Today's world is highly influenced by the technology and its tools. The field of library and information science is no exception to this. Due to tremendous advancements in ICT (Information and Communication Technology) libraries are facing lot of challenges in the ways information is organized, stored, disseminated and accessed. Libraries of agricultural institutions are also facing the same challenges and have no exception to this. India is an agrarian society and basically depends on agricultural outputs for economic development. So far, there are 47 State Agricultural Universities, 5 Deemed Universities of ICAR, 4 Central Universities with the Faculty of Agriculture Science, 1 Central Agricultural University, 45 ICAR Institutes, 17 National Research Centers, 6 National Bureaux and 25 Directorates/Project Directorates working under ICAR to promote and coordinate education, research and its application in agriculture and allied sciences. Libraries of agricultural institutions can play an important role in providing the right direction to the agricultural, scientific, and technological development of a nation. The agricultural sector faces a series of challenges related to production, marketing and safety. These challenges can be faced effectively and positively by agrarian society if timely information is provided with the help of technology. The technological changes faced by today's libraries require library professionals to restructure their role and competency skills to manage libraries successfully. As the technology is the dire need of today's technology-driven society, it becomes essential to implement and manage technological changes in libraries effectively. According to National Research Council, 1987, “Management of technology is a field that links engineering, science and management disciplines to plan, develop and implement technological capabilities to shape and accomplish the strategic and operational objectives of an organisation”. Technology management in agricultural libraries has a great emphasis on the management of change, both technological innovation and professional development of staff.

1.1 STATEMENT OF THE RESEARCH PROBLEM

The present study assesses in detail the task of managing technological changes in various selected agricultural institutions of Delhi, Haryana, Punjab, Himachal Pradesh, Jammu and Kashmir. It evaluates the role and importance of implementing technology in agricultural libraries. The focus of the study is to explore how ICT enabled changes are transforming traditional ways of operating libraries’ various activities, how efficiently these changes are managed by library managers, how staff of these libraries react to these changes, how end users reap out benefits with these changes and whether staff and users are involved in these change process, what possible change management strategies or models are consulted or adopted, how effectively and efficiently new methods, systems
and techniques are implemented and how resistance to change as encountered in agricultural libraries is managed for implementing change process successfully. Attempts have also been made to study users’ expectations from the libraries of the agricultural institutions in this ICT era.

1.2 TERMS USED IN THE STATEMENT OF THE RESEARCH PROBLEM

1.2.1 Management: Managing is an art or process of converting ideas into results by getting things done through and with people in an organized setting. (Gupta, 1994) Management is the creation and maintenance of an internal environment in an enterprise where individuals, working in groups, can perform efficiently and effectively toward the attainment of organizational goals. (Koontz & Cyrill, 1987) Management is the process of setting and achieving goals through the execution of five basic management functions (i.e. Planning, Organizing, Staffing, Directing and Controlling) that utilize human, financial and material resources.

Librarian, as a manager is supposed to manage basically five M’s to facilitate user oriented services. These M’s are:

```
MEN
MACHINES
MATERIAL
METHODS
MONEY
```

MEN, here refers to library personnel, MACHINE refers to technology deployed in library such as fax machine, Xerox machine, computers, printers, RFID technology etc., MATERIAL refers to all book and non-book material, METHODS refers to various management theories and principles such as scientific theory, classical theory, management principles laid down by Henri Fayol etc. and MONEY refers to various funds library requires to run different operations and daily routines of the library.

1.2.2 Technological: The term ‘technological’ refers to information and communication technologies (ICT) which is used in information handling and processing information, with the help of man and machine. According to The World Confederation for Physical Therapy (WCPT),
“ICT is the phrase used to describe a range of technologies for gathering, storing, retrieving, processing, analysing, and transmitting information”. For the Libraries, ICT has tremendously changed the Management of Resources or House Keeping Operations as well as the way services are delivered. While general IT application tools and Integrated Library Management Systems are largely used in house keeping operations, like acquisition, cataloguing, circulation control, serials control, etc. Internet has been used extensively as a resource as well as a tool to deliver the Library and Information Services (LIS). In the specific context of LIS, one of the implications of use of ICT is that libraries can reach out globally to provide their services 24-hours a day in very cost effective manner. (Chauhan, 2004) Technological changes in libraries and information services will include the designing of a new system that is Web-based and incorporated into the parent organisation, such as the municipal council or a university. Such a system needs to be robust, secure, and capable of searching, generating reports, and allowing users to customise it according to their needs. It should consist of several subsystems and linkages, which should include a management information system designed to reflect policy, the strategic plan and the change management process, from the housekeeping systems designed to aid acquisition and processing to the seamless integrated systems intended to support users and electronic services (Wilson, 1998).

1.2.3 Change: “Change underlies a qualitatively different way of perceiving, thinking & behaving to improve over the present. Change is an alteration on the existing field of forces which tend to affect the equilibrium. The organizations we work in or rely on to meet our needs & wants are also changing dramatically, in terms of their strategies, their structures, their systems, their boundaries & of course their expectations of their staff & managers. Thus any factor in the environment that infers with organization’s ability to alter the human, financial and material resources, its needs or to produce & market its services becomes a force of change”. (Harigopal, 2001) Rapid advancements in technology & globalization of trade have given momentum to change. The change is not going to decelerate and speed of change continues to affect all the sectors of life, change management is a fundamental competence needed to manage the change in organizations. Change management can be used to create & maintain a healthy organization, improve operations & culture and anticipate & manage change. So the need for change is increasing & the capability to change is becoming essential for organizations to survive & succeed in today’s marketplace.

1.2.4 Library: Library is the nerve centre for any institution as it supplies the relevant and latest information to its users to keep them abreast in their area of interest. The term ‘library’ here refers to the libraries of agricultural institutions undertaken for study.
1.2.5 Study: The word ‘study’ refers to make efforts for acquiring knowledge for a particular cause. Here the term ‘study’ is used as lot of time and mind is devoted to study how technological changes are managed by library professionals, how positively these changes are adopted by staff and how these changes have influenced users of these agricultural institutions.

1.2.6 Select: The term ‘Select’ is used as only selected agricultural institutions were undertaken for the proposed research study and the entire research depends upon the availability of the technological infrastructure, application of technology & its tools and influence of these changes in the libraries of these agricultural institutions.

1.2.7 Agricultural Institutions: An institution is described as an organization, establishment, foundation, society or the like, devoted to the promotion of a particular cause or program, especially one of public, educational, or charitable character. (Dictionary.com) An agricultural institution plays a crucial role in providing information to agricultural scientists working in various educational & research institutions and to the farmers for sustainability and upliftment of agricultural production.

1.3 JUSTIFICATION OF THE STUDY

Changes express continuity between an older base of knowledge & practice and newer concepts & methodologies. There is no doubt that the importance of successfully enacting technological changes in libraries & information systems in agricultural institutions is a critical issue facing today’s library professionals and information managers. Agriculture has been the main stay of livelihood particularly in India where occupancy of about 70% population is based on agriculture and its allied fields. Agricultural scientists & farmers need reliable and timely information about best practices of production, processing, marketing, input and output prices and financial markets. Thus, in the light of the rapid technological & workplace transformations, the libraries of agricultural institutions need to be more competent in the present era for further extension and modification of agricultural information resources.

“Change is the only constant” is a well-known premise. The libraries no longer have a choice, hence needs change to survive & grow. The need for change is becoming essential for organization to survive & succeed in future. In spite of knowing the fact that change is necessary to survive & grow, some individuals resist change because of fear, vested interests, lack of trust or
misunderstanding, differences in assessment of the situation, limited resources & inter organizational agreements.

The library & information professionals have to change & adapt the developments taking place in IT & communication channels. The information technology has acquired the do-or-die prominence, those who go with the advances will survive & other will become obsolete. In this backdrop the present study seeks to evaluate the technological change management issues building on the case of libraries of Select Agricultural Institutions and hence is seen as relevant in the light of today’s changing context.

1.4 OBJECTIVES OF THE STUDY

In the context of libraries & information services in agricultural institutions, change is greater in extent than even before. Changes especially due to technological advancements are happening everywhere and the future success of libraries depends on how much library professionals are successful at leading these changes. It is therefore, essential that libraries of select agricultural institutions play a crucial role in providing information to agricultural scientists working in various educational & research institutions and to the farmers and rural community for sustainability & upliftment of agricultural production. Technology thrust should lay greater emphasis on the transfer of agricultural information from the research institutes to its actual users.

Kannappanavar and Praveenkumar (2004) cite Goel who stated that, “Every library grows in terms of reading materials, equipment, space, staff, readers etc. in course of time. Also, there is a change in the specialized needs and interests of the readers, the kinds of services being expected and the speed at which the reading material and the information are being produced and circulated. All these have contributed to a change in the nature of the libraries, which becoming more and more complex and require rethinking, replanning and reorganization. The larger the library, the more complex would be its organization and the consequential management problems. In order to meet all these pressures and to organize and manage a modern library in a manner that it comes upto the expectations of the users and continues to be effective, efficient and meaningful, it needs a competent manger”. The competent managers here are Library managers or Professionals who are responsible for the administration of a particular library.

