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4.1 Introduction:-

In the previous chapter, investigator has introduce the development agricultural education and research in India After the independent, the govt. of India given the priority to developed of agricultural education and research activity. The ICAR has prepared a model agricultural university act in 1966. ICAR establish a state agricultural university in major state of India. Library is heart of educational institute and it provides valuable information to scientists and agricultural education community. For the development of agricultural library and quality improvement, the ICAR has appointed some committees for agricultural library development. The investigator studied the reports, papers published on the reports and comments made by LIS professional in this regard which is produced herewith.

4.2 Concept of Library and Information Services:-

Libraries are built and maintained to provide information resources for a specific and defined community. A public library serves the residents of a specific geographic region. An academic library serves the students and faculties of a parent college or university. Special libraries support to achieve organizational goals by serving the members. Corporate libraries serve the commercial firms. In each case, the library only exists to serve its parent community. Each library performs three basic functions in the process of serving its community, selecting and collecting information, organizing information, and serving users. In the agricultural university, librarian used the ICT as a tool (such as Library Management Software (LMS), Internet, and Telecommunication etc.) to serve it researcher’s right information at the right time. Some librarian suggested four basic functions in the area of library services.

(1) Instructing the User about library management.
(2) Assisting the users to solve his/her queries.
(3) Aiding the users in selection of good works.
(4) Promoting the library within the community.
Although over a century has passed, these four functions remain the core of reference and information services in today’s digital environment. The primary objective of a library, irrespective of type or size, is to promote the use of its resources. Library services bring together the documents or information sources and their users by personal efforts of the library staff.

4.2.1 Type of Library Services:-

Libraries provide a variety of library and information services to satisfy different information requirements of users. Here the researcher mentions library and Information services are as under.

(1) Reference Service:-

Reference services help users to locate and obtain specific pieces of information from information sources such as reference books, catalogues, directories, files, abstracting and indexing periodicals, databases (online and CD-ROM) and other reference materials. Library personnel may either help users in searching (direct search) or they themselves do the search for users (delegated search) in online or offline mode. Reference service is subjective because of its stress on personalized service. Instruction has objective connotations about it because it encourages the user to independent study. About the Rangnathan reference service was the essence of librarianship.

(2) Referral Service:-

Referral services aim to refer users to the sources of information such as secondary publications, information units, professional organizations, research institutions and specialists/experts. Such services do not provide the documents or information required by the user for his/her query but give the direction where available. Librarians utilize directories and databases on sources, specially designed and developed for rendering referral services.

(3) Current Awareness Service (CAS):-

CAS satisfies users’ current approach to information and thereby keeps them up-to-date in the field of their work. The important characteristics of CAS are as under:
(1) It is a technique of communicating current information to users.
(2) It provides latest developments in a subject field and does not provide
answer to any specific query.
(3) Generally covers a broad subject area and supplements the user’s own
channel/media of obtaining information.
(4) It is known for the speed and timeliness.
(5) It is meant for use before its contents are absorbed by secondary
publications like abstracting and indexing journals.
CAS may be provided through variety of media and channels such as current
awareness lists, current contents, routing of periodicals, list of research in
progress and forthcoming meetings/seminars/conferences, newspaper clippings
etc.

(4) Selective Dissemination of Information (SDI) Service:-
SDI is a special type of current awareness service. It provides each user with the
references of documents to their predefined areas of interest, selected from
document published recently or received during a particular span of time. In
1950s, H. P. Luhn first coined the concept of SDI as a computer mediated
information services. The workflow of SDI service is based on the following
steps:
(1) Create users’ profile.
(2) Create document profile.
(3) Matching the User’s profile and document profile.
(4) Give the notification to users.
(5) Take a feedback from the users.

(5) Literature Search Service:-
It is an extension of reference service. This service includes the following steps:
(1) Analysis of the search parameters of a query.
(2) Formulation of a suitable strategy for searching different information
sources.
(3) Identification and choosing of most appropriate sources to be searched and
the order of searching them.
(4) Understanding of retrieval features of online databases and CD-ROM
(6) Document Delivery Service (DDS):-

Document delivery is a key element in access to information. Unless the documents required by the user are available to him/her, all the other services are of no use. DDS is a complex process and is concerned with supply of documents to users on demand in required format. DDS is the last point in this chain of information services that actually locate the required document and supplies it to users in required format. Electronic DDS supports delivery of documents in digitized form at anytime from anywhere.

(7) Translation Service:-

In the area of science and technology about half of the world’s literature is published in languages other than English. Access to non-English literature by people who know English is possible through translations. Translation services thus help in the global access of information. In India, DESIDOC, NISCAIR, IASLIC, ONGC, BARC, BHEL, DRDO laboratories and several wings of the Ministry of Defense and Ministry of Science and technology provides translation facilities.

(8) Web-OPAC Service:-

Web-OPACs are next generation of OPACs. Web-enabled OPACs allow users to search library catalogues and access other services from any client at Library Services anywhere at any time. It allows users to search for the bibliographic records contained within a library’s collections. It helps to users for find out necessary information and removes the time barriers. The users access the Web OPAC service with a standard web browser connect as a client machine because the mechanism does not require installation of any additional client-side software. (Bhatnagar, Anjana. (2005).

(9) Article Indexing Service:-

Modern automation packages also provide facility to create and index database of articles or papers published in the journals subscribed by the library. The abstracts of papers/articles may also be included in the database. Such a database allows specific and combined searching by author, title, keywords etc. and produces number of user specific services like table of contents services,
compilation of subject bibliographies and generation of CAS, SDI, etc. in online and off-line mode.

