BRRIL (Gazipur)	1970	500
9.	BINAL (Mymensingh)	1973	400
10.	AIC (Dhaka)	1973	250
11.	BSRIL (Ishurdi)	1974	200
12.	BARIL (Gazipur)	1976	1000
13.	PUSTL (Patuakhali)	1979	800
14.	BSMRAUL (Gazipur)	1983	600
15.	DAEL (Dhaka)	1983	225
16.	BLRIL (Savar)	1986	200
17.	FRILDC (Mymensingh)	1987	375
18.	HDUSTL (Dinajpur)	1989	700

As per the table 3.1 Bangladesh Agricultural Institute (Dhaka) Library (BAIL) is the oldest one and it was the first agricultural college library in the then British Bengal, established in 1938. Bangladesh Jute Research Institute Library (BJRIL) (1951) is the second oldest one. Hazeer Danesh University of Science and Technology Library (HDUSTL) (1989) is the latest library preceded by BLRIL (1986) and FRIL (1987).

From this table it is clear that maximum number of agricultural libraries were established after the liberation of Bangladesh. Bangladesh

Agricultural University library has a large number of users (5600), followed by Bangladesh Agricultural Institute Library (BAIL) (1200), Bangladesh Agricultural Research Institute Library (BARIL) (1000), PUSTL (800). SRDI library has the lowest number of users (150), antedated by BTRIL library (175) and BSRI library (200). It can be concluded that BAUL has the highest number of users. Further, library users in agricultural libraries of Bangladesh are graphically shown in 3.1.A.

Fig. 3.1: Library Users in Agricultural Libraries of Bangladesh

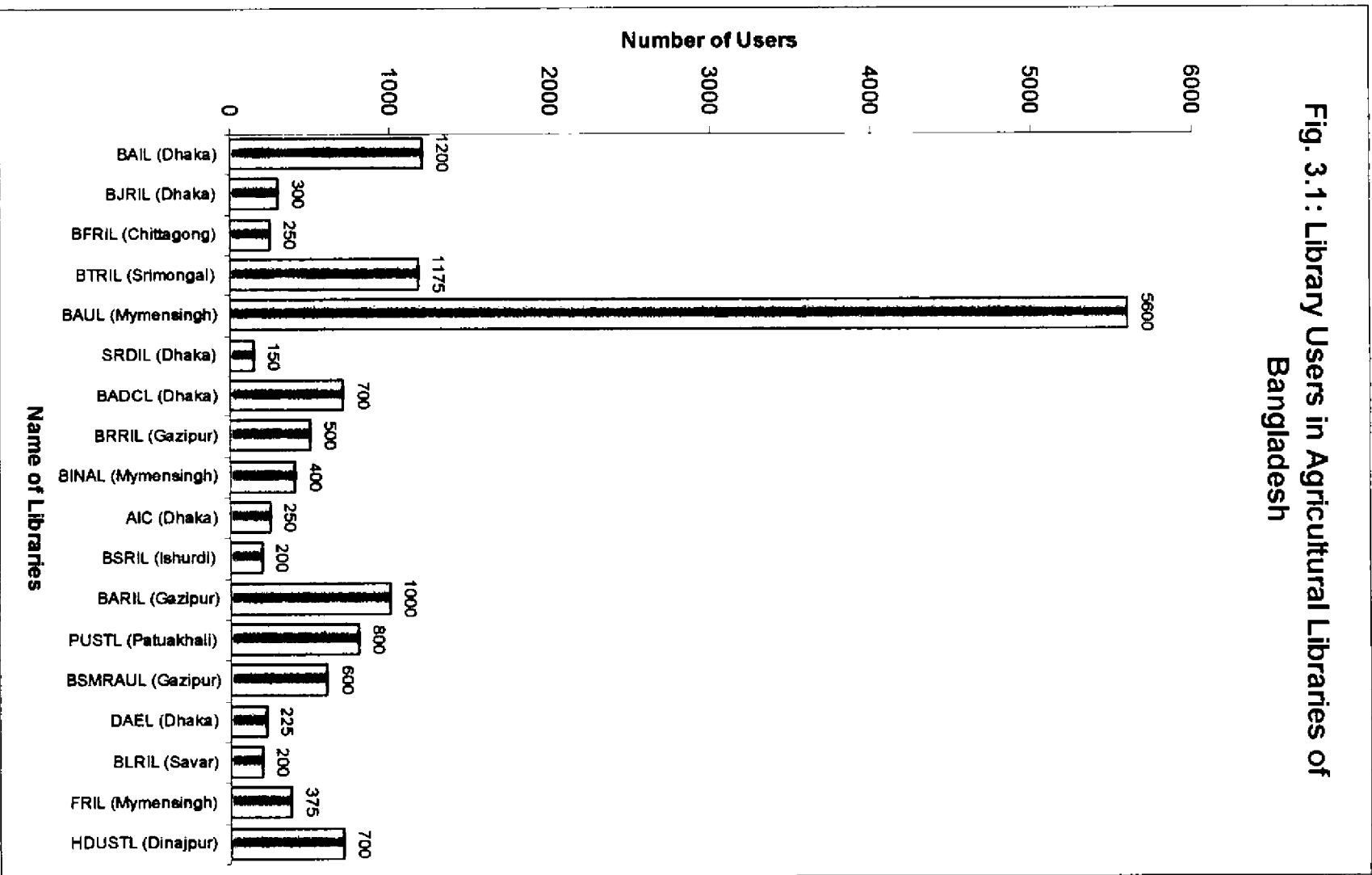


Table 3.2: Collection in the Agricultural Libraries of Bangladesh

Sl. No.	Name of the Library	Books	Periodicals (with back issues)
1.	BAIL (Dhaka)	28000	5000
2.	BJRIL (Dhaka)	6000	2000
3.	BFRIL (Chittagong)	20000	1000
4.	BTRIL (Srimongal)	4040	200
5.	BAUL (Mymensingh)	165000	35000
6.	SRDIL (Dhaka)	3000	500
7.	BADCL (Dhaka)	22000	700
8.	BRRIL (Gazipur)	13620	4000
9.	BINAL (Mymensingh)	5000	2000
10.	AIC (Dhaka)	15000	2500
11.	BSRIL (Ishurdi)	3240	1000
12.	BARIL (Gazipur)	21200	7000
13.	PUSTL (Patuakhali)	13590	1200
14.	BSMRAUL (Gazipur)	10600	2000
15.	DAEL (Dhaka)	6500	100
16.	BLRIL (Savar)	3100	2000
17.	FRILDC (Mymensingh)	13000	120
18.	HDUSTL (Dinajpur)	10000	600

Bangladesh Agricultural University Library has the largest collection of books (165000), followed by Bangladesh Agricultural Institute Library (28000), Bangladesh Agricultural Development Corporation Library (22000) and Bangladesh Agricultural Research Institute Library (21200). The SRDIL Library has got the smallest collection of books (3000), preceded by BSRIL (3240), and Bangladesh Tea Research Institute Library (4040).

BAUL also has the largest collection of periodicals (35000 volumes) followed by BARI library (7000), and BAI library (5000). The DAE library has the smallest number of periodicals (100), preceded by FRI (120) and BTRI (200). It has been observed that BAUL has the largest number of Bangladeshi and foreign periodicals. The number of books and periodicals available in the agricultural libraries are mentioned by graph no. 3.2-A and 3.2-B.

Fig. 3.2-A: Books in Agricultural Libraries of Bangladesh

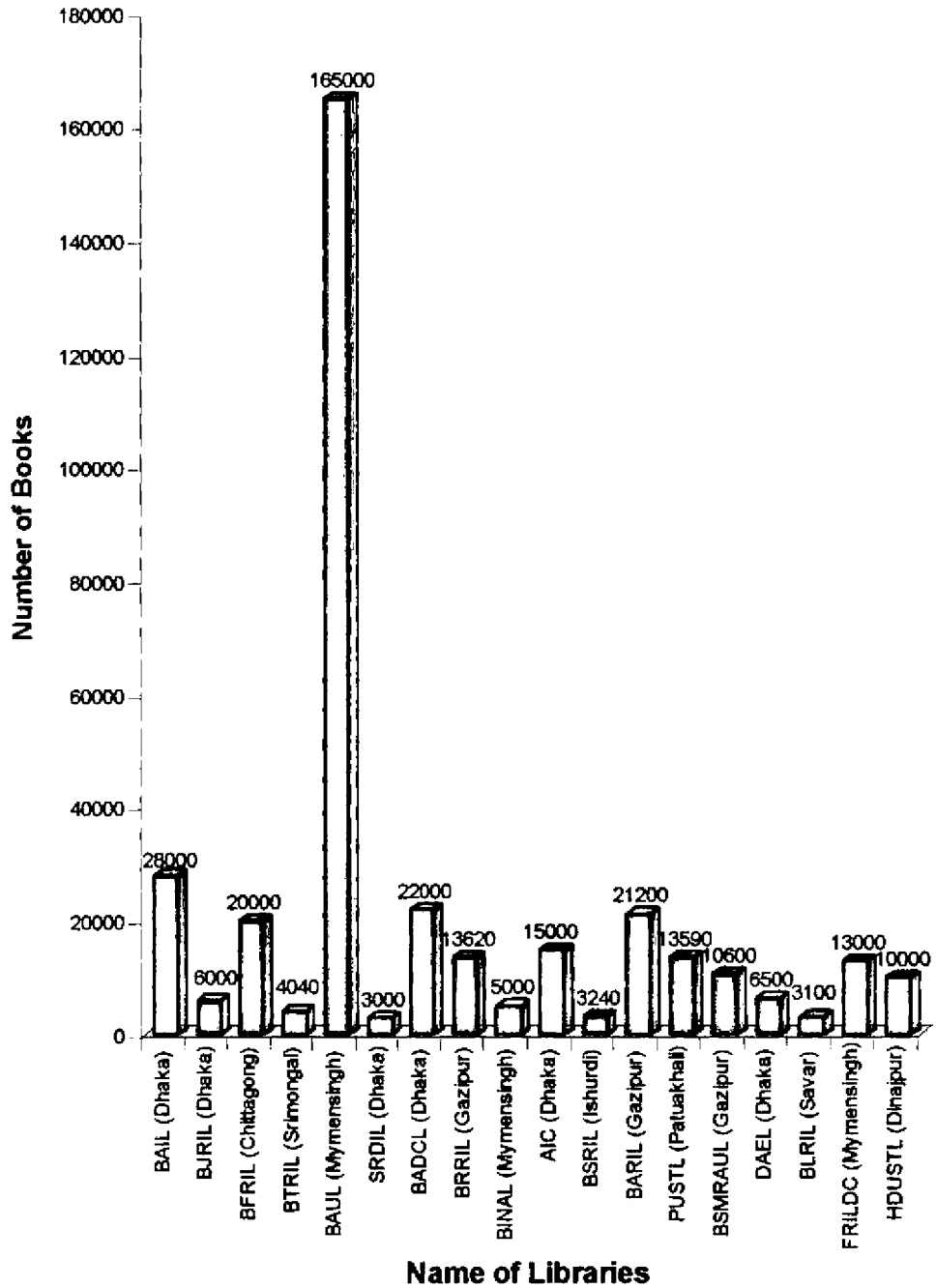


Fig. 3.2-B: Periodicals in Agricultural Libraries of Bangladesh

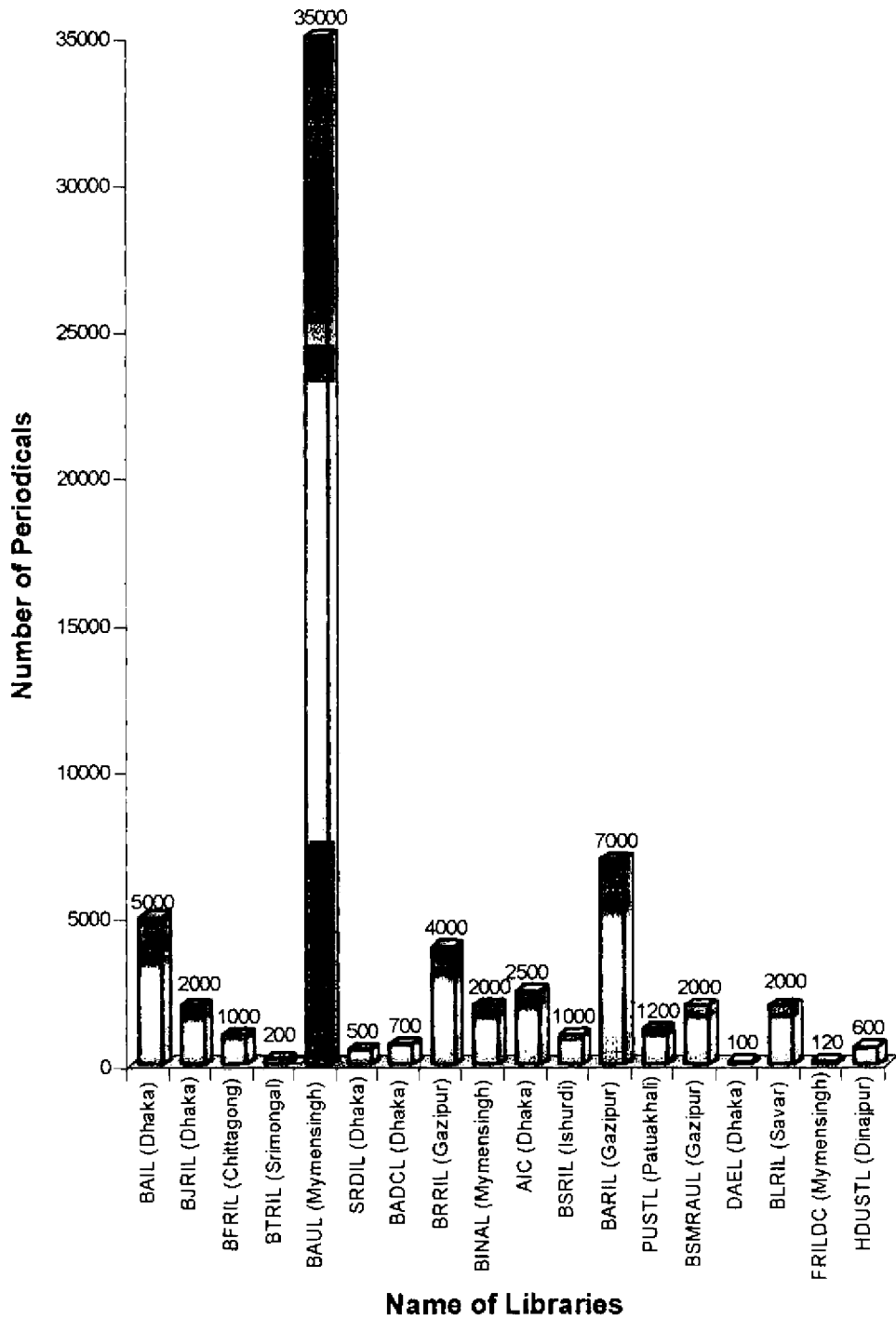


Table 3.3: Subject Areas where the Collection is Strongest

Sl. No.	Name of the Library	Books
1.	BAIL (Dhaka)	Agronomy
2.	BJRIL (Dhaka)	Agriculture
3.	BFRIL (Chittagong)	Forest & Forestry
4.	BTRIL (Srimongal)	Technology
5.	BAUL (Mymensingh)	Agronomy
6.	SRDIL (Dhaka)	Soil Science
7.	BADCL (Dhaka)	Agriculture
8.	BRRIL (Gazipur)	Rice related books
9.	BINAL (Mymensingh)	Soil Science
10.	AIC (Dhaka)	Soil Science
11.	BSRIL (Ishurdi)	Agronomy & Farming System
12.	BARIL (Gazipur)	Agronomy
13.	PUSTL (Patuakhali)	Agronomy
14.	BSMRAUL (Gazipur)	Agricultural Economics
15.	DAEL (Dhaka)	Agricultural Extension
16.	BLRIL (Savar)	Livestock
17.	FRILDC (Mymensingh)	Fisheries
18.	HDUSTL (Dinajpur)	Agronomy

Six libraries have good collection on Agronomy. Three libraries possess strong collection on soil science. Other libraries have good collection on their own fields. The number of collections differs from library to library depending upon their objectives and activities.

Table 3.4: Subject Areas Covered in the Collection of Agricultural Libraries

Sl. No.	Name of the Library	Subject areas covered
1.	BAIL (Dhaka)	Agronomy, crop botany, soil science, agri. economics, mathematics and statistics, animal husbandry entomology, agricultural extension
2.	BJRIL (Dhaka)	Agriculture, botany, chemistry, textiles, physics, entomology, pathology, bio-chemistry
3.	BFRIL (Chittagong)	Forest & Forestry, physics, chemistry, mathematics, engineering, botany, zoology, economics, statistics
4.	BTRIL (Srimongal)	Technology, bio-chemistry, soil science, pest management, statistics, plant physiology
5.	BAUL (Mymensingh)	Agronomy, plant breeding, crop botany, horticulture, veterinary science, animal husbandry, agricultural engineering, water management, irrigation & water management, agri-economics, statistics, fisheries, agricultural extension

Contd. Table 3.4

6.	SRDIL (Dhaka)	Soil Science, crop production, chemistry, water management, geology, botany, statistics
7.	BADCL (Dhaka)	Agriculture, fertilizer, irrigation seed, plantation, livestock, economics management, accounting, sociology
8.	BRRIL (Gazipur)	Rice related books, agriculture, agri. economics, other field crops, botany, biological science
9.	BINAL (Mymensingh)	Soil Science, agronomy, crop botany, entomology, pathology, nuclear techniques, plant breeding
10.	AIC (Dhaka)	Soil Science, crops, agricultural engineering, agricultural economics, livestock and fisheries, statistics
11.	BSRIL (Ishurdi)	Agronomy & Farming System, physiology, breeding, entomology, pathology, agri-economics, agri-engineering, training and communication
12.	BARIL (Gazipur)	Agronomy, horticulture, botany, entomology, plant pathology, soil science, agri-economics, agri-engineering, plant breeding, biochemistry

Contd. Table 3.4

13.	PUSTL (Patuakhali)	Agronomy, agri economics, botany, statistics, entomology, genetics and plant breeding, agricultural extension
14.	BSMRAUL (Gazipur)	Agricultural Economics, agro forestry & environment, crop botany, agricultural extension education, agronomy, entomology, genetics and plant breeding, agricultural extension
15.	DAEL (Dhaka)	Agricultural extension education, agronomy, botany, pathology.
16.	BLRIL (Savar)	Livestock, fisheries, animal husbandry
17.	FRILDC (Mymensingh)	Fisheries, zoology, fish diseases, fish culture, agriculture, environment, shrimp
18.	HDUSTL (Dinajpur)	Agronomy, agriculture, agri-economics, botany, genetics and plant breeding, bio-chemistry, agricultural extension

Source of Finance

The financial factors are essential for running the library of agricultural information systems in Bangladesh. The sources of finances to these libraries vary and depend on the quantity of quality research activities that are carried out in the respective institutes. No agricultural

information systems are sound in the financial position to meet the expenditure towards material growth and maintenance. The table 4.5 indicates various sources of finances.

Table 3.5: Source of Finance for the Agricultural Libraries

Sl. No.	Name of the Library	International	Govt.	BARC	UGC
1.	BAIL (Dhaka)	X	X	✓	X
2.	BJRIL (Dhaka)	(IJO)	✓	✓	X
3.	BFRIL (Chittagong)	WB ✓	✓	X	X
4.	BTRIL (Srimongal)	X	✓	X	X
5.	BAUL (Mymensingh)	(USIS, British Council)	X	(Special ✓ funds)	✓
6.	SRDIL (Dhaka)	X	✓	X	X
7.	BADCL (Dhaka)	X	✓	X	X
8.	BRRIL (Gazipur)	(IRRI) ✓	✓	X	X
9.	BINAL (Mymensingh)	(WB) ✓	✓	X	X
10.	AIC (Dhaka)	(FAO) ✓	✓	✓	X
11.	BSRIL (Ishurdi)	X	✓	✓	X
12.	BARIL (Gazipur)	(WB) ✓	✓	✓	X
13.	PUSTL (Patuakhali)	X	✓	X	X
14.	BSMRAUL (Gazipur)	(JICA) ✓	✓	X	✓
15.	DAEL (Dhaka)	ODA, ASSP	✓	X	✓
16.	BLRIL (Savar)	(JICA) ✓	✓	X	X
17.	FRILDC (Mymensingh)	X	✓	✓	X
18.	HDUSTL (Dinajpur)	X	✓	X	X

Note: '✓' indicates source of finance.

Table 3.5 shows that fourteen libraries are receiving financial assistance from the government of Bangladesh. Seven libraries are also getting grants from BARC's special funds. Moreover ten libraries are receiving financial help from other international organizations like IRRI, World Bank, IJO, FAO, ODA, JICA, ASSP, USIS and British Council. Bangladesh Agricultural University Library and Bangabandhu Sheikh Mujibur Rahman Agricultural University Library are getting financial support from University Grants Commission of Bangladesh.

Adequacy of Funds

On further inquiries, it was revealed that the funds made available for acquisition of reading materials and for rendering information services are quite inadequate.

Table 3.6: Adequacy for Meeting the Requirements of Acquisition as Well as Services

Sl. No.	Response	No of Libraries	Percentage
01.	Adequate	04	22.22%
02.	Inadequate	12	66.66%
03.	Poor	02	11.11%
	Total	18	100%

Table 3.6 shows that only 22.22% of libraries have expressed that fund are adequate. It may be mentioned that majority of libraries are facing the problem of inadequacy of funds.

In connection with this question, the researcher has put another question to suggest the methods for improving the finance and services in the libraries. The responses are presented in table 3.7.

Table 3.7: Desired Need for Improving the Finance and Services

Sl. No.	Response	No of Libraries	Percentage
01.	To ask for more financial support from government and other sources	07	38.85%
02.	To come under network	03	16.65%
03.	To ask for more financial support from government and other sources as well as to come under network	08	44.40%

Table 3.7 shows that majority (44.40%) of the libraries are in favour of asking for more funds from both government and other financial sources and to come under network system. 16.16% of libraries have suggested to form a resource sharing network to improve the financial position and services and 38.85% of libraries have suggested to ask for more funds.

Table 3.8: Services Provided by Agricultural Libraries

Sl. No.	Service	Total Libraries	No of Libraries providing the service	Percentage
01.	Reference service	18	15	82.25
02.	Current awareness	18	12	66.66
03.	SDI services	18	07	38.85
04.	Inter-library loan services	18	06	33.30
05.	Indexing & abstracting services	18	07	38.85
06.	Reprographics Services	18	11	61.05
07.	Computerized library services	18	08	44.40

Table 3.8 reveals that 82.25% of libraries are providing reference services. 66.66% of libraries are offering current awareness services and only 44.40% of libraries are extending computerized library services.

The above analysis shows that majority of libraries are providing reference services and only a small number of libraries are providing computerized information services.

Table 3.9: Extent of Utilization of Services Provided by Libraries

Sl. No.	Service	No of Libraries	Percentage
01.	Completely being utilized	09	49.99
02.	Partially being utilized	07	38.85
03.	No response	02	11.15
	Total	18	100

It is evident from table 3.9 that 49.995% of respondents have expressed that the services provided by them are completely utilized; 38.85% of respondents have answered that the services are not completely being utilized and 11.15% of respondents have not responded. The analysis reveals that majority of library services provided by the libraries are being completely utilized.

Library Operations

A question has been asked to know whether the library operations are manual or partly computer based or fully computer based. The table given below shows the responses.

Table 3.10: Library Operations

Sl. No.	Response	No of Libraries	Percentage
01.	Manual operations	10	55.50
02.	Partly computer based	07	38.85
03.	Fully computer based	01	5.55
	Total	18	100%

From Table 3.10, it may be said that the services of 10 libraries are fully manual. 7 libraries are partly computerized and only one library is fully computer based. From this it can be said that majority of library's operations in Bangladesh are manual. Library operations of agricultural libraries in Bangladesh are shown by pie-graph (3.10-A).

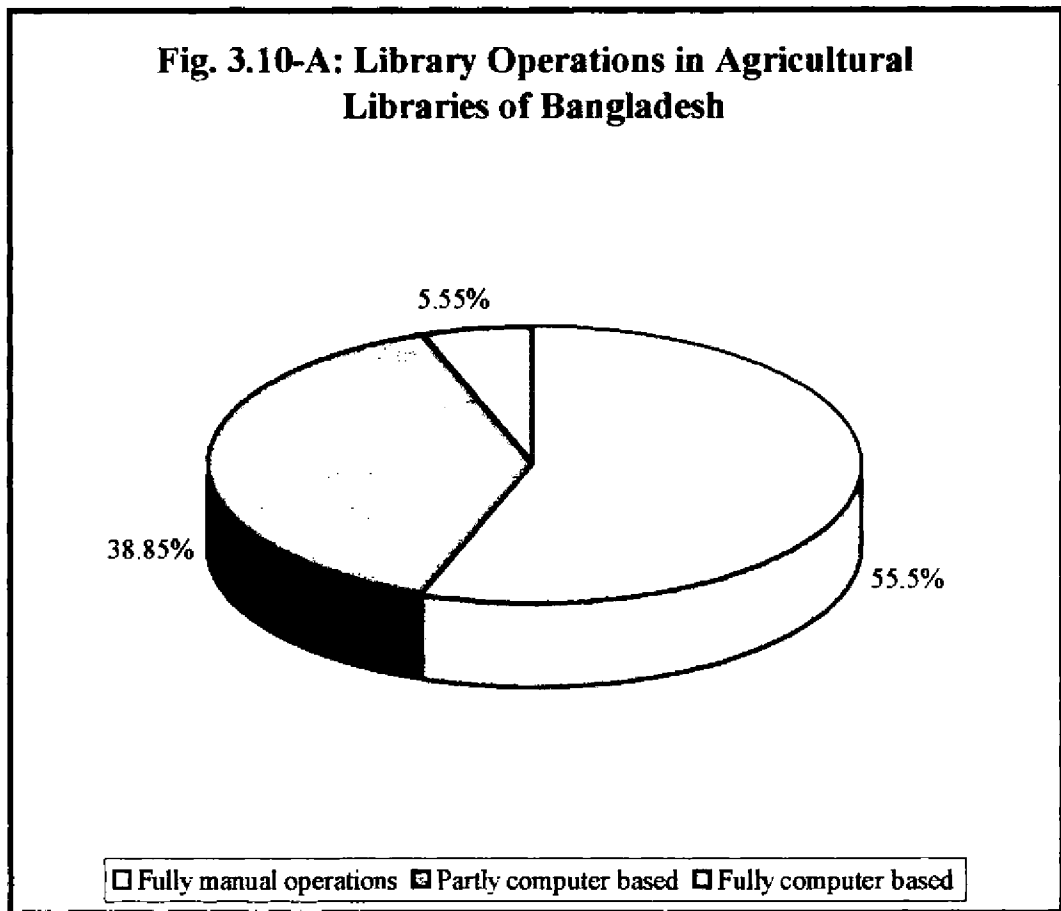


Table 3.11: Methods of Purchase of Books

Sl. No.	Main Methods	No of Libraries	Percentage
01.	By inviting quotations	11	61.05
02.	Appointing vendors	03	16.65
03.	From local book shop	03	16.65
04	From publishers	01	5.55
	Total	18	100%

Table 3.11 shows that 11 libraries (61.05%) are purchasing books by inviting quotations, 3 libraries (16.65%) by appointing vendors, 3 libraries (16.65%) also collect books from local book shops and one library is purchasing books from publishers. Hence it is clear that majority of libraries are purchasing books mainly by inviting quotations.

Subscription to Periodicals

The number of periodicals acquired by the agricultural libraries in Bangladesh mostly depend upon:

1. The financial resources of each library.
2. The research and teaching activities carried out by the institution. and
3. The nature of demand for agricultural information by its users.