Keeping in view the above facts the main objectives of the study are as follows:
• To understand the basic concept of change management.
• To identify compelling reasons for introducing technological change.
• To understand the process and methodology involved in handling change dynamics.
• To examine the areas in which resistance to change has been encountered.
• To highlight the strategies undertaken to overcome the resistance.
• To highlight the causes of failure in change.
• To measure the over-all impact of changes & performance of the libraries of agricultural institutions in changing scenario.

1.5 HYPOTHESES

• Librarians do not consider any Change Management Model while planning and implementing technological changes.
• Technology comfort among staff is necessary to decline resistance and maximize participation.
• The technological changes are perceived by most of the library staff in a positive manner as they understand that it is necessary to succeed and grow.
• Internet facility and user education are the most preferred services by the users.

1.6 SCOPE AND LIMITATION

The present study evaluates the management of technological changes with special reference to Information and Communication Technology (ICT) and its tools in the selected agricultural institutions located in following areas:-

• Delhi
• Haryana
• Punjab
• Himachal Pradesh and
• Jammu and Kashmir.

There are various State Agricultural Universities (SAU), Deemed Universities (DU) and research institutions in these areas which are visited during the course of study. However, out of these institutions only those institutions were taken into consideration for the proposed study where the availability of large number of professionals, ICT infrastructure & application of ICT and its tools are found in
their respective libraries. Availability of large number of professionals and ICT infrastructure is found very less in research institutions as compared to SAU and DU. Hence the focus of the study revolves more around the SAU and DU than Research institutes and others.

Agricultural Institutions & Libraries under taken for the study are as under:

**State Agriculture Universities**
- Yashwant Singh Parmar University of Horticulture and Forestry (YSPUHF), Himachal Pradesh.
- Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya (CSKHPKV), Himachal Pradesh.
- Chaudhary Charan Singh Haryana Agricultural University (CCSHAU), Haryana
- Punjab Agricultural University (PAU), Punjab.
- Sher-e-Kashmir Agricultural University of Science and Technology, Kashmir (SKAUST-K), J&K
- Sher-e-Kashmir Agricultural University of Science and Technology, Jammu. (SKAUST-J), J&K.

**Deemed Universities**
- Indian Agricultural Research Institute (IARI), New Delhi.
- National Diary Research Institute (NDRI), New Delhi

**Research Institutes and others**
- Central Soil Sanity Research Institute (CSSRI), Haryana.
- Indian Agricultural Statistics Research Institute (IASRI), New Delhi.
- National Centre for Agricultural Economics and Policy Research (NCAP), New Delhi.
- National Bureau of Plant Genetic Resources (NBPGR), New Delhi.

A brief profile of institutions and their libraries visited during survey is given to understand various disciplines studied, facilities and services that libraries of these institutions are providing for education, research and extension in agriculture and allied disciplines.

**1.6.1 Dr. Yashwant Singh Parmar University of Horticulture & Forestry (YSPUHF)**

**Introduction:** Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Solan is named after the first Chief Minister of Himachal Pradesh Dr. Yashwant Singh Parmar. On December, 1985 the Horticulture Complex of Himachal Pradesh Krishi Vishvavidyalaya (HPKV) complex got the
The University is playing an important role in increasing horticulture production in the state of Himachal Pradesh in particular and in the country in general.

**Academics:** The University provides teaching facilities in horticulture, forestry and allied sciences. The entire teaching spectrum is broadly divided into a number of courses offered by two colleges viz.

- College of Horticulture
- College of Forestry

**Regional Research Stations:** Regional Research Stations throughout the state have been established and a considerable strengthening of regional research stations is being done through ICAR, DST (Department of Science & Technology), DBT (Department of Biotechnology) and State funding sources.

Agro-climatic distribution of regional research stations:

- RHRS at Jachh, District Kangra
- RHRS at Bhotia, District Hamirpur
- RHRS at Bajaura, District Kullu
- RHRS at Mashobra, District Shimla
- RHRS at Sharbo, District Kinaur

**Krishi Vigyan Kendras (KVKs):** The KVKs operate under the Directorate of Extension Education of the university are located in the different regions of Himachal Pradesh to organize location specific trainings and demonstrations.

- KVK at Saru, District Chamba
- KVK at Rohru, District Shimla
- KVK at Reckong Peo, District Kinnaur
- KVK at Kandaghat District Solan

**University Library**

The YSPUHF has a well established modern library named as **Satyanand Stokes Library** (SNS). It is named after Satyanand Stokes, a native of U.S. who became Indian National and heralded apple revolution in Himachal Pradesh. It is catering to the information needs of the academic community of the University. The library has seating capacity for 326 users in common
reading area. The facilities of Book Bank, Inter library loan, document lamination and reprographic services, current awareness services are also available. The library is using SOUL software for the development of in house database. The database of books available in the library is being updated on day to day basis with details of recently acquired books. The editing and updating activities are in progress.

The library has following in-house bibliographic computerized databases:

- Database on M.Sc. and Ph.D Theses
- Database on Books
- Database of Serial Holdings.
- Database on Forestry Literature, Horticulture, Agriculture and Forestry Research information

**Library Collections**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
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**CD ROM Databases and Coverage**

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<tr>
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<td>1973-2009</td>
</tr>
<tr>
<td>CAB-CD</td>
<td>1987-1995</td>
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<tr>
<td>AGRICOLA</td>
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<tr>
<td>TREE-CD</td>
<td>1939-2009</td>
</tr>
</tbody>
</table>

**Technological Initiatives in Library**

The library has initiated the computerization operation in April 1989 and had made significance progress in the application of modern information to cope with the ever increasing flow of information. The whole collection of the library is computerized and OPAC is electronically accessible. The University was brought on Global Network through V-SAT by introducing E-Mail & Internet facilities on January 1, 1998. Faster ISDN connectivity was introduced on March 27, 2003. SNS library became the first SAU library in the country which has been converted in to Wi-Fi
Library in 2003-2004 besides introducing SOUL (Software for University Libraries) to facilitate its automation functions. On May 15, 2007 a Multimedia Centre was inaugurated in SNS library by Dr. Mangla Rai, Director General, ICAR. The objectives of the centre are to strengthening teaching, research and extension education; provide access to e-contents, e-knowledgebase including multimedia contents; and to establish linkage to ICAR-net, ICAR-e-journals consortium, Regional Research Stations and other related institutions. This Centre is equipped with 40 computers out of which 29 computers have internet facilities. One Xerox Phaser 7400 Colour Laser Printer and One Digital Multifunctional Photocopier have been installed for quality printout services. Techfocuz software ver.3.02 has been installed in the CD Mirror Server for storage of VCDs, DVDs, Audio CDs, bootable CDs, e-magazines and e-books CDs. The software enables to search multiple CDs and DVDs together with a single search command for comprehensive search. These products are searchable under network environment by all the users simultaneously. The scientists/teachers and students have been given electronic access to 2000+ e-journals w.e.f. Jul 23, 2008 through CERA Consortium for e-Resources in Agriculture; all the PhD theses w.e.f. 2000 onwards were digitized under ICAR Krishi-Prabha Project. For linking the Regional Research Stations of the university with the library, the connectivity facilities have been established at the Regional Stations of the University, so that the scientists / Staff working there can access the latest information and be in a position to communicate fast through E-Mail.

**Computer and Instrumentation Centre:** This centre is located in the ground floor of Satyanand Stokes Library at the main campus. The centre was established in May 1988 with assistance from ICAR under 7th five year plan. The centre has cells such as ARIS Cell, GIS & Remote Sensing Cell, Teaching and Training Cell, Computerization / automation Cell, Research Data Analysis Cell, and Instrumentation Cell. These cells provide campus wide information technology facilities to all the students and staff of the university and are responsible for developing and maintaining university website and automating administrative jobs. The centre provides E-mail and Internet facilities through campus wide Local Area Network (LAN) for resource sharing and exchange of information. It also provides connectivity to National Network of ICAR connecting various SAU’s and ICAR research institutes under Agricultural Research Information System (ARIS).

**Teaching:** The University library also imparts teaching and offers the 0+1 credit hour course to the postgraduate and Ph.D. students to familiarize about the information resources and searching, theses writing, computerized search formulation, on-line searching, networking, rendering bibliographical detail of references, etc.
1.6.2 Chaudhary Sarwan kumar Himachal Pradesh Krishi Vishvavidyalaya (CSKHPKV)

**Introduction:** Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya is an Indian Council of Agricultural Research (ICAR) accredited and ISO 9001:2000 certified institution, established in 1978. It is the leading hill agricultural university of India, known for innovations in transforming farming in Himachal Pradesh. A number of improved varieties of different crops are credited to the university.

**Academics:** The whole teaching spectrum is broadly divided into a number of courses offered by four colleges of Agriculture viz.

- College of Agriculture
- Negi College of Veterinary & Animal Science
- College of Home Science
- College of Basic Sciences

**Regional Research Station & Research Centers:** The Directorate had research network at main campus and three research stations at Bajaura (Kullu), Dhaulakuan (Sirmour) and Kukumseri (Lahaul) and 11 research sub-stations at Kangra, Nagrota, Malan, Berthin, Akrot, Sundernagar, Katrain, Leo, Lari, Sangla and Salooni.