(10)Lending Service :-

Lending service provides facility to allow books and other library materials to be read elsewhere by users. This service increases the use of library collection. Computerized lending includes following value-added user services

(1) Quick issue, return and renewal of books and other library materials.
(2) Automatic display of document availability and possible date of availability, display or printing of documents borrowed by a member.
(3) Quick generation of fine receipts;
(4) Issue of member ID card with photograph
(5) Membership history in the form of list of documents issued and returned by a member during his/her membership tenure.
(6) E-mail reminders for overdue books
(7) Reservation of document by users through OPAC/Web-OPAC, if it is on loan
(8) Inter library loan (ILL) services for documents not available in the local library

RFID and smart card based circulation system allows self-issue and self-return of documents, secure use of library resources and personalized access to public domain resources.

(11)Union Catalogue and ILL Service :-

Union catalogue is a collection of bibliographical details of resources belongs to a group of libraries. No library of the world can purchased all resources. Union catalogue helps user of one library to check the availability of required documents in other libraries, if not available in the stock of local library. Union catalogue is the result of co operative processing works of member libraries of a resource sharing network or consortium. These are available in the form of CD-ROM databases or online databases. Rowell initiated U.C. Berkeley's first program of inter library lending in 1894, with the California State Library as partner. Inter library loan (ILL) service handles the processing related with the
borrowing of items from collections beyond that of the local library. ILL service acts as a central service in resource sharing activities.

(12) Electronic Document Delivery Service :-

Document delivery has always been at the heart of services offered by libraries. Due to the digitization of document; it is possible to make more efficient through the introduction of electronic document delivery. The document delivery service is an integration of document discovery, the location of a supplier, request and delivery. It takes many forms, deals with variety of formats and involves a number of intermediaries. The different types of documents delivery services as under.

(1) Library networks and consortia based services.
(2) CD-ROM based services.
(3) Supplier and agent base services.

(13) Outreach Services :-

Outreach services aim to automate the processes required to deliver materials to the homebound and other patrons who cannot physically enter the library. Automated library systems also offer community information services in the form of list of names and addresses of local organizations or persons, local leisure facilities, employment etc. Outreach services allow creation of user interest profiles, reading histories, easy selection, delivery and return of items. Access to outreach services and community information service is often integrated with OPAC. (Source: http://librarycareers.drupalgardens.com/content/outreach-librarian)

(14) ICT Base Library Services:-

Information Communication Technology (ICT) has made significant impact on all spheres of human life. For the Libraries, ICT’s has tremendously changed the Management of Resources or House Keeping Operations as well as the way services are delivered. IT application tools and Integrated Library Management Systems are largely used in housekeeping operations, like acquisition, cataloguing, circulation control, serials control etc. In the library, Internet has been used extensively as a resource as well as a tool to deliver the Library and
Information Services. Library provides the following ICT base service to their users.

(1) Full text Database services
(2) CD-ROM Database Services.
(3) Web-based information services.

(Chauhan Budhdhi Prakash. (2004)

(15) Reprography Services:-
Reprography means reproduction of documents by photography or xerography. Reprography service is useful for information dissemination. This service provides with charges. Today, reprography plays a very important role in the transmission of knowledge in the library resources and services. Introducing Reprographic services helped to preserve the document from stealing or mishandling. (Source: http://www.nationallibrary.fi/services/palvelut/jaljennepalvelu.html)

4.3 Need of Agriculture Information Service:-
The National Agricultural Research System (NARS) is one of the largest systems in the world, with more than 26,178 full-time equivalent research staff functioning in government, public, and higher education institutions and universities. In the present era, the development in agricultural sector is very important for our GDP. After the 1960s on the success of the green revolution introduced other revolution like white revolution, yellow revolution, brown revolution, our country has continuous made progress in agriculture and agricultural education and research, our country stands in the first line among the category of self-sufficient countries in several sector in agricultural production. The use of the genetic engineering method and plant reproduction has become much effective and so better quality of seed can be produce. The agricultural information service is required for agricultural scientist, extension works, policy maker and farmers for awareness of current research in agriculture.
4.3.1 Need of Information Service to Agricultural Scientist:-
Scientists’ inclusion the most studied group of information users and findings that apply to scientists in general-especially to life scientists-can be extended to agricultural scientists. Information needs of scientists are generally considered to be met through the well- established scientific journal system and secondary bibliographic services. The scientists are engaged in his research work and they have required current information regarding his research works.

4.3.2 Need of Information to Farmer:-
Farmer is the end users of information in the agricultural communication system. The farmer is also the ultimate user of agriculture technology. The entire spectrum of agricultural research, education and extension activities center round the farmer because he is the person, who is expected to use the latest technologies for maximizing agricultural production. Farmer’s decision to accept or reject an innovation depends not only upon his communication behavior but also on how much information is relevant to the solution of the giving problem. Farmers generally required information on improved the seeds, fertilizers, sowing, irrigation, soil-testing and conservation, pest and disease, harvesting technology and marketing surplus produce. The farmers get the above information from the gram sevak, extension workers, farm broadcasting through radio and television.

4.3.3 Need of Information to Extension Workers:-
The ultimate aim of agricultural research and education is to transfer to technologies evolved to the farmers who is turn adopt the same for maximizing the agricultural production. The extension worker is a professional whose responsibilities are unlike scientists. He has received a latest from the scientist and transform the same in such way that the farmer could adopt the same in maximizing products. Majority of Indian farmers are illiterate and they are receptive of modernization. Experts feel that the rapid agriculture development during the recent year has been primarily due to planned communication strategy. As the candle remove the darkness around the people, the new technology in the agriculture has started removing ignorance from the minds of farmers by leading them from traditional to modernism. So the extension
workers need information for development of farmers and maximum used of agriculture technology.

