Chapter-8

MAJOR FINDINGS, SUGGESTIONS AND CONCLUSION

8.0 INTRODUCTION

The present study examined the **"Insights into Information Seeking and Communicating Behaviour of Agricultural Scientists of ICAR Institutes and Centres in Northeast India: A Study".** Specifically the focus of this study was on obtaining data on the nature of information needed by the agricultural scientists, the sources consulted, pattern of seeking of information by them and also the types of constraints faced by them while accessing information from the library. These needs are felt to meet the information requirement for carrying out research as well as other professional activities. To satisfy their needs they search various information channels such as online services, conversation with experts in the field and conversation with colleagues within or outside the organization.

Information needs and information seeking behaviour has been the focus or emphasis of great number of studies conducted so far in India as well as in abroad. Some of them are pertinent to theoretical, methodological aspect of a topic and some are research studies on information needs and information seeking behaviour of different types of users e.g. students, faculty members, researchers, scientists, media persons, lawyers etc.

A distinct look at the studies on 'Information Seeking Behaviour' in Northeast part of India revealed that not a single comprehensive study has been conducted as far as ICAR

concerned. But sufficient studies are done in the other parts of the country by the librarians and informational professionals.

The researcher designed questionnaires and administered to librarians/library in-charge and agricultural scientists of all twelve institutes and centres of ICAR in North EasternRegion of India. The researcher received responses from the librarians/library in-charge and scientists with response rate of 100% and 91.1% respectively.

The present study is an original effort in the process of identification and analysis of silent inclinations or developments in the information seeking by the scientist working in the ICAR institutes and centres of northeast region of India. To be successful in this modern era, one needs a variation in information; no matter how well versed one in his field or profession. In this study the researcher presented summary data on the information seeking behaviour of scientists and also observed the practical importance of these data.

The unpredictable and unstable advancement of computer technology in the past two eras has considerably altered the scenery of not only of research but also in other areas too, not just in relations of what way knowledge is disseminated but also in in what way knowledge is formed and communicated or transferred. Recent modes of technology have altered the information environment in which the scientists work. The search of knowledge has been modernized, predominantly through the enormous growth and development of available data, specifically through electronic resources accessible via Internet.

However, evaluation of the findings of any research study is constantly suitable to generalize the same. The overview of the findings may be applicable to other ICAR institutes and centres having similar research mandates.

Therefore, in this chapter, findings of this study are presented. The findings cover the analysis made in the previous chapter (**Chapter 7)** are being taken into account to see whether the set of objectives are achieved or not**.** Based on the findings, few suggestions for the improvement of the present status are given along with opportunities for further research and conclusion.

8.1 SUMMARY OF THE FINDINGS

The data collected through various means were analyzed in the previouschapter. The analysis of data has revealed a number of useful findings and they are summarized below:

8.1.1 Major Findings of the Study

The researcher had divided the major findings of the study into two parts which are as follows:

8.1.1.1 Findings from Libraries

- The response obtained from the libraries is 100% covering all the selected twelve institutes and centres of ICAR in North East Region of India.
- With regards to the establishment of the libraries in the respective institutes and centres most of them established in between the year 1975-1999 except one institute i.e., National Research Centre on Pig, Guwahati, Assam has started its library in the year 2004.
- Majority of them were having the qualification of Ph.D. and followed by M.Sc. and B.Sc. degree in the different fields of agriculture. Whereas only one library in-

charge from the institute of ICAR Research Complex for NEH Region, Umiam, Meghalaya having the bachelor degree in Library and Information Science.

- The libraries of all twelve ICAR institutes and centres were having different funding agencies as all the six institute libraries obtained their funds mainly from **ICAR, New Delhi**. Whereas, all the other six centre libraries obtained their funds from **ICAR Research for NEH Region, Umiam, Meghalaya**.
- The library staff strength isfound to be highest in the institute of ICAR Research Complex for NEH Region, Umiam, Meghalaya i.e. six staffs (one library in-charge, one in-charge library assistant, two library attendant and two other supporting staff) as compared to other institutes and centres.
- The library collection in the institutes and the centres were not up to the mark. There were no electronic sources found in both types of materials viz. books and journals.ICAR Research Complex for NEH Region, Umiam, Meghalayawas having the highest collections of book with 29,196 numbers of books in print format. Whereas, in ICAR Research Complex for NEH Region, Mizoram Centre, Kolasib, Mizoram was having the lowest with 534 number of books in print format only.
- It is observed that in the libraries of ICAR institutes and centres the ICT infrastructure mainly comprises of use of computer peripherals only. Out of all twelve institutes and centres nine institutes and centres were having computer peripherals (computers, UPS, scanners, printers, projectors and LAN/WiFi connections) whereas, the status of ICT infrastructure in other three institutes and centres were nil.
- There is not a single institute and centre library which is automated. Therefore, the status of library automation is nil in each and every selected institute and centre of ICAR in North Eastern Region of India.