In addition, the University has five Research Centres for advance research and extension activities:

- Advance Centre for Hill Bio Resource & Biotechnology
- Organic Farming Research and Training Centre
- Centre for Commercial Mountain Agriculture and Enterprises Development
- Centre for Policy Research in Mountain Agriculture & Rural Development
- Centre for Human Resources Development in Mountain Agriculture

**Krishi Vigyan Kendras (KVKS):** The CSKHPKV Palampur has eight Krishi Vigyan Kendras (Farm Science Centres) at following locations:

- KVK at Dhaulakuan (Sirmaur)
- KVK at Bajaura (Kullu)
- KVK at Bara (Hamirpur)
• KVK at Una
• KVK at Mandi (Sundernagar)
• KVK at Kangra
• KVK at Berthin (Bilaspur)
• KVK at Kukumseri (L&S)

**Agricultural Technology Information Centre (ATIC):** The ATIC was sanctioned in 11th January 1999 by ICAR to provide latest technologies, services and various products for the benefit of the farming community. Its objective is to build up required confidence among farmers and to strengthen linkage between the University and the farmers. It is also involved in sale and distribution of improved products emerging as a result of research being done at SAU’s like seeds, plants, livestock breeds, fish seed, poultry trains and processed products etc.

**University Network Services (UNS):** The UNS at CSKHPKV Palampur was formally launched on 22-09-2003. It consists of three sections:

- University Network maintenance
- Web site maintenance and
- Library automation.

University has broadband of 256 kbps bandwidth via leased line connectivity through BSNL, Dharamshala and 256 kbps DAMA VSAT connectivity through ERNET, New Delhi.

**University Library**

The university library caters to the needs of the students, teachers, extension specialists and the staff of the main campus of the university as well as the scientific staff stationed at the research stations, sub stations and KVKs of the University. This agricultural university library is designated as FAO depository library and therefore all the FAO publications are received in this library, free of cost. The library has also been declared as the regional library by the ICAR under the National Agricultural Research System of India. The library has seating capacity of 200 readers at a time. The facilities of Book Bank scheme, gifts and exchange, inter library loan, document lamination and reprographic services are also available. The University Library at Palampur has following collections:

**Library Collections**
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### Current Journals

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<tr>
<td>Online Journals</td>
<td>7153</td>
</tr>
</tbody>
</table>

## Technological initiatives in library

The university library is the on-line library and its resources can be assessed from any part of the world at http://hillagric.ernet.in or http://202.41.109.100. The library is connected with the LAN and WAN with 256 Kbps dedicated leased line of the BSNL. The University Library provides the on-line/off-line services. The Stations clients of the library and other ICAR and SAU readers can approach the library for the services by post or by e-mail. The on-line library is not only saving the time of its readers but of the staff as well.

The library is using **LIBSYS Software** for library management and the development of in-house database. LIBSYS Software package supports all in-house operations of the Library. The database of books available in the Library is being updated on day to day basis with details of recently acquired books. The editing and updating activities are in progress.

**Electronic Resources Centre:** Electronic Resources Centre is established for readers for browsing the library resources. This section is the nerve of the on-line library services and most widely used for CD-ROM Searching, Online Journal Access, Online Public Access Catalogue (OPAC), accessing the Internet, etc. The Library System Administrator and Joint Library System Administrator are helping in providing the on-line services, offered through this centre.

**e-GRANTH Project in the library:** The library is running a NAIP Project; Strengthening of digital library and information management under NARS (e-GRANTH), worth Rs. 8,61,48,100. The project has a provision for one Research Associate (RA) and one senior Research Fellow (SRF). The broad objective is to digitize the institutional repositories and automation of library resources with integration/collaboration with Online Computer Library Center (OCLC), USA.
**KrishiPrabha**: The CSKHPKV Library as one of the members of NARS also provides IP based, campus wide access to the full text of theses of all the SAUs and NARS Libraries under KrishiPrabha- Indian Agricultural Doctoral Dissertation Repository.

The following important databases are available in the library:

- CAB Abstracts (1910- To Date)
- AGRICOLA (1970-2006)
- AGRIS (1975-2006)
- FSTA (1969-2006)
- MEDLINE (1950-2006)
- J-Gate
- Indian Science Abstracts
- Forestry Database in CD-ROM (FRI, Dehradun)
- NUCSSI

Besides the above, the library has its own databases for:

- Theses holdings (Theses)
- Back volumes of the journals in the library (Journals)
- Books available in the library (Books)
- FAO publications (Books)

**On-Line Journals/Portals/Databases**

Library provides following links at its URL

http://www.hillagric.ernet.in/library/index.htm

- WebOPAC (Search Library Books, Theses, Journals)
- e-Books (search and download e-Books)
- CeRA (Consortium for e-Resources in Agriculture - Search On-line Full text International Journals)
- J-Gate Online Journal Portal (Search On-line Journals)
- KrishiPrabha (Search On-line Full text Ph.D. Theses of SAUs/ICAR Institutes)
- PG Research Topics
- Other Links
- Annual Report 2008-2009
Teaching: The University library imparts teaching at postgraduate level and offered the 1+0 credit hour course entitled, “Literature and Technical Writing” to the postgraduate students of the University.

1.6.3 Chaudhary Charan Singh Haryana Agricultural University (CCSHAU)

Introduction: Chaudhary Charan Singh Haryana Agricultural University popularly known as HAU is one of Asia's biggest agricultural universities named after India's seventh Prime Minister, Choudhary Charan Singh. It was initially a campus of Punjab Agricultural University, Ludhiana. After the formation of Haryana in 1966, it was established as an autonomous body on February 2, 1970 by an Act of Parliament. It won the Indian Council of Agricultural Research's Award for the Best Institute in 1997.

Academics: CCSHAU offers undergraduate, postgraduate and PhD programme in various disciplines of agriculture under six constituent colleges viz.

- College of Agriculture
- College of Agricultural Engineering & Technology,
- College of Veterinary Sciences
- College of Animal Sciences
- College of Basic Sciences & Humanities
- College of Home Science

Computer Centre: The Computer Centre was established in 1979. E-mail and Internet surfing are the two major activities of this centre. The Computer Centre has, at present one MICRO32 Unix machine, around 60 P-IV PCs and different kinds of printers for the use of faculty and students as well as for its staff. Two Sun Ultra 450 servers, three X235 IBM servers running Solaris operating systems are being used for internet connectivity. The installation of Campus-wide GIGABIT Network is implemented by this centre with funds from AHRD project. The Centre is the gateway for internet connectivity and runs the web-server for the University.

Research Station: HAU has one rice research station situated at Kaul and other research stations are at following location:
- RRS, Uchani, Karnal
- RRS, Buria, Yamunanagar
- RRS, Bawal

**Krishi Vigyan Kendra:** HAU has four Krishi Vigyan Kendra at following location:

- KVK at Kaithal
- KVK at Kurukshetra
- KVK at Sadalpur
- KVK at Panipat

**University Library**

The university library known as **The Nehru Library** is named after India's first Prime Minister, Pt. Jawahar Lal Nehru. It was established in 1948 with the establishment of College of Veterinary Sciences and officially dedicated to the university community in the year 1975. The library has the capacity to accommodate more than 3 lakh volumes of books and bound journals with seating capacity of 650 readers.

The library avails **Bookshop facility** which no other library is providing in the country for the purchase of its reading material. The library is providing various services like online service, CD-ROM database service, reference service, and circulation services to the university community. The entire range of **Circulation functions** use bar-coded University ID-cum-Library Cards for Check-out and Check-in of reading material, calculation of overdue charges, printing of gate-passes, reservation of books, printing of reminders for outstanding books, checking of a book whether it is checked-out or is available on shelf, if checked-out to whom it is issued and when it is due, blocking of user account, statistical data, and all other circulation-related functions are computerized.

Nehru library possesses a very rich collection of learning resources available in various disciplines of Agricultural and its allied fields. Presently, Library subscribes to 694 journals of which 225 are foreign. The Library has exchange relations with several foreign and Indian publishers. HAU Journal of Research, Haryana Veterinarian, Haryana Kheti, and Thesis Abstracts are official publications of this University which form the backbone of the exchange programme.
Library Collections

Books 2, 12, 559
Periodicals 97,578
Theses 10,623
CD-ROM 139
Books & Theses on CDs 2,204
Total 3, 23,103

Current Journals

Indian 471
Foreign 229
Total 700

CD-ROM Databases

CABI Abstracts 1972 to current
AGRICOLA 1970 to current
Biological Abstracts 1997 to current
Indian Science Abstracts 1990-2000
Census of India 2001 2001
AGRIS

Technological initiatives in library: Nehru library has started its automation in 1991, with the existence of Research, Planning and Development Division, which was set up to prepare library modernization plans, and implement the same successfully by eliminating the cumbersome manual library operations. The Library had implemented LIBSYS Software for automation of its entire range of activities in 2000. The Library Servers are linked to the Campus Network for providing online library services all over the campus.