- **4.3.4 Need of Information for Policy Makers:**

Agriculture policy makers look for a wide range information relating overall economy. Their information is requirements include physical resource such as land utilization, soil type and water resource and climate and transportation facility manpower requirement both actual and potential. Nature of farming system, farmer’s behavior includes farm management study. Merchants, Traders and Bankers aim at maximizing their profit. They required the information on prices fluctuation of agricultural produces for marketing purpose. *(P.S.G Kumar.(2008)).*

**4.4 Growth of Agricultural Libraries in India:**

Libraries, being a part and parcel of the education and research system, are playing a vital role. They provide information support and function as a nerve center for research affairs around which the progress of the country is spiraling high. Their development has been parallel along with the growth and development of institutions in particular and the country as a whole in general. Libraries have served the nation and borne many constraints during the span of 64 years of independence. The ICAR model act regarding the powers and function of the university states to maintain laboratories, libraries, research stations and institutions and museums for teaching research and extension. This statement gives a legal base to libraries of agricultural universities. Special emphasis was laid to the development of an agricultural research infrastructure immediately after Independence. The ICAR acts as a repository of information and provides consultancy on agriculture, horticulture, resource management, animal sciences, agricultural engineering, fisheries, agricultural extension, agricultural education, home science, and agricultural communication. Following table show the growth and development agricultural libraries in India.
Table-1

Growth & Development of Agricultural Libraries in India

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Details</th>
<th>No. of Institute</th>
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<tbody>
<tr>
<td>1</td>
<td>SAUs libraries</td>
<td>56</td>
</tr>
<tr>
<td>2</td>
<td>CAU library</td>
<td>01</td>
</tr>
<tr>
<td>3</td>
<td>Deemed Universities Libraries</td>
<td>05</td>
</tr>
<tr>
<td>4</td>
<td>National Research Centers (NRC) Library</td>
<td>17</td>
</tr>
<tr>
<td>5</td>
<td>ICAR Institutes Library</td>
<td>51</td>
</tr>
<tr>
<td>6</td>
<td>National Bureaus (NB) Library</td>
<td>06</td>
</tr>
<tr>
<td>7</td>
<td>Project Directorates (PD) Libraries</td>
<td>23</td>
</tr>
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</table>

(Source: [www.icar.org.in/library](http://www.icar.org.in/library) (accessed on 12/10/2014)

Many field stations libraries/KVS libraries are functioning under the aegis of ICAR.

4.4.1 ICAR Library:-

ICAR library was established in 1929 under ICAR’s one of the mandates to render the information services to Scientists, Researchers, Policy makers, Farmers, research managers etc. on agriculture and its allied sciences. Its collection includes books, journals, Reports, CDs etc. on Crop Sciences, Animal Sciences, Forestry, Fisheries, Soil Science, Statistics etc., The total title wise collection of books are 62422 and holding are 63003. The members of ICAR library are 106. The physical occurrence of the library spreads over two locations at Krishi Bhavan and Krishi Anusandhan Bhavan at Pusa. The publications of Crop Sciences, Animal sciences and general interest like literature, religion, music, philosophy, culture, Indian constitution under theme "Indiana" and publications of Reference natured are kept in Krishi Bhavan, and scientific literature on Veterinary, Dairy, Horticulture, Soil sciences, Engineering etc, and also publications of Reference natured are kept Krishi Anusandhan Bhavan at Pusa. ICAR Library, Krishi Bhavan has been modernized and developed Information Kiosks, internet Surfing, On-line catalogue etc by using latest ICT tools. The mandatory housekeeping activities of library have been automation by using "e-Grantha laya" software developed by the NIC and developed bibliographical details of publications available in
Krishi Bhavan (at present) and made available through on-line OPAC. The Database of members with photos was developed and given on-line user log-in facility to see their status of circulation. Barcode technology has been implemented in library housekeeping works and membership Cards. 

4.4.2 Indian Veterinary Research Institute Library:-
The IVRI Library known as National Library of Veterinary Sciences is the oldest library in this specialized area in South Asia region. The library was started as an integral part of the Imperial Bacteriological Laboratory since its foundation on December 9, 1889 in Pune. A good number of current books on Veterinary Sciences were initially purchased, besides procurement of important periodicals on Bacteriology, Pathology and Veterinary Sciences from annual recurring grant. Dr. Alfred Lingard, the Founder Head of the Laboratory, donated his personal library to this institute in 1893. The laboratory along with the library was shifted to Mukteshwar in 1893. By 1913, there were more than 3500 volumes of books and periodicals at IVRI Library, Mukteshwar. With the gradual increase in annual library budget and equal amount of additional ad-hoc grant, back numbers of important periodicals were purchased in 1924. The publications in library increased to 8000 in 1927. Presently, the library at Mukteshwar is having a collection (Holdings) of about 37500 numbers which include certain rare publications dating back to 1800. A branch library was built in 1901 at Kurgaina, Bareilly, which was transferred to its present site at Izatnagar and a link library was also established in Animal Nutrition Division building in 1936. After independence, the library at Izatnagar expanded rapidly. In view of growing need for space, a spacious library building was constructed and library was shifted in this new building in December, 1983. The present library building has around 3210 sqmts. Area of reading room is about 826 sqmts & carpet area of stack room is 1840 sqmts. The library has been using Dewey Decimal Classification Scheme for books arrangements. At present library held about 54731 books, 4572 theses, 3835 reports and 194750 journals and other serial publications. The library held 234 Scientists, 518 M.V.Sc. & Ph.D. Students and 325 other staff members registered as library users.
4.4.3 National Dairy Research Institute Library:

The Institute has a National Library on Dairying, which possesses an impressive collection of literature on dairying and related subjects. The foreign and national periodicals are subscribed to keep track of the current scientific/technical developments. Besides, there are books and volumes of bound journals, bulletins, theses, CD-ROMs, microfilms and reprints. The Library also provides Internet browsing, old documents, reference literature, photocopying services, printing and scanning facility to the students, scientists and research workers of NDRI and other sister Institutes, SAUs and research organizations. The plan and policies for the major procurements and management issues of library are monitored by LAC (Library Advisory Committee) comprising of Chairman (a Senior Principal Scientist) and one representative (Principal / Senior / Scientist) from each Division of the Institute. Head Library Services looks after day to day work and management and besides routine purchases. The library provides library service like internet surfing, Web OPAC literature search service, reprography services, online journal services, paper clipping etc. (Source: http://www.ndri.res.in/ndri/Design/library.html access on 10 November 2014)

4.4.4 Appointment Committees and Commissions on Agricultural Libraries:

In 1966, ICAR has drafted a modern agricultural universities act, the velocity development of agricultural education and research in India. Library was main tools for development agricultural education and research activity. The ICAR has appointed some Committees and Commissions for the make better of agricultural education and research. The most specific committee which is advocates the various recommendations for the betterment agricultural libraries in India.

Report on Library and Bibliography Services (1957):

The development of library and documentation services for agricultural institute, the ICAR invite Dr.Ralph R Shaw from USA in 1957. Dr. Ralph meet to Dr. Krishna Rao in India. ICAR appointed a committee on “Report on Library and Bibliography Service”. The committee has given some recommendation. The ICAR published this reports in 1959.
Dr M.S. Randhawa Committee (1957):-

Dr. M.S. Randhawa which states “Libraries are a necessary part of the researcher’s tool. Every possible step should be taken to improve library facilities which are often inadequate. The recommendations of this Committee created deep awareness among librarians and administrators for better agricultural libraries.”

Indo American Agricultural Library Survey and Study (1967):-

In 1967, chairmanship of Dorathi Parkar, ICAR has appointed a committee on “The Indo American Agricultural Library Survey and Study”. The committee gave 69 recommendations for the overhauling the entire system of agricultural libraries and documentation centers in India. ICAR has published under title on “The ICAR Institute of Agricultural University Library” Some significant as under

1. Improvement in the physical facilities of ICAR institute libraries
2. Strengthening the collection of books and journals
3. Appointment of trained librarians in the institutes’ libraries
4. Status of library equal to that of a Department of the institute
5. Status of librarian at par with Head of the department.
6. Making of a National Agricultural Library in India headed by a Director.

Dr. Ramaiah Committee (1969):-

Dr. Ramaiah committee has appointed under the chairmanship of Dr K. Ramaiah, Honorable member of Parliament, consisting of scientists like Dr M.S. Swaminathan, Dr C.M. Singh, Dr N.N. Singh, etc., The purpose of this committee to review the recommendations of Dr Dorothy Parker Committee, which accepted a few of out of them.

Various National Conference/ Seminar (1980-2010):-

Several recommendations which came out from the deliberations and discussions of various national agricultural conferences/seminars/workshop being organized at national level by the ICAR, AALDI, CeRA, and other bodies from time to time. (Singh K.P. 2012).
4.5 Development of Agriculture Information System in the World:-

An agricultural information system can be defined as a system, in which agricultural information is generated, transformed, transferred, consolidated, received and feedback in such a manner that these processes function synergistically to underpin knowledge utilization by agricultural producers. Accordingly, an agricultural information system consists of components, information related processes (generation, transformation, storage, retrieval, integration, diffusion and utilization), system mechanisms (interfaces and networks) and system operations (control and management). Agricultural information is considered as an essential input to agricultural education, research and development and extension activities. Different kinds of information are required by different kinds of users for different purposes. The potential users of agricultural information include government decision-makers, policy-makers, planners, researchers, teachers and students, program managers, field workers and farmers. Here the researcher mention a development of agricultural information system at global.

➢ 4.5.1 FAO’s Library:-

FAO’s library was established in Rome at the in 1952 FAO Conference, according to the decisions of the 1950 Conference. It was named David Lubin Memorial Library by the Conference to honor the founder of the International Institute of Agriculture (IIA). The extensive IIA collection formed a solid base for the present-day Library, which is considered one of the world's finest collections in Agriculture, Food and Nutrition, Rural Development, Plant Production and Protection, Animal Production and Health, Agricultural Machinery, Agro-industries, Agro-forestry, Forestry, Fisheries, Sustainable Development, Statistics, Agricultural Economics and other related subjects. The Library has over one million volumes of the journal collection contains approximately 13,000 titles of which 1,450 are electronic. The heavily used working collection consists of FAO documentation, books and serials in FAO subject fields, a reference collection and specialized Library collections in Fisheries and Forestry.
The International Institute of Agricultural was an international organization founded by David Lubin, namesake of FAO’s library. It operated from 1905 until 1945. Upon cessation of activities, it donated its library collection to the FAO. This collection is a valuable source of historical agricultural resources dating back to the 15th century.