8.1.1.2 Findings from Users (Scientists)

- Of the 186 Scientists identified for the study, the researcher distributed all total 179 questionnaires and finally 163 questionnaires were received back which were completed in almost all the aspects which have been taken into account for further analysis, making the respond rate of 91.1% of the scientists.
- The duly filled in questionnaires collected during the period of March, 2014 to July, 2015 from the Scientists who were engaged in the selected 12 (twelve) institutes and centres of ICAR in the North Eastern Region of India.
- The questionnaires were distributed among the scientists in the institutions across eight states in North Eastern Region. The states like Meghalaya, Nagaland, Arunachal Pradesh and Sikkim having both institutes and centres in their states. While, in Assam, Manipur, Mizoram and Tripura having only one institute or centre in each state.
- Majority of responses received with 100% from institutes and centres viz. National Research Centre on Mithun, Medziphema, Nagaland, National Research Centre on Orchids, Pakyong, Sikkim Centre, Sikkim and ICAR Research Complex for NEH Region, Nagaland Centre, Jharnapani, Nagaland. Whereas, the lowest responses received with *68.7% from* ICAR Research Complex for NEH Region, Lembucherra, Tripura Centre.
- Majority of 37.4% respondents belong to the age group of below 36 years, followed by 29.4 % belong to the age group of 46-55 years, 20.2% belong to the age group of 36-45 years and lastly, 13%belong to age group of above 56years.
- Out of 163 respondents, the majority of them are male respondents 83.4% and that of female respondents are 16.6%.

- The 163 scientists, based on the nature of work, they were categorised as: 45.4 % Scientist/Assistant Professor, followed by 31.3% Senior Scientist/ Associate Professor and 23.3 % Principle Scientist/ Professor.
- The Scientists having diverse and allied specialisation in the field of agriculture viz. Animal Husbandry, Horticulture, Plant Breeding, Agronomy, Entomology etc. who were engaged in their respective research works or activities.
- Based on the participation in Congress, Conferences, Seminars, Workshop and in Summer Institutes: 158 (96.9 %) respondents participated in 'conferences' ranked as **one**, followed by 149 (91.4 %) respondents participated in 'seminars' ranked as **two**, 123 (75.5 %) respondents attended in 'workshop' ranked as **three**, 43 (26.4 %) respondents participated in 'congress' ranked as **four** and very least number of respondents with only 32 (19.6 %) number participated in 'Summer Institutes' ranked as **five**.
- The category wise (Scientist, Senior Scientist and Principle Scientist) the area of activities: majority of them 48.5% engaged in research activity only, 32.5% engaged in other activities like extension, demonstration, technology dissemination, training activities etc., 19% engaged in both research and teaching activities and whereas no one was engaged only in the teaching activity.
- Regarding library visit pattern, majority of the respondents i.e., 41.1% visits library once a month, followed by 34.4% respondents used to visit the library rarely, 15.3% visits the library once a week, 7.4% whovisits library on daily basis, whereas 1.8% never used to visit the library.
- Based on the purpose of the library visit majority of 157 (96.3 %) respondents visit library for 'consulting reference books' ranked as **one**, followed by 149 (91.4 %) respondents used to visit library for 'getting books issued/returned' ranked as **two**,

79 (48.5 %) respondents visits library for 'reading newspapers and magazines' ranked as **three**, 53 (32.5 %) respondents visit the library for 'consulting workshopseminars and conference proceedings' ranked as **four** and with 47 (28.8 %) respondents visit library for 'consulting journals' ranked as **five**.

- Majority of 158 (96.9 %) respondents generally consult 'reference books' in the library ranked as**one**, followed by 136 (83.4 %) that consult 'text books' ranked as **two**, 89 (54.6 %) consults 'research reports' ranked as **three,** 73 (44.7 %) consults 'scholarly journals' ranked as **four**, 60 (36.8 %) consults 'newspaper/ popular magazines' ranked as **four** and 56 (34.4 %) consult 'Govt. Reports' ranked **five**.
- The respondents mostly required often with 146 (89.6 %) respondents required 'procedural information' ranked as **one**, 139 (85.3 %) respondents required 'information for preparing a research project' ranked as **two**, 129 (79.1 %) respondents required 'information for writing a review article' ranked as **two** and only 76 (46.6 %) respondents required 'other' types of information like information for preparing presentation, current information related to their subject of both India and abroad etc. ranked as **four**.
- Based on information sources 151 (92.6 %) 'Consult Indexing Journal' ranked as **one**, followed by 142 (87.1 %) 'Consult Review article in a periodical' ranked as **two**, 139 (85.3 %) 'Discussion with experts in the field' ranked as' **three**, 130 (79.6 %) 'Consult Bibliography' ranked as **four**, 119 (73 %) 'Consult indexing and Abstracting Journal' ranked as **five**, 117 (71.8 %) 'Discussion with colleagues within the organisation' ranked as **six**, 94 (57.7 %) 'Discussion with colleagues elsewhere' ranked as **seven**, 91 (55.8 %) 'Discussion with supervisor' ranked as **eight**, 79 (48.5 %) 'Visit Library/ Information Centre' ranked as **nine**, 52 (31.9 %)

'Consult Library Catalogue' ranked as **ten** and with 25 (153.3 %) 'Discussion with librarian/Reference staff of your library' ranked as **eleven**.