The library has automated its following activities with the financial assistance from ICAR: (http://202.141.47.8:8080/HAU/lib-modernization.html)

- Internet Surfing Laboratory with 18 PCs has been established.
- CD-ROM databases are accessible over 5 PC nodes.
- Library Catalogue has been computerized and web-enabled.
- Abstracts of Doctoral Dissertations have been linked to OPAC database.
- New Additions can be viewed through PCs linked to Campus Network.
- Periodicals’ Holdings has been computerized, and can be viewed through PCs linked to Campus Network.
- Entire library collection has been bar coded.
- Traditional multiple library cards coupled with University I-Card have been replaced with a single bar coded University ID-cum-Library Card.
- All circulation functions including Library Membership has been automated.
- Stock Verification of library stock has been computerized.
- Majority of the paper correspondence has been replaced with e-correspondence.
- All accounting and management functions have been computerized.
- Digital Library comprising Census 2001, 240 FAO publications, etc. has been established.
- Multimedia Library with 15 PCs has been established.
- Videoconferencing Facility for interaction among the scientists at national and international levels has been established in the Library in August 2007.

The library offers Internet surfing facility which was set up in 2001 with five nodes with location in CD-ROM database services room. There are, as of now, 25 Internet nodes in the Library. These nodes are located in the separate Internet Lab. Videoconferencing Facility became operational in August 2007. The scientists of CCCSHAU can have live scientific discussions with the scientists of other organizations (remote locations) having common interests. It can be used for watching a common CD, by a group of students/scientists or for making a PowerPoint Presentation to a group of the audience.

KrishiPrabha (e-Theses): KrishiPrabha is a full-text electronic 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 7500 dissertations, has been created by Nehru Library, with financial support from Indian Council of Agricultural Research, New Delhi under its National Agricultural Innovation Project.

Digital Library: HAU Digital library provides link to the following:

- CeRA: Gateway to e-journals,
- e-Reference sources
- Vidyanidhi: Indian Theses Database
- e-Conference Alerts
• e-Books
• e-Databases
• Agricat
• Miscellaneous (http://202.141.47.8:8080/HAU/digital.html)

**Teaching:** The library offers a 2-credit hour course to the postgraduate students. This course is compulsory for M.Sc. but optional for Ph.D. students. There are two parts of the Course - Library and Information Services and Technical writing.

1.6.4 Punjab Agricultural University (PAU)

**Introduction:** The Punjab Agricultural University was established in 1962. In 2006 the College of Veterinary Science was upgraded to become Guru Angad Dev Veterinary and Animal Science University (GADVASU) at Ludhiana. The PAU has played a key role in increasing food grain production in the Punjab State and Green Revolution in India. In recognition of its outstanding achievements in agricultural research, education and extension, it was adjudged the Best Agricultural University in India in 1995 by the Indian Council of Agricultural Research. ICAR has set up five centers of Advanced Studies at PAU (out of these three are now in GADVASU).

The Punjab Agricultural University now has four constituent colleges for providing education in agriculture and its allied fields, viz.

- College of Agriculture
- College of Agricultural Engineering
- College of Home science
- College of Basic Sciences & Humanities

**Research Centers and KVK’s:** The PAU has various Research Stations and KVK’s situated at different locations as follows:

- Main Research Station, PAU, Ludhiana
- Regional Research Station, Ballowal Saunkhri, Distt. Nawan Shahr
- Regional Station, Gurdaspur
- Regional Station, Faridkot
- Regional Station, Bhathinda
- Regional Fruit Research Station, Abohar, Distt. Ferozepur
- Fruit Research Sub-Station, Gangia, Distt. Hoshiarpur
- Fruit Research Sub-Station, Bahadurgarh, Distt. Patiala

**KVK’s:**

- KVK Amritsar (Jahangir- Nag Kalan)
- KVK, Bathinda
- KVK, Hoshiarpur
- KVK, Gurdaspur
- KVK, Patiala
- KVK, Kheri (Sangrur)
- KVK Moga
- KVK Muktsar
- KVK, Ferozepur
- KVK, Faridkot
- KVK, Fatehgarh Sahib
- KVK, Jalandhar
- KVK, Ropar
- KVK, Kapurthala
- KVK, Muktsar
- KVK Shaheed Bhagat Singh Nagar (Langroya)
- KVK (Ludhiana) Samrala

Beside these PAU also provide Farm Advisory Services to farmer community in different Farm Advisory Service Stations (FASS) located at Amritsar, Bhatinda, Chandigarh, Ferozpur, Faridkot, Gurdaspur, Hoshiarpur, Jalandhar, Kapurthala, Patiala, Ropar, and Sangrur. PAU also gets national award for excellence in technology transfer in the year 2009.

**Computer Centre:** The University has a Computer Centre which was established in 1980 under the ICAR/UNESCO scheme for Centre of Advanced Studies in Postgraduate Teaching and Research. The present set up includes Pentium Systems along with the two nodes of E-mail/Internet. The Computer Centre provides computer facilities to the entire university.
University Library

The central library of PAU was earlier known as Government College Library but later on in 1972, with the construction of its own building, it was renamed as Mohinder Singh Randhawa Library, the then Vice-Chancellor of PAU. The library has 760 seating capacity in its 4 reading halls. The aim of the library is to provide rich knowledge to its users and to extend it further through information technology, automation and networking.

Library Collection:

<table>
<thead>
<tr>
<th>Category</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Books</td>
<td>238002</td>
</tr>
<tr>
<td>Theses</td>
<td>35976</td>
</tr>
<tr>
<td>Bound Periodicals</td>
<td>102186</td>
</tr>
<tr>
<td>Audio-Visuals</td>
<td>348</td>
</tr>
<tr>
<td>CD’s</td>
<td>896</td>
</tr>
<tr>
<td>Books &amp; Theses-CD format</td>
<td>663</td>
</tr>
<tr>
<td>Total</td>
<td>3,78,749071</td>
</tr>
<tr>
<td>E-Books</td>
<td>22</td>
</tr>
</tbody>
</table>

This Library subscribes to 354 journals including 115 foreign, 239 Indian and 7318 online journals. Beside this library provide access to **3 CD-Rom databases**

- Biotechnology Abstracts
- CAB Abstracts
- Food Science & Technology Abstracts

Access to following **5 Online Databases** is also provided:

- Consortium of e-Resources in Agriculture (online database of full text journals)
- J-gate agricultural & biological sciences (online database of abstracts & full text journals)
- Myilibrary (online database of e-books)
- Krishiprabha (online Database of theses)
- Indiastat.com (online database of statistical information)
Technological initiatives in library

The library is fast approaching towards complete computerization and automation of all its operations through Library Management Software-LIBSYS 4. The LAN facility and OPAC database of books, theses and periodicals have become operational in the Library premises. Internet service is available free of any charges to its members from PAU in the Computer Section of this Library. **Access to CD-ROM databases** is available in the library free of cost to its members. The library has free Online Access to 50 online journals. Readers can make use after having the site address from Computer Section. J-gate Online service provides seamless access to the abstracts of millions of journal articles available online offered by more than 4800 publishers. It has a massive database of journal literature, indexed from e-journals with links to full text also. PAU is also providing Video-Conference facility available at Punjab Agricultural Management and Extension Training Institute on its campus. This state-of-the art facility was inaugurated by the President of India A.P.J. Abdula Kalam in September, 2003. Library also subscribes to the INDIASTAT.COM site, which provides statistical information on and about India. The site is maintained by Datanet India Pvt. Ltd., New Delhi. It can also be assessed in the Computer Section of the Library. It also provides online information on ICRISAT library database. ICRISAT is a non-profit, nonpolitical organization that does innovative agricultural research with a wide array of partners across the globe. PAU is a member of CeRA (Consortium for e-resources in Agriculture) Consortium under which campus wide access is provided to Springer (1190), Annual Reviews (22), CSIRO (Australia) (8) and Nature at www.cera.jccc.in-CeRA. It has facility of interlibrary loan too in the country.

1.6.5 Sher-e-Kashmir Agricultural University of Science & Technology, Kashmir (SKAUST-K)

**Introduction:** Sher-e-Kashmir University of Agricultural Sciences and Technology (SKUAST) is a multicampus University, named after Jenab Sheikh Mohammad Abdullah (popularly known as Sher-e-Kashmir). It was established in the year 1982 through an Act passed by the State Legislature in the 33rd year of the Republic of India with its jurisdiction over the entire State of Jammu & Kashmir with its headquarter at Shalimar, Srinagar. In the year 1998-99, the territorial jurisdiction of the University was redefined by amending the SKUAST Act under which a separate Agricultural University was established for Jammu Division and named as Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu (SKUAST-J) with its territorial jurisdiction
extended to the entire Jammu Division. The parent University was renamed as Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir (SKUAST-K) with its territorial jurisdiction extended over whole of Kashmir and Ladakh Division.

**Academics:** The University is imparting various academic Programmes through its six faculties at present, viz.

- Faculty of Agriculture at Wadura
- Faculty of Forestry at Bennihama (Ganderbal)
- Faculty of Postgraduate Studies at Shalimar
- Faculty of Veterinary Sciences & Animal Husbandry at Shuhama
- Faculty of Horticulture at Wadura
- Faculty of Fisheries presently at Shuhama

University is strengthening its R&D infrastructure by obtaining generous financial support from national funding agencies particularly by ICAR. Besides, DBT, DST, APEDA, ICFRE, NOVOD Board and Ministry of Agriculture, Government of India has also given substantial financial support.

**Research Stations/Sub-stations:**

- Main Research Station, Shalimar, Srinagar
- Sheep Research Station, Shuhama
- K.D. Research Station, Old Airport, Srinagar
- Cattle Research Station, Manasbal, Baramulla
- RRS And Faculty of Agriculture, Wadura Baramulla
- Division of Sericulture, Mirgund Baramulla
- Regional and Rice Research Station, Khudwani, Anantnag
- Fruit Research Sub-station, Balpora, Shopian
- High Altitude Rice Research Sub-station, Larnoo, Anantnag
- High Altitude Maize Research Sub Station, Sagam, Anantnag
- Pulses Research Sub- Station, Habak, Srinagar
- Saffron Research Sub- Station, Konibal, Pulwama
- Kala Zeera Research Sub Station, Izmarg, Gurez, Baramulla
- Fruit Research Sub Station, Pahnoo, Shopian
- RRS and Faculty of Fisheries, Rangil, Ganderbal
- RRS and Faculty of Forestry, Lar, Ganderbal
- Regional Agricultural Research Station, Leh, Ladakh
- Regional Research Sub-station, Kurbatang, Kargil

**KVK’s in Kashmir Division**

- KVK Ananthnag (Pumbay)
- KVK Pulwama (Malangpora)
- KVK Budgam (Narkara)
- KVK Srinagar (Shuhuma)
- KVK Baramulla (Putshi)
- KVK Kupwara

**KVK’s in Ladakh Division**

- KVK Kargil
- KVK Leh

The University organizes various Kisan Melas, Kisan Goshties, Kisan Samman Divas, Radio/TV talks and interaction meetings with farmer community on wide range of topics. It also has Agricultural Technology Information Centre (ATIC) which is fully functional at the Main Campus to serve the intermediary users and end users (farmer) in decision making and problem solving.

**University Library**

**Introduction:** The Library System of SKAUST-K comprises of one Central Library, five Faculty Libraries and ten Station Libraries all across the Valley. The University lays great emphasis on the development of library and information facilities at both the Main Campus and its constituent units through the addition of nascent information sources, development of the infrastructure and establishment of connectivity through Intranet and Internet. Comprehensive Web Page giving information about the SKUAST-K Library System has been designed, developed and posted on website of the University. The web page gives a detailed account of the Library activities and functions.
**Library collections:**

Books: 1685

Foreign Journals: 55

Indian Journals: 73

**Other additions:**

Annual Reviews and Advances: 26

Scientific/Technical Reports: 182

**Technological initiatives in library:** The Library System of SKUAST-K is heading fast towards the total automation of library services. In this connection, a considerable emphasis is laid on the development of its infrastructure.

The library avails the facilities of network infrastructure, library networks and databases developed by ICAR, IASRI, INFLIBNET and ERNET. 20 Computer systems are equipped with audio-visual and multi-media support. These are utilized to cater the time-to-time requirements of the users. However, the videoconferencing facility remains to be developed. CD-ROM and OPAC facility is provided. The Internet facility is available round the clock on 24 x 7 basis facilitated by ERNET India as ISP. The seating capacity of 50 is available to carryout Internet and Intranet surfing in the browsing lab. The bibliographic record of the stock available in the Library System was computerized in the form of five comprehensive databases viz.

- **SOUL Database** for books and theses
- **Article Alert Database** for Research Articles published in subscribed print journals
- **Green Stone Database** for full-text theses and seminar proceedings
- **Journal Directory Database** for Back-file Journal Collection
- **PhyVfn Database** for record-keeping and physical verification of other Library Assets

All these databases have been integrated through an interface developed indigenously using Visual Basic. The library is endeavoring to develop a full text Theses and Research Publications Database using DSpace Software. The proposed database will enable the Library to create a digital library of Theses and Research Publications and put it online for use to registered users of the University on 24 x 7 mechanisms. The DSpace software will enable the scientists and students of the University to submit their theses and research papers online and the library staff and faculty to
notify the students and other stakeholders online about the recent developments in research and publication.

**AgriKhoj search engine**: Library also avails the facility of AgriKhoj search engine to search documents from the NISAGENET system through keywords. A user can access this utility from home page and search the desired information specific to agricultural education and research.

The Central Library is an active Partner in “KrishiPrabha: Indian Agricultural Doctoral Dissertation Repositories” project. Library also avails the facility of free and full text access to ICAR Journals and NISCAIR information sources.

e-Journal Consortia and FOAP: The Library is actively working on the e-journal consortium in agriculture under the aegis of ICAR through NAIP where-under the scientific and student community of the state will get free online and full text access to hundreds of foreign and Indian Journals, particularly related to agriculture and allied sciences. The access to all journals that provide FOAP (Free Online Access against Print) in the field of agriculture and related disciplines is ensured and scientists and users were not only informed about the availability but made skillful enough to properly harness the facility.

**Agriculture Research Information System**: The ARIS as a part of Library Systems provides network support, internet facility and soft/hardware footing. It provided LAN-WAN internet connectivity to all Divisions through around 250 nodes.

**Teaching**: The Library System is offering one regular academic course 601 (0+1) entitled “Library Science and Technical Writing” to familiarizes the students about the efficient utilisation of the Library Services and Online Information Resources.

**1.6.6 Sher-e-Kashmir Agricultural University of Science & Technology, Jammu (SKAUST-J)**

**Introduction**: Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu came into existence on 20th September 1999 following the amendment in Sher-e-Kashmir University of Agricultural Sciences and Technology Act 1982 through the State legislature. The establishment of SKUAST-J was announced in 1996 by the then Prime Minister of India, Sh. H. D. Deve Gowda, during his visit to Jammu to fulfill the area specific needs of people of Jammu. Following these announcements, the Indian Council of Agricultural Research (ICAR) constituted Madan Committee
which recommended the establishment of the separate Agricultural University for Jammu. Chatha/RakhChatha was identified as the new main campus of the university and R.S.Pura campus become full-fledged Faculty of Veterinary Sciences.

**Academics:** The SKAUST-J imparts education in the fields of agriculture and allied sectors under two faculties viz.

- Faculty of Agriculture, Chatha/Udheywalla
- Faculty of Veterinary Sciences and Animal Husbandry, R. S. Pura

University has its eleven Research station/Sub-Stations/centre and six Krishi Vigyan Kendras in the entire Jammu province, engaged in research activities in the areas of agriculture, horticulture, livestock, dairy, fisheries and home science.

**Regional / Sub-Research Stations:**

- Regional Agricultural Research Station, Rajouri
- Maize Breeding Research Sub Station, Poonch
- Regional Horticultural Research Sub Station, Bhaderwah
- Rain Fed Horticultural Research Sub Station, Raya
- Dry Land Research Sub Station, Dhiansar
- Pulses Research Sub Station, Samba
- All-India Co-ordinated Research Project on Maize(ICAR), Udhampur
- Seed Production Farm, Chakroi
- Water Management Research Center, Chatha
- Cropping System Research, Chatha

**KVKs:**

- KVK, Jammu
- KVK, Doda
- KVK, Rajouri
- KVK, Udhampur
- KVK, Poonch
- KVK, Kathua
The university has been actively involved in the transfer of evolved technologies to the end users through the strong extension system such as:

**Kissan Call Center:** This is functioning in the University for addressing farmer's queries anytime.

**e-KIOSKS Facility for Farmers:** Online e-learning Kiosks are in advance stages of installation at 20 different remote locations in Jammu division to connect farmers with scientists through e-studio at main campus Chatha.

The activities of extension education are carried out by faculty members appointed under Krishi Vigyan Kendras (KVK). The scientist farmer interactions are frequent and liberal.

**University Libray**

Separate libraries have been established at the Chatha and R.S.Pura campuses having good reference book bank and subscription to National and International journals. The technical information and production recommendations are disseminated through the publications and print material in form of pamphlets, leaflet and posters.

**Library Collections:**

**Books**
- At Chatha 17226
- At R.S Pura 4966

**Indian Journals**
- At Chatha 71
- At R.S Pura 55

**Foreign Journals**
- At Chatha 27
- At R.S Pura 37

**Technological initiatives in library:** The library is using **SOUL management software** to automate its library operations. Keeping abreast with the latest technologies, facilities like Video Conferencing, internet and LAN are available for usage of faculty, students and staff members. CD-Rom facility is also available. CAB CD, VET CD and FSTA are being used extensively. On-line e-learning Kiosks facility is provided to farmers.
1.6.7 **Indian Agricultural Research Institute (IARI)**

**Introduction:** Indian Council of Agricultural Research is an autonomous organization under the Department of Agricultural Research and Education, Ministry of Agriculture, Government of India. It is country's premier national Institute, established in the Year 1905 at PUSA, Bihar for agricultural research, education and extension. Its original name before 1947 was Imperial Agricultural Research Institute. After the Independence the name was changed to Indian Agricultural Research Institute. In the year 1936 due to a massive earthquake it was shifted to Pusa, New Delhi.

It has got the status of a ‘Deemed-to-be-University’ under the UGC Act of 1956. The Institute imparts training in specialized areas of agricultural sciences through training programmes funded by the ICAR, DBT, DST and other organizations.