4.5.2 Contribution of IFLA in Agricultural Library:-

The International Federation of Library Associations and Institutions (IFLA) is the leading international body representing the interests of library and information services and their users. It is the global voice of the library and information profession. IFLA was founded in Edinburgh, Scotland, in 1927 at an international conference, IFLA have over 1500 Members in approximately 150 countries around the world. IFLA was registered in the Netherlands in 1971. Agriculture is an important activity all over the world. Farmers, ranchers, agricultural managers, and policy makers need to keep abreast of continuing advances in agricultural methods both in developed and developing countries. The IFLA Agricultural Libraries Discussion Group is aimed at promotion, development and support of library and information services for the benefit of the agricultural sector.

The AGRILIBS mailing list is aimed at promotion, development and support of agriculture, animal husbandry and allied sectors worldwide. The list is used to distribute information and communicate with anyone interested in topics related to agricultural library and information services.

(source: http://www.ifla.org/about/moreaccess on 10 November 2014).

4.5.3 National Agricultural Library USA :-

The National Agricultural Library is located in Beltsville, Maryland, 15 miles northeast of Washington, DC, near the intersection of U.S. Route 1 and Interstates 95 and 495 (Beltway Exit 25-North). National agricultural library was well developed and rich collection for provides the agricultural related information to scientists and agricultural education community. National agricultural library has Special Collections houses on rare books, manuscript collections, nursery and seed trade catalogs,
photographs, and posters from the 1500s to the present. Materials cover a variety of agricultural subjects including horticulture, entomology, poultry sciences, natural history, and are not limited to domestic publications. As part of the United States Department of Agriculture (USDA) and the Agricultural Research Service (ARS), Special Collections at the National Agricultural Library is charged with arranging, describing, preserving and making available rare materials significant to the history of agriculture and the USDA.

The National Agricultural Library Digital Collections (NALDC) offers an easy access to collection materials available in digital format. The NALDC offers rich searching, browsing and retrieval of digital materials and collections, and provides reliable, long-term online access to selected publications. NALDC includes historical publications, U. S. Department of Agriculture (USDA) research.(source http://www.nal.usda.gov/ access on 10 November 2014).

- **4.5.4 Global Forum on Agricultural Research:**

  The Global Forum on Agricultural Research (GFAR) is a platform at the global level for dialogue and action of all stakeholders of agricultural research and innovation for development. The objective of GFAR is boost knowledge and improves communication in relation to agricultural research and innovation. The role of the GFAR has been that of fostering and supporting the development of agricultural research information systems at national, regional and global levels.

- **4.5.5 Agricultural Information System (AGRIS):**

  AGRIS is the International Information System for Agricultural Science and Technology. AGRIS was created in 1974 by FAO of the United Nations to facilitate information exchange and provides bibliographic control of world literature dealing with all aspect of agricultural. AGRIS is a global public domain database with more than 4 million structured bibliographical records in English, French, German, Spanish, Japanese, Italian, Russian and Portuguese language on agricultural science and technology. The database is maintained by FAO, and its content is provided by more than 159 national and 31 international and intergovernmental centers participate institutions from 65 countries and submit about 14000 articles per month. AGRIS was developed to be an international cooperative system to serve both developed and developing countries. AGRIS
become an operational in January 1975 at Rome. AGRIS covers the wide range of subjects related to agriculture, including forestry, animal husbandry, aquatic sciences and fisheries, human nutrition and extension.

- **Objects:**-

  1. Create a single, comprehensive, current inventory of world-wide agricultural literature which not only reflects research results, production activities, rural development, but also identifies all related problems in the fields of competence and interest of FAD?

  2. To meet the information needs of the agricultural community by providing current awareness and specialized subject retrieval services from the inventory and to fulfill subsequent document delivery requests.

  3. To interact with new/or existing secondary specialized information services in order to increase their efficiency and eliminate gaps or duplication.

- **AGRIS Product:**-

  1. **AGROVOC:** - Agrovoc thesaurus jointly produced by FAO and the Commission of European Communities (CEC) is a controlled, structured vocabulary of agricultural terminology constructed according to the UNISIST Guidelines for the establishment and the development of monolingual and multi-lingual thesauri. AGROVOC is maintained by FAO in English, French, and Spanish languages. CEC, with its respective countries, has provided a German and an Italian version. Apart from these five languages, further language versions, for example, Portuguese and Arabic are being developed.

  2. **AGRINDEX:** - The input, as per provisions of AGRIS reference series is submitted on worksheet, OCR paper or magnetic tape. The operational cost of AGRIS Coordinating Centre (ACC) is borne by the FAO. It functions from Rome and Vienna. In Rome the ACC has responsibility for the overall management and development of the system. The AGRINDEX is arranging under categories 86 broad subject and available in printed and magnetic tape forms.

  3. **AGRIS CDROM:** - CD-ROM technology is thought to provide an excellent solution for retrieval for centers which do not have easy access to an online database. In 1989, AGRIS was expected to produce a CD-ROM disk with references of the last two or three years of the AGRIS database. Two test disks
were produced during recent years, one in co-operation with INIS with the BRS retrieval software, and the other by the Pan American Health Organization (PARa) with Micro CDS/ISIS. It is planned to make the production disk with PARa and to use UNESCO's Micro CDS/ISIS with adaptations provided by PARa as retrieval software. AGRIS FHN CD-ROM (Food and Human Nutrition) and AGRIS FORESTRY CD-ROM are available on AGRIS and its semi annually updates.