The subscription of periodicals for agricultural libraries in Bangladesh is a problem. Periodicals are very much costly. The following are the ways of procuring periodicals for libraries.

- i. Direct from publishers only
- ii. Through agents
- iii. Both directly from publishers and through agents.

Table 3.12: Methods of Subscription to Bangladeshi Periodicals

Sl. No.	Main Methods	No of Libraries	Percentage
01.	Direct from publishers	10	55.50
02.	Through Agent	05	27.75
03.	Both directly from publishers and through agents	03	16.65
	Total	18	100%

Table 3.12 shows that 55.50% of agricultural libraries are subscribing to Bangladeshi periodicals direct from the publishers. 27.75% of libraries are collecting periodicals through agents. Only 16.65% libraries are applying both the methods. Majority of libraries are mainly subscribing Bangladeshi periodicals direct from the publishers.

Table 3.13: Procedures of Subscription to Foreign Periodicals

Sl. No.	Main Methods	No of Libraries	Percentage
01.	Through Agent	08	44.40
02.	Direct from publishers	04	22.20
03.	Through agents and direct from publishers	03	16.65
04	Not subscribing	03	16.65
	Total	18	100%

Table 3.13 shows that 44.40% of libraries are subscribing to foreign periodicals through agents, 22.20% of libraries direct from publishers and 16.65% of libraries by applying both the methods. 16.65% of libraries are not subscribing foreign periodicals. The analysis indicates that 83.25% (1+2+3) of agricultural libraries in Bangladesh are subscribing to foreign periodicals to meet the information needs of the agricultural scientists and researchers. Majority of libraries are acquiring foreign periodicals through agents.

Scheme of Classification

Irrespective of the size of the collection, it is essential that the library classification should make each document readily available. In other words, it should enable one to locate a document immediately.⁵¹ A systematic arrangement will lead to maximum use of the collection.

Table 3.14: Scheme of Classification

Sl. No.	Scheme of Classification	No of Libraries	Percentage
01.	Dewey Decimal Classification (19 th edn.)	11	61.05
02.	Universal Decimal Classification	06	33.30
03.	No. Classification	01	5.55
	Total	18	100%

Table 3.14 exposes that most of the agricultural libraries 61.05% in Bangladesh are applying Dewey Decimal Classification. 33.30% of libraries are using Universal Decimal classification. Only 5.55% of libraries are not applying any classification scheme. It is clear that 94.35% of agricultural, libraries in Bangladesh are following classification scheme for arranging the documents in order.

Cataloguing

The library users may use the collection of the library either for study or research or reference. At a given time, a user may not find all the documents on the shelf. Therefore in order to know about the complete collection, reliance has to be placed on dependable tool called the library catalogue.⁵²

Table 3.15: Catalogue Code Followed by Agricultural Libraries

Sl. No.	Catalogue Code Followed	No of Libraries	Percentage
01.	Classified Catalogue Code (CCC)	4	22.20
02.	AACR-2	13	72.15
03.	Catalogue Code not followed	01	5.55
	Total	18	100%

Table 3.15 shows that 13 libraries are following Anglo-American Cataloguing Rules. Only one library is not following any catalogue code. Four Agricultural libraries in Bangladesh are following classified catalogue. Majority of libraries is applying AACR-2 with modification for cataloguing of library materials.

Bibliographical Services

Quick and easy access to information is vital to the development of various fields of knowledge. Therefore it is essential that relevant information must be brought to the attention of professionals and researchers who have urgent need for it.⁵³ In this respect bibliographical sources play an important role.

Table 3.16: Compilation of Bibliographies

Sl. No.	Reply	No of Libraries	Percentage
01.	Yes	8	44.40
02.	No	10	55.50
	Total	18	100%

Table 3.16 shows that 44.40% of agricultural libraries are compiling bibliographies. Majority of the libraries are not compiling bibliographies.

Circulation

The circulation system to be chosen should be the one which takes least possible time in issue and return of books. It should also be economical in terms of staff, money and materials. The circulation system adopted depends upon various factors like uses, document resources etc.

Table 3.17: Circulation System Followed by Agricultural Libraries

Sl. No.	Issue Method	No of Libraries	Percentage
01.	Register	10	55.50
02.	Browne system	01	33.30
03.	Newark system	01	5.55
04.	Computerized (CDS/ISIS)	01	5.55
	Total	18	100%

It is evident from the table that 55.50% of libraries are following register system. 33.30% of libraries are following Browne System. One library is following Newark system and one library is following computerized system.

Staff

A staffing pattern should lay down a definite personnel policy, which is considered basic to any sound programme to provide effective library services. Without sufficient and qualified staff, it is not possible to run the library efficiently.⁵⁴ The staffing pattern differs from library to library due to different objectives of the different library systems.

Table 3.18 shows that out of 210 library staff 53 members are professionals, 31 members are semi-professionals and 126 are non-professionals. Majority of library staffs belong to non-professional category. Bangladesh Agricultural University library is having the largest number of staffs (96), followed by AIC (23) and BRRIL (08). Bangladesh Tea Research Institute Library has no professional staff. Department of Agricultural Extension library is having the least number of staff (02) and preceded by Soil Resources Development Institute Library (03). The number of library staffs in agricultural libraries are shown by pie-graph (3.18.A).

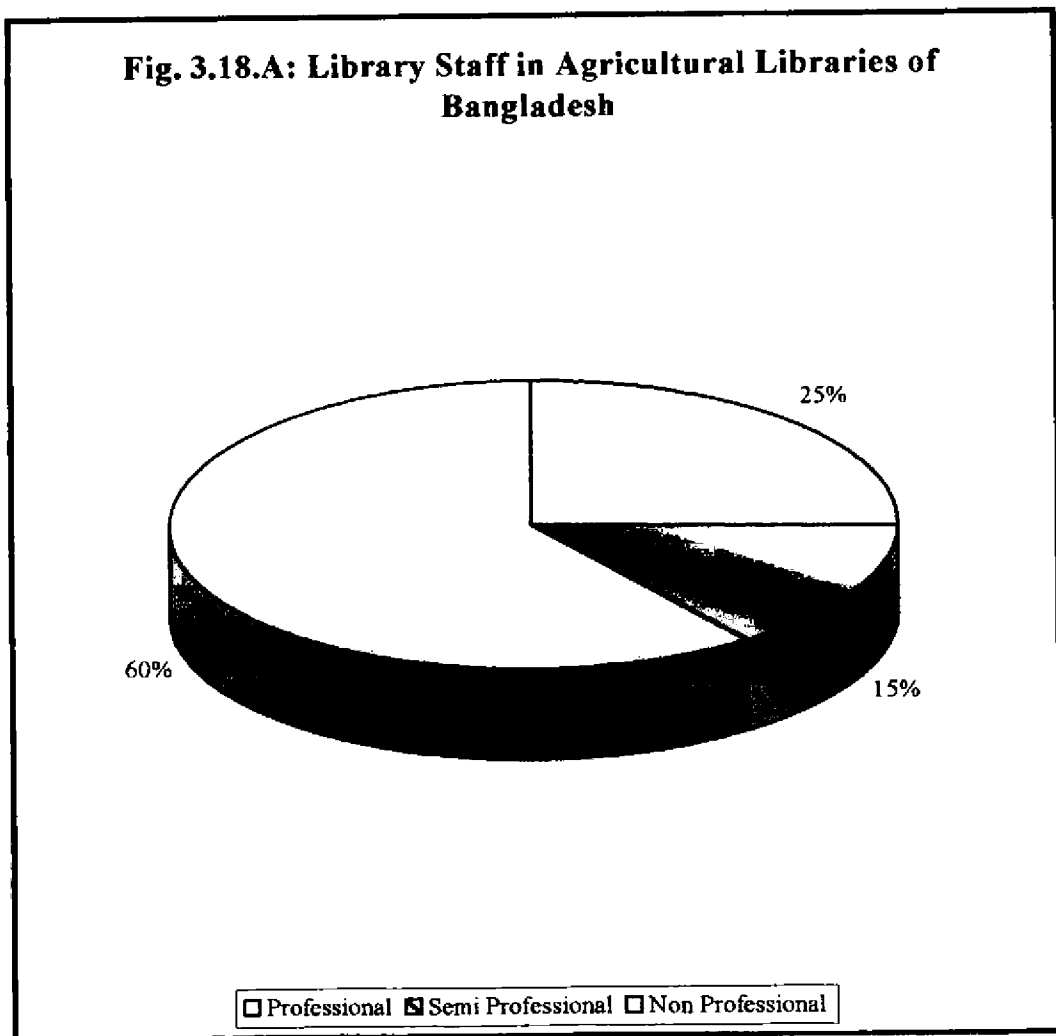


Table 3.18: Strength of Library Staff

Sl. No.	Name of the Library	Professional	Semi Professional	Non Professional	Total
1.	BAIL (Dhaka)	04	02	02	08
2.	BJRIL (Dhaka)	03	01	02	06
3.	BFRIL (Chittagong)	03	02	04	09
4.	BTRIL (Srimongal)	-	01	03	04
5.	BAUL (Mymensingh)	12	05	79	96
6.	SRDIL (Dhaka)	01	01	01	03
7.	BADCL (Dhaka)	02	-	05	07
8.	BRRIL (Gazipur)	03	01	04	08
9.	BINAL (Mymensingh)	03	01	01	05
10.	AIC (Dhaka)	10	07	06	23
11.	BSRIL (Ishurdi)	01	01	02	04
12.	BARIL (Gazipur)	02	02	03	07
13.	PUSTL (Patuakhali)	01	02	03	06
14.	BSMRAUL (Gazipur)	01	01	04	06
15.	DAEL (Dhaka)	01	-	01	02
16.	BLRIL (Savar)	01	02	02	05
17.	FRIL (Mymensingh)	03	01	02	06
18.	HDUSTL (Dinajpur)	01	02	02	05
	Total	53	31	126	210

Table 3.18 shows that out of 210 library staff 53 members are professionals, 31 members are semi-professionals and 126 are non-professionals. Majority of library staffs belong to non-professional category. Bangladesh Agricultural University library is having the largest number of staffs (96), followed by AIC (23) and BRRIL (08). Bangladesh Tea Research Institute. Library has no professional staff. Department of Agricultural Extension library is having the least number of staff (02) and preceded by Soil Resources Development Institute Library (03). The number of library staffs in agricultural libraries are shown by pie-graph (3.18.A).

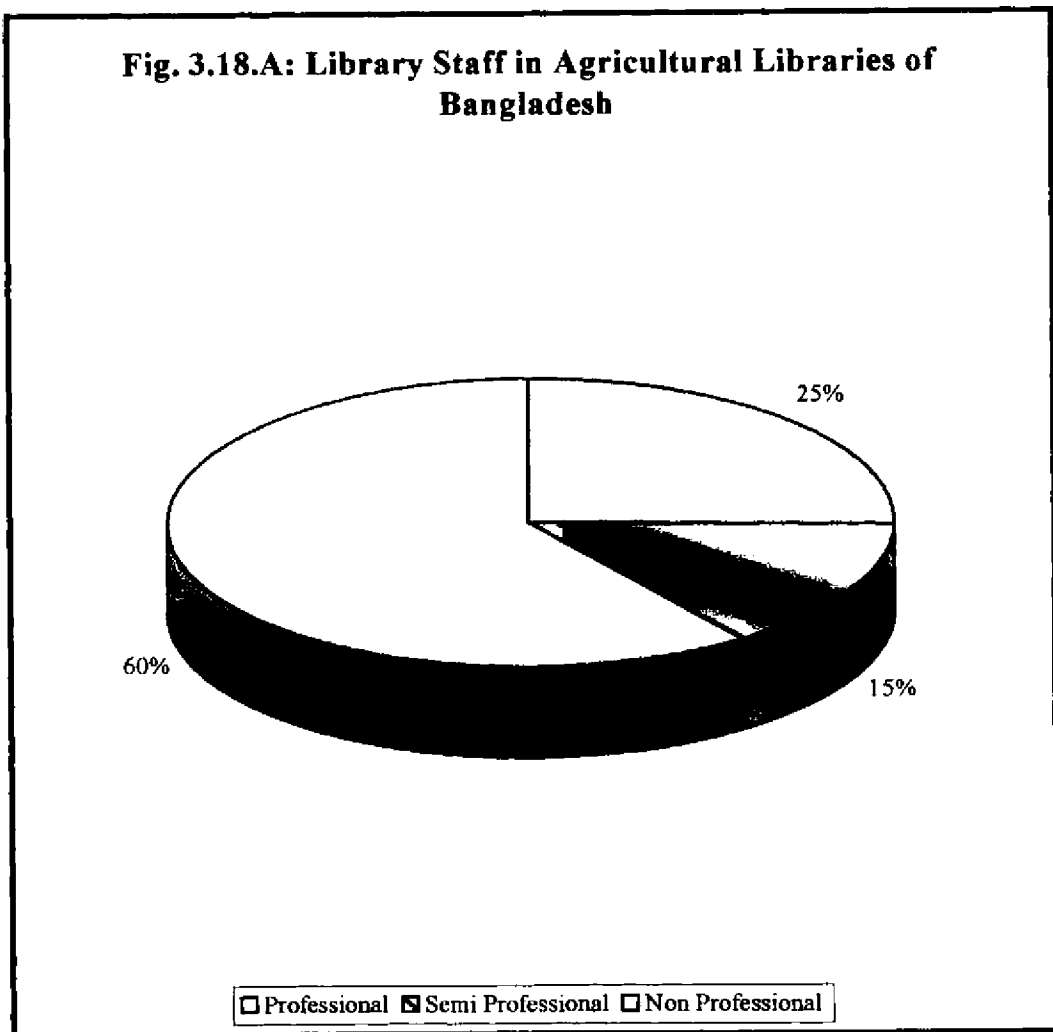


Table 3.19: Present Staff Strength to Run the Libraries

Sl. No.	Reply	No of Libraries	Percentage
01.	Sufficient	05	27.75
02.	Insufficient	13	72.25
	Total	18	100%

From the above table it is very clear that 72.25% of libraries do not have sufficient library staff. It is an acute problem in the agricultural libraries of Bangladesh. Only 27.75% of libraries expressed that present staff is sufficient to run the libraries. This analysis indicates that the majority of agricultural libraries do not have sufficient staff. This may be due to lack of funds, lack of proper initiative and etc.

Inter-Library Loan Services

Inter-library loan system is the back bone to resource sharing.⁵⁵ To know about inter library loan services, the investigator asked some questions on loan period and on reader's interest in obtaining information from other libraries. In the context of our country, inter-library loan services should be introduced among the agricultural libraries of Bangladesh. It can help meet the requirements of information needs of the scientists and researchers in the field of agriculture. Today, no library can claim to be sufficient in library collections.

Table 3.20: Readers Interest on Information available in other libraries

Sl. No.	Reader's Interest	No of Libraries	Percentage
01.	High	13	72.15
02.	Low	05	27.75
	Total	18	100%

Table 3.20 shows that 72.15% of library users are interested in getting information from other libraries. 27.75% library users have shown their less interest on information available in other libraries. Hence, it is clear that the agricultural library users are interested in the information available at other libraries.

Table 3.21: Types of Information Needed by Readers through Inter-Library Loan

Sl. No.	Types of Information Needed	No of Libraries	Percentage
01.	Periodicals	08	61.54
02.	Non book materials	01	7.69
03.	Reference tools	02	15.38
04.	Books	02	15.38
	Total	13	100%

Table 3.21 shows the types of information needed by users through inter-library loan. 61.54% of library users are interested in periodicals through inter-library loans. 15.38% of library users are interested in reference tools through inter-library loan. 7.69% library users are interested in non-book materials through this service.

Table 3.22: Method of Obtaining Documents through Inter-Library Loan

Sl. No.	Main Method	No of Libraries	Percentage
01.	By writing letters	08	61.54
02.	By personal visits, by writing letters and by telephone	05	38.45
	Total	13	100%

Table 3.22 shows that 61.54% of libraries are getting information from other libraries by writing letters and the remaining 38.45% of libraries by personal visits, telephone etc. to meet the information needs of the users.

Utilization of Computers

Today information technology has made library services easy to provide.⁵⁶ Computers are very much essential for each and every agricultural library of Bangladesh. Computerization of agricultural libraries in Bangladesh is very much needed to meet the information needs of the agricultural scientists and researchers.

Table 3.23: Utilization of Computers

Sl. No.	Responses	No of Libraries	Percentage
01.	In use	10	55.50
02.	Not in use	08	44.4
	Total	18	100%

Table 3.23 reveals that 55.50% of agricultural libraries in Bangladesh are using computers and 44.40% of libraries are not using computers. It may be concluded that majority of agricultural libraries are using computers.

Table 3.24: Purpose of Using Computers (presently used)

Sl. No.	Purpose	Total Libraries	No. of Libraries	%
01.	Storage and retrieval of agricultural information	10	08	80
02.	Reference services	10	07	70
03.	Clerical & Administrative works	10	09	90

The above table indicates that 80% of agricultural libraries are using computers for storage and retrieval of agricultural information, 70% of libraries are using computers to provide reference services to the users,

90% of libraries are using computers for clerical and administrative works. Majority of the libraries are using computer for clerical and administrative works.

Willingness in Joining the Network of Agricultural Information System:

Willingness is very much essential for the libraries to join resource sharing network in order to meet the information requirements of the agricultural scientists and researchers.⁵⁷ In this regard, the researchers asked a question as to whether they are willing to join the proposed agricultural information network system.

Table 3.25: Willingness in Joining the Proposed Network of Agricultural Information System

Sl. No.	Willingness	No of Libraries	Percentage
01.	Willing	16	88.80
02.	Not willing	02	11.20
	Total	18	100%

Table 3.25 bears the testimony that 88.80% of agricultural libraries are interested in joining agricultural information networking system. Only 11.20% of libraries are showing their disinterest in networking. It is concluded that majority of agricultural libraries are interested in joining agricultural information networking system.

Through analysis of National Agricultural Information System of Bangladesh reveals that there are good amount of agricultural materials to partially meet the needs of scientists and researchers. But in the absence of union catalogue and etc. these can not be easily located for use of the scientists and researchers. In no library there is any special provision for supply of books and journals not to speak of information to scientists and researchers. The scientists and researchers have to take initiatives to get the information consulting the library materials. Quality materials and up-to-date materials are limited. Lack of automation, networking and etc. are great hindrances in meeting their needs. Indifferent attitude, poor attention, negligible behaviors and etc. of the librarians in some cases are major obstructions, faced by the scientists and researchers. Library development and use of books are dependent on each other. Library development attracts the readers who on the other hand force library to be developed.

References

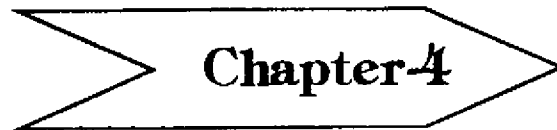
1. Niyogi, Bratati. *Information needs in Jute and allied industries in India (Unpublished Ph.D. thesis)*. Jadavpur University: Dept. of LIS, 1992, P 166.
2. Veeranjaneyulu, K. *A study on agricultural information systems in Andra Pradesh, India (Unpublished Ph.D. thesis)*. S.V. University: Dept. of LIS, 1997, P 31.
3. *50 Years of BAI, Souvenir*. Dhaka: BAI, 1989, P.1.
4. *Official records of BAI*, 1993.
5. *Consultation with the Senior Librarian of BAI*.
6. Hamida Begum. *BJRI and SRDI: A Comparative Study (unpublished M.A. Thesis)*. Dhaka University: Dept. of LIS, 1990, P 13.
7. *Official documents of BJRI*, 1983.
8. See reference no. 6, *Ibid*, P 28.
9. Begum Shirin Akhter. *Directory of Scientific Libraries in Bangladesh (Unpublished M.A. Thesis)*. Dhaka University: Dept. of LIS, 1982, P.23.
10. *Brochure of BFRI*, 1999.
11. Bangladesh Tea Research Institute. *Glimpse on Bangladesh Tea and BTRI*. Srimongal: BRTI, 1999, P.1.

12. Banu, Salima. *Bangladesh Agricultural University Library: A Case Study (Unpublished M.A. Thesis)*. Dhaka University: Dept. of LIS, 1982, P 1.
13. *Official Document of BAUL*, 1998, P 1.
14. See reference no. 12, *Ibid*, Pp 2-4.
15. *Ibid*, P 3.
16. *Consultation with the Director of SRDI*.
17. Hamida Begum. *BJRI and SRDI: A comparative study (Unpublished M.A thesis)*. Dhaka University: LIS Dept., 1990, Pp 67-68.
18. *Official Records of BADCL*, 1976, P.1.
19. Fatema Begum. *Bangladesh Agricultural Development Corporation Library: A Critical Study (Unpublished M.A. Thesis)*. Dhaka University: Dept of LIS, 1979, P.2.
20. *Ibid*, P 28.
21. Khan, Alauddin. *Bangladesh Rice Research Institute Library: A Case Study (Unpublished M.A. Thesis)*. Dhaka University: Dept. of LIS, 1989, P.3.
22. *Annual Report of BINA*, 1994-95, P.4.
23. *Brochure of BINA*,, 1999, P 1.
24. *BINA brochure*, 1994, P 5.
25. GOB, Ministry of Agriculture. *Project Planning of NALDOC*, 1973.

26. *Consultation with the Principal Librarian of AIC.*
27. Library Association of Bangladesh (LAB). *National Seminar Souvenir*. Dhaka: LAB, 1993, Pp 27-28.
28. Mostaque Ahmed. *Information Services to Agricultural Scientists: Role of the Agricultural Information Centre (BARC)*. Papers presented at the workshop on Library, Documentation, Publication and Audio-visual. Organized by BARC. Dhaka, June 14-18, 1998.
29. Sarkar, Usha. *Sugarcane Research and Training Institute Library: A Case Study (Unpublished M.A. Thesis)*. Dhaka University: Dept of LIS, 1989, P 9.
30. *Brochure of BSRI*, 1998, P 2.
31. See reference no. 29, *Ibid*, P 19.
32. *Annual Report of BARI, 1998*. Gazipur: BARI, 1999, P 3.
33. *Official Documents of BARIL*, 1999.
34. *Annual Magazine of the College*, 1998, P 1.
35. *IPSA Brochure*, P 4.
36. *Official Documents of IPSA*, 1984, P 7.
37. Asian Productivity Organization. *Trends and Perspectives in Agricultural Education in Asia-Pacific*. Tokyo: APO, 1999, P 185.
38. *Brochure of IPSA*, 1996, P 6.
39. *DAE Report*, 1985.
40. *Consultation with the Librarian of DAE*.
41. *Brochure of BLRI*, 1999, P.1.

42. *Consultation with the Director General of BLRI.*
43. Ahmed, Farid Hasan. *Livestock Libraries in Bangladesh: A survey (Unpublished Masters Dissertation)*. Dhaka University: LIS Dept, 1987, P 37.
44. *Brochure of FRI, 1992, P 4.*
45. Graduate Training Institute. *Agricultural Research Management; A Training Manual* ed. by Amir Hossain, Mymensingh: GTI, 1993, P 5.
46. *Consultation with the Senior Librarian of FRILDC.*
47. *Brochure of FRILDC, 2000, P 3.*
48. *Annual Report of HDAC, 1997, P 3.*
49. Mahalik, R.K. *Information Needs and Seeking Behaviour of Working Journalists in Orissa: An Analytical Study (unpublished Ph.D. Thesis)*. Utkal University: Dept. of LIS, 1998, P 202.
50. Chhotey LAL. *Agricultural Libraries and Information System; A Handbook for Users*. New Delhi: R.K. Techno Science Agency, 1998, P 121.
51. Chhotey LAL. *Agricultural Libraries and Information System; A Handbook for Users*. New Delhi: R.K. Techno Science Agency, 1998. P 91.
52. *Ibid, P 60.*
53. Kumar Girja and Kumar, Krishan. *Bibliography*. 5th Edn. New Delhi: Vikas, 1998, P 10.

54. Veeranjanyulu. K. *A Study on Agricultural Information Systems in Andra Pradesh ((India) (Unpublished Ph.D. Thesis)*. S.V. University Tiruputi: Dept. of LIS, 1997, P 80.
55. Chandel A.S. and Saraf, Veena (ed.). *Planning in Library Resource Sharing*. Lucknow: Print House, 1986, P 5.
56. Kawatra. P.S *Textbook of Information Science*. New Delhi: APH, 2000, P 206.
57. Gopal Krishan. *Digital Libraries in Electronic Information Era*. New Delhi: Author Press, 2000, P 72-81.

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Chapter 4

4.0 Introduction

International Information Systems for Agriculture were established to communicate nascent micro-thought world-wide keeping in view of the information explosion. They provide free exchange of information among the scientists and researchers in various countries. The sharing of information generates new ideas.¹

At the international level, particularly with in the United Nations System and its Member States, a number of inter-governmental conferences and seminars was held in the past, which aimed at promoting the use of information systems for development in the Member States.²

Attempts have been made in this chapter to state and analyze the various agricultural information systems and services working at international level as coordinating and advisory agencies for national and regional agricultural information systems and services in the world. These international agricultural information systems and services are very relevant to the agricultural information systems and services of any nation/state, specially Bangladesh.

4.1 Food and Agricultural Organization (FAO)

Food and Agricultural Organization of UN was founded on 16th October, 1945. It has 174 member countries, one associate member country and European Union as a member organization. FAO is the United Nation's leading agency for food, agriculture and rural development.³ "Its aim is to eliminate world hunger and rural poverty by assisting countries to increase agricultural production and by promoting the institutional reforms required for sustainable development. FAO

advocates regional and global initiatives aimed at achieving world food security through greater self-reliance and a more equitable distribution of international resources and commodities. It is the first and the largest among the UN specialized agencies."⁴

In the following paragraphs, the objectives, functions, programmes and roles of FAO have been briefly analyzed along with a critical review.

Objectives

- (i) To mobilize governments, international organizations and all sectors of civil society in a coordinated campaign to eradicate hunger and to turn the slogan – “Food for All” – into a reality.
- (ii) To eliminate world hunger and rural poverty by assisting countries to increase agricultural production.
- (iii) To advocate regional and global initiatives aimed at achieving world food security through greater self-reliance and a more equitable distribution of international resources and commodities.
- (iv) To provide practical help to developing countries through a wide range of technical assistance projects.
- (v) To encourage an integrated approach with environmental, social and economic consideration included in the formulation of development projects.⁵

Functions of FAO

- (i) **An information centre:** It promotes "the exchange of information on food and agriculture, collecting, analysing and disseminating data covering production and trade in agriculture, forestry and

fisheries, as well as It publishes a wide selection of information booklets, technical papers and reference materials and offers a range of specialized data bases. Through its Global Information Early Warning System (GIEWS), FAO monitors conditions affecting food production and alerts governments and donors to the threat of shortages."⁶

- (ii) **A neutral forum:** Through its biennial conference, regional conferences and technical meetings, FAO provides a neutral forum for the discussion of food and agricultural issues. Major conferences namely World conference on Agrarian Reform and Rural Development in 1979, International Conference on Nutrition in 1992 and the World Food Summit organized in 1996⁷ were convened by FAO.
- (iii) **An adviser to governments:** With a strong technical base, a broad field experience and representatives in most developing countries, FAO is especially prepared to assist governments in the formulation and implementation of agricultural development plans.⁸
- (iv) **A development agency:** In many countries field projects are largely financed by the United Nations Development Programme (UNDP) through trust funds. Most trust funds are provided by a donor country and channeled through FAO to recipient countries. FAO directly funds field projects through its Technical Co-operation Programme (TCP), designed to provide prompt assistance for relief and other pressing projects."⁹

FAO in Bangladesh

Since Bangladesh joined FAO as a member in 1973¹⁰, a close co-operation has developed between Bangladesh and FAO in the fields of agriculture, food, forestry, fisheries, livestock, environment, rural development, and etc. The range of this co-operation expanded further with the establishment of FAO Representative's office in Dhaka in 1978.¹¹ It was one of the "first international agencies which extended considerable assistance to Bangladesh during the immediate post-liberation period for relief and rehabilitation as well as to support national efforts for economic recovery and reconstruction. Bangladesh has been one of its most active members, contributing significantly to FAO's endeavours, commissions, committees and working panels. Bangladeshi experts working for FAO throughout the world have also helped FAO to carry out its global mandate."¹²

Co-operation between Bangladesh and FAO has focused primarily "on building a national capacity at community, sub-national and national levels for the effective planning, utilization and management of natural resources and manpower, on promoting support to farming communities and rural families to increase food production to meet national requirement, and consequently to improve their living standard, income and nutritional status, and on providing increasing access to technical know-how."¹³

It strongly supports the transfer of appropriate technology and expertise to Bangladesh through training programmes in many institutions. Principal areas of the early assistance included agricultural

research and extension including a major study on soil resources leading to classification of the entire country into different agro-ecological zones to facilitate appropriate land use and agriculture planning.¹⁴

FAO focuses its priority on food security and rural development. Acute food insecurity in Bangladesh is reflected in endemic malnutrition which is a direct consequence of persistent poverty. It provides special support to marginal and landless farmers as well as women and disadvantaged groups in rural areas who constitute the majority of the poor in Bangladesh, through support to increase on-farm and off-farm outputs and income and consequently improve their living standards and nutritional status. Bangladesh has participated in more than 170 regional and international projects implemented in the country during the last three decades.¹⁵

It is observed that FAO has been contributing to our agricultural sector through various ways and means. It has been providing funds for the development of agricultural information systems and services in Bangladesh. It should provide more funds for the development of agricultural information networking at national and international levels.