**Academics:** To undertake need-based research, the whole teaching spectrum is divided in following disciplines:

- School of Crop Improvements
- School of Crop Protection
- School of Basic Sciences
- School of Resources Management
- School of Social Sciences

**Units/Centers:** The institute comprises of following units/centres, viz.

- Center for Agril.Tech. Assessment & Transfer
- Center for Protected Cultivation Technology
- Farm Operation Service Unit
- Library Services
- Unit of Simulation & Informatics

**IARI Regional Stations:** The regional stations of IARI are located at different locations as follows:

- Amartara Cottage, Shimla
- Indore, MP
- Kalimpong, Darjeeling (W.B)
- Karnal, Haryana
- Katrain, Kullu Valley (H.P)
- Pune, Maharashtra
- Pusa, Bihar
- Wellington, Tamil Nadu

**IARI Center**: The IARI has two centers; one in Tamil Nadu, Aduthurai and the second one is in Karnataka, Dharwad.

**KVK**: IARI has one KVK established in Shikohpur, Gurgaon

**Agricultural Technology Information Centre**: Agricultural Technology Information Centre (ATIC) has been established at IARI under the National Agricultural Technology Project (NATP) of the ICAR to facilitate direct access of the farmers to the institutional resources available in terms of technology advice, technology products etc., for reducing technology dissemination losses. It is effectively providing products, services and information to different stakeholders through single window delivery system.

**Eprints@IARI**: It is the open access institutional repository of IARI. Research outputs of IARI - journal papers, conference papers, reports, theses, patents etc. - are uploaded/self-archived by IARI scientists/scholars who do research on agriculture and related areas. Interested users can freely download and use documents as most of them are directly accessible and full-text downloadable. 'Request Copy' forms can be used for documents to which direct full-text download is restricted due to publisher embargo. (http://www.eprints.iari.res.in/)

**University Library**

**Introduction**: The **IARI Library** is one of the largest and the finest agro biological libraries in South East Asia. The Library functions as the depository of FAO, IDRC and AVRDC publications and also as the National Depository for CGIAR institutes’ publications.

**Library collections**:
- Books/monographs: 1 Lakh,
- Journal Volumes: 3, 50,000
- Bulletins: 5,000
- PG Theses: 15,000
Pamphlets: 10,000
News clippings: 30,000
Reports: 30,000

Technological initiatives in library: The library has started its computerization activities in 1993 to meet the ever increasing demands of the scientific community. The library so far has created a database for one lakh eighty thousands publications which is retrievable. It has also developed the database of 7500 Post Graduate Theses of IARI and a database of 8000 research fellow theses of ICAR.

The Library is providing reprographic services, inter-loan services and CD-ROM facility to its users. It has student facility unit and scientist facility wing to provide internet facility to its users and scientists separately. Library is subscribing to international databases. Research scholars can find out the required reference along with abstract by putting keywords of their topics from these databases. The Scientists of IARI can access CD-ROM services through their desktops which are connected with Library CD-ROM server through LAN.

Intranet services: IARI Library is providing following Services to its Intranet Users:
A. CD-ROM DATABASE ACCESS ERL Server
   AGRIS DATABASE 1975+
   AGRICOLA DATABASE 1970 +
   AGRICULTURE AND NATURAL RESOURCES 1975 +
   BIOTECHNOLOGY DATABASE 1982 +
   CAB ABSTRACTS 1972 +
   FOOD SCIENCE AND TECHNOLOGY ABSTRACTS 1990 +
   SILVER LINKER DATABASES Latest
   WATER RESOURCES ABSTRACTS 1967 +
   ZOOLOGICAL RECORDS 1978 +

B. ONLINE CATALOGUE OF BOOKS (OPAC)
   Books = 84356
   Research Bulletins = 23899
   Conference Proceedings = 9715
   Ph D and M Sc Thesis (IARI and ICAR Research Funded) = 14092
Combined Databases  = 120400
Article Dbase "Bibliography of Indian Agriculture-BIA" (since 1924-1999) = 13810
Journals (Titles) = 7174
Hindi Books = 5397

C. Full Text Online Journals accessible in IARI
IARI Subscribed Journal 2008

D. SCIRUS
E. Open Access Journals
F. E-Resources
G. Developing Library Network (DELNET) (user id: iari & password: iari222)
H. Information Library Network (INFLIBNET) (UGC)
I. Important Full Text Links
   - OAIster (a project of the University of Michigan Digital Library Production Services, originally funded through a Mellon grant). The goal is to create a collection of freely available, difficult-to-access, academically-oriented digital resources that are easily searchable by anyone. 3,488,842 records from 347 institutions (updated 2 September 2004)
   - EPrints.org dedicated to opening access to the refereed research literature online through author/institution self-archiving.

J. Bar-coded Circulation, online reservation
K. Training on Digital Library Resources to Library Users
L. National Agricultural Research Database / AGRIS Data Input Center
M. Training on Digital Library Resources to Library Users
N. Indian Agricultural Society Links:
   - Indian Society of Genetics & Plant Breeding
   - The Horticultural Society of India

**National Agricultural Technology Project (NATP):** Necessary infrastructure has been created with the financial assistance from NATP. Under this project, the library has acquired 10 computers, 3 servers and 3 printers and a Student Orientation wing has also been established. A database of the members has been created and Electronic Membership Identity Card has been issued. Connectivity has been established through global information network. A database for 1,50,000 scientific publications have been created and barcodes have been generated and affixed on the publications.
The Electronic circulation of publications has been started. The digitization of 27 rare and costly publications has been done through support from NATP.

**AGRIS project:** IARI Library was declared an input centre for national agricultural research database (NARD) under AGRIS Project. The Library was assigned the job of scanning articles from 10 most important Indian journals. The input was done in ISO format using AGRIN methodology. Articles were scanned, processed and sent to DIPA, ICAR for inclusion in AGRIS Index.

**C-DAC Project:** A memorandum was signed with C-DAC (Ministry of Information Technology) on 4th September 2004 to digitize old documents. Publications published before 1950 and not covered under Copyright Act were scanned. They can be accessed through the software developed by C-DAC.

### 1.6.8 National Dairy Research Institute (NDRI)

National Dairy Research Institute is the premier organization that provides Research & Development (R&D) and Human Resource Development (HRD) support for Dairy Development programmes of the Nation. It was established in 1923 as Imperial Institute for Animal Husbandry & Dairying at Bangalore. It was renamed as Imperial Dairy Institute in 1936. In 1955 its Headquarters were shifted to Karnal and in 1989, status of Deemed University was conferred to the Institute for further strengthening the academic programmes for human resource development. The Institute provides high quality education in the field of dairying which has no parallel in Asia. NDRI plays an important role in enhancing the teaching capabilities of SAUs dairying staff.

**Divisions:** The NDRI has eleven divisions to impart education in dairy science.

- Dairy Cattle Breeding
- Dairy Cattle Nutrition
- Dairy Cattle Physiology
- Animal Biotechnology Centre
- Animal Biochemistry has following
  - Dairy Technology
  - Dairy Engineering
  - Dairy Chemistry
  - Dairy Microbiology
- Dairy Economics, Statistics & Management
- Dairy Extension

**Research Station:** NDRI has two Regional Stations at Kalyani (West Bengal) and Bangalore.

**KVK and DTC:** Krishi Vigyan Kendra (KVK) at NDRI, Karnal became operational in July 1976. NDRI has Krishi Vigyan Kendra (KVK) and Dairy Training Centre (DTC) both housed in common building having adequate space for staff, well equipped classrooms and laboratories with latest audio visual facilities and library etc. It has developed infrastructure to run the need based skill oriented training programmes through "Learning by Doing". It conducts training programmes on different aspects of Animal Husbandry & Dairying and imparts training to the dairy farmers, farm-women and dairy entrepreneurs in the field of dairy production and processing. Different training programmes under the proposed name of Dairy Training Centre (DTC) at this Institute are provided under the overall control of Head, KVK.

**Agricultural Technology Information Centre:** The ATIC of NDRI, Karnal was inaugurated on 23rd November 2004 by Dr. Mangala Rai Secretary DARE & DG, ICAR, New Delhi. The centre provides technical know-how and advisory services to farmers regarding their problems to improve agricultural and livestock productivity.

ATIC display various institute activities through two documentary CDs i.e. “NDRI at a Glance” in English and “Rashtriya Dairy Anusandhan Sansthan Aek Parichary” in Hindi. In addition to this the centre displays a documentary CD on “Savach dugadh utpadandugadh Padarth Nirman Aur Packaging” to educate the visitors about the advantages of clean milk production. ATIC is also in the process of developing a website so that in future large number of farmers may have access to the information regarding dairying and agriculture to increase their productivity and can also establish contact through email.

**Agricultural Research Information System (ARIS) Cell:** ARIS Cell was established in 1997 under the aegis of ICAR with the aim to provide state-of-the art Computational and Communication facilities in the Institute. ARIS Cell has been instrumental in establishment and management of Local Area Network (LAN) connecting 300 plus nodes for providing internet & e-mail connectivity to the scientists, other officers and students in the Institute.
**Computer center:** The Computer Centre was established in 1982 with the aim to provide scientific data processing facilities to scientists and research scholars of the Institute. The activities of Computer Centre are being carried out through three units namely Data Processing Unit; Teaching & Training Unit and Computer maintenance Unit besides ARIS Cell and Bio-informatics Sub-Centre (BITS). The Centre is well equipped with a Multi-user Pentium/Unix Ware Computer, heavy duty Line Matrix Printer, P-IV system and software like MATLAB, SYSTAT, Compilers etc. National Information System for Agricultural Education Network (NISAGENET) is also being implemented in this Cell.

**NDRI Library**

The Institute has a National Library on Dairying which was established in 1955 at Karnal on the transfer of the Institute from Bangalore. It possesses a rich collection of literature on dairy science and related subjects. The periodicals are subscribed to keep track of the current scientific/technical developments. More than 350 periodicals are subscribed to keep track of the current scientific/technical developments. Besides, there are 94,270 volumes, which include 50,145 books 31210 bound journals, 8200 bulletins, 3247 theses, 268 microfiches, 2768 reprints and 1200 CDs. The Library building has space for stacking 1.5 lakhs volumes and accommodates 250 readers at one time. The Library also provides Internet, Email, Documentation, Reference, Current Awareness Services, Documentation & Bibliographic Services, Reprography Services, CD-ROM Literature Scanning and Inter Library Loan services to the faculty, students, research workers and staff of the institute.

**Technological initiatives in library:**

The Library is using LIBSYS software package, to automate its services and in-house operations. Retrospective conversions of bibliographic record have been completed and 55,000 bibliographic records of documents in the library can be accessed through the LIBSYS. The database of books available in the library is being updated on day-to-day basis. New additions for the library are also updated regularly.

The LIBSYS package has been successfully implemented for the issue/return of documents, membership information, reservation of documents, statistical information and other circulation activities. Data entry work for serial system is in progress.
The library has one CD-Server, one LIBSYS Server connected with the Hub for Local Area Network in NDRI. Library has 5 Pentium IV computers and 6 Pentium III computers connected with LAN. The library has his own Internet connection from BSNL for Internet and Email services. All computers are linked with CD-SERVER. Library has four Laser Printers for printing & reprographic services.

1.6.9 Central Soil Salinity Research Institute (CSSRI)

Introduction: The Central Soil Salinity Research Institute (CSSRI), a part of the ICAR system, was established in 1969 as a follow up to the recommendations of an Indo-American expert group on water management. The main campus is at Zarifa veeran village, Kachhwa Road, Karnal (Haryana). CSSRI researches focus on reclamation and sustainable management of salt affected soils and on the rational use of poor quality waters in agriculture.

The whole research programmes are imparted through four divisions, viz.

- Soil and Crop Management
- Crop Improvement
- Irrigation and Drainage Engineering
- Technology Evaluation and Transfer

Regional Stations: The institute has three regional stations at

- Canning Town (West Bengal) for research on problems of coastal salinity
- Bharuch (Gujarat) for salinity problems of black soil region
- Lucknow (Uttar Pradesh) for research on Gangetic alluvial sodic lands.

In addition, the co-ordinating unit of an All India Coordinated Research Project on “Management of Salt Affected Soils and Use of Saline Water in Agriculture” is also located at Karnal and a network of its research centres are in operation in different agro-ecological regions.

CSSRI Library

The library has a good collection of publications on topics such as agricultural salinity, water management, irrigation & drainage. The library subscribes 85 international and national journals to fulfill the needs of scientists, researchers, teachers and students. The library has 14597 books including Hindi books, 1933 pamphlets and 7940 bound volumes of the journals. Besides, there are
138 theses on subjects relating to Soil Science, Agricultural Engineering, and Water Management etc. available in the library.

The library is maintaining exchange relationship with National and International organizations and free mailing of Institute annual report and other publications to various research organizations, Universities and other agencies. The library extend information services to the scientific personnel of research organizations, universities, college students, research scholars and other agencies / individuals through reference of books, journals etc.

**Technological initiatives in the library**: The library is also providing services like Internet surfing, exploring, downloading, and literature search through CDs like SOIL and AGRIS. The readers are informed about fresh arrivals at library on weekly basis. The library has OPAC facility and users can access resources through Consortium for e-Resources in Agriculture (CeRA). Beside this library provide access to following **CD-Rom Databases**:

<table>
<thead>
<tr>
<th>Database</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRIS</td>
<td>1975 to March 2008</td>
</tr>
<tr>
<td>Soil CD Database</td>
<td>1973 to April 2007</td>
</tr>
<tr>
<td>Plant Gene CD Database</td>
<td>1972 to Feb. 2008</td>
</tr>
</tbody>
</table>

**1.6.10 Indian Agricultural Statistics Research Institute (IASRI)**

**Introduction**: IASRI was established in 1930 as a small Statistical Section in the then Imperial Council of Agricultural Research to assist the State Departments of Agriculture and Animal Husbandry in analysis of experimental data. In April 1970, the Institute was declared as a full-fledged Institute in the ICAR system and is since then headed by a Director. On 01 January 1978 the name of the Institute was changed to Indian Agricultural Statistics Research Institute (IASRI) with its own headquarters in New Delhi. It promotes research, education and training in Agricultural Statistics and Computer Application in Agriculture. Its history can be traced as follows:

There are various labs at the Institute like ARIS lab for Training, Stat lab for Statistical analysis and Centre for Advance Study Lab. Keeping pace with the emerging technologies in the area of Information Technology (IT), from the year 1998 onwards the computer hardware and software have been constantly upgraded/replaced with newer platforms and versions. (IASRI, Annual Report 2008-09)
IASRI Library

The IASRI library is a referral library in Agricultural Statistics and Computer Application. It has an excellent library resource base in the field of Agricultural Statistics, Computer Applications and allied fields to support teaching, research and consultancy in the relevant areas. It has a collection of 26812 books, 9234 reports, 8561 bound journals, 9324 reports 629 CD-ROMs, 25 CD-ROM Databases, 9 On-Line Databases, 2 Digitized Databases, 1 Current Contents (JCC) and 967 Theses & Dissertations.

Technological Initiatives in the Library

The Catalogue of library resources has been Bar-Coded & computerized. Library is also providing Computerized Circulation with Bar-Coded Electronic Membership Cards. It has developed its OPAC for use in the IASRI premises to search for bibliographical details of documents and its availability as well as on-line reservation of document(s). The library is subscribing various Indian Journals, Foreign Journal, On-Line Journals, science direct and CeRA Consortium. Beside this JCCC (J-Gate Custom Content for Consortia), a Content database under NARS is also available in the library. The user can also access the following three major on-line Portals Springerlink, Annual Reviews and CSIRO (Australia). Web access to Open J-Gate, DELNET, KrishiPrabha (e-/thesis), Math Sci.Net at URL http://www.ams.org/mathscinet and Indiastat.com at URL http://www.indiastat.com are also provided.

1.6.11 National Centre for Agricultural Economics and Policy Research (NCAP)

Introduction: The NCAP was established by ICAR in 1991 to strengthen agricultural economics and policy research in the National Agricultural Research System (NARS) of the country. It is centrally located in the Pusa campus in New Delhi. The Centre serves as the nodal agency of the ICAR in monitoring and interpreting the research implications of changes in ground realities and macroeconomic environment of the country as well as international developments in the agricultural sector.

Research activities of NCAP are broadly divided in five major themes: (i) Technology Policy, (ii) Sustainable Agricultural systems, (iii) Markets and Trade, (iv) Institutional Change, and (v) Agricultural Growth and Modeling. The significant study areas of the Centre include research investment, resource allocation for research, WTO and trade in agriculture, private sector
participation in agricultural extension, food policy, monitoring and evaluation of agricultural research and Organization & Management (O&M) reforms, impact assessment and institutional aspects of food systems, viz. livestock, fishery, and horticulture.

**Agricultural Research Information System**

The NCAP has ARIS Lab which is equipped with high speed network having Linux e-mail server which caters to the needs of 100 node points including the users within the ARIS lab, library and other common places. Many new node points were added for the benefit of research staff. ARIS is equipped with 2 MBPS leased line from ERNET, New Delhi to cater the e-mail and internet requirements of researchers and administration.

**NCAP Library**

NCAP has a small library-cum-documentation centre, where selected reference books, research publications, including NCAP publications, and few journals are procured. This limited though essential collection is because of the existence of IARI and IASRI libraries on the campus; the Centre's collection is planned to complement these libraries. In addition, the Centre's staff makes use of other important libraries in Delhi and has established some linkages. The Centre accords high priority to the development of a rich database on various socio-economic aspects of agriculture and rural development. These data are frequently used by the researchers. The Centre currently maintains 1,261 database publications. In addition, there are 64 CD ROM databases mainly from NSSO. As regards other publications, the NCAP library has in total more than three thousand reference books in various areas, and it subscribes to 20 national and 9 international journals/periodicals regularly. (Pal, 2007).

**Documentation Centre:** The centers’ Documentation Centre houses a total of 5207 publications covering 5000 books/data base, 9 foreign journal, 11 Indian journals, 127 reports, 50 SAARC publications and other references materials, etc. It also has a data base depository of FAO, CGPRT, CGIAR, SAARC, NSSO, and CSO. Library has a separate Section of **Hindi** publications.

**1.6.12 National Bureau of Plant Genetic Resources (NBPGR)**

The NBPGR has its Headquarters at New Delhi. It functions under the administrative control of the Crop Science Division of the ICAR. The Bureau draws guidelines from the Crop Science
Division of ICAR, Bureau’s Management Committee, Research Advisory Committee and Germplasm Advisory Committees. The NBPGR Headquarters, along with the network of 11 regional /base/ satellite stations covering different agro-climatic regions, and the linkages with 59 National Active Germplasm Sites constitute the Indian Plant Genetic Resource Management System. NBPGR act as nodal institute at national level for acquisition and management of indigenous and exotic plant genetic resources for food and agriculture, and to carry out related research and human resource development, for sustainable growth of agriculture.

After recognizing the importance of PGR as a discipline, the Bureau in collaboration with the Postgraduate School, IARI, New Delhi, started M.Sc. (PGR) degree course in 1997 and Ph.D. (PGR) course in 2004. The Bureau has four Divisions viz.

- Plant Exploration and Collection Division
- Germplasm Evaluation Division
- Germplasm Conservation Division &
- Plant Quarantine Division

In addition, the bureau has two units, viz. Exchange Unit & Cryopreservation Unit and three cells, namely PGR Policy, Agriculture Research Information System and Technical Cell and an experimental farm at its Headquarters in New Delhi and 10 regional/ base stations located in different phyto-geographical zones of India. Besides this, National Research Centre on DNA fingerprinting and an All India Coordinated Research Project on Under-utilized Crops are also located at the Bureau.

**ARIS Cell:** NBPGR has established this cell in 1997. It is responsible mainly for software development and procurement, management and maintenance of the Local Area Network (LAN) including computer hardware and software. In addition, this Cell also imparts computer training in relation to database management of Genetic Resources. This cell has so far

- Developed a LAN of 150 nodes at new and old building of NBPGR
- Developed and maintaining Library Database using the Libsys software.
- This unit has so far conducted 18 training programs on Information Management in PGR and trained about 200 personnel belonging to NBPGR, ICAR institutes, State Agriculture
Universities and State Agriculture Departments. Also conducted/co-ordinated international meeting/training programmes related to PGR databases.

- Has developed software for various activities in NBPGR like Diary/Dispatch/Financial Management System for the NATP Cell etc.
- Developed databases for PGR activities

**Repository:** The National Genomic Resources Repository is housed in the premises of National Bureau of Plant Genetics Resources, New Delhi. It is established as an institutional framework for methodical and centralized efforts to collect, generate, conserve and distribute genomic resources for agricultural research. ([http://www.nbgr.ernet.in/repository/home.htm](http://www.nbgr.ernet.in/repository/home.htm))

**1.7 METHODOLOGY**

The study covers librarian, deputy librarian and other professional staff of the library. An in-depth study has been conducted to know the change capabilities & change management strategies used in the libraries of agricultural institutions under study. Survey research approach has been used to gather information for the proposed research. This approach is undertaken to study and describe the ground realities and current state-of-the-art situation of the libraries undertaken for study. Individual survey has been done by a pre-structured printed questionnaire and through websites of institutions visited. Random sampling techniques have been used for data collection during the course of study. However, the criteria of sample selection are based on the availability of large number of professionals, ICT infrastructure & application of ICT in the libraries of agricultural institutions. Both the primary & secondary sources have been consulted for data collection. Primary sources have been collected through well-structured questionnaire & personal observation technique of survey approach. Beside, various publications such as newsletters, journal, magazines of the respective libraries have been referred. In an attempt to reach more conclusions from the investigation, statistical & quantitative techniques have also been applied for the tabulation of data, graphs, analysis & interpretation wherever required with the help of SPSS Software. Various tests like Chi square, Two-way Contingency Table and Correlation Coefficient Analysis were applied.

**1.7.1 Chi-Square ($\chi^2$):**

The Chi-square test (pronounced as Ki) is widely used as a non-parametric test in statistical work. **Pearson's chi-square** is by far the most common type of chi-square significance test. If simply "chi-square" is mentioned, it is probably Pearson's chi-square. This statistic is used to test the
hypothesis of no association of columns and rows in tabular data. It can be used even with nominal data. Note that chi square is more likely to establish significance to the extent that (1) the relationship is strong, (2) the sample size is large, and/or (3) the number of values of the two associated variables is large. A chi-square probability of .05 or less is commonly interpreted by social scientists as justification for rejecting the null hypothesis that the row variable is unrelated (that is, only randomly related to the column variable. (onlinestatbook.com/stat_sim/contingency/index.html). With the help of $x^2$-test we are in a position to know whether a given difference between actual and expectation has been caused by a chance or whether it has resulted because of the inadequacy of the theory to fit the observed facts. (Gupta, 2001)

$x^2$ is calculated as follows:

$$\chi^2 = \sum \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

Where $O_{ij}$ = observed frequency of the cell in $i^{th}$ row and $j^{th}$ column

$E_{ij}$ = expected frequency of the cell in $i^{th}$ row and $j^{th}$ column

If calculated value of $\chi^2$ is equal to or exceeds the table value, the difference between the observed and expected frequencies is taken as significant, but if the table value is more than the calculated value of $\chi^2$, then the difference is considered as insignificant i.e., considered to have arisen as a result of chance and can be ignored. (Kothari, 2007)

1.7.2 Two-way contingency tables:

Frequency tables of two variables presented simultaneously are called contingency tables. Contingency tables are constructed by listing all the levels of one variable as rows in a table and the levels of the other variables as columns, then finding the joint or cell frequency for each cell. The cell frequencies are then summed across both rows and columns. The sums are placed in the margins, the values of which are called marginal frequencies. The lower right hand corner value contains the sum of either the row or column marginal frequencies, which both must be equal to N. Hypothesis tests, may be performed on contingency tables in order to decide whether or not effects are present. Effects in a contingency table are defined as relationships between the row and column
variables; that is, are the levels of the row variable differentially distributed over levels of the column variables. Significance in this hypothesis test means that interpretation of the cell frequencies is warranted. Non-significance means that any differences in cell frequencies could be explained by chance. Hypothesis tests on contingency tables are based on a statistic called Chi-square.

The formula for computation can be represented as follows:

Expected Cell Frequency = (Row Total * Column Total) / N
(http://onlinestatbook.com/stat_sim/contingency/index.html)

1.7.3 Correlation Coefficient Analysis:

Correlation analysis enables us to have an idea about the degree and direction of the relationship between two variables under study. However it fails to reflect upon the cause and effect relationship between the variables. (Gupta, 2004). To measure the degree of relationship between the two variables, this is the most widely used method. This coefficient of correlation assumes that:

1. there is linear relationship between two variables
2. the two variables are casually related and
3. a large number of independent causes are operating in both variables so as to produce a normal distribution.

Coefficient of Correlation

\[
 r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{n}\sigma_x\sigma_y}
\]

Where,

\( x_i \) = i the value of X variable
\( \bar{x} \) = mean of X
\( y_i \) = i the value of Y variable
\( \bar{y} \) = mean of Y
\( n \) = no. of pairs of observations X and Y
\( \sigma_x \) = standard deviation of X
\[ \sigma_y = \text{standard deviation of } Y \]

A zero value of ‘r’ indicts that there is no association between two variables. When \( r = (+) 1 \), it means that there is perfect positive correlation and when it is \((-) 1\), it indicates perfect negative correlation.

This means that variations in independent variable \((X)\) explain 100% of the dependent variable \((Y)\). The value of ‘r’ nearer to +1 or -1 indicates high degree of correlation between the two variables. (Kothari, 2007)

1.8 PLAN OF THE WORK DONE

The study is descriptive in nature so as to understand the process & methodologies involves in handling change dynamics in the libraries of agricultural institutions under study. Various levels of management of different age group & gender formed the sample of study. To construct a convincing line of approach in the thesis, the chapterisation scheme is as follows:

CHAPTER I : INTRODUCTION

Chapter 1 contains the introduction and statement of the research problem. It includes various objectives and the hypotheses to be tested. It also explains scope and methodology followed to carry out the research work.

CHAPTER II : CONCEPTUAL ISSUES IN CHANGE MANAGEMENT

In this chapter an attempt has been made to discuss the conceptual issues in change management and resistance to change and their reasons. It throws light on various existing change management models and strategies to overcome resistance to change. It also examines various agriculture information networks, systems, associations and ICT initiatives taken in accessing and retrieving agriculture information.

CHAPTER III: REVIEW OF LITERATURE

This chapter deals with the various past studies in the related area of proposed research.
CHAPTER IV: INTERPRETATION, ANALYSIS & EVALUATION

In this chapter data is analyzed using various statistical techniques with the help of SPSS (Statistical Package for Social Science) software. Various methods such as test of significance using Pearson Chi square, Spearman’s Correlation analysis and Two-way Contingency Tables were applied.

CHAPTER V: TESTING OF HYPOTHESES, CONCLUSIONS & RECOMMENDATIONS

This chapter contains conclusions drawn after the statistical analysis of data in the previous chapter. Testing of hypotheses is also carried out. An attempt has been made to give recommendations at the end of the chapter which can prove beneficial in managing technological changes more effectively.

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A systematic list of various publications, whether print or electronic, consulted during this research work is provided at the end.
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