(4) Web AGRIS:-
The new Web-AGRIS Version 2.0 was released to robust information management system having integrated numerous updates, error fixes, and new features. The main achievements in this version include adaptation of Web AGRIS for compliancy to the AGRIS AP metadata standard, upgradation of the incorporated AGROVOC thesaurus, improvements in the search interface, improvements in the data entry system, export/download features, and inclusion of updated documentation. Web AGRIS is a complete, multilingual web-based system for distributed data input, processing and dissemination (through the Internet or on CD-ROM), of agricultural bibliographic information. Web AGRIS also allows to link to documents that are available in electronic format. It is based on common standards of data input (meta-data standard data structure), and dissemination formats (export formats (XML, HTML, ISO2709)), as well as subject categorization schema and thesauri, i.e., AGROVOC5. Depending on the ‘architecture’ of the production process and resources. Web AGRIS can be used either as a local application or in a joint collection of information (through exporting, harvesting data, etc). Each AGRIS network participating centre can choose to host a website for inputting, searching, and/or sending data to the central AGRIS database for publishing on CDROM. Web AGRIS improves accessibility of information, generally, through the use of multi-database or multi-host searching, and harvesting. The current version of WebAGRIS2 is realized by AGRIS/CARIS and Documentation Group, GILW, FAO in close cooperation with the Institute for Computer and Information Engineering (ICIE), Poland and IICA/CATIE, Costa Rica. The interface is based on html forms, and has been implemented as a CGI program. The program is invoked by the web server process. The access to the
CDS/ISIS databases is managed through BIREME’s software ISIS-DLL, an application program interface (API) for CDS/ISIS software of UNESCO in the Windows environment. (Hans Raj & V.S.Kaushik(2012).

- **4.5.6 Consortium for e-Resource in Agriculture (CeRA):-**

  CeRA is the short form of ‘Consortium for e-Resource in Agriculture’. It is a customized solution for accessing and sharing journal literature subscribed by all the participating libraries in the consortia, individually and collectively, through CeRA Consortium.

  - **Objectives of CeRA.**
    1. To upscale existing R & D Information resource base of ICAR Institutes /Universities comparable to world’s leading institutes /organizations,
    2. To subscribe e-journals and create e-access culture among scientists and teachers in ICAR institutes /Agricultural universities.
    3. To access the impact of CeRA on the level of research publications measured through NASS ID and science citation index

  - **Resource Available in CeRA:-**

    Following e-Resources are available in consortium of e-resource in Agricultural.

    - Annual Reviews (25 Journals)
    - CSIRO (Australia) (8 Journals)
    - Springer (70 Journals)
    - Informatics (416 Journals)
    - Elsevier Science Direct (416 Journals)
    - American Society of Agronomy (6 Journals)
    - Oxford University Press (30 Journals)
    - Indian Journals (200 Journals)
    - Taylor & Francis (1213 Journals)
    - Metadata from 625 other publishers
4.6 Agriculture Information System in India:-

- **4.6.1 Indian National Agricultural Information System (INAGRIS).**

  The agricultural information work of INAGRIS may be analyzed under four heads:
  
  1. Coordination
  2. Organization
  3. Management
  4. Communication

  Coordination is for collection of information, organization for storage and retrieval, management related to the functioning of the system, and communication takes care of transfer of information through dissemination.

  Under the networking programme, the libraries in India are to be designated as information centers at various levels. The main objects of INAGRIS are to integrate and coordinate the existing and future scientific and technological information sources, systems, and services, falling under agro-biological subject specialization, into an organized and effective network with the voluntary cooperation of different scientific and technical agencies in the country.

- **4.6.2 Agriculture Research Information Centre (ARIC):**

  The ICAR established a current research information centre by creating the Research Project File Unit at its Headquarters in 1957. The ICAR has input the agricultural data in AGRIS, FAO through ARIC from India. The main object of ARIC is to maintain an agricultural information system and participation in the International Information System on Agricultural Sciences and Technology (AGRIS) of FAO, United Nations. The Agricultural Research Information Centre of ICAR is maintaining an information system by documenting agricultural research projects conducted under the ICAR Research Institutes, Agricultural Universities, Project Directorates and other Research Projects/Schemes in the form of Research Project Files. Bio-data of about 4,800 agricultural scientists from ICAR Institutes and Agricultural Universities were maintained and stored in magnetic tapes for easy retrieval through computer.

  The ARIC also prepares bibliographical input from the Indian Agricultural Literature for the International Information System for Agricultural Sciences and Technology (AGRIS) of the United Nation's FAO and provides the Indian agricultural community its services from the total AGRIS database. These
centers provide SDI using CD-ROM from International Information System for the Agricultural Sciences and Technology (AGRIS) database and have prepared Indian National Agricultural Bibliography (1974-84) in IV volume including 40000 bibliography entries. (P.S.G. Kumar, 2008).

4.6.3 National Information system For Food Science and Technology (NICFOS):

The NICFOS established in CFTRI in 1977 under the NISSAT program is based on the FOSTIS plan drafted by CFTRI in 1973. The development of NICFOS on the infrastructural facilities available in CFTRI, its objectives, functional organization and the varieties of services are detailed elsewhere. It is however important to point out here that being located at CFTRI, one of its primary functions is as a support service to activities of CFTRI which include transfer of technologies developed by it. Its information resources development program includes acquisition of various categories of documents including all kinds of information needed for technology transfer and to generate a variety of services to suit different kinds of users involved in technology transfer summaries all NICFOS's activities in this regard. Technical enquiry services are offered which involve reference to documents and referral in regard to information not traceable in documents. Referral directories of on-going projects and institutions, and files of bio-data of specialists are compiled for this purpose. Monographs, State-of-the-art reports etc. are also prepared periodically with the specialist assistance of CFTRI scientists. Back up services are provided by supply of photocopies of documents needed by users and a host of reprographic equipment have been acquired for this purpose. A well organized translation service within house facilities for languages, namely, German, French, Italian and Spanish is in existence, for other languages, a translator's panel is being created. The information services for the common man is provided by the Public Relations and Publications Unit of CFTRI which brings out two popular periodicals in Kannada and Hindi respectively which not only include information on CFTRI technology but also information repackaged from NICFOS publications.
4.6.4 AGRIS Services in India:

In July, 1974, the Government of India formally decided to participate in AGRIS programme on a national basis through a national input centre under the Indian Council of Agricultural Research. After an initial experiment carried out in November 1974, the Agricultural Research Information Centre began sending bibliographic data on AGRIS INPUT SHEETS on regular basis from May, 1965 to the AGRIS Database at Vienna. For some time the input was sent on OCR. For economy and speed the input is now being sent on Worksheets only. The first input contained 7 items of information only. The Research Information Unit of the ICAR which was created in 1967 is functioning as the clearinghouse for agricultural research information. It has listed over 7,500 research projects under the care of about 12,000 research workers engaged in 33 research institutions, 56 agricultural universities, 54 multilocalional and multidisciplinary all India coordinated research schemes, 86 Government of India funded projects under the Department of Science & Technology, and a number of other schemes under international collaboration. Since the Agricultural Research Information Centre of the ICAR was responsible for documenting of the current research information, the work related to AGRIS was entrusted to the Centre. The Centre was shifted to Indian Agricultural Statistics Research Institute, Pusa, New Delhi from Krishi Bhavan in June 1977 to avail the computer facility. Now it is located at Krishi Anusandhan Bhavan, Pusa, New Delhi where large accommodation was made available by the ICAR from November, 1985. (P.S.G. Kumar, 2008).

India's input to AGRIS:

The ARIC has sent about 30,000 items during the initial ten years period (1975-1984) to the AGRIS database at Vienna against a total of 11,11,722 inputs, The major portion of Indian input is in English. About 100 core periodicals have been identified and indexing and abstracting is done according to the standard procedure adopted by all the countries of world to bring compatibility in the system.
4.7 Consortium of e-Resource in Agriculture:

An agricultural library is the special library, which primarily renders service to the policy makers, specialists, scientists, teachers, students, researchers, and farmers in agriculture and allied subjects. It is the nerve centre of all educational, research, trainings and extension activities in agriculture. Its collection and the clientele are discrete and pertaining to agriculture and allied subjects only. Agricultural libraries have now become highly complex centre with multiplicity of functions catering to a wide variety of clientele having divergent interests. Every agricultural institute/university has got its own independent library with self-contained budget and resources to serve their users. In time of information explosion, diversity of user needs, multidisciplinary research, duplicity of resources, escalation in cost of foreign journals, and financial crunch have made self sufficiency which lead libraries to obtain for resource sharing. But advent of Internet, advancement of ICT facilities, easy and 24x7 accessibility have made the libraries to obtain for consortium of e-journals to get maximum coverage of journals to larger number of users with minimum amount of budget. The ICAR to think about formation of e- Consortium under the Project of NAIP Component- I ICAR as the Catalyzing Agent for Management of Change in the Indian NARS, Sub-component-I Information, Communication and Dissemination System (ICDS), Module-I Information and Communication Technology (ICT) in the name of CeRA (Consortium for e-Resources in Agriculture). Sufficient infrastructure like hardware, software, networking, bandwidth to download full-text of article with images etc. is prerequisite of any e-Consortium. Since these facilities are already provided by ICAR to all its Institutes, Deemed Universities, State Agricultural Universities and Central University in the first phase of World Bank project National Agricultural Technological Project (NATP 1998-2005) the ICAR straight away considered to form e-Consortium under next phase of World Bank project National Agricultural Innovation Programme (NAIP 2006-2012). NAIP is the World Bank assisted agriculture project being executed by National Agricultural Research System (NARS) with lifespan of six years, starting from 24 July 2006 to 2012. (P.Visakhi.(2009).
4.7.1 Krishi-Prabha:-

Krishi-Prabha is a full-text database of Indian Agricultural Doctoral Dissertations submitted by research scholars to the 45 State/Deemed Agricultural Universities during the period from 1.1.2000 to 31.12.2007. This database, listing about 10,500 Dissertations, has been created by Nehru Library, Dr. Charan Singh Haryana Agricultural University, Hisar with financial support from Indian Council of Agricultural Research, under its National Agricultural Innovation Project.

4.7.2 e-Grantha:-

Timely access to information is becoming more and more crucial or Survival in every sphere of life and agriculture sector is no exception. The researchers demand for fast access to authentic and credible digital information sources in agriculture sector. The e-Granth is one such attempt initiated under National Agricultural Innovation Project (NAIP) of the Indian Council of Agricultural Research (ICAR).Digital initiatives Indian National Agricultural Research System NARS is a huge repository of knowledge and information on crop sciences, horticulture, resource management, animal sciences, agricultural engineering, fisheries, agricultural extension and agricultural education. Digital technologies and online access to information resources have brought increased expectation from library and information services.

(Source: http://www.egranth.ac.in/sites/default/files/eGranth-SuccessStory.pdf).

4.7.3 Krishi Kosh:-

Krishi Kosh is an open access Institutional Repository has been developed by customizing open source software DSpace. About 15 million pages have been scanned, cleaned/cropped, converted to text (OCR) and finally to PDF/A. Uploading to repository is going on at four digitization centers. Krishi Kosh is digitization and creation of open access Institutional Repositories including rare books, old journals and institutional publications.