4.2 International Information System for the Agricultural Sciences & Technology (AGRIS)

The need for international information services was felt among the nations with the advent of computer and in view of the increasing cost of information processing in sixties.¹⁶ It was more so because it was difficult for any one nation to cope up with the flow of the huge mass of information.¹⁷ The member States of UNESCO at first felt the need for a

World Information System for Science and Technology in 1969. It was within the conceptual framework of UNISIST that the international information systems like the INIS and the AGRIS attained maturity during the seventies.¹⁸

The origin of AGRIS goes back to 1969 when the Director General of FAO recognized that the problems of scientific communication within the field of agriculture had reached serious proportions due to the phenomenal growth of agricultural literature in the world and also due to the large number of services set up to deal with agricultural information, most of which were totally un-coordinated.¹⁹ Further recognizing that the information is a necessary input to agricultural research and questioning whether the existing systems provided for the free flow of information from the producer to the end users, the Director General acted to set up a panel of experts on the International Information System for the Agricultural Sciences and Technology. In July 1970, the panel recommended that,

1. an International Information System for the Agricultural Sciences and Technology (AGRIS) be established as soon as possible under the authority of FAO; and
2. the system be organized at two levels: Level-1 a comprehensive documentation service providing current awareness; Level-2 a network of services grouped by special field or mission, including specialized information services which would provide specific information through abstract services, extensive indexes and other

forms of individual and direct services to users across national border and barriers.²⁰

The main objectives of AGRIS are

- a) To provide a comprehensive agricultural information networking among nations of the world on the basis of multilateral cooperation and to avoid wasteful duplication of work in the field. It also aims at meeting the agricultural information needs of developing nations and helps them to train their scientific and technical personnel.
- b) To establish a single, current, comprehensive inventory of world-wide agricultural literature reflecting the research production activities and rural development.
- c) To provide current awareness services, selective dissemination of information and specialised subject retrieval services and to fulfill the document delivery requests. All the above objectives indicate that AGRIS will help the scientists and researchers meet some of their needs.
- d) To interact with new or existing secondary specialised information services so as to increase efficiency and to eliminate unnecessary duplication or gaps of research.
- e) To provide each participating country with available information in exchange of input provided by that country irrespective of the percentage of the total.²¹

Structure

AGRIS is a decentralised co-operative system in which each participating country is responsible for locating, identifying, cataloging, indexing and inputting records for the documents published within its borders. The AGRIS coordinating centre situated at FAO Headquarters in Rome, is responsible for general system management, but each member shares equally in establishing general policies and procedures for the management of the system. At present 135 national and 24 regional and international centres participate as input centres and submit about 1100 items per month.²²

The coordinating centre also operates a liaison unit – the AGRIS input unit – located at the IAEA, Vienna and Austria. Most of the input centres belong to developing countries but only 20% of the references are submitted by them. In spite of that AGRIS has established three main multinational centres for developing countries namely:

- (i) Agricultural Information Bank for Asia (AIBA) located in Philippines;
- (ii) Inter-American centre for Agricultural Documentation and Information at the Inter-American Institute of Agricultural Sciences (IICA/CIDIA) at San Jose in Costa Rica.
- (iii) “OMVIS” situated in Senegal meets the information needs of scientists and researchers in Mali, Mauritania and Senegal.

Scope

AGRIS covers subject fields, such as agriculture in general, geography, history, education extension and information, administration and legislation, agricultural economics, development and rural sociology; plant science and production; plant protection; post harvest technology; forestry; animal science, production and protection, fisheries and aquaculture; agricultural machinery and engineering; natural resources and environment, processing of agricultural products, human nutrition, pollution and methodology.²³

Functions

1. It maintains computerised databases for storing and retrieving large amounts of information using CD-ROM. It collects bibliographic references to materials, which may be either conventional journal articles, books or non-conventional grey literature, e.g. theses, reports, etc. not available through normal commercial channels. The composition of this database is; 75% journal articles, 18% monographs, 6% conference papers, 1% others.
2. It processes agricultural information received from the participating countries and other regional centres.
3. It provides AGRIS-SDI service. The subscribers of this service (usually scientists, administrators, extension workers etc.) receive regular computer produced references to the literature within their field of interest. Many countries such as Brazil, India, Poland, Bulgaria, Yugoslavia, the Netherlands, Spain and New Zealand have started their own AGRIS-SDI services.²⁴

4. It assists the member countries in developing their national information system in the field of agricultural sciences.
5. It imparts in-service trainings.
6. It holds seminars and symposiums for participating countries.
7. It makes general guidelines and evolves mechanisms for the standardisation of information of the participating centres/institutions.
8. It provides on-line communication to its database.
9. It provides the camera ready films, and the diskettes to be used in micro computers.²⁵

Publication

AGRIS publishes monthly bibliography entitled 'AGRINDEX' in English, French & Spanish. Approximately 21% of the current entries are abstracts. It is an important tool which aims at providing some 20000²⁶ items of references per year relating to all fields of agriculture, food, forestry, fisheries and rural development received from 135 national and regional centres. In other words, it is a world wide inventory of the published literature in the field of agricultural sciences.²⁷

Agricultural Information Centre (AIC) of Bangladesh being the National Centre for AGRIS prepared 719 entries of Bangladesh agricultural literature during the year 1997-2000 and sent these entries to the processing unit of FAO, Rome for inclusion in the Global AGRIS unit.²⁸

Limitations

1. Many participating countries do not send agricultural information due to financial and administrative problems.
2. Information about non-serial literature of agriculture is not included in input data by participating members.
3. AGRIS database containing literature is published in English, French and Spanish languages. As a result it is not useful for the countries where English, French and Spanish languages are not used as mother tongue.
4. One of the main limitations of AGRIS is that only 70% literature in the field of agriculture and related discipline is covered by this system as many countries are not participating in AGRIS.²⁹

Here it is found that AGRIS has many important original and research publications. All of its publications are extremely important for all countries of the world both developed and developing for the development of Agricultural system but the developed countries only are getting the opportunity of consulting them. Most of the developing countries like Bangladesh are deprived from the benefit of having access to such materials. In the case of Bangladesh, the agricultural scientists and researchers do not get many important materials for consultation. Even the foreign libraries situated in Bangladesh like USIS, British Council, UNIC, FAO library are not collecting all publications of AGRIS, though these materials are extremely important for meeting the important needs of the agricultural scientists and researchers of Bangladesh.

4.3 Agricultural Libraries Network (AGLINET):

AGLINET was established in 1970. Its purpose is to organize at regional and international levels an efficient document delivery system through cooperation among the large agricultural libraries of the world. It also encourages regional decentralization of responsibilities.³⁰ It is a cooperative library network in the field of agriculture. The basic convention on AGLINET was signed in 1974. The network consists of a chain of major agricultural libraries in each region.³¹

Objectives

AGLINET aims at combining efforts and resources towards achieving common interests. The objectives of AGLINET are as follows:

- (a) "Mutual and rational use of library resources, not only for the benefit of members of constituencies but also in support of other libraries within the country/region through efficient delivery of primary documents, especially unique material unavailable elsewhere, by means of inter-library loan, provision of reproductions, as well as bibliographic information."³²
- (b) Realization of a comprehensive resource coverage with appropriate regional and subject specialization.

Network Structure

AGLINET consists of the following three tiers: (i) Primary centres
(ii) Subject centres, and (iii) International centres:-

- (i) **Primary Centres:** Under this category, the agricultural libraries of national or regional importance are to function as primary centres.

These libraries should have comprehensive collections inclusive of forests, fisheries and food and with strong regional coverage as well as adequate service capacity. In the absence of these conditions, a bonafide national association of agricultural libraries, possibly members of the IAALD which maintain a Secretariat, may be made as the primary centre.³³

- (ii) **Subject Centres:** Under this category, the libraries in special subject fields within the board domain of agriculture with world wide coverage are made as subject centres.
- (iii) **International Centres:** These are agricultural libraries which have comprehensive coverage in its collection, with ample service facilities and the capabilities of taking a coordinating role in the network system.

Functions

AGLINET centres are responsible for:

- (i) Providing upon request, inter-library loan service, including reproduction and bibliographic information within the scope of each participating centre to other AGLINET centres of all categories – primary, subject and international.
- (ii) Forwarding major bibliographic tools published by each participating country to all other centres wherever possible.
- (iii) Notifying the international centres of changes that effect service operation of the AGLINET system e.g., the liaison officer, service facilities and cautions, etc.³⁴

The International Centre of the AGLINET performs the following functions:

- (i) Liaising, coordinating and supporting services for the system.
- (ii) Assembling and disseminating information on serial holdings of all centres in the form of union lists.
- (iii) Collecting statistical information on service operations.
- (iv) Providing inter-library loan service including reproduction and bibliographic information.
- (v) Forwarding major bibliographic tools published by each participant to all other centres.

There are 47 AGLINET centres in the world. AGLINET centres require more cooperation and coordination. The AGLINET system is not introduced in all the largest agricultural libraries in the world. Due to communication problems; it is not possible to share resources among the agricultural libraries. The close study of AGLINET objectives and functions indicates that there is enough provision for exchange of information. As such, the agricultural scientists and researchers of Bangladesh also can procure up-to-date required information from AGLINET, provided they seriously try to collect the information. But living in Bangladesh, it is not so easy to get the information. So a centre of AGLINET should immediately be started in Bangladesh to meet the information needs of the agricultural scientists and researchers and etc.

4.4 The Agricultural Information Bank for Asia (AIBA)

Agricultural Information Bank for Asia is a “project of the South East Asian Centre for Graduate study and Research in Agriculture, (SEARCA) which was established in 1974 and located at Los Banos, Laguna in Philippines.”³⁵

It has been designed to enable agriculturists, scientists, administrators, policy makers, scholars, technicians in government, business and industry and other end-users through out the region to have full access to agricultural information.

The objectives of the AIBA are:

- (1) To serve the research needs of Asian countries in the field of agriculture and its related disciplines.
- (2) To promote new and better techniques for handling and disseminating agricultural information.
- (3) To serve as the input/output centre in South East Asia and other Asian countries as a body of FAO;
- (4) To develop related mechanisms such as agricultural literature services, current research inventories, data banks training programmes, linkages between scientists and institution and retrospective bibliographies.³⁶

The functions of AIBA are given below:

- (1) It provides fiscal, legal and planning policy formulation.
- (2) It makes collaborative development of resources to provide for cooperative acquisition of materials, especially non-conventional literature.
- (3) It maintains central bibliographic recording to provide for the location of the required materials with in the network.
- (4) It maintains a clearing house/referral centre for non-conventional materials to provide microfiche/microfilm copies of unpublished agricultural literature produced in the region.
- (5) It makes identification of user needs to maintain a user profile of agricultural scientists or any institution in the region which desires selective dissemination of pertinent agricultural information.
- (6) It undertakes training programmes to provide instruction to users and heads of national centres on policies and procedures.
- (7) It compiles Union Catalogue of Agriculture, entitled "Filipiniana".
- (8) It maintains Data Bank for South East Asia and
- (9) It prepares abstracts and bibliographies.³⁷

Agricultural Information Bank for Asia acts as "an important input centre responsible for supplying input gathered from SEAMEO and other non SEAMEO states. As the South East Asian input and output centre for AGRIS, it is committed to serve the information needs of Asian countries in the fields of agriculture and related disciplines. AIBA also assists in getting an agricultural literature service, operational under the Philippines

Council for Agriculture and Resources Research. Its services are now offered to fifty two research centres and educational institutions, making available a range of 1,200 serial titles."³⁸

Although the AIBA was established to provide Agricultural Research Information System and Services to all Asian countries, it has not yet included all Asian countries in its programme. Bangladesh became the member of AIBA in 1974. It did not establish any office in Bangladesh. Since its establishment in 1974, AIBA played important roles in development of agriculture of developing countries of Asia but at present it is not playing so much important roles like AGRIS, CARIS, CABI etc. Bangladesh at present is not a member of AIBA.

4.5 Commonwealth Agricultural Bureau International (CABI)

Commonwealth Agricultural Bureau International (CAB international), began in 1928 when a service was established in London to support agricultural scientists, by identifying insects and providing scientific information and technical assistance. CAB and its services expanded further over the years that followed and increasingly became used and valued worldwide. In 1985 this was reflected in a new constitution (The agreement on CAB International) under which the organization changed from being exclusively Commonwealth to fully international, with membership open to any country. The old acronym CAB was retained as part of the official name of the reconstituted CAB International, in line with its new status. Its headquarters is located at Wallingford Oxfordshire, UK. It is an international intergovernmental organization registered with the United Nations.³⁹

CAB International primarily aims at providing information services based on all branches of agriculture and its allied subjects through out the world.

Structure

CAB International is basically a co-operative venture. It is owned and administered by its member governments consisting of 29 countries. It enjoys the status of an inter-governmental organization. Its membership is open to all governments that want to participate in this programme.⁴⁰

CAB International services consist of four institutes namely:

1. CAB International Institute of Entomology (CIE)
2. CAB International Mycological Institute (CMI)
3. CAB International Institute of Parasitology (CIP) and
4. CAB International Institute of Biological Control (CIBC).

The above three Institutes (No. 1-3) provide an authoritative identification service for agricultural pests and other organisms, conduct research, implement projects and provide training in their fields of expertise and the fourth Institute provides bio-control services, conducts trainings and participates in integrated pest management programmes.

Functions

1. It provides information services in the field of agriculture and its allied disciplines.

2. It maintains comprehensive database of records pertaining to research on agriculture, forestry and allied disciplines, including social sciences and aspects of human medicine.
3. It provides an online access to its databases. The machine readable database known as CABABSTRACTS is publicly accessible online through DIALOG Information Service (USA), BRS Information Technologies (USA), ESA-IRS (Italy) DIMDI (GER) and JICST (JAPAN). The databases are also available on CD-ROM.
4. It acquires the relevant scientific and technical literature including 10,000 serials and over 5000 other publications annually.
5. It publishes abstracting journals with the help of one hundred scientists through 11 Bureau.
6. It maintains a publishing unit for printing the journals and books.
7. It provides computerized SDI and CAS based on the most recent input to the database.⁴¹

CAB International Partnership Facility (PF)

The partnership facility (PF) is a special fund to support sustainable development in developing countries. It was set up in 1991 by CAB International's Members as a vehicle to attract and manage funding, to help CAB International meet specific developing country needs. The PF is a partnership between CAB International, the contributors and developing countries. It offers the contributors a means to achieve their development objectives by providing funds to seed self sustaining

programmes, and achieving a multiplier effect from multi-donor funding of projects. The PF enables CAB International to:

- respond to requests from developing countries to help in achieving their development plans through policy development
- aid the acceleration of information transfer
- implement innovative research
- contribute to institutional strengthening and
- contribute to human resource development, including training.⁴²

The current emphasis of the PF on projects fall mainly with a special focus on: plant health including biological control and Integrated Pest management; biodiversity and biosystematics; the supply of information resources for research; and training in all these areas. The PF has been beneficial to the developing world in various ways. It has provided tangible gains to a broad range of countries, by helping them define their own needs and the ways in which CAB International can help to meet their needs. It has contributed to the developing countries to build their capacity through the transfer of scientific and technical information in management skills, and the provision of scientific information and information technology.⁴³

4.6 Current Agricultural Research Information System (CARIS)

CARIS being an "International co-operative network consists of national, regional and international centres coordinated by FAO, through the CARIS coordinating centre located at FAO headquarters in Rome, Italy. This worldwide project was initiated in 1975 to cover all

developing countries. It aims at developing a mechanism for the collection and dissemination of information on agricultural research currently being carried on some 2500 institutions employing some 15000 specialists covering 5000 programmes and some 30,000 projects in developing countries through co-operative action involving member countries."⁴⁴

CARIS provides its services to a wide range of users such as researchers, planners, managers, administrators, policy and decision makers, development specialists, information specialists, funding agricultural agencies and international organizations.

Structure

The structure of CARIS consists of four types of centres; namely (a) National Centre (b) Regional Centre (c) International Centre (d) Coordinating Centre.⁴⁵

(a) National Centre: It is designated by each participating country. The member countries participate on a voluntary and equitable basis in the functioning of this network. Each focal point is responsible for contributing information on projects being carried out within its boundaries.

In return, it has access to all the information contributed by other countries and takes from the system whatever information it needs. It is responsible for the following activities.

- (i) Collection of data
- (ii) Organization and indexing of data

- (iii) Processing the data to produce the national CARIS database on inventory
- (iv) Regular updating and maintenance of the database or inventory
- (v) Publication of national directories
- (vi) Provision of the data to the CARIS coordinating centre and to the regional centre, if one has been established for inclusion in their databases
- (vii) Dissemination of information and provision of question-answer services using the national, regional or global databases and
- (viii) Collecting feedback from users in order to evaluate and improve the services provided.

(b) **Regional Centre:** It may be chosen by a group of participating countries on the basis of common investment and characteristics such as language, geographical vicinity, existing regional structures, etc. The regional centre is responsible to perform the following functions:

- (i) Promotion of regional cooperation with CARIS
- (ii) Processing of data received from national centres
- (iii) Management and maintenance of a regional database and
- (iv) Publication of regional directories.

(c) **International Centre:** It is located in an international research organization participating directly in CARIS. The International centre is

responsible for contributing data on projects carried out within its own organisation. However, an international research centre of agriculture may choose to participate through the national CARIS centre in the host country.

(d) Coordinating Centre: It is located at FAO headquarters in Rome, Italy. The coordinating centre undertakes the following responsibilities:

- (i) developing the CARIS methodology and preparing the working tools
- (ii) coordinating the activities of the participating centres
- (iii) providing technical assistance and organizing training programmes for CARIS staff and end-users
- (iv) maintaining the global database consisting of all the data collected and processed by the participating centres
- (v) making the database available to participating centres
- (vi) promoting wider participation in the CARIS system and
- (vii) promoting collaboration and exchange of information with similar systems in the developed countries.⁴⁶

Scope

CARIS covers almost all the subjects pertaining to agriculture and its related fields. Thus the scope of CARIS contains the following subjects:

- (i) plant science and production
- (ii) plant protection

- (iii) post harvest technology
- (iv) animal science, production and protection
- (v) fisheries and aquaculture
- (vi) processing of agricultural products
- (vii) food and human nutrition
- (viii) forestry and wood technology
- (ix) agricultural machinery and engineering
- (x) water resources
- (xi) energy resources
- (xii) pollution related to agriculture
- (xiii) agricultural economics, development and rural sociology and
- (xiv) education and extension

CARIS requires sufficient cooperation and coordination among its four centres. It maintains accuracy, similar standards and procedures in all input centres. All the activities of CARIS are done for the welfare of the developing countries in the world. 135 national and 19 international and intergovernmental centres participate in CARIS. These centres have submitted exhaustive information about 30000 currently active projects. In addition, two regional centres submit input on behalf of 6 countries in their respective regions. Agricultural Information Centre of Bangladesh Agricultural Research Council (BARC) as a national centre for CARIS of FAO, sends inputs of Bangladesh agricultural research information on current agricultural research projects for inclusion in the world database of CARIS, Rome.⁴⁷

Updating the data: The frequency of updating the data is determined by the national centres. In some countries updating may have to be carried out every six months. CARIS data are recorded in English, French or Spanish. The participating countries may also add optional data in accordance with local needs. Thus CARIS is considered as one of the latest global cooperative networking in the field of agriculture and its allied areas with special focus on the problems of the developing nations. It acts as an information support to research; a tool for research planning and management; and a source of information for technical cooperation among developing countries.⁴⁸

4.7 International Crop Research Institute for Semi Arid Tropics (ICRISAT)

ICRISAT established in 1972 is one of 16 non-profit, international research and training centres, funded through the Consultative Group on International Agricultural Research (CGIAR). The CGIAR is an informal association of approximately 50 donors from both public and private sectors. It is co-sponsored by the Food and Agricultural Organization of the United Nations (FAO), the World Bank, and the United Nations Development Programme (UNDP). Six crops are under the jurisdictions of ICRISAT's research:- Sorghum, pearl millet, finger millet, chickpea, pigeon pea and groundnut. These six crops are vital to life for the ever increasing populations of the semi-arid tropics (SAT). ICRISAT's mission is to conduct research which can lead to enhance sustainable production of these crops and to improve management of the limited natural resources of the SAT. ICRISAT communicates information on

technologies as they are developed through workshops, networks, training, information services and publishing.⁴⁹

It has the following objectives:

- (i) to develop a comprehensive collection of information in various documentary forms, relevant to ICRISAT's research on the above crops and to develop a selective collection of information on disciplines, techniques and methodologies useful in research programmes related to ICRISAT's mandate crops and the semi-arid tropics.
- (ii) to provide a range of information storage, retrieval, dissemination and document delivery services to scientists and others working on programs involving ICRISAT's mandate crops and the semi-arid tropics; and
- (iii) to participate in relevant national and international information networks for the exchange of information and for the sharing of information resources.⁵⁰

Library and Documentation Services

ICRISAT's library and documentation services are important component of full-fledged programmes called information management and exchange programme. The library has dual responsibility: (a) to provide traditional library services to researchers and others at ICRISAT's Asian Centre in Patancheru and to ICRISAT's researchers located in eastern, southern and western Africa, and (b) to provide information retrieval and dissemination services to researchers in National

Agricultural Research Systems (NARS) of the semi-arid tropics comprising 48 countries including India, parts of south-east Asia, sub-Saharan Africa and Latin America.⁵¹

The library and documentation services Unit of ICRISAT is also a home for the Semi-Arid Tropical Crops Information Service (SATCRIS), a world-wide information service on ICRISAT's mandate crops and related interests in soils, agro-climatology, socio-economics, etc. The library's database is being built with inputs from CAB International (CABI) and FAO's AGRIS in machine-readable form. The database thus integrates specialized literature with library cataloguing data and functions both as an Information Retrieval System as well as an Online Public Access Catalogue. Two of its most important services are demand searching service and the Selective Dissemination of Information service. The search service uses in-house database as well as several CDROM databases. The SDI service is provided to over 400 individuals each year in 51 countries of the world. A strong document delivery service complements the bibliographic retrieval and dissemination services.⁵²

The library is also active in experimenting with new information technologies. A microcomputer based expert advisory and diagnostic system on groundnut crop protection is under development in close collaboration with researchers at ICRISAT and extension personnel in different parts of India where groundnut is grown.

ICRISAT has collaborative activities with Bangladesh. During the year 1999-2000, it has provided germplasm to Bangladesh for different research programmes on chickpea.⁵³

4.8 International Rice Research Institute (IRRI)

IRRI was established in 1960 by the Ford and Rockefeller foundations in cooperation with the government of the Philippines. International Rice Research Institute (IRRI) is an autonomous non profit agricultural research and training organization with offices in more than ten nations. The institutes' main goal is to find sustainable ways to improve the well being of present and future generations of poor rice farmers and consumers while at the same time protecting the environment. Most of IRRI's research is done in cooperation with national agricultural research and development institutions, farming communities and other organizations of the world's rice-producing nations. Its research activities began in 1962 and are now estimated to have touched the lives of almost half the world's population. The institutes research headquarters has laboratories and training facilities on a 252-hectare experimental farm on the main campus of the University of the Philippines Los Banos about 60 Kilometers south of the Philippines capital, Manila.⁵⁴

Objectives

- (i) To generate and disseminate rice-related knowledge and technology of short-and long-term environmental, social and economic benefit and to help enhance national rice research and extension systems.
- (ii) To improve the well-being of present and future generations of rice farmers and consumers, particularly those with low incomes.

- (iii) To provide educational scholarships for local communities and organize income-generating training activities and to arrange other community projects that will help improve living conditions in the poor communities that neighbor the institute.
- (iv) To help poor rice farmers in developing countries grow more rice on less land using less water, less labour and fewer chemical inputs.⁵⁵

Research agenda of IRRI

Its research agenda is closely linked to the institutes traditional goals and objectives. Based on this, the guiding principles underlining IRRI's research agenda are:

- ❖ Poverty alleviation
- ❖ Sustaining natural resources in the face of the growing intensification of rice based systems due to increased population pressure.
- ❖ Fast tracking scientific and technological interventions to address rice production and farmer livelihood issues in developing countries.
- ❖ Facilitating research and development linkages.
- ❖ Reducing transaction costs and overhead expenses in program implementation.⁵⁶

Regarding intellectual property rights (IPR), IRRI intends to pursue an IPR policy that will provide the institutes stakeholders with access to materials and information in order to promote research and the use of

research outputs, while respecting the IPR of others. Because of seed health and quarantine regulations, all requests for germplasm are directed to IRRI's Genetic Resources Centre. Finally, IRRI is being increasingly asked to act as an honest broker or objective evaluator in relation to much of its research - that is, to objectively assess exactly what a new technology may have to offer poor rice farmers. National agricultural research and extension programmes also began working with IRRI to further intensify rice production. Rice germplasm held in trust by IRRI served as the genetic building blocks in the development of most of these varieties.

Almost as important have been IRRI's efforts to preserve traditional varieties so they are not lost forever. From its inception, IRRI has had an international program of genetic conservation involving the multi-plying and storing of seeds of all known varieties for future use by rice scientists worldwide. As a result of these efforts, the International Rice Gene-bank at IRRI, now it is holding in trust for mankind more than 85000 different rice varieties.⁵⁷

IRRI developed the world's first semi-dwarf breeding lines for rice in the mid-1960's, about the same time the International Centre for Maize and Wheat Improvement (CIMMYT) in Mexico developed the first semi-dwarf breeding lines for wheat. The high yields and rapid farmer adoption of the new varieties triggered the Green Revolution, which saw rice production increase dramatically, allowing much of Asia to avoid widespread famine, IRRI employs many hundreds of scientific and

support staff, 95% of whom are Filipinos. More than 50 scientists are recruited internationally, many from China and India.⁵⁸

IRRI's training programmes match its research focus by providing relevant Ph.D thesis, post doctoral research, short term group courses and mid-career training opportunities for national rice scientists. Under the supervision and guidance of IRRI scientists, MS and Ph.D. students, mostly from developing countries, learn traditional and new research approaches to address rice production problems back home. Each year, about 200 trainers also learn new techniques and update their rice research skill.⁵⁹

Rice surpluses and low prices in recent years have given many an impression that the world's food production problems are solved. But population pressure in the rice growing counties is intense: about 80-100 million additional people must be fed each year. Prime rice lands are under pressure and farmers have less water, less labour and less land. As a result, they are being forced to till highly erodible and marginal lands or to migrate to urban areas in search of livelihood, often leading to even more poverty, Asian's population is projected to increase from 1995's 3.4 billion to about 4.8 billion in 2025. Ironically the poorest populations will continue to grow the fastest. In South Asia, the population is projected to increase by 732 million in between 1995-2025.⁶⁰

Demand for rice during the next 25 years is expected to increase by 65% in the Philippines, 51% in Bangladesh, 46% in India, 45% in Vietnam and 38% in Indonesia. In one generation for example, the Philippines' population will grow from today's 75 million to 115 million.

Based on this, by 2025, rice yields must increase to 8.0 tons per hectare in irrigated areas and to 3.8 tons in rain fed areas, to meet the growing demand. Yield now is 5.0 and 1.9 tons per hectare, respectively. IRRI and its partners in the rice world must also tackle the adverse effects of intensive rice cultivation on natural resources and the environment.⁶¹

There is a long history of Bangladesh - IRRI collaboration. IRRI began working with Bangladesh in 1966 when the government of what was then East Pakistan emphasized rice research within the cereals section of the Agricultural Research Laboratory in Tejgoan, Dhaka. The collaborative research programmes on rice in IRRI began with the supports of the Ford Foundation. In 1967, IR8, the first widely distributed semi-dwarf variety, was introduced into the country.⁶²

Since its establishment in 1970, the Bangladesh Rice Research Institute (BRRI) and IRRI have worked closely. The two institutes launched the Rice Research and Training Project in December 1975 with funds from the Ford Foundation, the Australian Agency for International Development (formerly AIDAB), and the Canadian International Development Agency (CIDA). In 1981, the United States Agency for International Development (USAID) provided support for the project.

The primary objectives of the Rice Research and Training Project are: (i) to increase rice production and make Bangladesh self-sufficient by developing improved varieties suited to local environments. (ii) to develop technically and economically sound rice production technologies and test these in farmer's fields and (iii) to strengthen the country's rice

research capability through short and long-term training of Bangladeshi scientists.

The second phase of the project ran from 1981 to 1987. A third phase supported by USAID, CIDA and IRRI, began in 1988 and ended in mid-1993. In addition, the International Development Research Centre (IDRC) of Canada, for example has provided funds for cropping systems research. The Asian Development Bank (ADB) supported the demonstration of appropriate technologies and research on integrated pest management (IPM) and is presently supporting research on rainfed rice. Asian Development Bank (ADB) also supported research on the rice wheat system. The Rockefeller Foundation has funded irrigation water management studies and recently supported work on the prioritization of rice research issues.⁶³

The most recent development in major donor-supported collaborative undertaking in Bangladesh is the Poverty Elimination through Rice Research Assistance (PETRA) project which started in 1999 with financial assistance from the Department for International Development (DFID) of the United Kingdom. PETRA is being implemented by IRRI under a contract with GoB, with BRRI as the grain partner but involving many institutions outside the public sector.

The NGOs play a critical partnership role in implementing the project. The project conducts research on crucial demand – driven issues of rice production systems that will benefit the rural poor. A special feature of PETRA is that it provides for scientific collaboration with advanced institutions outside of Bangladesh in critically important

research areas for which locally available expertise is inadequate. IRRI has Memorandum of understanding (MOU) with BRRI to foster technical cooperation in research and training on rice and rice- based farming systems. It has separate MOUs with the Bangladesh Agricultural University and Bangabandhu Sheikh Mujibur Rahman Agricultural University for cooperation in research and training. Working partnerships have been developed and are currently in force with major NGOs such as CARE Bangladesh, Grameen Krishi Foundation, BRAC, PROSHIKA and with public sector institutes such as Dhaka University, BARD, RDA and BIDS.⁶⁴ The present collaboration between IRRI and BRRI is one of partnership and co-operation. BRRI scientists take major responsibilities in conducting research that are mutually agreed upon and jointly planned. The current areas of research collaboration include the following:

- ❖ Rice germ-plasm evaluation
- ❖ Yield-gap analysis
- ❖ Technologies for enhancing productivity of rain fed low lands
- ❖ Evaluation of emerging and available new technologies in flood-prone areas
- ❖ Improving nutrient and water management in rice-wheat systems
- ❖ GIS-based poverty mapping in Bangladesh
- ❖ Rice seed health evaluation and improvement
- ❖ Development of salt-tolerant rice varieties for coastal areas
- ❖ Enhancing of new technologies for the farmers
- ❖ Hybrid rice development and
- ❖ Rice research priorities in different agro-ecological zones

In March 2000, the Government of Bangladesh presented to IRRI a plaque of appreciation citing the positive role that IRRI has played in improving the scientific capacity of BRRI during the past three decades. The plaque also expressed GoB's appreciation of the partnership and synergistic role of IRRI with BRRI in continued research planning, sharing of germ-plasm and sustaining natural resources toward improved food security and poverty alleviation in Bangladesh.⁶⁵

IRRI and human resource development

Well-trained human resource is at the core of success in research. IRRI continues to play an important role in the technical capacity building of rice scientists of BRRI and other partners in Bangladesh. Also, Bangladeshi scientists participate in major IRRI-organized conferences/workshops and training activities. Through the Training Centre, IRRI conducts human development programmes in the form of graduate degree programmes, non-degree short courses and special on the job programmes. The post-doctoral fellowship or project scientist programme serves the dual purpose of specialized training of the participants and at the same time provides them opportunity for scientific contribution in IRRI's research. Since 1965, the BRRI – IRRI Rice Research and Training Project supported the graduate studies of 150 Bangladeshi scientists most of whom were from BRRI and conducted their thesis research at IRRI. Another 508 Bangladeshi scientists have received short-term training at IRRI during this period.⁶⁶

Table 4.1: Bangladeshi participants in IRRI's human resource development programme

Serial No.	Category	Participants
01.	Ph.D degree scholars	70
02.	M.S. degree scholars	80
03.	Short-term training participants	508
04.	Post-doctoral fellows on project scientists	30
Total		688

Some on going project titles are given below which will be completed within the year 2005.

1. Ecology and management of Rice Hispa in Bangladesh.
2. Rice sheath Blight complex caused by *Rhizoctonia* Species: Pathogen epidemiology and management strategies.
3. Food and nutrition security and micro-nutrients availability in rice-based diets.
4. Management of weedy rice in Asia.
5. Population improvement programme in drought prone RLR ecosystem.
6. Survey on resource management in coastal areas in collaboration with BRRI.
7. Development of Hybrid rice in Asia.
8. Pest and natural enemy interaction in low input rice cropping systems.⁶⁷

Future outlook

To maintain self-sufficiency in rice, Bangladesh will have to continue to increase rice production by raising yields at a rate that is at least equal to population growth rate until the demand for rice is stabilized. Although population growth rate decreased to about 1.7% in recent years, it is not expected to stabilize within the next 25-30 years. Meeting the challenge of increasing rice production will be increasingly difficult through the years as areas for rice production will continuously decrease to meet the growing demand for some high-value crops and for urban and industrial development. Increasing irrigation coverage to the fullest ecologically sustainable level should form a major cornerstone of a strategy for higher rice production.⁶⁸ Development of more high-yielding varieties with different maturity periods and plant height combinations that are suitable not only for flood-free areas but also for shallow-flooded rice lands, will be required. The daunting challenge of meeting Bangladesh's future rice needs will demand greater collaboration among the members of the rice research community than in the past. Collaboration will be needed for planning and implementing strategic research and for technology transfer across national boundaries. IRRI has been committed to continue playing a major role in Bangladesh in this regard.⁶⁹ IRRI only provides funds for the educational and other development facilities for BRRI scientists. As a result, only BRRI scientists are getting opportunities to take higher education, short-term training and etc.

4.9 Agricultural Information System of SAARC Agricultural Information Centre (SAIC)

The problems and prospects of agriculture and the ecology of the SAARC countries are more or less the same. The SAARC Technical Committee on Agriculture (TCA) underscored the need for a regional information system effective for promotion of cooperation in the field of agriculture among the member countries and proposed to the SAARC standing committee for establishment of the SAIC in Bangladesh. The Council of Ministers in its First Session, held in Dhaka on 12-13 August 1986, accepted the recommendations of the standing committee and declared in the Joint Communique issued at the conclusion of the first session that SAIC would be established in Bangladesh. The SAARC Agricultural Information Centre (SAIC), started functioning in Dhaka in January 1989. Its main objective is sharing information mutually for the advancement of agriculture, livestock, fisheries, forestry and allied disciplines.⁷⁰

Objectives

The objectives of SAIC are as follows:

- i) To establish regional information network on agriculture and allied disciplines.
- ii) To identify agricultural document and pertinent literature.
- iii) To identify user-specific formats for information storage and dissemination.
- iv) To compile directories, bibliographies etc. of regional importance.

- v) To produce and collect audio-visual media products (microfilms, microfiche, video-films etc.)
- vi) To render SDI and current awareness services.
- vii) To organize training on information and communication sciences.
- viii) To establish linkages with international information networks like AGRIS, CARIS, CABI, etc.⁷¹

Functions

The functions of SAIC are:

- a) To collect information on current agricultural literature, ongoing research and development projects, education and training opportunities and resource persons in various fields of agriculture through the member countries focal points in the network.
- b) To select, analyze and process regional agricultural documents useful to regional users.
- c) To provide access to these documents for users of the region.
- d) To produce bibliographies, directories etc. of regional importance.
- e) To provide SDI services, copies of documents, microfiche of non-conventional literature generated in the region.
- f) To organize and provide training on information and communication sciences.
- g) To function as the regional centres of South Asia and have access to other regional and international systems.⁷²

Governing Board

A governing board (GB) composed of eminent information personalities from each Member Country formulates policy matters, approves projects, recommends budget estimates, monitors and evaluates administrative and overall activities of SAIC. The Board is headed by a chairman nominated for a two-year term from member countries by alphabetical rotation. Decisions taken by the Governing Board have to be approved by the SAARC standing and the SAARC Council of Ministers.⁷³

Organization and Activities of SAIC

The various activities of the SAIC are assigned to four separate yet complementary divisions: Publication, Information, Computer, Library and Reprography. Each division is headed by a professional who is responsible for the implementation of activities in his or her area. At the same time, a consultative relationship among the divisional heads ensures that activities requiring cross-divisional cooperation are properly executed. The SAIC director plays an active role in the overall coordination of divisional efforts.

The centre actively collects, compiles, packages and disseminates pertinent agricultural information to SAIC clientele in SAARC member countries. In support of this, the centre develops and maintains a wide range of databases covering all fields of agriculture. The centre has access to international agricultural databases, applying appropriate information in a regional perspective.⁷⁴

Completed Programmes

From 1990 onward, SAIC undertook its maiden programmes, some of which have been completed successfully. These are: Directory of Agricultural Institutions in SAARC countries, Directory of Agricultural Scientists and Technologists of SAARC countries, Directory of Agricultural periodicals of the SAARC countries, Bibliography on Agroforestry in SAARC countries, database on Potato, Database on fish diseases in the SAARC countries and Database on Post-harvest Technology in SAARC countries.⁷⁵

Ongoing Programmes

The ongoing programmes include SAIC Newsletter, Selective Dissemination of Information (SDI), Preparation and Distribution of Bibliographies, Acquisition of Books, Journals, Annual Reports, etc. produced in the SAARC countries. Directory of on going research projects in SAARC member countries, improved farm implements currently used in the SAARC countries, Microfiching of non-conventional Agricultural Information Materials, Indexing of Newspaper Clippings and articles, Audiovisual materials on success stories in Agriculture. Directory of training programmes in SAARC countries, Periodical services, Agricultural Yearbook of SAARC member countries, Translation of Information for users at the grass-root level, Database of Technologies currently in Practice at different Agro-ecological Regions of SAARC Member countries, Agricultural Research and Extension Systems in SAARC countries and study of Agricultural Information Systems and Services in SAARC countries.⁷⁶

SAARC Agricultural Information Centre (SAIC) was established to share information mutually for the advancement of agriculture, livestock, fisheries, forestry and allied disciplines. But SAIC is unable to establish regional information network on agriculture in the SAARC countries. It organized some seminars, workshops and symposiums, and published some directories regarding agricultural scientists and agricultural institutions in the SAARC countries. It has not been working to its objectives. Due to political crisis in the SAARC countries, SAIC has not been working properly. For this reason, the member countries of SAARC should take initiative so that SAIC can work in a proper manner. In the above we find that huge amount of fundamental information is being constantly generated for the development of agriculture and related fields. All these information are essential for our scientists and researchers to meet their information needs. The above international agricultural systems and services can help our scientists and researchers with valuable information for development of agriculture in Bangladesh. There should be regular supply of information from these international agricultural organizations to our agricultural scientists and researchers to meet their information needs which can not be met by our agricultural information systems and services.

References

1. Khanna, J.K. *Handbook of Library Information Systems and Services: a study of networks in India, U.K. & U.S.A.* New Delhi: Beacon, 1996, P 2.
2. Khan, H.A. and Ijari, S.R (edited). *Current Problems and Trends in Library and Information Services.* New Delhi: IBC, 1990, P 251.
3. *Ibid*, P 321.
4. Food and Agriculture Organization (FAO). *FAO in Bangladesh: an overview.* Dhaka: FAO, 1997, P 1.
5. Food and Agriculture Organization (FAO). *Bangladesh and the UN: Partnership in Progress.* Dhaka: FAO, 1997, P 8.
6. *Ibid*, P 1.
7. *Ibid*, P 1.
8. *Ibid*, P 2.
9. *Ibid*, P 2.
10. Habibullah, S.M. *The Diary of Bangladesher.* 49th edn. Dhaka: Globe Library, 1999, P 25.
11. *See ref. 3*, P 3.
12. *Ibid*, P 3.
13. *Ibid*, P 3.
14. *Ibid*, P 4.
15. Food and Agriculture Organization (FAO). *Bangladesh and the UN: Partnership in Progress.* Dhaka: FAO, 1997, P 9.

16. Gupta, B.M. et. al. (edited). *Handbook of Libraries, Archives and Information Centers in India*. Vol.6, New Delhi: IRC, 1988, P 21.
17. Prasher, R.G. *Managing University Libraries*. New Delhi: Today and Tomorrow Publishers, 1991, P 15.
18. Khanna, J.K. *Handbook of Library Information Systems and Services: a study of networks in India, U.K. & U.S.A.* New Delhi: Beacon, 1996, PP 201-207.
19. Agarwal, S.N. and others (ed.). *Perspectives in Library and Information Science*. Vol.1. Lucknow: Print house, 1982, P 212.
20. *Ibid*, P 13.
21. See reference 13, *Ibid*, P 22.
22. See reference 15, *Ibid*, PP 102-103.
23. Khanna, J.K. *Handbook of Library Information Systems and Services: a study of networks in India, U.K. & U.S.A.* New Delhi: Beacon, 1996, P 205.
24. Fazley Rab, Syed. *The Changing Frontiers of Library and Information Science: concepts, models and applications*. New Delhi: Commonwealth, 1994, P 213.
25. *Ibid*, P 214-15.
26. See reference 1, *Ibid*, P 312.
27. Fazley Rab, Syed. *Ibid*, P 215.
28. *Ibid*, P 215.
29. Khanna, J.K. *Handbook of Library Information Systems & Services: a study of network in India, U.K. & U.S.A.* New Delhi: Beacon, 1996, P 119.

30. Agarwal, S.N. and Others (edited). *Perspectives in Library and Information Science*. Vol.1. Lucknow: Print House, 1982, P 22.
31. *Ibid*, P 221.
32. Fazley Rab, Syed. *The Changing Frontiers of Library and Information Science: concepts, models and applications*. New Delhi: Commonwealth, 1994, P 211.
33. *Ibid*, P 312.
34. *Ibid*, P 313.
35. Sison, J.C. *Regional Cooperation in Agricultural Information in Asia: The role of AIBA*. Papers included in Handbook of Libraries, Archives and Information Centres in India. B.M. Gupta et. al (ed.). New Delhi: IIP, 1987, P 9.
36. Gupta, B.M. et. al. (edited). *Handbook of Libraries, Archives and Information Centers in India*. New Delhi: IIP, 1987, P 9-10.
37. *Ibid*, P 12-13.
38. Fazley Rab, Syed. *Ibid*, P 218.
39. Gupta, B.M. et. al. (edited). *Handbook of Libraries, Archives and Information Centers in India*. New Delhi: IRC, 1988, P 217.
40. *Ibid*, Fazley Rab, Syed /PP 229-230.
41. See Ref. No. 15 *Ibid*, PP 125-129.
42. *Encyclopedia of Britannica*. Vol. 5, 2000. P 165.
43. *Ibid*, P 167.
44. Khan, H.A. and Ijari, S.R (edited). *Current Problems and Trends in Library and Information Services*. New Delhi: IBC, 1990, P 322.

45. *Ibid*, Fazley Rab, Syed/PP 232-234.
46. *Ibid*, P 235.
47. Bangladesh Agricultural Research Council. *Annual Reports of 1998-99*. BARC: Dhaka, 2000, P 36.
48. Syed Fazley Rab. *op. cit.* P 234.
49. Veeranjanyulu, K. *A Study on Agricultural Information Systems in Andra Pradesh, India (Unpublished Ph.D Thesis)*. S.V. University Tirupati: LIS Dept., 1997. P 53.
50. *Ibid*, P 54-55.
51. *Ibid*, P 54.
52. ICRISAT. *Partnerships in Research for Development*. Pathancheru: ICRISAT, 1998, P 17.
53. Bangladesh Agricultural Research Council. *Annual Reports of 1999-2000*. BARC: Dhaka, 2002, P 31.
54. International Rice Research Institute (IRRI). *Brochure of 1999*. LosBanos: IRRI, 1999, P 1.
55. *Ibid*, P 2.
56. *Ibid*, P 3.
57. *Ibid*, P 9.
58. *Ibid*, P 8.
59. IRRI. *Facts about the International Rice Research Institute*. Manila: IRRI, 1998, P 2.
60. International Rice Research Institute (IRRI). *Brochure of 2002*. Manila: IRRI, 2002, P 5.

61. *Ibid, op.cit.* P 5.
62. IRRI. *Facts about cooperation: Bangladesh and IRRI.* Dhaka: IRRI, 2000, P 3.
63. *Ibid,* P 4.
64. *Ibid,* P 6.
65. *Ibid, op.cit.* P 6.
66. *Ibid,* P 7.
67. *Official Records of IRRI* Dhaka Office, 2001.
68. IRRI. *Facts about cooperation: Bangladesh and IRRI.* Dhaka: IRRI, 2000, P 8.
69. *Ibid,* P 9.
70. *SAIC Brochure,* 1989, P 1.
71. *Ibid,* P 2.
72. Abdur Nur, A.K.M. *The SAARC Agricultural Information Centre: The first agricultural information centre in the SAARC countries.* Papers published in the Eastern Librarian, Vol. 19(1/2), 1994, P 28-29.
73. SAARC Agricultural Information Centre (SAIC). *Introducing SAIC.* Dhaka: SAIC, 1996, P 13.
74. *Ibid,* P 14.
75. *Ibid,* P 15.
76. *Ibid,* P 16.

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Chapter-5

5.0 Introduction

We live in an age where information has become an essential ingredient of all human activities. It is a medium of communication of ideas and resources for research and development necessary for the sustenance and promotion of the progress and prosperity. Advancement of science and technology has given rise to a proliferation of scientific literature and information and the same held good for Agricultural science and technology.¹

The ever growing population, depletion of natural resources and the constraints in food production have become major problems in many of the developing countries specially Bangladesh. These problems can be overcome by means of developing sustainable agriculture, leading to adoption of new agro-technologies by farmers in rural areas with the help of agricultural scientists and researchers. Information is now widely accepted as a valuable and un-exhaustible commodity and as an important resource, which can be acquired, stored, processed, synthesized and properly monitored to achieve the set goals in the realms of accelerated agricultural development.² The smooth communication of agricultural information in the society like Bangladesh is indispensable for the survival and development of its people.

5.1 Information: Meaning and definition

It is not easy to answer the question “What is information?” because the divergent opinions about it can be related to different conceptions of the phenomena. The term information gradually became complex as specialists and scholars interpreted it in different ways in different

contexts. Information is one of the fundamental resources indispensable for development in all the vital spheres of the life of the civilized society. Information' as a term has been a "derivation from two Latin words 'formatio' and 'forma' meaning giving shape to something and forming a pattern respectively.³

An eminent information scientist named G.B. Davis⁴ gave his opinion regarding information in the following way. Information is "data that has been processed into a form that is meaningful to recipient and is of real perceived value in current as prospective decisions." He further observed that information is processed data and it has a meaning to its recipient.

E. Ploman has given his ideas regarding information in a different way. According to him, Information is "fundamental of all resources in the sense that all other resources depend on information and knowledge; it is the perception of and evaluation of resources which makes their use possible."⁵ Thus according to him information is fundamental of all resources and everything depends on it and it helps evaluate resources.

According to ALA Encyclopedia of Library and Information Services, Information is a "property of data resulting from or produced by process that produced the data. The process may be simply data transmission (in which case the definition and measures used in communication theory are applicable), it may be data selection, it may be data organization, it may be data analysis"⁶ According to ALA encyclopedia of Library and Information Services, information is property of data which may be produced from processed data. This process may be simply data transmission, data selection, data organization and data

analysis. This definition is very limited in meaning and scope. Because, it is not limited to transmission, selection and organization.

J. Martin defined information as "the staple diet of the readers of a newspapers and mass audiences of the broadcasting media and the cinema. It is directed ceaselessly at those millions of consumers so relentlessly targeted by the advertising industry and is dispensed around the clock from any number of inquiry desks at railway stations and airports, libraries and similar public or private service institution".⁷ According to J Martin information is the staple diet of the readers of a newspaper and mass audiences of the broad casting media and the cinema. This definition is also very limited in scope. This definition only depicts information in the light of communication theory.

According to UNISIST⁸ Information is the "symbolic elements used for communicating scientific and technical knowledge irrespective of their nature (numerical, textual etc.) material carriers, form of presentation etc. It refers to both substance and contents of documents and to physical existence. The term is also used to designate both the message (substance and form) and its communication (act). The UNISIST-II gives a restricted meaning to information in the context of science, technology and societal development."⁹ Agricultural information is actually the activated knowledge of agriculture. Prof. Hamid stated that in Medieval Latin, 'Informatio' had the sense of image, instruction and formation. In classic French the word 'Information' was used in the singular term 'Une information' to mean processing and collecting facts in legal investigation. He further stated that in common and everyday usage, "information is associated with a human situation, with a communication medium... Thus

it is said that information is good and more information is better, that information is power...”¹⁰

5.2 Taxonomy of Information

The use of information in society is so “complex and myriad in nature that there cannot be a single category of information. Even if there is certain category, it is however, difficult to differentiate without any basis. In fact, information can be categorized using different characteristics that depend upon the purpose of such grouping. According to Kablitz information can be of three kinds:

- i. Semantic information (as a message)
- ii. Semantic information (as a process)
- iii. Documented information.

While, semantic information as a message is used for transmission of knowledge, the same as a process is used to store and disseminate on a permanent basis. On the other hand, documented information having the characteristics of analytical and synthetic nature is full of facts, statistics or statements supported by evidences.”¹¹

Bhattacharya has divided information under two broad groups:

- (a) Discursive information
- (b) Non-discursive information

Discursive information is the message conveyed by a systematised body of ideas or its accepted or acceptable substitutes, having one or more of the following attributes:

- i. Ranging over a wide field

- ii. Proceeding logically or coherently from topic to topic and
- iii. Reasoning from premises to conclusion or proceeding from particular to general utilizing analytical reasoning or proceeding from logical abstraction to logical interaction.

Non-discursive information, on the other hand, is a unit of facts conveyed by a systematised body or its accepted or acceptable substitutes. Non-discursive information is subdivided into two types: (i) Qualitative and

(ij) Quantitative.¹²

Information can be categorized on the basis of its use and purpose for which it is used. J.H. Shera¹³ has categorized information into six types as under:

- i. Conceptual information
- ii. Empirical information
- iii. Procedural information
- iv. Stimulatory information
- v. Policy information
- vi. Directive information.

He also made an effort to define those types of information. According to him:

(i) The conceptual information relates to ideas, theories and hypothesis about the relationship which exists among the variables in the area of problem.

(ii) Empirical information relates to data and experience of research which may be drawn from oneself or communication from others.

(iii) Procedural information is the data of investigation which is obtained, manipulated and tested, it is essentially methodological and it is derived from scientific attitude.

(iv) Stimulatory information is a type of information which is motivated by oneself or environmentally derived.

(v) That type of information which is focussed on the decision making process is known as policy information.

(vi) Information, which is used for coordination and for enabling effective group activity is grouped under directive information.”¹⁴

Types of information have been judged by Christie from different angles taking into account the following four broad dimensions:

(a) relating to behaviour, (b) organisational penetration; (c) item content; and (d) technological fit.

From behavioural patterns, however, information can be of only two types. They are:

- (a) general, which is more of relating to purpose and
- (b) specific that relates to the psychological mechanism involved.

On the basis of organisational penetration, three fundamental types of information can be identified. These are:

- (i) Material information
- (ii) System information and
- (iii) Product information¹⁵

An organisation requires the above three types of information to produce informative materials, viz. document either in printed or non-printed form. Here it can be ascribed that, the types of information distinguished above are primarily concerned with the organisational effectiveness for production and consumption of documents.

In respect to item content, information can be divided into two types: (a) Data information (b) Programme information. While data information refers to statistical numbers, symbols, etc. that are used in specific purposes, programme information on the other hand, is manipulated to show how former is utilized. The fourth key type under these dimensions, i.e. technological fit, is less significant due to the introduction of electronic system that handles a wider spectrum of information.¹⁶

Agricultural information is that kind of information, which is used in the development of agricultural research, extension and education. Without these types of information no country can prosper in the field of agriculture. According to L.O. Aina,¹⁷ there are four main categories of agricultural information.

- (i) **Technical/Scientific:** This type of agricultural information arises from research and development work aimed at increasing agricultural production by providing high yielding crop varieties, controlling major pests and diseases, developing new methods of crops production and so on.
- (ii) **Commercial:** Farmers, who are involved in export crops also need commercial information to maximize their profits. This includes

information relating to agricultural credits and co-operatives, national prices for export commodities and information on agro-based products.

- (iii) **Social:** This includes information on traditional agricultural practices, local cultures, background information on local communities and availability of labour.
- (iv) **Legal:** Farmers require legislation relating to ownership of and distribution of land, sale of agricultural production and etc. Favourable laws will help them maximize their production.

5.3 Importance of Information: Bangladesh Perspective

Information is an "important resource, valuable input and power for societal development. The present information age is characterized by society, which is conscious of the value of information and its use. The information revolution is the third major force following agricultural and industrial revolutions that is shaping the way of living in the civilized world. It is a fact of significance that a country which is rich in information is rich in economic spheres too."¹⁸ Information is power as it is the basis of all planning, indeed of all activities everywhere and for every body. It has now become the summum-bonum of modernization which, in turn, implies the application of new technologies for advancement in all spheres of human activities.¹⁹

There is no field of human activity where information is not a component. Whether it is research and development, business and industry, government affairs, education and training: the information has to be acquired, processed, stored, retrieved and disseminated for communication.

Indeed the effectiveness of performance in all these spheres of activity depends largely upon the availability of information at the right time in adequate quality and quantity. All human activities result in the creation of information which are mostly communicated through media. It is absolutely necessary for an information system to respond to environmental stimuli and acquire information to meet the requirements of user interests.²⁰

Another significant and important aspect of information is "the general acceptance that there should be free flow and exchange of scientific and technical information without any barriers. Information is viewed as an essential resource for all economic and social change. Information is for use. It is capable of converting natural resources into artifacts and consumable products."²¹

"Information generation, dissemination, transfer and communication take place between people through diverse channels and media, in a variety of contexts and environments. In other words individuals have to operate in an information communication environment of their own".²² Now a days information is seen as a facilitator of change, a disturber of traditional relationships and alignments, and as the future basis of financial, political and societal power. It has been called a commodity, a public good, one of the few things that does not diminish in value in proportion to the number of people who use it. Information is vital to problem solving and decision making.²³

Agriculture is vital resource to Bangladesh as it provides food for the entire population and work for much of the population. Agriculture is the key industry, which controls the base of nation's economy and draws

the attention of a large section of the population. Agricultural outputs dominate the development of our country.²⁴ Everything can not be grown everywhere, because the production of the crops depends on the weather conditions, soil, marketing facilities and potentialities and attacks by pests etc. Natural calamities too have adverse effect on the country's agricultural development. Due to the continuous efforts of the country's farmers and agricultural scientists/ researchers, extension personnel, the industry have reached its present stage of development. A wide gap exists between the technological information generated in the laboratories and the grass-root level users i.e. agricultural workers mainly due to lack of communication, lack of willingness to transfer of needed information to the end users etc. Similar information gap also exists amongst the agricultural scientists/researchers associated with different agricultural research organizations in Bangladesh due to lack of coordination and cooperation. So useful information should be passed on from laboratories to field workers for proper application for wider field-testing and from laboratory to laboratory for a more improved and innovative methodology.²⁵

The published literature on agriculture and allied sciences are scattered over a variety of documents viz., books, journals, newspapers, Govt. publications, conference proceedings and technical/ scientific reports of professional organizations and etc. Thus scattered agricultural information has to be utilised. For this, the above materials should be collected, processed, preserved in the agricultural libraries to disseminate among the scientists and researchers. Moreover, the cluster of the users of the agricultural information consists of heterogeneous mixture of students,

academicians, researchers, extension workers, policy makers, agro-industrialists and also the farming communities.²⁶

The responsibility of the information scientists is to repackage the information from the generating points in order to disseminate the same to the target users and promote its use in a befitting manner for the development of agriculture. Proper supply of agricultural information can play a significant role in every sphere of agricultural sector of the country like Bangladesh.²⁷ Thus there is no doubt that progress in all spheres of agriculture will not come to a grinding halt, if information is collected, sifted, processed and finally disseminated to the end users pin-pointedly, exhaustively, timely, unerringly and economically.

5.4 Information needs of the agricultural scientists and researchers

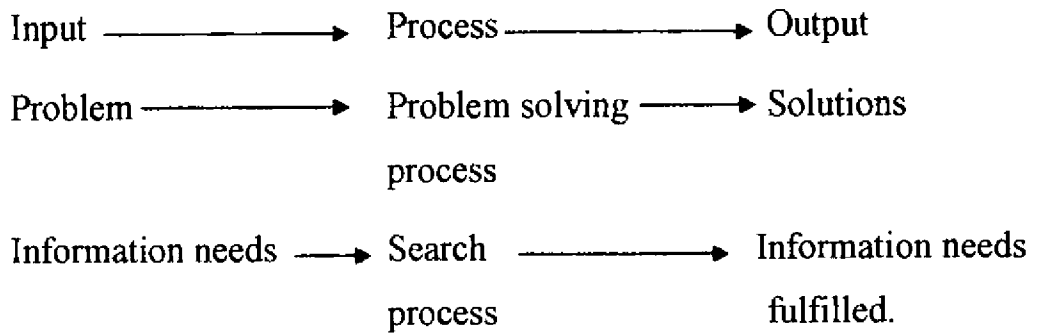
Information ranks “next to the basic human needs: Air, water, food and shelter. Its collections, transfer and use are all pervasive and universal. Information needs of individual researchers and educational institutions in agricultural sector where information is an essential ingredient for development, had not so far been the subject of serious discussion in Bangladesh.”²⁸

The information need (need for information) is a factual situation in which there exists an inseparable inter connection with ‘information’ and ‘need’. Information originates and is generated because there exists a need or an interest. The need for information with specific context is an objective demand of the users. R.L. Derr²⁹ has emphasized two necessary conditions for information need as under:-

- i. The presence of an information purpose

- ii. The information in question, contributes to the achievement of an information purpose.

According to Girja Kumar,³⁰ the information need may be expressed as input-process—output model. The basic components of the system are: (a) Problem (b) Problem solving process and (c) Solution. The problem is analysed to determine information needs. Solution results in resolving of the situation by filling the gap in the knowledge. The model set-forth by him can be illustrated as below:



According to W.J. Paisley³¹ information need is not a psychological state of mind, rather it is an objective need oriented towards particular tasks, problem etc. User information needs has different areas. The inter relationships among the areas are shown by T.D. Wilson³² given in the following figure to the next page:

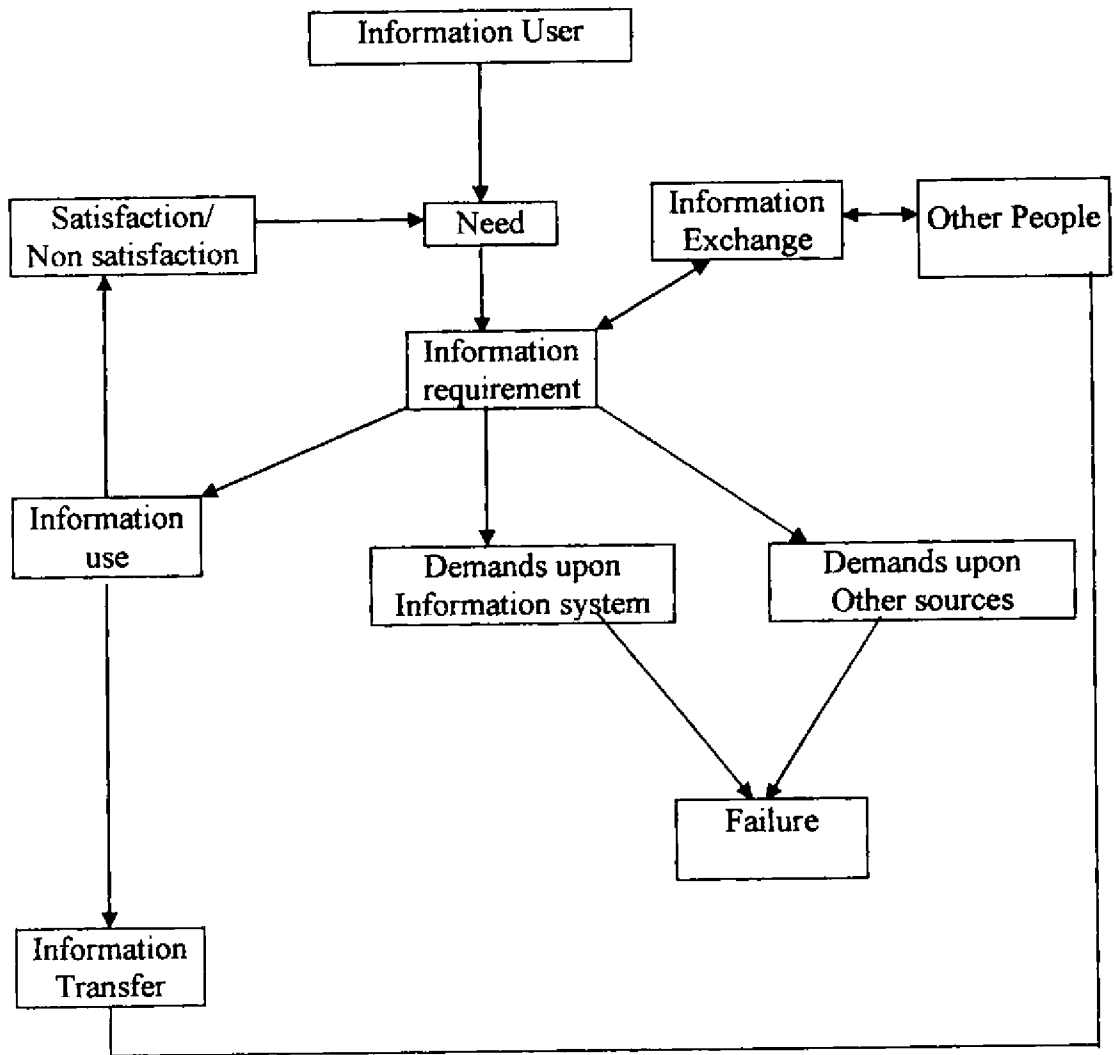


Figure 1: Shows the Inter-relationship among the areas usually covered in users' information needs (Wilson, 1981: 4).

The study of information needs of the users aims to assess the effectiveness of a library in meeting the needs of the users. It also helps in planning to change or alter or extend library services for provision of improved library services to the users.³³

Three forms of need are identified by F.W. Lancaster³⁴ and that distinction between them is essential for understanding present and

possible library action. **First** the unfelt or un-activated need is the most difficult form to evaluate but it is not to be ignored. They are affected by environmental factors that help the development of needs. **Second**, “unexpressed needs; those that people feel or are aware of without using the library as a means to satisfy them i.e. they are not expressed in a library context. **Third**, it has been noted that there are two aspects of users needs; intentional and unintentional. “A corollary of these three forms of need is that there are three areas of effectiveness. **Firstly**, the satisfaction of expressed needs; **Secondly** the promotion and direction of unexpressed needs; and **Thirdly**, taking part in the development of un-activated needs.”³⁵ According to Mr. Pullak information needs may also be “assessed through the user community profile. It provides the community’s socio-economic and political features, its culture and traditions; its leadership and power structure, its economic potential and how its resources are distributed and the nature of its local institutions and the like aspects”.³⁶

In the categories of the users of agricultural information, the active scientists and researchers in research work normally top the list of user groups.³⁷ They are attached to the agricultural universities, colleges and research organisations scattered all over Bangladesh.

The administrators, policy makers, legislators, district agriculture officers, subject matter officers and professional staff of the agriculture related institutions are always in need of information in order to manage the affairs and responsibilities comfortably, efficiently and adequately.³⁸ Teachers use libraries for updating their knowledge and also for improving their professional competence.

The various categories of information needs of the agricultural scientists and researchers may be classified in the following ways:

(a) Ephemeral

(i) Newspapers (ii) Agricultural news and press release (iii) Market reports (iv) Weather reports, forecasts.

(b) Enduring non-scientific

(i) Parliamentary publications, official reports (ii) Publications from agricultural associations (iii) Popular articles, reports, reviews (iv) Advisory publication such as technical news letters, farming notes, bulletins, monograph, agriculture in brief, agriculture at a glance etc.

(c) Enduring scientific primary

(i) Scientific journals, technical notes (ii) Patents, specifications (iii) Theses, dissertations (iv) Research reports bulletin (v) Conference proceedings etc.

(d) Enduring scientific secondary

(i) Text books (ii) Reviews and monographs (iii) Reference books, hand books, manuals etc. (iv) Bibliographies, indices, abstracts.³⁹

The agricultural science has large volume of non-scientific information including popular literature also. Despite the importance of this kind of literature, much of it presents great difficulty to the users wishing to keep informed of the available publications and obtain those relevant to his interest.⁴⁰

5.5 Current status of the agricultural information users

After conducting a survey, Dana L. Roth estimated that the scientists/ researchers “spend on average 25 to 30 percent of their professional time searching for information. But there are also scientists who spend most of their time in research”.⁴¹ Obviously it is desirable that information needs should be studied with a view to improving the library’s role as an information transfer agent. The library, its devices and operations aim to serve the needs and demands of clientele served by it. It is, thus, clear that the librarian must know his users in order to be able to serve them to their satisfaction.⁴²

Different types of users exploit information resources in a library. The term ‘user’ refers to the patrons who come to the library/information centre to use its resources. In designing an agricultural information system, users are identified and classified into various categories. Every library or types of libraries have their users.⁴³ It is necessary to know what type of users use the library/libraries in meeting their information needs. By analyzing the material of the present survey conducted, the researcher identified the current status of the users in the following ways:

- | | |
|-------------------|-------------------------|
| a) Teachers | b) Students |
| c) Researchers | d) Scientists |
| e) Administrators | d) Extension personnel. |

5.6 Analysis of data

This chapter aims at finding out the information needs of the agricultural scientists and researchers in Bangladesh. Agricultural scientists and researchers need information for their research as well as teaching. In order to know their information needs, an attempt was made to analyze the major areas of interest of agricultural scientists and researchers, sources of information, adequacy of information, etc.⁴⁴

Four hundreds (400) set of questionnaires were distributed to the scientists and researchers engaged in various agricultural research organizations. Out of which two hundreds and ninety five (295) questionnaires being filled in, by the respondents were sent back to the researcher. Thus the data subjected to analyze was based on 295 or 73.75% respondents. Analytical techniques adopted, include tabular presentation of data and the proportion in percentages.

Table 5.1 : Respondents by age

Sl. No	Age (Years)	No. of Respondents		Total	%
		Male	Female		
01.	25-35	95	28	123	41.7
02.	36-45	77	16	93	31.5
03.	46-57	72	07	79	26.8
	Total	244	51	295	100.0
		82.7%	17.3%	100%	

Table 5.1 shows the age-wise classification of the respondents. A very large group of respondents (73.2%) is between the age group of 25-45 years. 82.7% respondents are male. Female respondents are 17.3%. Male respondents are more than female respondents. Respondents by age are shown by Fig. 5.1-A.

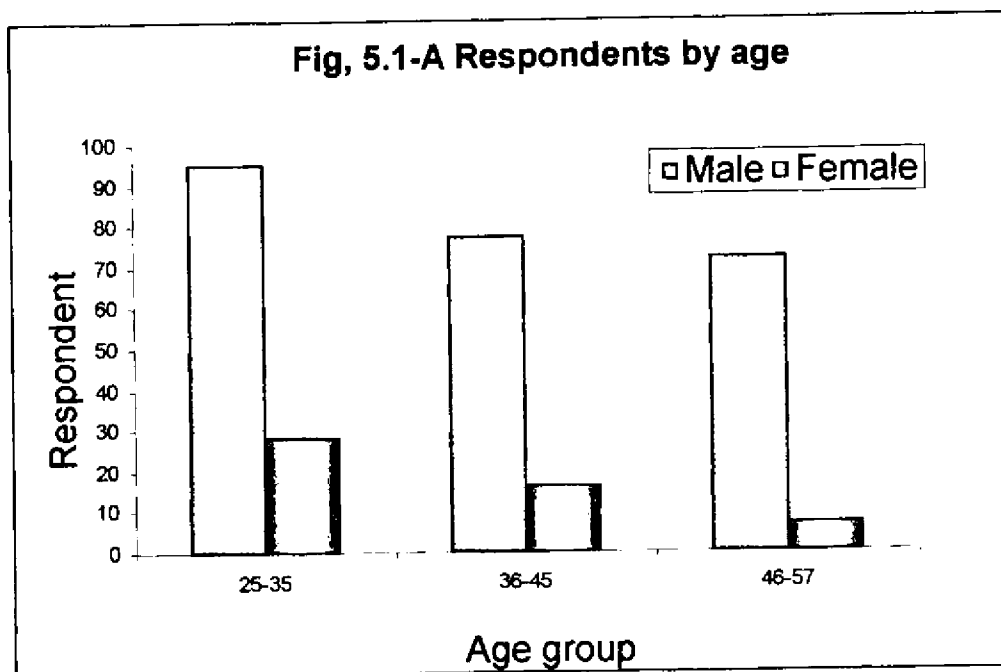


Table 5.2: Respondents by level of education

Sl. No.	Level of education	Number of respondents			Total
		Scientists	Researchers	Teachers	
01	Graduates	15 (11.1)	14 (14.0)	05 (8.3)	29 (11.5)
02	M. Sc. In Agriculture	80 (59.3)	68 (68.0)	38 (63.3)	148 (63.1)
03	Ph. D.	40 (29.6)	18 (18.0)	17 (28.3)	58 (25.4)
Total		135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Table 5.2 reveals that 25.4% of respondents possesses doctorate degree. Only 11.5% respondents have graduation degree. Most of the respondents (63.1%) possesses masters of science degree in agriculture. 28.3% teachers have doctorate degree, only 29.6% scientists and 18% researchers possess Ph.D. degree. Scientists have more doctorate degree as compared to the Teachers and researchers. Majority of respondents are having masters of science degree in Agriculture. Agricultural scientists' and researchers' information needs vary mostly with their level of education. Respondents by level of education are shown in the fig. 5.2-A

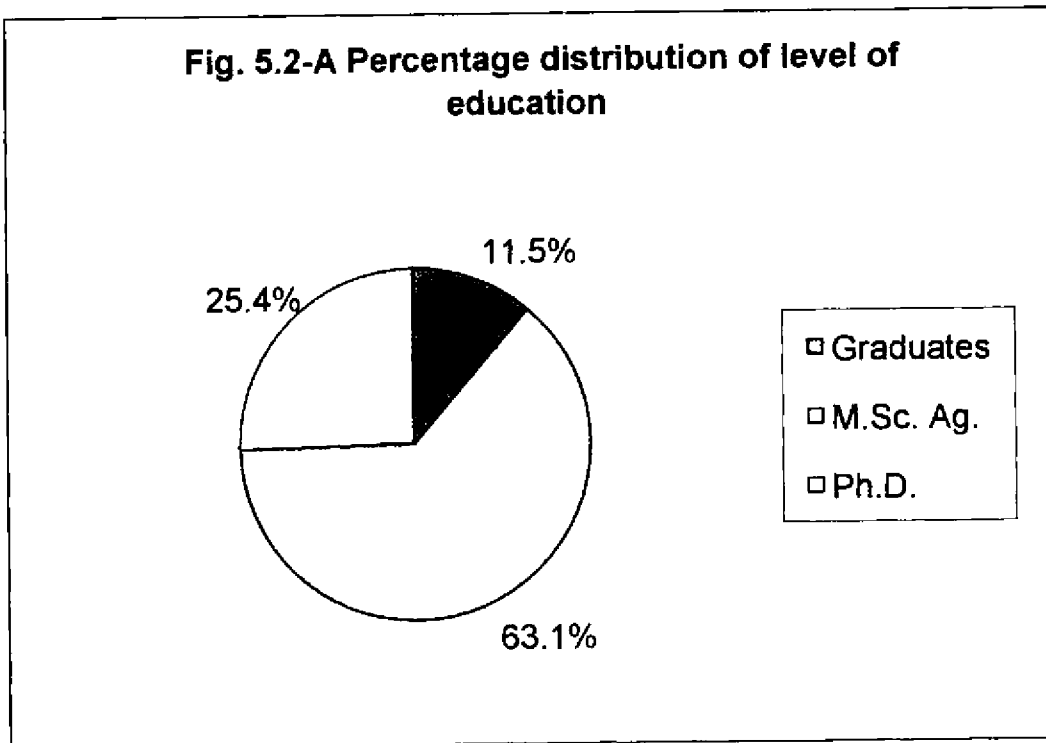


Table 5.4: Respondents by subject of research field

Sl. No.	Specialization	No. of Respondents			Total
		Scientists	Researchers	Teachers	
1.	Agronomy	17	19	08	44
2.	Genetics and plant breeding	18	16	04	38
3.	Soil science and Agri-chemistry	14	09	07	30
4.	Bio-Chemistry	05	01	04	10
5.	Entomology	13	10	06	29
6.	Agricultural economics	04	04	04	12
7.	Agriculture Engineering	08	08	03	19
8.	Plant Physiology	05	04	06	15
9.	Plant Pathology	15	07	04	26
10.	Horticulture	08	03	04	15
11.	Extension education	05	02	03	10
12.	Agricultural statistics	04	03	01	8
13.	Microbiology	07	03	05	15
14.	Forestry	03	05	NA	8
15.	Fisheries	04	05	NA	9
16.	Veterinary	05	NA	01	6
	Total	135	100	60	295

Table 5.4 reveals the details about the subject specialization of the agricultural scientists and researchers in Bangladesh. Out of 295 respondents, 167 respondents are specialized in Agronomy, Genetics & Plant breeding, soil science, entomology and plant pathology. Rest of 295 (128) respondents are experts in other 11 subjects. Therefore it can be said that, most of the respondent's research areas are in Agronomy, Genetics &

plant breeding, soil science, entomology and plant pathology. It shows that major agricultural researches are being done in the aforesaid fields i.e. Agronomy, Genetics and plant breeding, soil science, entomology and plant pathology which have more application in the society.

Table 5.5: Selection of Research Areas by the Respondents.

Sl. No.	Basis of selection	No. of respondents			Total
		Scientists	Researchers	Teachers	
01.	Selection based on thirsted areas in Agriculture	62 (45.9)	44 (44.0)	13 (21.7)	119 (40.3)
02.	Consultation with senior colleagues	33 (24.4)	27 (27.0)	19 (31.7)	79 (26.8)
03.	On researchers own idea	30 (22.2)	22 (22.0)	25 (41.6)	77 (26.1)
04.	Directions by sponsoring agency	10 (7.4)	07 (7.0)	03 (5.0)	20 (6.8)
Total		135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note: Figure in brackets indicate percentages

Table 5.5 Shows the details about respondent's areas of research. 40.3% of the respondents are selecting research topics based on thirst areas of agriculture. 26.8% of the respondents have been taking their research programmes with consultation of senior colleagues. The remaining 32.9% respondents are selecting their research areas by the help of sponsoring agencies and researcher's own idea. It reveals that a large number of the respondents are selecting research areas on the basis of thirst areas in agriculture.

Table 5.6: Respondents by source of research literature

SI No.	Source	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Abstracting and indexing periodicals	75 (55.6)	47 (47.0)	31 (51.7)	153 (51.9)
02.	Colleagues	23 (17.0)	19 (19.0)	12 (20.0)	54 (18.3)
03.	Attending technical programmes	20 (14.8)	23 (23.0)	13 (21.7)	56 (19.0)
04.	Attending conferences	17 (12.6)	11 (11.0)	04 (6.6)	32 (10.8)
05.	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note: Figure in Brackets indicates percentages.

Table 5.6 reveals the source of research literature. Majority of the respondents (51.9%) have collected sources of research literature by scanning abstracting and indexing periodicals. The teachers are having the main source from abstracting and indexing periodicals. 18.3% respondents meet up their information needs by the help of colleagues. 14.8% scientists and 23% researchers collect their research literature by attending technical programmes. Another 10.8% respondents meet up their information needs by attending conferences. It may be said from the table that the respondents are dependent for their research topics on scanning abstracting and indexing periodicals.

Table 5.7: Respondents by opinion regarding Adequacy of Books in the agricultural libraries of Bangladesh

Sl No.	Opinion	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Inadequate	95 (70.4)	72 (72.0)	36 (60.0)	203 (68.8)
02.	Adequate	14 (10.4)	11 (11.0)	10 (16.7)	35 (11.9)
03.	Fairly adequate	26 (19.3)	17 (17.0)	14 (23.3)	57 (19.3)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note : Figures in Brackets indicate percentages.

Table 5.7 reveals that 16.7% teachers 10.4% scientists and 11% Researchers express their opinion that books in the agricultural libraries of Bangladesh are adequate. 60% teachers, 70.4% scientists and 72% researchers express the views that books are inadequate. 23.3% teachers, 19.3% scientists and 17.0% researchers express their views that books available in the agricultural libraries are fairly adequate. The majority (68.8%) of the respondents express their opinion that books in the agricultural libraries is inadequate. The respondents' opinion regarding adequacy of books are mentioned by the fig. 5.7-A.

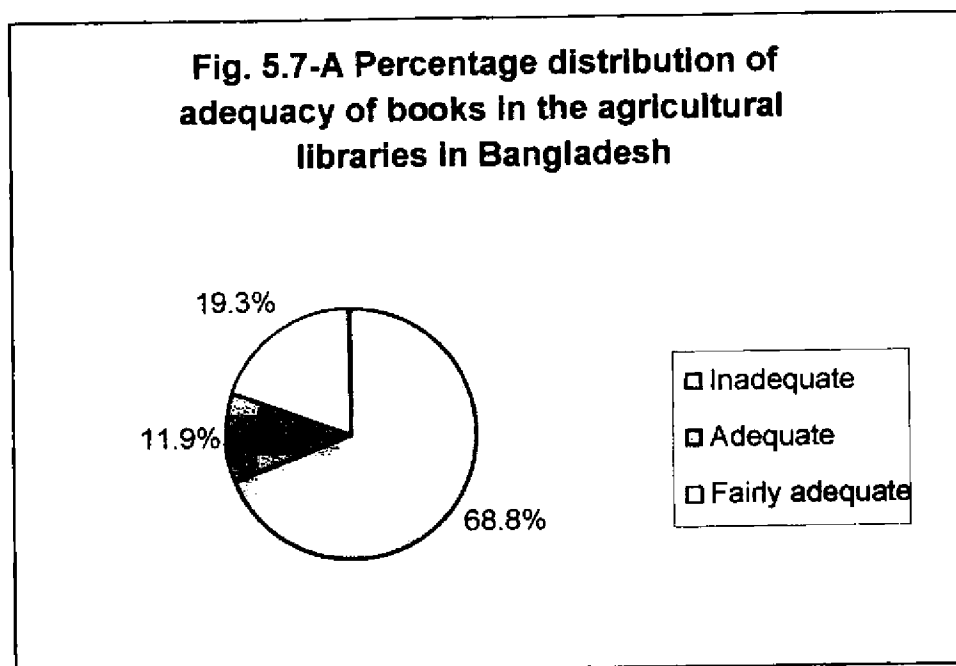


Table 5.8: Respondents by opinion regarding adequacy of periodicals in the library.

Sl No.	Opinion	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Inadequate	100 (74.1)	76 (76.0)	32 (53.3)	208 (70.5)
02.	Adequate	14 (10.4)	08 (8.0)	12 (20.0)	34 (11.5)
03.	Fairly adequate	21 (15.6)	16 (16.0)	16 (26.7)	53 (18.0)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note: Figures in brackets indicate percentages.

It may be mentioned from table 5.8 that 70.5% respondents have viewed that the periodical collection is inadequate in the agricultural libraries of Bangladesh. Only 11.5% respondents have expressed that the periodical collection is adequate and 18.0% fairly adequate. It may be mentioned from the table 5.8 that periodical collections in the agricultural libraries in Bangladesh are inadequate. The values are presented in the fig 5.8.A.

Fig. 5.8-A Percentage distribution of adequacy of periodicals in the agricultural libraries in Bangladesh

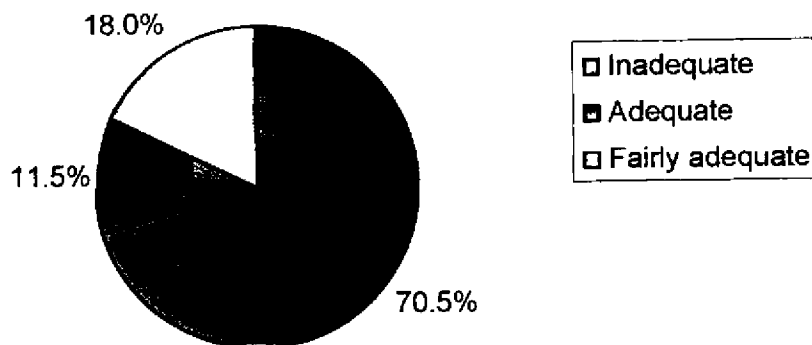


Table 5.9: Respondents by opinions in what extent the library is meeting their information requirements.

Sl. No.	Opinion	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	0-20%	21 (15.6)	14 (14.0)	12 (20.0)	47 (15.9)
02.	20-40%	37 (27.4)	35 (35.0)	20 (33.3)	92 (31.2)
03.	40-60%	61 (45.2)	33 (33.0)	15 (25.0)	109 (36.9)
04.	60-80%	15 (11.1)	14 (14.0)	08 (13.3)	37 (12.5)
	80-100%	01 (0.7)	04 (4.0)	05 (8.3)	10 (3.4)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note: Figures in brackets indicate percentages.

Table-5.9 Shows the respondents opinions regarding in what extent the library is meeting their information needs. The highest number of respondents (36.9%) have expressed that the library is meeting their information needs from 40% - 60%. Only 8.3% teachers, 0.7% scientists and 4% researchers expressed that the libraries are meeting their 80- 100% requirements. 31.2% respondents have expressed that libraries are meeting their 20-40% information needs. Only 12.5% respondents think that libraries are meeting their 60% - 80% information needs and 15.9% respondents have expressed their opinions that the libraries are helping in meeting their 20% information needs. The above analysis reveals that the Agricultural libraries of Bangladesh are not meeting fully the information needs of the agricultural scientists and researchers of the country.

Table 5.10: Respondents are using other libraries for research.

Sl. No.	Opinion	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Yes	96 (71.1)	68 (68.0)	38 (63.3)	202 (68.5)
02.	No	39 (28.9)	32 (32.0)	22 (36.7)	93 (31.5)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note : Figures in brackets indicate percentages.

Table 5.10 reveals that 68.5% of the respondents are taking help from other libraries for meeting their information needs. The rest of 31.5% of the respondents are not using other libraries. On the analysis of the above it is clear that majority of respondents are partly depending on other libraries for agricultural information.

It may not be possible to keep all the information materials in a single library due to lack of sufficient funds. Hence, the respondents have to depend on other libraries for their occasional reference of the agricultural information sources.

Table 5.11: Respondents' interest to get materials from other libraries

Sl No.	Name of Ingredients	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Current periodicals	66 (48.9)	45 (45.0)	25 (41.7)	136 (46.1)
02.	Good study environment and physical facility	33 (24.4)	29 (29.0)	20 (33.3)	82 (27.8)
03.	Adequate reference books	23 (17.0)	19 (19.0)	04 (6.7)	46 (15.6)
04.	Prompt services	13 (9.6)	07 (7.0)	11 (18.3)	31 (10.5)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Table 5.11 reveals that 46.1% (66+45+25=136) respondents is motivated to be member of other libraries for reading current periodicals. (40.7%) teachers, 45.0% researchers and 48.9% scientists are motivated to be member of other libraries for current periodicals. The 2nd majority of respondents (82) are motivated to be member of other libraries due to their good study environment and physical facilities. It is clear from the analysis that majority of respondents are motivated to consult other libraries for current periodicals.

Table 5.12: Respondent's opinion regarding scanning of abstracting and indexing periodicals

Sl. No.	Reply	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Yes	90 (66.7)	60 (60.0)	42 (70.0)	192 (65.1)
02.	No	45 (33.3)	40 (40.0)	18 (30.0)	103 (34.9)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note: Figures in Brackets indicate percentages.

Table 5.12 shows the details about respondents' scanning of the abstracting and indexing periodicals in order to know the latest articles published in various journals. Majority (65.1%) of respondents are scanning the abstracting and indexing periodicals. 34.9% respondents are not scanning abstracting and indexing periodicals. It reveals that majority of scientists and researchers are scanning the abstracting and indexing periodicals in order to know the latest articles in their subject.

Table 5.13: Respondents by current awareness

Sl No.	Opinion	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Yes	86 (63.7)	48 (48.0)	32 (53.3)	166 (56.3)
02.	No	49 (36.3)	52 (52.0)	28 (46.7)	129 (43.7)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note: Figures in brackets indicate percentages.

Table 5.13 indicates respondents' opinion regarding current awareness. 56.3% of respondents are able to keep pace with latest literature and 43.7% of respondents are not able to have access to current information. 53.3% teachers are able to keep themselves aware of the latest literature in their field. 63.7% scientists and 48.0% researchers are able to keep themselves informed with up-to-date literature. Hence it can be concluded that the knowledge about the latest literature in respective fields depends on the type of respondents.

Table 5.14: Respondents by source of information about current publications

SI No.	Source	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Through friends	22 (16.3)	18 (18.0)	13 (21.7)	53 (18.0)
02.	Through library staff	41 (30.4)	22 (22.0)	10 (16.7)	73 (24.7)
03.	Through experienced professionals	49 (36.3)	36 (36.0)	17 (28.3)	102 (34.6)
04.	By attending technical meetings	23 (17.0)	24 (24.0)	20 (33.3)	67 (22.7)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note : Figures in brackets indicate percentages.

The table 5.14 reveals 18.0% of respondents come to know information about current publications through friends. The highest number (34.6%) of respondents come to know about current information through experienced professionals, 22.7% of respondents by attending technical meetings and 24.7% respondents come to know about current publications by the help of library staff.

The above analysis shows that the respondents are getting required current information mainly through library staff and experienced professionals. The scientists and researchers are not able to know the current information due to lack of good library facilities in agricultural research institutes in Bangladesh.

Table 5.15: Respondents' awareness regarding inter library loan

Sl No.	Awareness	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Provision	40 (29.6)	36 (36.0)	25 (41.7)	101 (34.2)
02.	No provision	95 (70.4)	64 (64.0)	35 (58.3)	194 (65.8)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note: Figures in brackets indicate percentages.

Table 5.15 reveals the awareness of provision of inter-library loan. Only 34.2% of respondents are aware of the provision of inter-library loan. Majority of respondents (65.8%) are not aware of the provision of inter-library loan. The analysis shows that majority of respondents are not aware of inter-library loan. This is because of negligence of the authorities and lack of good library facilities in the agricultural research organizations in Bangladesh.

Table 5.16: Respondents by inter-library loan requirement

Sl No.	Requirement	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Requirement	97 (71.9)	63 (63.0)	36 (60.0)	196 (66.4)
02.	Not required	38 (28.1)	37 (37.0)	24 (40.0)	99 (33.6)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note : Figures in brackets indicate percentages.

Table 5.16 presents the opinion of respondents regarding the requirement of inter library loan. Majority of respondents (66.4%) have expressed that there is a great necessity of inter-library loan. Only 33.6% respondents have expressed that it is not required to them. From the above analysis, we can say that most of the scientists and researchers need inter-library loan services for their research.

Table 5.17: Respondents by need for SDI services

Sl No.	Need	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Needed	125 (92.6)	81 (81.0)	45 (75.0)	251 (85.1)
02.	Not Needed	10 (7.4)	19 (19.0)	15 (25.0)	44 (14.9)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note: Figures in brackets indicate percentages.

It is evident from the table 5.17 that most of the respondents (85.1%) indicated that they needed SDI services and the remaining (14.9%) replied negatively. It reveals that the SDI services are very essential to the majority of the respondents.

Table 5.18: Respondents awareness of Agricultural information sources.

Sl. No.	Agricultural information sources	No. of Respondents						Total	
		Scientists		Researchers		Teachers		Aware	Not aware
	AWARENESS	Aware	Not aware	Aware	Not aware	Aware	Not aware	Aware	Not aware
01.	AGRIS	89	46	59	41	20	40	168	127
02.	AGRIN DEX	34	101	38	62	19	41	91	204
03.	AGRICOLA	20	115	21	79	15	45	56	239
04.	CAB International	61	74	40	60	18	42	119	176

Table 5.18 reveals the awareness of the respondents' agricultural information sources. 168 respondents are aware of AGRIS. 204 respondents are not aware of AGRINDEX. Majority of respondents (239) are not aware of AGRICOLA. The awareness of agricultural information sources is very significant for research..

Table 5.19: Respondents by awareness of National Agricultural Information Systems/Services

Sl No.	Awareness	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Aware	85 (63.0)	62 (62.0)	42 (70.0)	189 (64.1)
02.	Not aware	50 (37.0)	38 (38.0)	18 (30.0)	106 (35.9)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note: Figures in brackets indicate percentages.

Table 5.19 shows respondents' opinion regarding the awareness of National Agricultural Information Systems and Services. Most of the respondents (64.1%) are aware of National Agricultural Information Systems and Services (NAISS). Only 35.9% of respondents are not aware of NAISS. Comparatively a large number of teachers (70.0%) are aware of National Agricultural Information System and Services.

Table 5.20: Respondents by adequacy of Agricultural Information sources

Sl. No.	Opinion	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Sufficient	09 (6.7)	08 (8.0)	10 (16.7)	27 (9.2)
02.	Moderately sufficient	66 (48.9)	58 (58.0)	30 (50.0)	154 (52.2)
03.	Insufficient	60 (44.9)	34 (34.0)	20 (33.3)	114 (38.6)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0.)

Note: Figures in brackets indicate percentages.

Table 5.20 shows respondents opinion about the level of adequacy of agricultural information sources. 38.6% of the respondents have expressed their opinion that adequacy of agricultural information sources is insufficient, 52.2% moderately sufficient and 9.2% of respondents have expressed that agricultural information sources are sufficient. Majority of teachers and researches expressed that the availability of agricultural information sources are moderately sufficient. The analysis reveals that the agricultural information sources available in the agricultural libraries are moderately sufficient. This may be due to the smaller number of sources available in the agricultural libraries of Bangladesh. Respondents' opinion regarding the adequacy of agricultural information sources are shown in the figure 5.20-A.

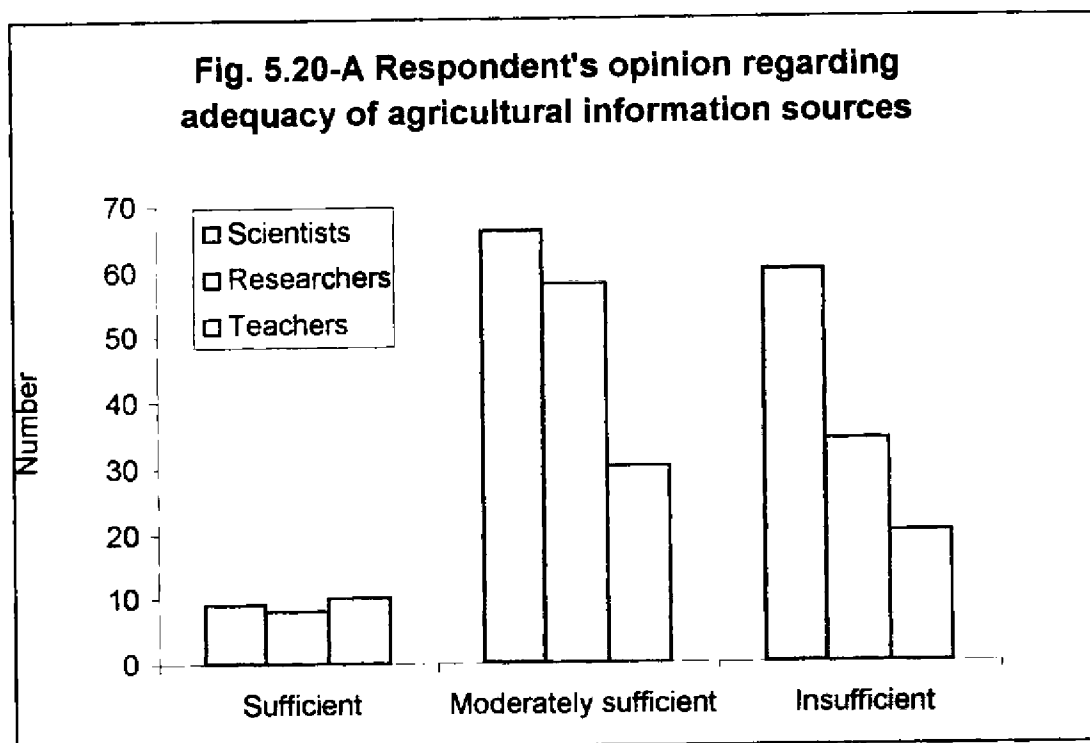


Table 5.21: Respondents by need for computerized Agricultural information service.

Sl No.	Need	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Needed	131 (97.0)	94 (94.0)	34 (56.7)	259 (87.8)
02.	Not needed	04 (3.0)	06 (6.0)	26 (43.3)	36 (12.2)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note : Figures in brackets indicate percentages.

Table 5.21 reveals that 87.8% of respondents are in urgent need for computerized agricultural information services for fruitful research .12.2% of respondents do not think that it is an essential service for their research.

Table 5.22: Respondents By level of computerized Agricultural information services.

Sl No.	Level	No. of Respondents						Total	
		Scientists		Researchers		Teachers		Total	Respond
		No	Respond	No	Respond	No.	Respond		
01.	Local	135	43	100	29	60	25	295	97 (32.9)
02.	National	135	42	100	35	60	25	295	102 (34.6)
03.	International	135	49	100	36	60	10	295	95 (32.2)

Note : Figures in Brackets indicate percentages.

Table 5.22 Shows the respondents opinion of level of computerized agricultural information services. 32.9% of respondents have expressed that local level of computerized agricultural information services are very much essential. 34.6% of respondents are in favour of national and 32.2% of respondents are in favour of international level of computerized agricultural information services which are very essential for research and education purpose.

Table 5.23: Respondents By knowledge of computer operations.

Sl. No.	Level of knowledge	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Preliminary knowledge	64 (47.4)	48 (48.0)	36 (56.7)	146 (49.5)
02.	Operational knowledge	58 (43.0)	47 (47.0)	18 (30.0)	123 (41.7)
03.	Manipulation of packages	10 (7.4)	03 (3.0)	05 (8.3)	18 (6.1)
04.	Production of software	03 (2.2)	02 (2.0)	03 (5.0)	8 (2.7)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note : Figures in brackets indicate percentages.

Table 5.23 reveals the respondents knowledge of computer operations. Only 2.7% of respondents have expressed that they are able to produce soft ware while 49.5% have basic knowledge and 41.7% of respondents have operational knowledge. 6.1% respondents have knowledge how to manipulate packages. Respondents' computer operations knowledge are shown in the fig. 5.23-A.

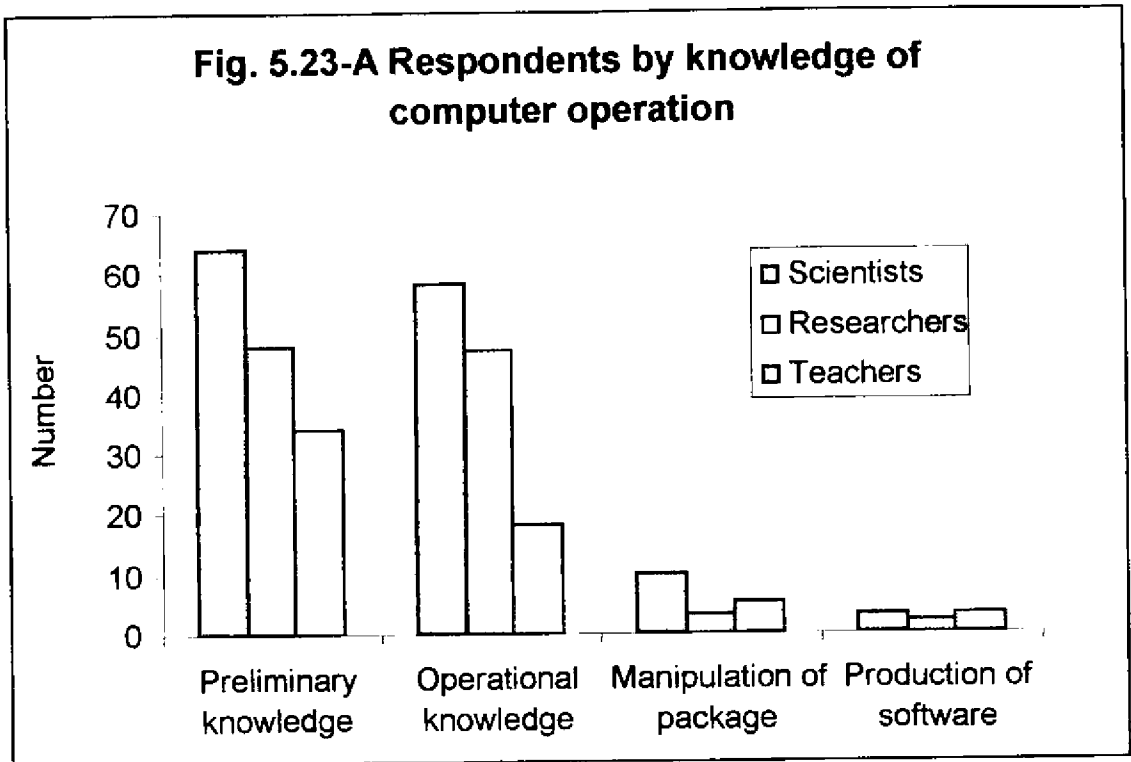


Table 5.24: Respondents by opinion regarding networking of Agricultural information system

Sl. No.	Opinion	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Yes	127 (94.1)	92 (92.0)	48 (80.0)	267 (90.5)
02.	No	08 (5.9)	08 (8.0)	12 (20.0)	28 (9.5)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note : Figures in Brackets indicate percentages.

Table 5.24 reveals respondents' opinion regarding networking of agricultural information systems. 90.5% of respondents have expressed that networking of agricultural information system is very essential and 9.5% of respondents replied negatively. Majority of Scientists (94.1%), Researchers (92.0%) and teachers (80.0%) are of opinion that networking of agricultural information system is very much essential. The analysis shows that majority of respondents are interested in networking of agricultural information system.

Table 5.25: Respondents' opinion regarding introduction of Agricultural Information Networks in their organization.

Sl. No.	Opinion	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Yes	128 (94.8)	93 (93.3)	50 (83.3)	271 (91.9)
02.	No	07 (5.2)	07 (7.0)	10 (16.7)	24 (8.1)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note : Figures in brackets indicate percentages.

Table 5.25 reveals the opinion of respondents regarding the introduction of agricultural information networks in their organizations. 91.9% of respondents are interested in the introduction of agricultural information networks in their subject to create more efficiency in teaching and research and 8.1% of respondents are not interested.

Table 5.26: Respondents Opinion about the factors responsible for inadequacy of manpower position of Agricultural libraries in Bangladesh.

Sl. No.	Opinion	No. of Respondents			Total
		Scientists	Researchers	Teachers	
01.	Negligence of the authorities	29 (21.5)	15 (15.0)	10 (16.7)	54 (18.3)
02.	Lack of adequate financial support	55 (40.7)	42 (42.0)	20 (33.3)	117 (39.7)
03.	Negligence of the authorities and lack of adequate financial support	37 (27.4)	28 (28.0)	23 (38.3)	88 (29.8)
04.	Lack of trained manpower	11 (8.2)	05 (5.0)	05 (8.3)	21 (7.1)
05.	No comment	03 (2.2)	10 (10.0)	02 (3.3)	15 (5.1)
	Total	135 (100.0)	100 (100.0)	60 (100.0)	295 (100.0)

Note : Figures in Brackets indicate percentages.

Table 5.26 Shows respondents' opinion about the factors which are responsible for the inadequacy of manpower position in the agricultural libraries of Bangladesh. 39.7% of the respondents have expressed their opinion that lack of adequate financial support may be the most influential factor in the agricultural libraries. It is a burning problem for overall development of agricultural libraries in Bangladesh. 29.8% of respondents depicted that both negligence of the authorities and lack of adequate financial support are also responsible for inadequacy of manpower position in the agricultural libraries. Only 5.1% respondents commented nothing about the factors. From the aforesaid table, we may conclude that a large group of respondents holds the view that agricultural libraries of Bangladesh have been suffering from inadequate financial support.

5.7 Testing of hypotheses

Hypothesis – 1

“The existing agricultural information sources available in various agricultural libraries of Bangladesh are absolutely inadequate to meet the information needs of the agricultural scientists and researchers.

The analyses of tables 5.7, 5.8 and 5.20 reveal that the existing agricultural information sources in various agricultural libraries are not adequate to meet the requirements of the scientists and researchers. Hence, the hypothesis is positive.

Hypothesis –2

“The agricultural scientists and researchers of Bangladesh are in need of computerized agricultural information system for accessing, updating and upgrading their knowledge.”

The analyses of data presented in tables 5.21 and 5.22 reveal that agricultural scientists/ researchers are in need of computerized agricultural information for accessing, updating and upgrading their knowledge. Hence, the hypothesis is tested to be positive.

Hypothesis –3

“The resource sharing of agricultural information sources is not up-to the satisfaction among the agricultural libraries of Bangladesh.” Tables 3.19, 3.20, 3.21, 3.22 and 3.23 reveal that sharing of agricultural information sources by agricultural libraries in Bangladesh are not up-to the satisfaction. Hence the hypothesis is found to be positive.

References

1. Sharma, C.D. and Ojha, D.C. *Advances in Library and Information Science: Agriculture and Environment*. Vol. 2 Jaipur: RBSA, 1989, P 11.
2. *Library Science with a Slant to Documentation and Information Studies*. Vol. 35, No.1, 1998. Paper D, P 37.
3. Devarajan, G. *Library and Information User and Use Studies*. New Delhi: Beacon, 1995, P 9.
4. Davis G.B. *Management information Systems: Concepts, foundations Structures and Development*. New York: McGraw Hill, 1977.
5. Ploman, E. *The Changing Information Society. Agricultural Information Development Bulletin* Vol. 7, No. 4, 1985, P 2-6.
6. American Library Association. *ALA World Encyclopedia of Library and Information Services*. Chicago: ALA, 1986, P 249.
7. Martin, J. *Information Society*, London: ASLIB, 1989, P 1.
8. UNESCO. *Intergovernmental conference on Scientific and Technical Information for Development*. UNISIST- II. Paris 1979, PGI/ UNISIST II.
9. IDRC/SDIC. *New Horizons in Agricultural Information Management*. Proceeding of an International symposium. March 13-16, Beijing, China, P 54.
10. Prof. Hamid. *Global Information and World Communication: New Frontiers in International Relations*. 2nd edn. London: Sage, 1997, P 25.

Hypothesis –4

“There is an urgent need for networking of agricultural information system in Bangladesh for effective and necessary information supply to the agricultural scientists and researchers in Bangladesh.”

Data presented in tables 5.24 and 5.25 reveal that there is an urgent need for networking of agricultural information system in Bangladesh for effective information supply to the agricultural scientists and researchers in Bangladesh. Hence the hypothesis is found to be positive.

Hypothesis –5

“There is a favourable environment for planning of agricultural information networks for Bangladesh.”

In general most of the tables and their analysis of data specially the tables 3.5, 3.6 and 3.25 reveal the feasibility conditions to plan the agricultural information networks for Bangladesh. Hence the hypothesis is positive.

References

1. Sharma, C.D. and Ojha, D.C. *Advances in Library and Information Science: Agriculture and Environment*. Vol. 2 Jaipur: RBSA, 1989, P 11.
2. *Library Science with a Slant to Documentation and Information Studies*. Vol. 35, No.1, 1998. Paper D, P 37.
3. Devarajan, G. *Library and Information User and Use Studies*. New Delhi: Beacon, 1995, P 9.
4. Davis G.B. *Management information Systems: Concepts, foundations Structures and Development*. New York: McGraw Hill, 1977.
5. Ploman, E. *The Changing Information Society. Agricultural Information Development Bulletin* Vol. 7, No. 4, 1985, P 2-6.
6. American Library Association. *ALA World Encyclopedia of Library and Information Services*. Chicago: ALA, 1986, P 249.
7. Martin, J. *Information Society*, London: ASLIB, 1989, P 1.
8. UNESCO. *Intergovernmental conference on Scientific and Technical Information for Development*. UNISIST- II. Paris 1979, PGI/ UNISIST II.
9. IDRC/SDIC. *New Horizons in Agricultural Information Management*. Proceeding of an International symposium. March 13-16, Beijing, China, P 54.
10. Prof. Hamid. *Global Information and World Communication: New Frontiers in International Relations*. 2nd edn. London: Sage, 1997, P 25.

11. Mohalik, R.K. *Information Needs and Seeking Behaviour of Working Journals in Orissa: An analytical study (Ph.D. Thesis)*. Utkal University: LIS dept., 1998, P 81.
12. Bhattacharyya, A. *Information Sciences: Unified View through a System Approach*. Calcutta: IASLIC, 1978, PP 18-20.
13. Shera, J.H. *The foundations of education for librarianship*. New York: Becker & Hayes, 1972, P 25.
14. Christie, B. *Face to File Communication: A psychological approach to information system*. Chichester: John Wiley, 1981, P 39.
15. *Ibid*, P 40.
16. Aina, L.O. *An Empirical Analysis of the information component of agriculture extension service in Ibadan area (unpublished Ph.D. dissertation)*. University of Ibadan: LIS Dept., 1986, 374 P.
17. Devarajan, G. *Progress in information technology*. New Delhi: Ess Ess, 1996, P VII.
18. Khanna, J.K. *Handbook of Library Information Systems and Services: A study of networking in India, U.K. & U.S.A*. New Delhi: Beacon, 1996, P 9.
19. Prasad, H.N. *Information needs and users*. Varanasi: IBC 1992, P 11.
20. *Ibid*, PI3.
21. *Ibid*. P 14.
22. Satyanarayana, N.R. and Satyanarayana, R. (ed). *Problems of information science*. New Delhi: New age international, 1996, P 6.
23. *The Dhaka University Studies*. Vol. 60, No.2, 2000, P 52.

24. Ojha, D.C. (ed.) *Advances in library and information science: agricultural information systems*. Vol. 2. Jodhpur: Scientific publishers, 1995, P 77.
25. *Ibid*, P 78.
26. *Ibid*. P 79.
27. Nair, R. R and Francis, A.T. *Information needs of agricultural scientists: Problems & prospects*. Papers presented at 17th IASLIC seminar, Calcutta: IASLIC, 1996, P 121.
28. Derr, R.L. *A Conceptual analysis of information need*. Published in *Information processing management*. Vol.19, 1983, PP 273 –278.
29. Giraja Kumar. *Defining the concept of information needs*. In Binwal, J.C. et.al. *social science information: Problems and prospects*. New Delhi: Vikas, 1990, P 257.
30. Paisley, W.J. *Information needs and its users*. ARIST –3, 1986, PP 1-30.
31. Wilson, T.D. *On user studies and information needs*. *Journal of Documentation*. 37(1); 1981; 3-15.
32. Bhunia, A. K. *Information seeking behaviour of users and non users of public librar*. (Unpublished Masters Dissertation). Jadabpur University: Dept. of LIS. 1991, P 9.
33. Lancaster, F.W. *Information retrieval systems: Characteristics testing and evaluation*. 2nd Edn. New York: Johnwiley, 1979, PP-140-149.
34. *Ibid*, PP 143-149.

35. Saha, Pulak. *Information needs of Development Research communication and services centre for the development of sustainable agriculture in India (unpublished Masters dissertation)* Jadavpur University: LIS Dept. , 1998, P 20.
36. Chopra, H.R. and Sharma, U.C (ed.). *Library science and its facets*. Vol. 1. New Delhi: Ess Ess, 1998, P 170.
37. Lancaster, F.W. *Information retrieval systems: Characteristics testing and evaluation*. 2nd Edn. New York: Johnwiley, 1979, P 171.
38. SAARC Agricultural Information Centre (SAIC). *Agricultural Information Needs, Mode, Mechanism and Information flow in SAARC countries*. Proceeding of the regional workshop. 31 March to 2 April, 1997. Dhaka: SAIC, 1997, PP 98-101.
39. *Ibid*, P 99.
40. *Ibid*, P 100.
41. Roth, Dana L. The needs of library users, UNESCO Bulletin for libraries. Mar-April 1974, Vol. 28, No. 2, PP 92-95.
42. Kumar, Krishan, *Users survey concerning teachers and research scholars in the dept. of Chemistry*. University of Delhi. Annals of Library science and Documentation, Dec. 1968, Vol. 15, No. 4, PP 175-207.
43. Kumar, Krishan. *Users survey: Identification of users and their information needs in health science libraries*. ILA bulletin. April-Sept. 1982, Vol. 18, No. 1-2, PP 40-50.
44. Veeranjanyulu. K. A study on agricultural information systems in Andra Pradesh. (India), Ph.D. thesis. S.V. University: LIS dept., 1997, P 105.

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Chapter-6

6.0 Introduction

Resource sharing or Networking is based on the premise that no library, irrespective of size, can acquire all the materials, users need. The driving forces that compel the library authorities to share resources are: (1) the astounding proliferation of information, (2) increasing cost of learning materials, (3) decreasing purchasing power of the local currency and (4) budget constraints. In the context of these factors, it is unrealistic to assume that an individual library can stock all the resources that are needed by its users.¹ A library network is a planned and organized means of developing and distributing library resources and services cooperatively throughout a dispersed geographic area to each point of need. A properly planned, organized and managed resource sharing network will enable the most geographically remote, small and weak libraries to have rapid access to and participate in developing the total agricultural library resources and services within the country. A resource sharing network is not intended to replace basic local agricultural library's resources and services. It is intended to supplement the network participating libraries in a planned and organized manner.²

The term resource applies to any recorded reading materials, person or action to which one turns for aid when needed. When the term is used alone, it is not necessarily seen as implying reciprocity. The word "sharing" entails apportioning, allotting or contributing something that is owned to benefit others.³

According to United Nations Information System for Science and Technology (UNISIST), "Networking is a set of inter-related information

systems associated with communication facilities, which are co-operating through more or less formal agreements and institutional agreements in order to jointly implement information handling operations with a view to pooling their resources and better serving the users. They generally follow identical or compatible rules and procedures."⁴ This definition is comprehensive. It contains almost all the essential ingredients of networking. In Bangladesh perspective this very concept may be followed in understanding the meaning, implications and applications of networking. Therefore, resource sharing or networking in its most positive aspects implies reciprocity, meaning a partnership in which each partner has something useful to contribute to others and in which each is willing and able to make the desired resources available when needed.⁵

The library network aims at providing materials, information and services by different types of libraries to the needy users. These libraries may be in different jurisdictions but agree to serve one another on the same basis as each serves its own constituents. The most essential tools for networking are union catalogue of library materials, telecommunication, computer etc.⁶

Thus it is imperative to share library resources and to go in for networking of agricultural information systems in Bangladesh. This may be possible only on the application of modern information technology in the agricultural libraries of Bangladesh. The need of networking of agricultural information system for Bangladesh was well recognized, in early 1984, when an attempt was made by BARC to establish Bangladesh Agricultural Information Network (BAIN). But BAIN could not be materialized due to the lack of resources, lack of trained manpower

6.1 Objectives of BD-AGRINET

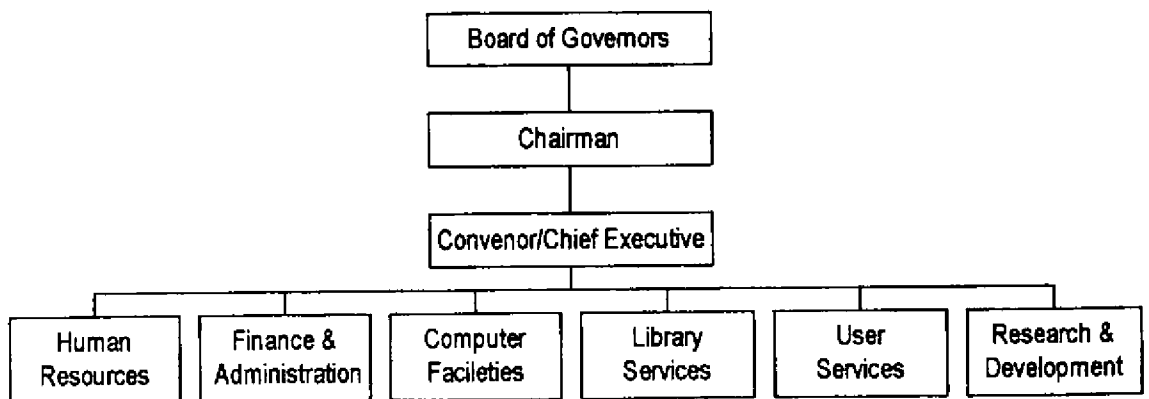
The objectives of the proposed network will be as under:

- (i) To promote sharing of resources among the libraries of agricultural universities, colleges and agricultural research institutes of Bangladesh by collecting, storing, disseminating information and by offering computerized services to the users;
- (ii) To co-ordinate efforts for suitable collection development and reduce unnecessary duplication of library materials wherever possible;
- (iii) To enable the users to acquire the materials not available in their own library, from other libraries participating in the network system;
- (iv) To establish a referral centre for maintaining a central on-line union catalogue of books, serials and non-book materials of all the participating libraries and to develop a specialist bibliographic database of books, serials and non-book materials for search and access;
- (v) To possess and maintain electronic and mechanical equipments for fast communication of information delivery;
- (vi) To evolve standards and uniform guidelines in techniques, methods, procedures, hardware, software and services for adoption by the participating libraries to facilitate pooling, sharing and exchanging resources and services;

- (vii) To co-ordinate with other national and international networks for exchange of information and documents;
- (viii) To create a database of projects, specialists and institutions for providing on-line information service;
- (ix) To develop facilities for education and training in library and information science.
- (x) To assist locating out-of-print material and to facilitate fast retrieval in special areas;
- (xi) To take initiative for promotion of agricultural research, development and innovation of information technology in Agriculture.¹⁰

The proposed organizational structure of BD-AGRINET is given below:

Organizational Chart of BD-AGRINET



It has been attributed that inflation and budgetary limitations are the primary forces that lead to resource sharing or networking in libraries. But these are not the only forces that make resource sharing or networking work; they are only pressures that force consideration of problems and opportunities. The only approach that permits resource sharing or networking to work is that which entails:

- a) having resources to share,
- b) having the willing to share, and
- c) a plan for accomplishing resource sharing or networking

6.2 Need for automation in agricultural libraries

The growth of agricultural libraries networks is so closely related to the development of information technology, the success of networks is, as a result, very much affected by the impact of technology. In a nutshell, there is a type of bond between the information technology and library networks that links/cements the two together. Application of information technology in information and library field is called library automation. To provide the immediate information services more exhaustively and accurately from the ever growing information revolution, it is a must to automate and computerize the activities of the agricultural libraries in Bangladesh to attend to the needs of agricultural information users at large. Now the social and cultural effects are fully realised and computers have paved the way to an automated information society through local, regional, national and global communication networks. The main objective in automating an agricultural library is to significantly improve the resource utilization and service levels to the users at the individual

library level.¹¹ The major areas where automation can be taken up in agricultural libraries of Bangladesh are:

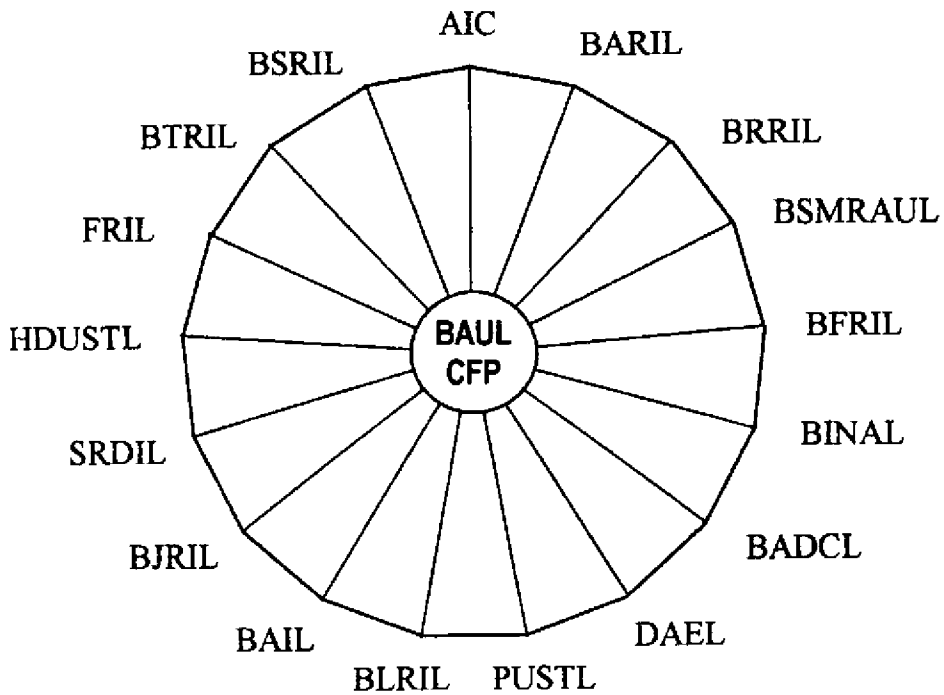
- (i) Acquisition and fund accounting
- (ii) Serial control
- (iii) Processing and maintenance
- (iv) Circulation and
- (v) User services etc.

6.2(a) Components of networking structure and procedures

- (i) The Bangladesh Agricultural University Library (BAUL) will act as the Central Focal Point (CFP) and will work as the catalytic agent to support, inspire or speed up significant action or change in the activities of the network participants and will also serve as the “National Focal Point (NFP)” by virtue of its being the CFP.
- (ii) Every participating library in the system will be required to sign a memorandum of understanding regarding the networking rules and regulations to be formulated and provided by the CFP.
- (iii) If any participating library fails to return the borrowed materials in due time, its name will be black listed and the library will be dropped from the network.
- (iv) BAUL will be responsible for maintaining a computerized union catalogue of all the library materials which will be sent by participating libraries. Each participating library will be equipped with CFP by compatible computer and programme.

(v) The next step requires transfer of the desired material to the point of need. This involves establishing effective procedures for transferring materials and ensuring their return in due time. Agricultural information networking in Bangladesh is shown by the following figure-6.2(a)-A.

Figure-6.2(a)-A: Agricultural Information Networking in Bangladesh



6.3 Functions of Proposed BD-AGRINET

The network will perform a number of functions to achieve its objectives:

- (a) To co-ordinate and communicate the resources and services within the network;
- (b) To facilitate efficient and economic inter-lending of information resources;
- (c) To provide reprographic and translation facilities;

- (d) To establish centralized databanks for quick information service;
- (e) To formulate standards for information techniques, procedures, processes and services for use of the libraries forming part of the network; and
- (f) To establish co-ordination with other regional, national and international centres, engaged in information handling.¹²

6.4 BD-AGRINET Members: Functions and Responsibilities

The BD-AGRINET members will have functions and responsibilities in support of the development of a comprehensive collection of relevant agricultural information and the development of linkages with national, regional and international information sources. Each institute will be encouraged to develop information resources in its particular area of interest, i.e. FRI will concentrate on acquiring materials regarding aquaculture and related disciplines. BLRI will concentrate on developing holding on livestock sciences, etc. The BAUL, in the role of the principal information centre within the BD-AGRINET, will be responsible for providing various centralized support services to BD-AGRINET member institutes. Maintaining linkages with regional and international information services, the BAUL will be in a position to provide AGRINET members with comprehensive bibliographic information, document delivery, reference and referral services. The BAUL will act as an information focal point in which material can be transmitted from one network member to another.¹³

6.5 Network Topology

The network topology is the arrangement of nodes on a network. This includes the physical arrangement or the geographic pattern by which the nodes are connected. It also includes the logical arrangement, the possible destinations to which each can route data. Inter-connection of system can be achieved in many ways, but basically there are three most important methods, viz. point-to-point, multi-point / multi-drop and broadcasting.¹⁴ We will consider here the inter-connection design of hardware components called nodes. Some of the important nodes are explained below:

Star topology

The star network is one in which one member of network holds the majority of the resources while, at the same time, all other network members use the same resources. Figure-6.5-A illustrates such a network, with member A possessing virtually all the resources, while the other network members B, C, D & E using the resources.¹⁵

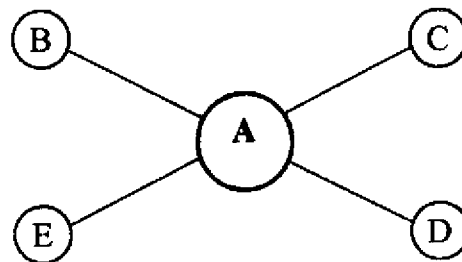


Figure-6.5-A: Star Topology (network)

Tree topology

The tree network topology, on the other hand, is suitable for an environment where network members share resources locally. In this topology the nodes are connected hierarchically. Here mini-computers are used as intermediary nodes and micro-computers as end nodes. It makes for reduced communication costs as several terminals can be connected to a single communication line.¹⁶ This type of topology is illustrated in fig.6.5-B. Here 1 is the root node. 1.1 & 1.2 are the child node of node 1. Similarly 1.11 & 1.12 are child node of node 1.1 respectively. In this case every child node communicates to other through their parent node.

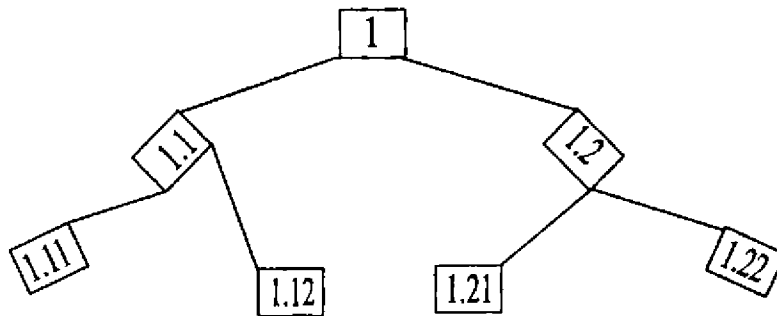


Figure-6.5-B: Tree like topology of network.

Ring topology

The ring like topology is shown in fig.6.5-C. In this case each node is connected with exactly two nodes. Two connected nodes are called adjacent to each other. For example node 1 is connected with node 2 & node 7. 2 and 7 are called adjacent node of 1. To form the ring 1st node is made adjacent of last node.

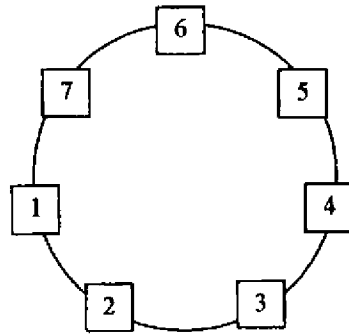


Figure-6.5-C: Ring topology

In ring topology each network member is connected with other members like a ring. This topology generally suits a network on a small campus in a building with well-defined but limited operations.

Mesh topology

In this topology all nodes are connected directly or through other nodes, but all of them must be connected. Directly connected nodes are called neighbor nodes and nodes connected via other nodes are called remote nodes.¹⁷ In fig.6.5-D, node 2 is neighbor node of 1 and 6 is remote node of 1.

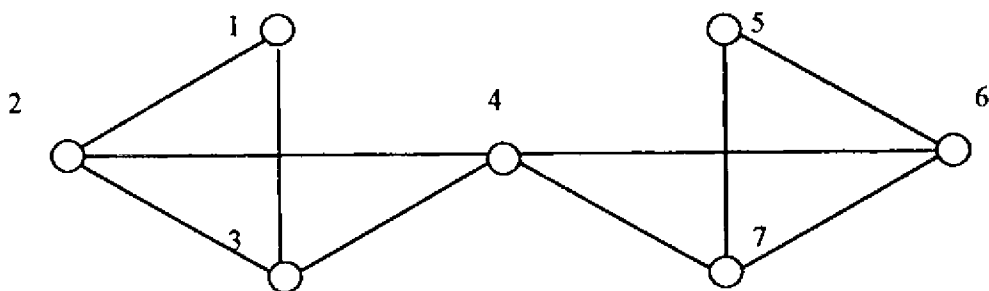


Figure-6.5-D: Mesh network

Bus topology

It consists of a number of nodes linked to a central communication 'Highway' or bus in such a way that every node has a single bi-directional connection to a shared cable which enables each node to be directly connected to each of the rest of the nodes over this shared cable.¹⁸ It is shown in the following fig. 6.5-E.

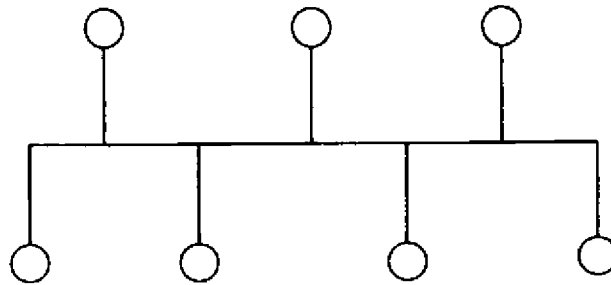


Figure-6.5-E: Bus network

Hierarchical topology

It is suitable for an environment where network members share resources locally, their requests are sent on to the next higher level in the system or in effect, the next greater resource centre. This topology is similar to the tree topology but each node here is independent network.¹⁹ Generally it is used for WAN systems. Fig.6.5-F shows the hierarchical topology.

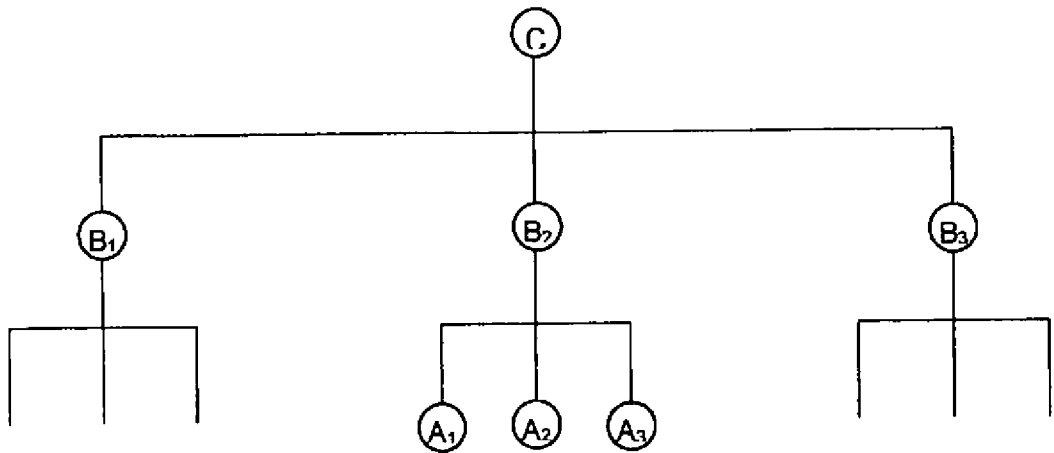


Figure-6.5-F: Hierarchical network

Distributed topology

In a distributed/fully connected network, members who take equal, but different, resources are connected with every other member. The foremost and basic rationale of the distributed network is the sharing of the different resources of the network members by each other.²⁰ The fully connected network topology is shown by fig.6.5-G.

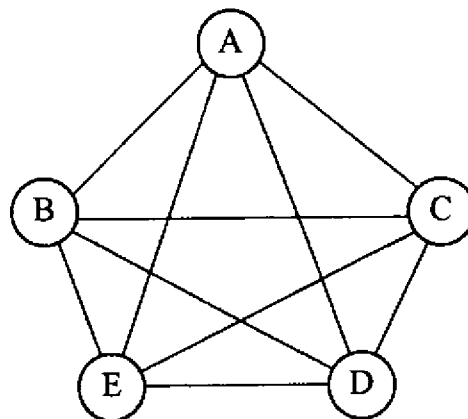


Figure-6.5-G: Distributed/fully connected network.

The advantages of distributed networks are:

- (i) Failure at one node/site will not collapse the system.
- (ii) Lesser cost for storage and maintenance of database.
- (iii) Quick processing of queries.
- (iv) Increased flexibility and reliability in the network.

In the above, some of important topologies are analysed in brief. The distributed topology may be adapted in Bangladesh. The successful topology for BD-AGRINET depends on several factors like funds, trained personnel, hardware, software and communication facilities that continually influence their growth. The following number of terminals in BD-AGRINET will be connected to national and international networks. The institutions are as follows:

1. Agricultural University Libraries in Bangladesh.
2. Agricultural Libraries in Dhaka City.
3. Agricultural College Libraries in Bangladesh.
4. Agricultural Research Institutes Libraries in Bangladesh.

6.6 Hardware

Library Network hardware is getting reduced in size and cost. At one time, a medium sized library needed a mainframe. Now a mini computer will do that. Laser disk technologies have added an extra dimension. Large bibliographic databases can now be accessed even by micro-computers and CD-ROM networks have become operational.²¹

Ideally BD-AGRINET participants may have or go in for computer system which:

- have minimum hardware redundancy
- have scope for up-gradation
- have high computing facilities
- have provision for additional terminals
- are compatible to improve software
- are compatible with other computer systems.

Hardware configuration may be divided into two sections: essential for libraries and additional ones that are essential for networking.

Exact configurations will depend upon the size of the participant library as well as type of network and number of user. A possible hardware configuration is indicated in table 6.1. The configuration is recommended on the basis of CALIBNET, DELNET and INFLIBNET.

Table 6.1: Hardware Configuration of the BD-AGRINET Participants

1.	Computer Processor	
	Word length	32 bits (min)
	Process speed	500 MHz (min)
	Memory	128 MB (min)
	Disk space	3.2 GB (min)
	CD-ROM drive	1
	Floppy drive	1
2.	Printer	1
3.	Cartridge tape drive	1
4.	Communication Interface with x-25 pad	1
5.	No. of asynchronces controller	1
6.	Telephone line	1

The hardware configuration for BD-AGRINET host computer is shown in Table 6.2.

Table 6.2: Hardware Configuration of the BD-AGRINET Host Computer

1.	Control Processor	
	Through put	1.2 Mips (RISC/CISC)
	Architecture	32 bits or above
2.	Main Memory	256 MB expandable upto 1 GB
3.	Peripherals	
	Disk capacity	9/18 GB Total
	Cartridge Tape drive	2
	Printer (DMP)	2 (132 columns)
	Laser Jet	1
	Present terminal requirement	15-20
4.	Input/output channels	40
	Aggregate transfer rate	4 MB/Sec.
5.	Communication	
	Mode of communication	Synchronous/Asynchronous
	Protocol support	X-25

6.7 Software

The software required for the proposed network will be in the following areas:

- (i) for the library routines like acquisition, circulation, etc.;
- (ii) for database creation and maintenance;
- (iii) for communication interfaces.

In selecting the software there are two options:

1. To develop the software required for the system, and
2. To procure a readymade software package available in the market. There are several general and specialized software packages available in the market for library and information services. The available software may be selected after due evaluation. The software may have to be modified according to the requirements of the network. The software needs are to be compatible to the on-line network²²

Software required for BD-AGRINET can be grouped:

- System software
- Applications software; and
- Networking software

System software controls hardware, manages all resources and serves users. It is offered by the hardware vendor. It controls computers and peripherals. In the library environment, the application software in MS-DOS or windows is good for database creation, while Unix and Xenix are well known for networking.²³ UNESCO developed software CDS/ISIS may be used in many libraries in Bangladesh.

6.8 Some Considerable Basic Factors

6.8.1 Co-ordination

The basic configuration of network exhibits a federal one with a decentralized system. The nodes (i.e. the Libraries of Agricultural Universities, Colleges and Research Institutes) act as vital gatherer, storer, retriever and disseminator of information. Co-operative linkages with electronic communication facilities with high degree of co-operation with information professionals, provides scope for conducive network for information service.

The basic technology required to support an information network is to create in-house databases in various institutions. This involves getting compatible record formats and adopting the common communication format, inputting records for various types of information sources, and developing search strategies, and vocabulary control for this purpose.²⁴

6.8.2 Standardization

Observance of an adherence to standard techniques, procedure and methods is an essential pre-requisite for the effective functioning of a network. Participating libraries will have to follow certain procedures and practices without which the resources held by them cannot be effectively and meaningfully shared.²⁵ In BD-AGRINET standardization in classification, cataloging, indexing, bibliographic description, interchange of bibliographic data is very essential.

6.8.3 Training

For better results, BD-AGRINET should offer continuous training to librarians in the use of software, hardware and networking techniques in an on-going way. The training should start as soon as the work on the network begins.

6.8.4 Cost-Benefit Analysis

By sharing its resources, libraries of BD-AGRINET will benefit a lot. At present, the cost of the various automation parameters is decreasing day by day. So, it is not difficult for a library to buy a computer. Using network will surely decrease the cost of agricultural libraries in Bangladesh.

6.9 Administration of BD-AGRINET

BD-AGRINET is to be housed in Bangladesh Agricultural University Library at Mymensingh, one of the most important areas for agricultural education and development. It will act as central information facility, which may control other participating libraries. It can be formed with the representatives of Agricultural University libraries, college libraries and Agricultural Research Institute Libraries. Agricultural Information Networking membership governing board may be formed with the Vice-chancellor of BAU as its Chairperson and at least two principals (on rotational basis for two years), three members from the Agricultural Research Institutes (on rotational basis for two years) and eight senior librarians from different agricultural universities and colleges on rotational basis (again two years). The librarian of Bangladesh Agricultural University will act as Member-Secretary for BD-AGRINET governing board. The main function of this governing board is to see the functional activities of BD-AGRINET.

6.10 Information Communication in BD-AGRINET

There are many options available to connect the different nodes in the network. BD-AGRINET participants will participate in the Wide Area Network (WAN), where the data transmission rate envisaged is 100k bps. The appropriate channels of communication could either be dedicated telephone lines or satellite links. The main advantages of the satellite based networks are: a) reliability; b) high transmission rate; and c) economy in access to remote locations, etc. BD-AGRINET, being a nation wide network may ultimately go in for both satellite as well as leased lines although it will begin its operation with dedicated telephone lines. The exact choice will, however, depend upon the actual traffic flow in the BD-AGRINET.

Until the telecommunication support is made available, the libraries equipped with computer facilities should find alternative to interact with each other through fax, telex, telephone and speed post. The participant libraries of BD-AGRINET may extend off-line bibliographic services to each other based on their local databases. The off-line facility should enable them to enjoy various benefits that include:

- (a) Consolidated reference service and
- (b) Coordinated selection and acquisition.

6.11 Implementation Plan

Considering the existing infrastructural facilities, financial resources, manpower and technological aspects, the implementation of BD-AGRINET is considered in a phased manner. It is felt that under the given circumstances, a three-phase implementation is ideally suitable for

implementing the BD-AGRINET. The phase-wise implementation has been based on the following conditions:-

1. Getting the libraries as well as users tuned to resource sharing via network;
2. Reasonableness of cost;
3. Introduction of computer culture in the libraries.

The phase-wise tasks to be undertaken are hereunder:

Phase I

The following shall be accomplished in Phase-I:

1. Introduction of computer culture in the agricultural libraries;
2. Procurement of hardware and software and site preparation by individual libraries;
3. Setting up of communication infrastructure;
4. Creation of machine-readable catalogue as per the standard format (CCF);
5. Internal procedures/systems computerization of each library.

In the first phase, all the infrastructures for automation of library activities and networking will be created, and the personnel will be trained up on automation and computers. The libraries will create a machine readable database (catalogue) of its holdings according to standard format and automate all its house keeping services and be ready to join in the network.

Phase II

1. Setting up of the network;
2. Linking of the individual libraries into the network;
3. Introduction of various user services through network.

The second phase would culminate in the setting up of the formal network and linking all the participant libraries into the network and will introduce various services through the network.

Phase III

1. Bringing all the Agricultural University libraries, College libraries and libraries of research organizations into the network;
2. Join hands with other local, national and international networks.

In the third phase, it is proposed to bring all the agricultural university libraries, college libraries and libraries of research institutes into the network, and the network will join hands with other local, national and international networks.

The resource sharing network in agriculture will help research activities and development works to our socio-economic progress. The secrecy of the success lies with the agricultural network implementers, its managers and its users who have the combined responsibility to remain responsive, integrated and powerful forces to accomplish the target.

References

1. Gopal, Krishan. *Digital Libraries in Electronic Information Era*. New Delhi: Authors press 2000, PP 80-84.
2. Ahmed, Zakiuddin and Alam, F. *Management of Information Resource Sharing Network in Science and Technology: A Bangladesh Perspective*. Paper presented at the National Workshop on Scientific and Technical Information in Bangladesh. Organised by BANSDOC, Dhaka, 1996, P 2.
3. *Ibid*, P 3.
4. UNISIST II quoted by Satyanarayana, R and Rajan, T.N. *Information networks: Structure and Operation with Reference to India*. International Information Communication and Education, 1985, P 156.
5. Sujatha, G. *Resource Sharing and Networking of University Libraries*. New Delhi: Ess Ess, 1999, P 4.
6. Veeranjanyulu, K. *A Study on Agricultural Information Systems in Andra Pradesh (India) (Ph.D. thesis)*. Tirupati: S.V. University Dept. of LIS, 1997, P 141.
7. A Training on *Library, Documentation, publication and audio-visual*. Organized by AIC (BARC), Dhaka, June 14-18, 1998.
8. Agricultural Information Centre. *Working paper for National Agricultural Information System*. Dhaka: AIC, 1990, P 4.
9. *Library Herald*, Vol. 33, no. 3-4. Oct 1995 – March 1996, PP 108-110.

10. Veeranjanyulu, K. *A Study on Agricultural Information Systems in Andra Pradesh (India) (Ph.D. thesis)*. Tirupati: S.U. University Dept. of LIS, 1997, PP 140-171.
11. Sujatha, G. *Resource Sharing and Networking of University Libraries*. New Delhi: Ess Ess, 1999, P 153.
12. *Ibid*, op. cit. P 173.
13. Qumrul Islam, Mohammad. *Agricultural Information Networking in Bangladesh: Documentation Activities*. Paper presented at the workshop of BARC Library Development Project. Dhaka: AIC, 1997, P 210.
14. Bose, Kausik. *Information Networks in India: Problems and Prospects*. New Delhi: Ess Ess, 1994, P 117.
15. Kaul, H.K. *Library Networks: an Indian Experience*. New Delhi: Virgo, 1992, P 119.
16. *Ibid*, P 94.
17. *Ibid*, P 95.
18. Mannan, S.M. *Networking and resource sharing among the libraries in Bangladesh: Present condition and Future Prospect (Unpublished Ph.D. thesis)*. Dhaka University: Dept. of LIS, 1997, P 120.
19. Gopal, K. *Digital Libraries in Electronic Information Era*. New Delhi: Authors press, 2000, P 76.
20. Sujatha, G. *Resource Sharing and Networking of University Libraries*. New Delhi: Ess Ess, 1999, P 156.

21. Bose, Kausik. *Information Networks in India: Problems and Prospects*. New Delhi: Ess Ess, 1994, PP 67-68.
22. *Ibid*, P 171.
23. *Ibid*, P 172.
24. Veeranjanyulu, K. *A Study on Agricultural Information Systems in Andra Pradesh (India) (Ph.D. thesis)*. Tirupati: S.U. University Dept. of LIS, 1997, PP 160-167.
25. *Ibid*, P 173.

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Chapter-7

Findings and Recommendations

It is well recognized that knowledge is expanding rapidly. The exponential growth of agricultural information generation led to a phenomenon characterized by the term "Information Explosion". Agriculture is an important activity of mankind. It is not possible to achieve self-sufficiency in food production without adequate information supply to agricultural scientists and researchers. This study is aimed at building up a well equipped and well organized agricultural information system to serve the agricultural information needs of the scientists and researchers engaged in agricultural research, teaching, extension and other developmental activities.

The agricultural scientists and researchers are finding it difficult to keep themselves abreast of new developments within their area of specialization. The current agricultural information is dispersed in large number of research reports, periodicals and other documents. It became difficult for agricultural scientists and researchers to have timely access to reliable information. The agricultural environment in Bangladesh in relation to availability of agricultural information sources is confined to agricultural libraries, research stations and National and International agricultural databases. Planning of computerized agricultural information system for Bangladesh is the utmost necessity.

But at this stage due to various factors as stated in the thesis it may not be possible to do away with the conventional system and to switch over to modern computerized agriculture information system. Both the

aspects are given due consideration in this study while planning agricultural information networks for Bangladesh.

In this present study the following important points were found out:

- Various types of information needs for the agricultural scientists and researchers of Bangladesh.
- Different attitudes of agricultural scientists and researchers towards introducing computers in the handling of agricultural information.
- Various information sources available in the agricultural libraries and examination of the same for bringing under networking system.
- Existing agricultural information resource sharing among the various agricultural libraries of Bangladesh.

The following hypotheses, formulated are proved:

1. The existing agricultural information sources in various agricultural libraries in Bangladesh are not adequate to meet the information needs of the agricultural scientists and researchers.
2. The agricultural scientists and researchers are in need of computerized agricultural information system for accessing, updating and upgrading their knowledge.
3. The agricultural information resource sharing among the agricultural libraries are not upto the satisfaction.

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2. The agricultural scientists and researchers are in need of computerized agricultural information system for accessing, updating and upgrading their knowledge.
3. The agricultural information resource sharing among the agricultural libraries are not upto the satisfaction.

4. There is a need for networking of agricultural information systems and there exist a favourable environment for planning of agricultural information networks in Bangladesh.

Findings

The following findings are drawn from the analysis of data obtained from agricultural information systems and from the agricultural scientists and researchers of Bangladesh.

1. Bangladesh Agricultural University Library (BAUL) can act as a Central Agricultural Information Focal Point (CFP) because it has the largest collection of books and periodicals. On the other hand, Agricultural Information Centre of BARC can help the scientists and researchers in various ways such as providing CD-ROM and Internet facilities.
2. The financial sources of these libraries are mainly Bangladesh Government, which is responsible for development of agricultural research in the country. In spite of financial assistance from GOB and other donor agencies the study reveals that 66% of agricultural libraries have to face inadequate funds to meet the information needs of the scientists and researchers in agriculture sector of Bangladesh. Majority of the libraries (83%) requires more funds from the government. In order to save the money and manpower, they prefer to come under networking and resource sharing system.
3. The information services to the users of the agricultural system are utmost necessary and important. Eighty three percent of agricultural libraries are making their efforts to provide information services to the users. However a small percentage of libraries

(44%) are providing computerized information services. It is observed that the overall trend is to go for computerization of bibliographic data of agricultural libraries. Majority of the libraries is not providing computerized information services to the scientists and researchers in this age of information technology.

4. The acquisition policy of agricultural libraries in purchasing books is mainly by inviting quotations and appointing vendors. Majority of the agricultural libraries is subscribing to Bangladeshi periodicals direct from publishers and foreign periodicals through agents.
5. Processing of agricultural documents in the libraries is done with the help of Dewey Decimal Classification (DDC) and Universal Decimal Classification (UDC). Large number of agricultural libraries (72%) is following AACR-2 for description of bibliographic data.
6. The analysis of agricultural library system in Bangladesh shows that majority (72%) of agricultural libraries do not have adequate manpower.
7. The study reveals that majority of readers (73%) are interested to have agricultural information available in the libraries situated outside. To fulfill the above, the libraries are trying to provide inter-library loan services.
8. The study reveals that agricultural libraries are yet to have computers for information storage and retrieval. However only ten libraries possess computers for the purpose of storage and retrieval of agricultural information.

9. The study also reveals that all the agricultural libraries are showing their interest and willingness to join networking of agricultural information system.
10. Forty percent (40%) of the agricultural scientists and researchers are selecting their research topics in thirist areas of agriculture. They are also selecting research areas in consultation with senior colleagues from different institutions.
11. Majority of (65%) respondents used abstracting and indexing periodicals as sources of research literature. The teacher respondents have been using Abstracting and Indexing periodicals as the main sources of information for their research.
12. Majority of the agricultural scientists and researchers have expressed that books and periodicals in agricultural libraries of Bangladesh are inadequate.
13. The users of the agricultural information system under study are in need of information available in the agricultural libraries in Bangladesh. They are also in need of information available outside Bangladesh. Majority of agricultural information users are using other libraries for information in current periodicals.
14. The study reveals that the agricultural scientists and researchers are in difficulty in using abstracting and indexing periodicals whenever they are in need. It is due to dispersal of agricultural research stations geographically.
15. Majority of the users are getting required nascent agricultural information through non-formal ways i.e. mainly through friends

and participating in technical meetings. However, teachers working in agricultural colleges are getting current information through library staff.

16. It is observed that only 34% of respondents are aware of the provision of inter-library loan in the agricultural libraries. The agricultural scientists and researchers are very much interested in utilization of Selective Dissemination of Information (SDI) services. The respondents are also interested in getting the advantages and benefits of National agricultural information systems and services.
17. Majority of the agricultural scientists and researchers have expressed that the agricultural information sources are moderately sufficient to meet their information needs.
18. Most of the respondents (87%) have expressed the need for designing computerized agricultural information system from which they can have access to required information. They also felt the need for having access to National and International computerized agricultural information sources and services. It shows that users are in need of computerized agricultural information system and services. They are also aware of the advantages of computerized library and information services.
19. The study also reveals that majority of respondents (90%) are interested in Networking of agricultural information system. Further, the respondents are also interested in the introduction of agricultural networks in the specific field of agriculture.

Recommendations

The following recommendations are made by the researcher:

1. The Government of Bangladesh should lay down a clear National Information policy in the agricultural sciences and make it obligatory on the part of national agricultural research institutes to provide free flow of information to the agricultural scientists and researchers.
2. BARC should undertake the responsibility for planning National Agricultural Information Network System for all agricultural libraries in Bangladesh to provide agricultural information to the agricultural scientists and researchers. BARC should also take the responsibility of supplying hard copies of the journals and books to the agricultural scientists and researchers in Bangladesh.
3. The collection of standard books, research journals, reports etc. should be increased in the agricultural libraries of Bangladesh in order to meet the information needs of the agricultural scientists and researchers.
4. To save money, the libraries should avoid purchase of duplication copies and in this regard all the agricultural libraries should prepare union catalogue.
5. One of the essential prerequisites for the creation and development of indigenous database is the availability of a large number of trained information professionals such as system analyst, database manager, computer hardware/software specialists, Information scientists, Abstracters, Indexers and subject specialists. It is therefore, necessary to organize intensive practical training programmes for these categories of personnel.

6. Standardization plays a vital role in effective usage of Bibliographic database. Standards are also necessary for overall co-operative endeavours. The existing International standards for database creation be examined for adoption and new ones needed may also be developed.
7. Bangladesh is already participating in a co-operative venture in several International database like UNESCO, UNFP, UNDP, AGRIS, CARIS, CABI and etc. The national centres of excellence in agricultural sciences should develop capabilities for the continuously augmenting the database creation in various fields of research activity in agricultural sciences.
8. Instantaneous access to bibliographic database by itself is not sufficient and would be of no avail unless backed-up equally by efficient document delivery, translation and other support services. Continuous improvement, using non-print media such as magnetic, electronic and optical diskette should be brought out.
9. Development of software programmes for creation of indigenous vocabulary control devices should be necessary. CDS/ISIS, MINISIS and LYBSIS can be used for this purpose, we can also use commercially developed customized library automation for house keeping operations such as LYBSIS etc.
10. CD-ROM technology should be used in the creation of agricultural database.
11. There is a need for wider circulation of agricultural publications and also wider circulation of information about new arrivals. This has to be done by a central agricultural information supply agency, incorporating all materials at one place and this catalogue should

be made available to agricultural scientists and researchers, extension workers, planners and agricultural policy makers etc.

12. Indexing and abstracting services for all agricultural information are necessary for ensuring their easy and speedy access to the agricultural scientists and researchers.
13. It is very much essential that retrospective bibliographies of all agricultural information should be brought out besides the current lists in order to exploit the information from these sources.
14. It is suggested that reference service should be provided not only to the agricultural scientists and researchers but also to the farmers in order to utilize the agricultural information to the maximum extent possible.
15. The agricultural libraries of Bangladesh should conduct small courses to enable agricultural scientists and researchers to be aware of the generation of nascent information by National, Regional and International Agricultural Research Institutes.
16. Agricultural information materials available in all libraries of agricultural universities, agricultural colleges, agricultural research institutes and department of agricultural extension should be available to all the agricultural scientists and researchers in Bangladesh irrespective of their belonging to any particular institute.
17. The agricultural librarians and Documentalists of Bangladesh with the help of Library Association of Bangladesh (LAB) and Bangladesh Association of Librarians. Information Scientists and

Documentalists (BALID) have to take initiative for preparing agricultural library standards.

18. The Bangladesh Agricultural Research Council (BARC) should establish agricultural resource centres/Informatics in specialized disciplines to meet the individual information needs of the agricultural scientists and researchers.
19. The agricultural libraries of Bangladesh should develop the collection of non-book materials e.g. tapes, videocassettes, audio-visual materials and CD-ROMS along with other necessary documents.
20. The department of Information Science and Library Management of Dhaka University and the Department of Library and Information Science of Rajshahi University should introduce courses on agricultural librarianship of 100 marks in the curriculum of final year masters course and should organize training programmes of three months duration for upgrading the knowledge of the agricultural librarians and documentalists.
21. The agricultural libraries should organize user orientation programmes in the use of libraries, especially in using the computerized information services.
22. To overcome the present financial crisis, agricultural libraries of Bangladesh should mobilise their own financial resources either by marketing information or information consultation services.
23. Agricultural scientists and researchers of Bangladesh should be encouraged to attend conferences, seminars and research review meetings both locally and overseas.

24. The telephone systems within the country and the communication systems like telex, E-mail and Fax between the country and foreign countries should be provided to enhance the communication of agricultural information.
25. Agricultural research institutes and the universities of agriculture should be provided with adequate printing equipments and other materials, trained technical and editorial manpower to enhance the creation of agricultural information.
26. More local journals in agriculture sciences and related disciplines should be published since Bangladeshi scientists and researchers find it difficult to publish their research findings in overseas journals.
27. Acquisition policy should be developed for each agricultural research library to enable it acquire only those publications that are relevant to the research work of its parent organization. Such a policy should also include the exchange of publications with selected organizations and institutes locally and abroad.
28. Librarians and other personnel working in agricultural colleges, universities and research libraries should be encouraged to have additional training or continuing education in their own fields along with computer science and information technology.
29. The Government of Bangladesh should form a commission to help automate step by step all the libraries in the agricultural research institutes, agricultural colleges and agricultural universities.

18. Total strength of library staff.

- a. Professional :
- b. Semi professional :
- c. Non-professional :

19. Do you feel that the present staff is sufficient to run the library ?

Yes No

20.(a) If the staff is not sufficient, how many more persons do you feel necessary ? _____

(b) Please justify your demand with reasons

- (i)
- (ii)
- (iii)
- (iv)
- (v)

21. Please give the following informations :

Designation	Qualification	Salary	Work allotted
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- a. Librarian
- b. Dy. Librarian
- c. Asst.
- d. Other professional staff
- c. Non- professional

II. Library users

- a. Teachers :
- b. Students :
- c. Administrators :
- d. Scientists :
- e. Researchers :
- f. Others (Pl. specify) :

22. Average number of users per day :

III. Library collection

23. Total collection of titles in the library.

- a. Manuscripts :
- b. Text books :
- c. Periodicals :
- d. Thesis :
- e. Reports :
- f. Reports & proceedings :
- g. Audio-visual materials :
- g. Others :

24. Subject area covered :

25. How do you rate your present collection ?

almost adequate inadequate poor.

26. Volumes added during fiscal years (5 years)

Year : 1994-95 1995-96 1996-97 1997-98 1998-99

Volume :

27. List the subject areas where collection is stronger (in order)

- a. f.
- b. g.
- c. h.
- d. i.
- e. j.

28. Do your library possess any special material like ?

AGRIS, AGRI index, AGRICOLA, CABI Yes No

29. Do you think that your library collection should up-to-date ?

Yes No

IV. Library Finance

30. Please give details of the library expenditure for the 5 years.

Years	Books	Periodicals	Indexing	Others	Total
1994 - 95					
1995 - 96					
1996 - 97					
1997 - 98					
1998 - 99					

31. Mention the sources of finance for the library

- a. International / outside Bangladesh ()
- b. Government ()
- c. BARC ()
- d. UGC ()
- e. Others specify ()

32. Are the finances adequate to meet ~~the requirement~~ the requirements of readers both in collection / acquisition and service ? Yes No

If No, please suggest the methods of improving the finance & services.

- a. Ask for more finance from Government and other sources ()
- b. To come under network in showing the resources and services with other libraries ()
- c. To reduce the objectives of the library to amount available ()
- d. Both a & b ()

33. What methods do you follow for the allocation of Budget ?

V. Library service

34. Services rendered by your library / information centre (please \checkmark)

- a. Reference services
- b. CAS (Current Awareness Service)
- c. SDI (Selective Dissemination of Information)
- d. Inter library loan services
- e. Indexing and abstracting services
- f. Reprographic services
- g. Computerized Services
- h. Others (Please specify)

35. Are the services adequately utilized ? Yes No

36. Are the library operations ?

- a. Fully manual and conventional
- b. Partly computer based
- c. Computer based

37. Do you think that the library services should be developed in the light of other library services in developing countries ? Yes No

VI. Acquisition (Methods of book purchase)

- 38.a. By inviting quotations
- b. Appointing vendors
- c. From local book shops
- d. Other specify

39. Methods of periodical subscriptions

- | | |
|--|--|
| (i) Bangladeshi periodicals | (ii) Foreign periodicals |
| a. Through agents <input type="checkbox"/> | a. Through agents <input type="checkbox"/> |
| b. Direct from publishers <input type="checkbox"/> | b. Direct from publishers <input type="checkbox"/> |
| c. Others (Pl. specify) <input type="checkbox"/> | c. Others (Pl. specify) <input type="checkbox"/> |

VII. Scheme of classification / cataloguing

40. Scheme of classification followed.

- a. Colon classification
- b. Dewey Decimal classification
- c. Universal Decimal clasification
- d. Others (Pl. specify)

41. Type & format of catalogue maintained

- a. Dictionary
- b. Classified
- c. None

42. Catalogue code followed

- a. ALA
- b. C.C.C.
- c. AACR-2
- d. Other

43. Are you compiling bibliographies ?

If yes, what type of bibliographies. ?

VIII. Circulation

44. Issue method followed in the library

- a. Register
- b. Brown system
- c. Newark system
- d. Others (Pl. specify)

45. Number of books issued per user.

46. For how long days, books are issued to a user.

IX. Inter Library loan services

47. Average book loan period (in weeks) _____

48. Do you think that your library should be linked-up with other agricultural libraries of Bangladesh ? Yes No

49. How are you getting the information to your users when they need ?

- a. By sending persons ()
- b. By writing letters ()
- c. By telephone ()
- d. By all means ()

50. Are your readers interested to get agricultural information available in other agricultural libraries ?

If yes, what type of agricultural information actually they need.

- a. Periodicals
- b. Non-book materials
- c. Reference tools
- d. Books
- e. Others materials, if any

51. Have you been facing any communication problems in getting information from other libraries ? Yes No

If yes, specify the problems.

X. Computer facilities

52. Have you initiated computerization ? Yes No

53. Please write the details of hardware and software.

- (i) Hardware
- (ii) Software

54. Do you use computer ? Yes No

If yes, for what purpose you are using the computer ?

- a. Storage and retrieval of Agricultural information ()
- b. Reference services ()
- c. Clerical and administrative work ()
- d. Others (Pl. specify)

55. If you are not willing to use the computer, what are the reasons you are against using the computer ?
- a. The cost of installing and maintenance of the computer is more. ()
 - b. Difficulty in using the computer and learning the computer language ()
 - c. Others (Pl. specify) ()

56. Does your library have any database (please mention) ?

57. Any suggestion or comments you would like to mention that are relevant to the computerization of Agricultural information.

XI. Library network.

58. Are you interested in joining network of Agricultural information system in Bangladesh ? Yes No
59. Do you have local Area Network (LAN) facility ? Yes No
60. Are you participating in a wide Area Network (WAN) or taking its benefit ?
 Yes No
61. What specific tools, do you use for rendering agricultural information services (Please mention) ?
62. Do you think that agricultural information networking can play a very vital role in providing agricultural information to meet up information needs of agricultural scientists & ~~your~~ researchers ? Yes No
63. State your opinion and role in networking of Agricultural Information system in Bangladesh.

64. If the library have any publicatiobn (please mention) :
65. In the context of the desired information needs of agricultural information uses to what extent the existing libraries/information centres can fulfill the information needs of the agricultural scientists and researches of Bangladesh (please mention in brief).

Questionnaire filled by :

Signature & date :

Address :

Questionnaire for the Survey of the Information needs of the Agricultural Scientists and Researchers of Bangladesh

(Please Tick (√) marks where necessary)

Confidential

1. Name _____ :
2. Sex _____ : 1. Male 2. Female 3. Age
3. Name _____ of the organisation
to which attached _____ :
4. Qualifications _____ :
 - a. Graduate _____
 - b. Master's degree _____
 - c. Doctorate degree _____
 - d. Others (Pl. specify) _____
5. Status _____ :

a. Researcher <input type="checkbox"/>	d. Scientist <input type="checkbox"/>
b. Teacher <input type="checkbox"/>	e. Administrator <input type="checkbox"/>
c. Students <input type="checkbox"/>	f. Others (Pl. specify) <input type="checkbox"/>
6. Specialization :

a. Agronomy <input type="checkbox"/>	i. Plant pathology <input type="checkbox"/>
b. Genetic's & plant breeding <input type="checkbox"/>	j. Horticulture <input type="checkbox"/>
c. Soil science & Agri. chemistry <input type="checkbox"/>	k. Extention education <input type="checkbox"/>
d. Bio-chemistry <input type="checkbox"/>	l. Agricultural statistics <input type="checkbox"/>
e. Entomology <input type="checkbox"/>	m. Microbiology <input type="checkbox"/>
f. Agricultural economics <input type="checkbox"/>	n. Forestry <input type="checkbox"/>
g. Agricultural engineering <input type="checkbox"/>	o. Fisheries <input type="checkbox"/>
h. Plant physiology <input type="checkbox"/>	p. Others (Pl. specify) <input type="checkbox"/>
7. For how long you have been using the University/institute library :

8. How often do you visit the library ?
- a. Daily b. Twice a week
- c. Once a week d. Occasionally
9. How do you generally select your area (topic) of research ?
- a. Section based on thirsted areas in agriculture
- b. Consultation with senior colleagues
- c. On your own idea
- f. If any other
10. How do you get the research literature concerning your research topic ?
- a. By scanning abstracting and indexing periodicals.
- b. By sharing with colleagues
- c. By attending technical programmes
- d. Any other sources
11. In your opinion stock of books for your research work is
- a. Inadequate b. Adequate c. Fairly adequate
12. In your opinion stock of periodicals for your research work is
- a. Inadequate b. Adequate c. Fairly adequate
13. In total to what extent the library is meeting your information needs for your research work ?
- a. 0 - 20% b. 20 - 40% c. 40% - 60%
- d. 60% - 80% e. 80% - 100%
14. Please ^{mention} ~~tick~~ appropriate box to indicate your needs of information services (According to priority viz. 1, 2, 3, 4, 5, 6, 7 etc.)
- a) Document loan b) Reprographic Services
- c) Current Awareness Service d. Reference Services

- e) Selective Dissemination of Information Services
- f) Indexing and abstracting Services
- g) Computer Literature Searches
- h) Inter Library Loan Services
- i) Bibliographical Verificaiton of Citation
- j) Audio Visual Materials Services

15. How do you come to know a new publication acquired by the library ?
(Kindly indicate the order in which you come to know)

- a. Display in the library
- b. List of Additions
- c. Library Catalogue
- d. Informally thourgh other students/researchers etc.
- e. Informally through the librarian/library staff.
- f. Any other sources (Pl. specify).

16. For which of the following purposes you primarily use the library .

- a. Teaching
- b. Research
- c. Scholarly writings
- d. Self knowledge
- e. Prescribed Course
- f. Recreation

17. Have you visited any other library for your research work ?

Yes No

If yes, what are the other libraries you have visited during the last one year for your research work ?

Sl. No.	Name of the Library	Period of visit	Nature of Inf. Collected	Other (if any)
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18. What motivated you to become a member of the other libraries ?
- a. Current periodicals
 - b. Good study environment and physical facilities
 - d. Prompt services
 - e. Others (if any)
19. What type of publications such as books, periodicals, maps, reference books, proceedings etc. do you use for your research work in order of priority.
- 1. 4.
 - 2. 5.
 - 3. 6.
20. Do you continuously scan the abstracting and indexing periodicals in order to know the latest articles published in your research work ?
- Yes No
- If no. what reasons do you attribute for it ?
21. Are you able to keep up-to-date with the latest literature in your field ?
- Yes No
22. How do you come to know about current publications in your field ?
- a. Through friends
 - b. Through library staff
 - c. Through experienced professionals
 - d. Through technical meeting
 - e. Others (please specify)
23. Does your library provide\$ documents through inter library loan (i.e. procuring books which are not available in your library from other libraries.) ?

24. If no, do you feel that this service is necessary to fulfill your information needs ?
25. Do you think that the library should provide SDI services (i.e.) continuously informing the scientists and individually about the latest information published in various sources ? Yes No
26. Do you aware of the following agricultural information sources available in your field ?
- a. AGRIS Yes No
- b. AGRINDEX Yes No
- c. AGRICOLA Yes No
- d. CABI Yes No
27. Do you think that all the agricultural libraries of Bangladesh should be computerized as soon as possible ? Yes No
28. Do you think that computerized Agricultural Information Services are very much essential for your research work ? Yes No
29. Do you feel that all the agricultural libraries of Bangladesh should have internet connection with other agricultural libraries of the world ?
- Yes No
30. Do you browse internet to meet up your agricultural information needs ?
- Yes No
31. Do you aware of National Agricultural Information Systems/Services in other countries ? Yes No
- a. Is there any such national agricultural information centres/services in Bangladesh ? Yes No
- b. If yes, please name the centre/services

32. Do you think that all the libraries should keep link with the FAO library (UNO)? Yes No

33. Are you keeping abreast of information generated by the organizations like BARC, BARI, BRRI, BAU etc. ?
If yes, please state how you are acquiring that information.

34. Do you feel that existing available agricultural information sources of your area are sufficient for your professional work ?

- a. Sufficient b. Moderately sufficient
c. Insufficient.

35. To meet your information, are you getting help from professional colleagues? Professional colleagues in the country
Professional colleagues out side the country.

36. Do you feel that there is an urgent need for computerized agricultural information services in Bangladesh ? Yes No

If yes, please state whether there is any need for agricultural information :-

- a. Local
b. National
c. International

37. Do you have knowledge in computer operations ?

- a. Preliminary knowledge
b. Operational ~~of~~ knowledge
c. Manipulation of package
d. Production of software

38. Please record your opinion on computerization of your library facilities.
39. Do you feel that networking of agricultural information system is very much essential for your research ? Yes No
40. State your opinion and role in network of Agricultural information system in Bangladesh.
41. Introduction of Agricultural Information Networks to your subject create more efficiency in research/study and teaching. Yes No
42. As possibly you know that the present manpower position of the agricultural libraries and information centres of Bangladesh is inadequate.
Do you think that the following factors are responsible for inadequacy ?
- a. Negligence of the authorities
- b. Lack of adequate financial support
- c. Any other (please mention)
43. What is/are your opinion/recommendations or suggestions for developing an efficient and effective library information services for the information needs of the agricultural scientists and researchers of Bangladesh ?
(Please mention in brief).

Questionnaire filled by :

Signature & date :

Name :

Designation :

Address :