- It is revealed that 157 (96.3 %) respondents usually consult 'Scholarly Journals' ranked as **one**, followed by 132 (81 %) respondents consult 'text books' ranked as **two**, 121 (74.2 %) respondents consult 'Research/Govt. Reports' ranked as **three**, 98 (60.1 %) respondents consult 'Conference Proceedings' ranked as **four**, 32 (19.6 %) respondents consult 'other resources' like newspaper, magazine, CD/DVD etc. ranked as **five**, 24 (14.7 %) respondents consult 'monographs' ranked as **six** and with least of 11 (6.8 %) respondent consult 'Abstracting and Indexing sources' ranked as **seven**.
- For keeping update in the area of research the majority of scientists with 159 (97.6 %) respondents keep themselves updated in their research work by 'Searching Internet on given topics' ranked as **one**, followed by 143 (87.7 %) respondents keep updated by 'Scanning Current issues of Journals' ranked as **two**, 123 (75.5 %) respondents keep updated by 'Attending Workshop/ Seminar' ranked as **three**, 98 (60.1 %) respondents keep updated by 'Workshop/ Seminar and Conference Proceedings' ranked as **four**, 69 (42.3 %) respondents keep updated by 'Pre-prints/ reprints directly from author' ranked as **five**, 54 (33.1 %) respondents keep updated by 'Personnel Communication' ranked as **six**, 45 (27.6 %) respondents updated by 'other sources' ranked as **seven,** 28 (17.2 %) respondents updated by 'Technical/ Research Report' ranked as **eight,** and very least percentage with 22 (13.5 %) respondents by 'Indexing/ Abstracting Periodicals' ranked as **nine**, 21 (12.9 %) respondents updated by 'Book, Monographs etc.' ranked as **ten**, 14 (8.6 %) respondents by 'Yearbooks/annual review' ranked as **eleven**, 13 (8.0 %)

respondents updated by 'Dissertation/Thesis' ranked as **twelve** and with 7 (4.3 %) respondents updated by 'Bibliographies/Library Catalogue' ranked as **thirteen**.

- Regarding the adequacy of library resources a response rate as high as 57.7% is of opinion that library collections in the Centre and Institute library is not adequate at all, 35.6% respondents found library collections are partiallyadequate at all,whereas only 6.7% respondents found library collections are adequate.
- Most of the Scientists follow the patterns of obtaining journal articles like 162 (99.4 %) respondents obtain journal articles by 'Subscribing Journals Personally' ranked as **one**, followed by 161 (98.8 %) respondents obtain journal articles by 'Access and Downloading to Open Access Journals for full text' ranked as **two**, 157 (96.1 %) respondents obtain journal articles by 'other sources' ranked as **three**, 55 (33.7 %) respondents obtain journal articles by from 'J-Gate Custom Content Centre of INFLIBNET (JCCC)' ranked as **four**, 42 (25.8 %) respondents obtain journal articles by 'Under Document Delivery Service of INFLIBNET/ DELNET' ranked as **five** and only 36 (22.1 %) 'Consult journals in library' for obtaining journal articles for their research ranked as **six**.
- Centred on the dependency on different types of information sources, 79.1% the of scientists responded to personal collections and with concerning to other sources like internet surfing, using searching tools etc. majority of the scientists with i.e., *'to great extent'* with 60.1% whereas, with very least i.e., 14.7% on library collection and with 36.2% on personal collection of colleagues *'to some extent'*for accessing information.
- As regards to the mode of collection like own efforts with 100%, computerized information sources with 76.1% and as concern to colleagues with 58.9% responded *'to great extent'* for collecting their required information. While, as

concerns tosupervisor with 74.2%, library staff with19%, librarian with only 6.1%, full-time research assistant with 79.8%, part- time research assistant with 13.5% responded *'to some extent'* for collecting information for their research.

- In case of types of sources the majority of scientists depends on primary sources with 99.4% *'to great extent'*, followed by secondary sourceswith 59.5% *'to some extent'* and on tertiary sources with 54.6%*'to some extent'* for their research and allied works.
- The different types of difficulties that come across by the Scientists while accessing information like : 156 (95.7 %) respondents were found problem of 'lack of reading materials' in the library ranked as **one**, followed by 138 (84.7 %) respondents who found 'lack of access to all information' ranked as **two**, 63 (38.7 %) respondents were faced 'time problem' ranked as **three**, 56(34.4%) respondents found 'other problems' like misplacement of reading sources, non-cooperation from the staff, Non-availability of adequate reading materials etc. ranked as **four**, 25 (15.3 %) respondents were found problem like 'lack of knowledge of information sources' ranked as **five** and 13 (8 %) respondents found problems of 'lack of knowledge in use of library services' ranked as **six**.
- As concerns to time problem the most of the Scientists with 44.8% says time problem is extremely difficult for looking information sources in the library, followed by 37.4% have considerable problem, 14.1% have little problem and only 3.7% says that they were having no time problem for looking or accessing information sources in the library.
- Majority of scientists with 58.3% found it extremely difficult and 41.7% said they have considerable problem while searching information because of lack of automation in the library.

- As related to finding or locating suitable sources of the interest the majority of Scientists with 44.8% found it extremely difficult, 35.6% had considerable problem and 19.6% said they have little problem.
- Regarding the ideal timing of the library majority of Scientists i.e., with 39.9% have the opinion that it should be open in between 16- 18 (After Office Time), followed by 28.2% preferred the ideal timing should be in the office time, 23.3% respondents preferred the timing in between 9-12 (Prior to Office Time) and 8.6% respondents say the library should be open at all time.
- Most of the Scientists i.e., 42.3% respondents say that the ideal number of books to be issued should be '4' books, 25.2% have opinion of '5' books, 14.1% say '3' books, 11% say '6'books, 4.9% say only '2' books and only 2.5% say '7' books.
- Based on the response that the reference materials should be issued to the users or not, the majority with 51.5% were agree that the reference material should be issued to the users, 33.7% were strongly agree and 4.7% replied that they were strongly disagree that the reference materials should be issued to the users.
- Suggestions that were given by the Scientists are :
    - 153 (93.9 %) respondents suggest to have 'fast internet facility' in the library ranked as **one**;
    - 148 (90.8 %) respondents suggest to 'develop the library collection as per user's needs' ranked as **two**;
    - 132 (81.0 %) respondents suggest 'other types of suggestions' which are mentioned below ranked as **three**;
    - 112 (68.7 %) respondents gave suggestion to 'introduce innovative practices in the library services' ranked a **four**;

- 94 (57.7 %) respondents suggest to conduct 'user education programme by the library' ranked as **five** and;
- 79 (48.5 %) respondents suggest to improve the 'resource sharing' facilities of the library ranked as **six**.

Other additional points as suggested by the Scientists also need to be taken into attention towards having an effective information scheme for the Scientists in the digital environment. The remarks or comments given by them are also required to evaluate their applicability while planning such an information scheme.

8.2 REALIZATION OF SET OBJECTIVES OF THE STUDY

The findings of the study have allowed the researcher to achieve the set objectives of the study. The objective wise findings of the study have been discussed below:

- **Objective One** *was designed to know the allied specialization of the different agricultural scientists of ICAR Institutes and Centres of Northeast India.*

Information is a vital and indispensable product of the modern society. It grows from experience, observation, inference, Interaction and cultivation of knowledge. It is intended for socio-economic development without which the present society cannot move. Such information is very essential for human activity. Nature of information needs varies from one individual to another depending upon their subject of interest and area of specialisation. From the present study the area of specialisation is found in their interest subjects viz. Animal Husbandry, Horticulture, Soil Science, Agronomy, Entomology etc.

- **Objective Two** *was concerned to study the information needs, use pattern and gathering behaviour of the agricultural scientists of different ICAR Institutes and Centres of Northeast India.*

Information sources serve the information needs of various kinds of users. The majority scientists i.e., with 157 (96.3 %) respondents visit library for consulting reference books, followed by 149 (91.4 %) respondents used to visit library for getting books issued/returned, 79 (48.5 %) respondents visits library for reading newspapers and magazines, 53 (32.5 %) respondents visit the library for consulting workshopseminars and conference proceedings and with 47 (28.8 %) respondents visit library for consulting journals. The purpose of visit to the library of the users, largely depend the free time available to the users or make free to keep themselves to know the developments in their respective disciplines.

Use pattern of users in the library are perhaps one of the most effective methods of understanding their information requirements. Majority of the users 15 (96.3 %) respondents usually consult Scholarly Journals, followed by 132 (81 %) respondents consult text books, 121 (74.2 %) respondents consult Research/Govt. Reports, 98 (60.1 %) respondents consult 'Conference Proceedings, 32 (19.6 %) respondents consult other resources like newspaper, magazine, CD/DVD etc., 24(14.7%) respondents consult monographs and with least of 11 (6.8 %) respondent consult Abstracting and Indexing sourcesas to manage to know the current literature in the field of their interest due to availability in the libraries. The users prefer to visit other libraries in addition to the libraries of specific subjects libraries and suggested networking should be among local, university, state level, public, subject, national libraries, government libraries, which is indispensable for a fruitful research. For networking all the libraries should be computerized with internet connectivity.

Information gathering is a matter more or less related to sense making in which individual chooses an item of information that best fits to his /her needs and purposes. From the study it is revealed that most users gather information 'to great extent' on the

personal collections and other sources like internet or online sources. They also obtained their journal articles 'to some extent' by subscribing journals personally, by access and downloading to open access journals for full text and also through other sources like JCCC@ CERA, Research Gate website, PubMed, collecting through friends or colleagues were working inside and outside India etc.

- **Objective Three** *was attempted to correlate the adequacy of the collection and research needs of agricultural scientists of different ICAR Institutes and Centres of Northeast India.*

The success or failure of a library depends upon the adequacy or inadequacy of its collection. From the users point of view the most adequate collection is one, which covers as many subjects as possible. Since users from different sections of the scientific community consult different types of materials i.e. books, periodicals, report, conference proceedings etc. the collection and library services must be adequate in all respects to make it more user-friendly. But the present study reveals that the libraries have failed in this objective. Majority of the users 94 (57.7 %) is of opinion that library collections in the Centre and Institute library is not adequate at all. The libraries are not in the process of acquiring new books and new editions, even where there are no sufficient copies of standard text books available. Some journals, which are being subscribed by the library, are incomplete because some important numbers are missing. These journals are generally received very late, sometimes as late as by a year. The level of satisfaction of services provided, number of collections and variety of information sources are not satisfactory. The users expressed dissatisfaction due to lack of up to date information and prompt services. Majority of the users visit other libraries on non-availability of documents in their respective libraries. They purchase personally, borrow from the personnel collections of their colleagues within and outside the organisation, from supervisor and experts. Institutes

and centres are facing problems of space, books, reference materials, furniture, qualified library professionals and connectivity of Internet. The Internet facilities are insufficient, because there is no proper connectivity of internet in the libraries. A proper and channelled connectivity of internet should be provided to libraries which will be helpful for the users (scientist) of those respective libraries.

- **Objective Four** *was to identify the various channels through which information is accessed by agricultural scientists of different ICAR Institutes and Centres of Northeast India.*

The user is the best judge of his requirements. A part from receiving information through institutionalized libraries, the users have their own private channels for obtaining information. Sometimes compared to the institutionalized channels, personal channels are direct and more effective. From the study it is concluded that most of the respondents i.e.,129 (79.1 %) depend on the personal collections 'to great extent'and other sources like internet surfing, using searching tools etc. with i.e.,98 (60.1 %).Most of the users keep updated themselves in the area of their research work by Searching Internet on given topics with 159 (97.6 %),Scanning Current issues of Journals 143 (87.7 %), Attending Workshop/ Seminar and Workshop/ Seminar and Conference Proceedings with 123 (75.5 %) and to some extent 69 (42.3 %) updated by Pre-prints/ reprints directly from author, 54 (33.1 %) updated by Personal Communication.

Most of the respondents depend on the mode of collection especially from their own efforts 163 (100 %), from computerized information sources 124 (76.1 %) and from their colleagues 96 (58.9 %) for accessing the required information for their research works or related activities.

- **Objective Five** *was designed to identify constrains faced by the agricultural scientists of different ICAR Institutes and Centres Northeast India.*

Constraints are common phenomenon that every user faces in using or searching information. The scientists face difficulties in access to use the information not because of one factor alone, but because of multiple factors.It is observed that most of users replied that they were facing problems in the library like lack of reading materials 156 (95.7 %) and lack of access to all information 138 (84.7 %) and some extent they were facing time problem 63 (38.7 %) also. The most of the respondents found extremely difficult in finding or locating information in the library. They also found extremely difficult while searching information because of lack of automation in the library. From the study it is concluded that automation is one of the most important operations to perform the library activities. It is considered as the light houses for information in the field of research to provide the effective and efficient services. The another reason is also that the scientists are not familiar to the sources, they need skill development activities which will update knowledge of reference tool or other sources and also face problem in locating a reference when they are misplace.

- **Objective Six** *was designed to get suggestions and some remedies which will help the agricultural scientists of different ICAR Institutes and Centres of Northeast India.*

Majority of the scientists suggested that they preferred to use the library after office time as the favourable time for them. The users suggested the number of books issued for approximately be '4' books. The majority of scientists agreed to the fact that the reference materials should be issued to the users.

Information environment is very complex. In order to retrieve desired information to the users, the information intermediary has to adopt certain behavioural strategies to make the system effective.

Majority of 153 (93.9 %) respondents suggest to have fast internet facility in the library, 148 (90.8 %) respondents suggest to develop the library collection as per user's needs etc. They also gave suggestion to introduce innovative practices in the library, theysuggeststo conduct user programme by the library and alsosuggests to improve the resource sharing facilities of the library.

The librarians expressed during interviews that in fact, all the libraries want to develop their collections, improve their services and stand out in this competitive age, but due to rapid growth of information, varied application of information technology, financial constraints it has become a big challenge for library professionals, especially of special libraries. In such a condition one should be very careful to manage collection of reading materials as well as providing services as according to the present era of digital environment. Improving quality does not mean only to adopt new and expensive technologies. It also means improved and innovative service improvement is possible working on continuous basis and developing as budget permits. It is remembered that in case we are in a position to achieve it successfully, only then librarianship can be sustained for future and excellence can only be achieved by intelligence and sincere efforts.

8.3 SUGGESTIONS AND RECOMMENDATIONS

From the above discussions, now it is very much clear that the Agricultural Scientists are not getting full satisfaction while seeking information from their respective libraries to meet their varied information needs. The general findings of the study, the problems they

encountered and their willingness towards improvement of the existing system with specific suggestions have revealed the need for making certain feasible suggestions for onward recommendations to concerned authorities for implementation.The need for having an effective plan for making the Agricultural Scientists to fulfil their needs would be the ultimate goal, in this regard.

The following suggestions and recommendations, thus, can be made as the outcome of the study:

1) In this Digital Era, Institutions and Centres of ICAR who are directly linked with the researches in the field of agriculture should have provisions to have Resource Centres /Units related to the field equipping digital resources.
2) Existing library systems of such institutes and centres should enrich their collections keeping in view the information needs of the scientists working in the respective institutes and centres with different forms of print and digital materials.
3) Library must be digitised or automated so that all the library materials will be digitised (books and journal etc.) and may be accessible to desktop of all computers of the institutes and centres through LAN which will not only save the time of the scientistsand also will be easy for them to refer and seek for any type of research related sources or materials.
4) The concept of digital library should be realized by digitizing its resources by the library in a phased manner. For digital library project, free Web based open source repository software packages such as Greenstone /DSpace, would be installed and used for archiving digitized. Digital Institutional Repository of the Institutes and Centres also need to be created within the initiative of the library.

5) A high speed internet facility is very much essential. Broadband Internet connection having speed should be installed for delivering or to make accessible to web-based resources.This will help to provide information services to the users.
6) Professionally qualified librarians and other supporting professional staff should be appointed for effective and efficient functioning of library and information services.
7) MLISc. With Ph.D. degree in LIS should be mandatory for librarians to cope up with the advancement of new technologies in the institute and centre libraries.
8) Knowledgeable library staff with computer knowledge and having library science degree should be appointed in the libraries.
9) Conducting user education programme from time to time to make them aware of the challenges of leadership in digital era.
10) Extending library hours as per the demand of the users so that users studies should be carried out time to time.
11) A consortiafor the wide publicity of R & D activities is to be accelerated and development among the institute and centre libraries.
12) ICAR policy should be modified or improved so that the scientists will be able access many important online journals from the J-Gate system of the ICAR family.
13) Libraries should join to the consortia and be connected JCCC@ CeRA (Consortium for Electronic Resources in Agriculture) which may encourage the scientists in making use of online journals.

14) For electronic journals and online full-text databases,ICAR should provide more funds to make availableinternational databases to their users for browsing and searching.
15) Networking among all agricultural institutes and centres of India should be established for sharing resources among member libraries.
16) Taking into account the existing status and infrastructure of the libraries, sufficient grants should be provided by the ICAR for infrastructure development of the libraries.
17) Upgrading the skills and technology, training plan for each library professional through workshop, short term and long term courses may be considered.
18) For use of ICT applications, user education programme is to be introduced, formulated and implemented in order to improve the proficiency, skills and knowledge.
19) The activity of use of video conferencing as a library facility should be accelerated and effectively used. The ICT based services can be contributed towards knowledge sharing.
20) The international databases such as CAB abstracts, AGRIS, AGRICOLA and CARIS should be made available online and offline and sufficient funds shouldmake available in the library budget.
21) Translation services are needed to be introduced to the research communities in agriculture sector by taking help from some translating agencies.
22) The total ICT infrastructure should be developed in all the agricultural institutes and centres of libraries of ICAR in North East India.

23) The networking system should be developed in all institutes and centres of all eight states i.e. Assam, Meghalaya, Manipur, Mizoram, Nagaland, Arunachal Pradesh and Sikkim.

8.4 PROPOSED PLAN FOR ICAR INSTITUTE AND CENTRE LIBRARIES IN NORTHEAST REGION

From the above discussions, it has been realized that the Agricultural Scientists are not fully satisfied while seeking information in the digital environment to meet their diverse research purposes and information needs. It is observed from the overall findings of the study that the problems that the scientists come across and they suggest towards improvement of the prevailing system.They realized and come up with precise suggestions for the requirement for forward recommendations to concernedauthorities for implementation. The need for having an active "***Plan for ICAR Institute and Centre Libraries in Northeast Region****"*, as a proposed plan for making the Agricultural Scientists to fulfills their needs, would be the decisive goal, in this respect. The supreme and clear motive for automation of library is to upsurge efficacy. It has been visibly discovered that application of information and communication technology in library is not at all a time-consuming matter of choice but it is a matter of existence in universal digital age.

The following discussion of a proposed plan may be helps to overcome the barriers and also to find out some plans to be adopted for positive management of technological changes in the institute and centre libraries of ICAR. The steps under the plan are as follows:

1. A proposed plan for establishment of an 'ICAR Library Network', a name for which can be proposed as "ICARLIBNET" to network the entire institute and centre libraries of ICAR of North Eastern Region of India which can be prepared

and submitted to the funding agencies for the benefit of all ICAR libraries of North East part of India.

2. To set up this network, the first step is to computerizeall individual and separate ICAR libraries.
3. Secondly, the network would first accumulate detailed rules and procedures which should be in tune with prevailing standards for the database developments as well as network operation and then make sure their appropriate implementation by the contributing or participating libraries.
4. ICAR Research Complex for NEH Region, Umiam, Meghalaya library will act as a hub and can have a host computer and the centres of ICAR can form a networkin the first stage and with other respective institutesof ICAR in the next stages.
5. '*Ministry of Agriculture'* which is the main funding agency of ICAR may be requested to provide financial support for the development of the network, database formation in libraries, as the expenditure incurred on this will pay back in terms of rationalization of library acquisitions, resource sharing and increased use of information in the techno savvy environment.
6. A clear picture of the proposed plan ofICAR Library Network (ICARLIBNET) has been shown in the **Figure 8.1** below:

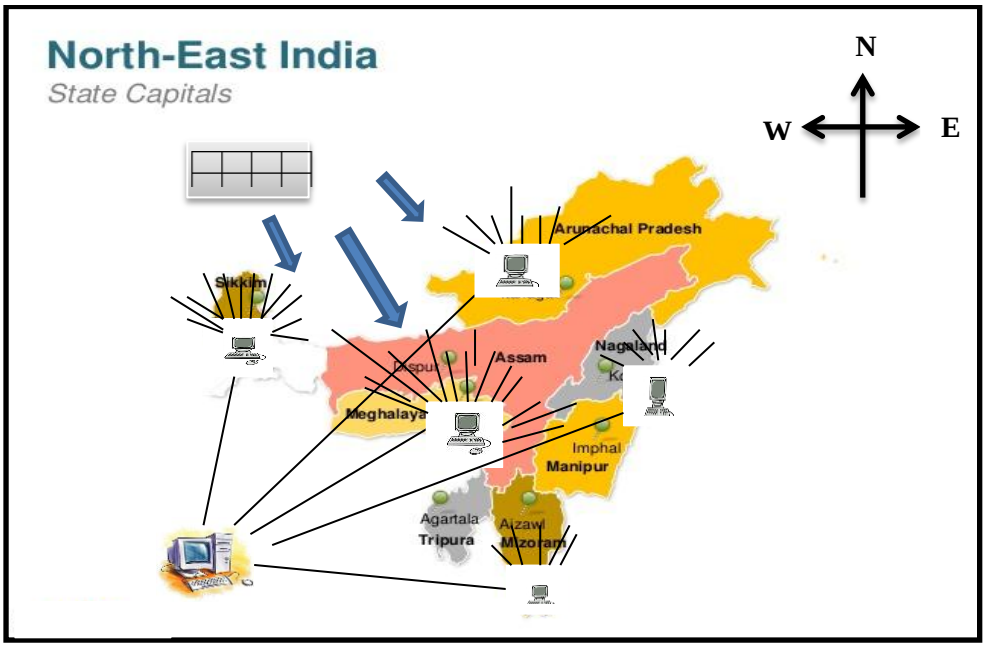

Figure 8.1: Proposed Plan ICARLIBNET of Northeast India

Therefore, the LIS professionals are to be inspired to introduce computer in library activities. They need only infrastructural support, funding from the authority and training to make their dream fruitful or possible. In the outlook of the fast nature of technological alteration, libraries need to find out ways to determine, select, approve and implement suitable skills and technologies.

8.5 SUGGESTION FOR FURTHER STUDY

This is first time study, which is limited to the working agricultural scientists of ICAR institutes and centres of North EasternRegion of India.The present study concentrated on *"Insights into Information Seeking and Communicating Behaviour of Agricultural Scientists of ICAR Institutes and Centres of Northeast India: A Study"*. Keeping in view this limitation of the present study, the scope of the future research studies on the similar and related topics are presented below-

1) Similar studies can also be conducted among other Agricultural Institutes and Centres not of different states which are not included in the study.
2) A study of information seeking behaviour of scientists working in state agricultural institutes and centres of North East India.
3) A comparative study of information needs and information seeking behaviour of state and central agricultural scientists of North Eastern Region.
4) Studies that focus on gender differences could be beneficial in further understanding of information seeking behaviour.
5) In 21st century the concept of the libraries have been totally total changed. In IT environment there is a need to study the users' assessments to ensure that library systems are providing the users with the information what do they need.

It is expected that the present study will serve the purpose of bringing improvements in the different services of the ICAR institutes and centres library and also may prove helpful to the new scholars to do further studies in the field of library and information science.

8.6 CONCLUSION

India exists as an Agrarian Society and mainly depends on agricultural yield or production. Agricultural sciences constitute a major component of the existing universe of knowledge. Scientists, who are engaged in different branches of agriculture, can be taken into consideration as the agricultural scientists and they constitute one of the biggest components of the user communities who accumulate process and analyse, retrieve and disseminate information in their respective fields. As a group of information users the agricultural scientists have their own nature and purpose of information needs. To meet their varied and complex information needs, also they undergo a number of strategies and

activities in the process of seeking the right information in different environment. Their information needs have to be satisfied by the libraries, information centres, systems, etc. through their services and other facilities. In today's digital era, ICT-based services play an important role in serving the needs of the users. They can be benefited in many ways from the newly emerged digital environment. A new shift in the information seeking behaviour of the users of different communities has also been observing since last few decades.

While reviewing the related literatures as a part of the present study, it has been confirmed that a number of users studies have been conducted across the global and Indian scenario on various aspects dealing with a number of issues. Agricultural Scientists are also found to be a major group of users on whom studies have been taken up to transact different issues associated with the same. Therefore, '*Users Study*'and its major component '*Information Seeking Behaviour*' is one of the important major areas of research in Library and Information Science.

In the present study "***Insights into Information Seeking and Communicating Behaviour of Agricultural Scientists of ICAR Institutes and Centres in Northeast India: A Study****"* undertaken to assess their information needs, information seeking behaviour in their agricultural environment, to know their allied specialization, study the information needs, use pattern and gathering behaviour,to correlate the adequacy of the collection and research needs of agricultural scientist, identify the various channels through which information is accessed by agricultural scientists, the problems and barriers encountered while seeking information and also to suggests some remediesthrough which the agricultural scientists can meet their information needs.

The study has adopted census survey methodby distributing semi-structurally designed questionnaire, by interviewing and observing to some extent while collecting data from the scientists and librarians/ library in-charges ofICAR Institutes and Centres of Northeast region of India.For data analysis percentage technique has been adopted and same was coded, tabulated, computerized and analysed for statistical inferences and also for empirical interpretationwith the help of computer using data analysis software MS Office Excel 2010.

Based on the objectives of the study the survey was conducted and findings were found. The survey revealed that the study covers all theagricultural scientists and librarians/ library in-charges who are engaged in all the twelve ICAR Institutes and Centres of Northeast India. The response rate of the survey is 91.1%.Information is a vital and indispensable product of the modern society. Nature of information needs varies from one individual to another depending upon their subject of interest and area of specialisation. From the present study, the area of specialisation is found in their interest subjects viz. Animal Husbandry, Horticulture, Soil Science, Agronomy, Entomology etc.who were engaged in their respective research works or activities.Information sources serve the information needs of various kinds of users. The purposes of visiting library mainly for consulting the reference books and for getting books issued/returned it was found that not a single respondent visit library for e-mail internet access, for accessing e-journals/ databases, CD/ DVD databases, pre-prints/ reprints directly from author and for other purposes.Related to use pattern of users in the library are perhaps one of the most effective methods of understanding their information requirements. It is perceived that majority of the respondents usually consults scholarly journals, text books, research/govt. reports and conference proceedings as the main sources from the library.Information gathering is a matter more or less related to sense making in which individual chooses an

item of information that best fits to his /her needs and purposes. From the study it is revealed that most users gather information ‘to great extent’ on the personal collections and other sources like internet or online sources. They also obtained their journal articles ‘to some extent’ by subscribing journals personally, by access and downloading to open access journals for full text and also through other sources like JCCC@ CERA, Research Gate website, Pub Med, collecting through friends or colleagues were working inside and outside India etc. The success or failure of a library depends upon the adequacy or inadequacy of its collection. From the users point of view the most adequate collection is one, which covers as many subjects as possible.But the present study reveals that the libraries have failed in this objective. Majority of the users is of opinion that library collections in the centre and institute library are not adequate at all. The user is the best judge of his requirements and also knows how to achieve his requirement through various channels of information. In this study, most of the respondents showed dependency on the mode of collection especially from their own efforts, computerised information sources and from their colleagues for accessing the required information for their research works or related activities.Constraints are common phenomenon that every user faces in using or searching information. In case of scientists, they face difficulties in access to use the information not because of one factor alone, but because of multiple factors. It is observed in the study that most of users replied that they were facing problems in the library like lack of reading materials, lack of access to all information,finding or locating information in the library and some extent they were facing time problem also. Information environment is very complex. In order to retrieve desired information to the users, the information intermediary has to adopt certain behavioural strategies to make the system effective. The scientists in this present study gave different types of suggestions and majority of them suggested to have fast internet facility in the library, to develop the

library collection as per user's needs, to introduce innovative practices in the library, to conduct user programme by the library and also to improve the resource sharing facilities of the library etc.

The above discussions have shown that the agricultural scientists are not fully satisfied while seeking information in the existing digital environment to meet their varied purposes. The general findings of the study, the problems they encountered and their willingness towards improvement of the existing system with specific suggestions have called for the need for having an active plan for ICAR institute and centre libraries in Northeast Region of India, as a proposed plan for making the Agricultural Scientists to fulfils their needs, would be the decisive goal, in this respects. A proposed plan includes the establishment of an 'ICAR Library Network', a name for which can be proposed as "ICARLIBNET" to network the entire institute and centre libraries of ICAR of northeast region of India which can be prepared and submitted to the funding agencies for the benefit of all ICAR libraries of northeast which not only helps in proper resource sharing among the networked libraries also it will helpful for the improvement in the collection of respective libraries.

In today's information era, new information technological thrust shows superior importance on the transmission of scientific and technological information from the research institutes and centres to its genuine users. Therefore, the success of institutes or centres library system depends upon the efficiency and efficacy of information services rendered to the users to come across their research efforts. The institute or centres are expected to deliver the essential services which are tremendously useful to the research community.There is no library or information system which is independent to achieve the complex information needs of numerous groups of users. The findings of the present study

also have exposed the truth of the same. The existing libraries and information systems have failed to satisfy the specific group of users under study i.e., the agricultural scientists. Single important aspects of the user studies in Library and Information Science Research are to propose a plan of a new information networking system through which the needs of the users under concerned can be fulfilled. As libraries or information systems are set to help their users, the same is compulsory to be reengineered for their outstanding development so that usersdemands for the information are fulfilled or satisfied. If implemented the proposed plan, the Agricultural Scientists under study would be in a situation to get their preferred information in the new environment. In fact this plan would be benefited to the needy researchers in all fields of agriculture, in the long run. Satisfying the needs of the users community will stand-inresearch pursuits which motivate in future and also support towards general development.

In conclusion, the agricultural scientists agree that library is the central base of any Institute. For additional utilization and accepting the appropriate ethics of library in today's information world, the special libraries of these institutes and centres must firstly digitized and assemble the most adequate materials which satisfy the users of those libraries. Though, the study evidently stated that agricultural librarian has a special and dynamic role to play in the fast changing and increasingly significant information based agricultural field. In direction to play this role, we need to look in two directions **first** in the direction of users for their guidance or management and for a declaration of needs, problems and importance and **second** is the information technologies concerned with for difficulties, solutions or explanations and resources. Thus, it is the librarians' superior duties to stick together and implement their part or role that might be capable of managing the multifaceted information needs of their agricultural users in this competitive digital environment.