4.7.4 DOAJ:-

The DOAJ (Directory of Open Access Journals) is an open access resource and provides open access to scientific and scholarly journals, that meet high quality
standard by exercising peer review and is free to all from time of publication based on the open access initiative. The aim of the Directory of Open Access Journals is to increase the prominence and ease of use of open access scientific and scholarly journals thereby promoting their increased usage and impact. The Directory aims to be broad and cover all open access scientific and scholarly journals that use a quality control system to guarantee the content. Following table-11 provides information on journals of agricultural related subjects.

Table-2
List of Open Access Journals in DOAJ

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Name of Subjects</th>
<th>No. of Journals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agricultural (General)</td>
<td>201</td>
</tr>
<tr>
<td>2</td>
<td>Animal Science</td>
<td>124</td>
</tr>
<tr>
<td>3</td>
<td>Forestry Science</td>
<td>47</td>
</tr>
<tr>
<td>4</td>
<td>Aquaculture and Fisheries</td>
<td>19</td>
</tr>
<tr>
<td>5</td>
<td>Nutrition &amp; Food Science</td>
<td>46</td>
</tr>
<tr>
<td>6</td>
<td>Plant Science</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>Total Journals</td>
<td><strong>490</strong></td>
</tr>
</tbody>
</table>


➢ **4.7.5 DOAR(Directory of Open Access Repositories):**

DOAR is open an access repository was started in 2003 with purpose of multiplicity of Open Access research archives. The initial Open DOAR was developed and maintained by the University of Nottingham as part of a portfolio of work in Open Access and repositories under the SHERPA umbrella. The repository contains the projects related information. DOAR repository has been visited by project staff to check the information on regarding subject. This in-depth approach does not rely on automated analysis.
and gives a quality-controlled list of repositories. 122 projects were covered on agricultural science, food and veterinary science.

(source http://www.opendoar.com access on November 2014).

4.8 Agriculture Information System in Gujarat:-

Gujarat is the western state in the India and it has a long sea coast of Arabian Sea. The area of the Gujarat is under lower rainfall, during the monsoon average rainfall 25 to 30 inch. The progress of agriculture, agricultural education and research, the government has given the priority to development of agriculture information system in Gujarat. The Govt. of Gujarat has established a four agriculture universities campus.

- Anand Agricultural University.
- Navsari Agricultural University
- SaradarKrishinagar Dantiwada Agricultural University
- Junagadh Agricultural University

These agriculture universities have started extension activities to provide the information of agricultural research and agricultural technology. The universities have started a “Khedut Margdarshika” programme for farmers to given the information about the agricultural education and research activities.

These universities have run a research centre for various crops and vegetable and directly invited to farmers for awareness of current research works in agricultural and agricultural education and research.

The state government has started a ATMA (Agriculture Technology and Management Agency) for agriculture extension activities in selected districts in Gujarat since November-2007. The main purpose of ATMA is to provides the current information through agricultural eminent person for farmers at district, taluka and village level. The government of Gujarat has planned to achieve 10% increases in production of various agricultural crops in the kharif season in 2005-06. Accordingly the taluka wise planning of various Kharif crops of the district has been done. In order to attain 100% success rate, a meeting of the developed staff was organized and all the Gram sevak at village level development officers (agriculture) at taluka level have been provided necessary guidance. The farmers have been explained about the key points for obtaining
higher production of a particular crop. The government has implemented the training and meeting program with the aim of providing scientific knowledge and solves the problems of farmers on the spot. Moreover farmers can increase the production per unit of area if the follow scientific farming techniques. So the Gram sevak are one part of agriculture information system for providing information to farmers. The ministry of agriculture, Govt. of Gujarat arranged a Krishi-Mahotsav for provides agricultural education and research regarding current information to the farmers. The department of agriculture prepared a Krishi-Rath and sends every taluka and village for awareness of agriculture technology, agricultural education and research. Krishi-Rath is one part of Krishi-Mahotsav. Krishi-Mela 2013 was held in Himatnagar, Radhanpur, Bharuch, JamJodhpur, Kagwad and Limkheda, The main theme of exhibition of Krishi-Mela was micro-irrigation, dripirrigation, animal husbandry. Generally Krishi-Mela was arranged in May month. Pasu Arogya Mela was the part of Krishi-Mela. The Indian government started a Kissan Call Centre scheme over the country. (Source: [http://agri.gujarat.gov.in/index.htm](http://agri.gujarat.gov.in/index.htm)).

Kissan Call centers service has been made available right from 6 A.M. to 10 P.M. except on Sundays and gazetted holidays. Kissan Call Centre services are available at a common toll free telephone number which can be dialed from anywhere in the country. The location is immaterial as the calls can originate from any village to land at a specific call centre and a specific seat which would be answered by an eminent agriculture graduate knowing the local language and having an understanding of the local agricultural issues. In the Gujarat, Kissan call centre is available in Ahmadabad. This centre is also provides answer or information of any agriculture related query in the regional language. (Source: [http://www.kisaan.net/](http://www.kisaan.net/)).
Conclusion:-

In this chapter, the researcher discusses the concept about library and information services, type of service and need of library services. The ICAR has appointed committee and commission for development of agricultural libraries in India. The researcher mention that the development of agricultural information system in the India and abroad level. AGRIS is biggest International Information System for Agricultural Science & Technology and it provides AGRIS database service. ICAR has started AGRIS data input center in India. The researcher also mentions about e-resources consortium and digital repository available in the agriculture field. The investigator discuss about the agricultural information system development in Gujarat state. The Govt. of Gujarat has arranged a Kirshi-Mahotsav and Krishi-Mela for provides current information on agricultural education and research and use of agricultural technology.

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IGNOU. Academic Library Services: Study Material. New Delhi: IGNOU.


Website Bibliography:


