IMPACT OF INFORMATION TECHNOLOGY ON THE AGRICULTURAL UNIVERSITY LIBRARIES IN UTTAR PRADESH: A STUDY

DISSERTATION

SUBMITTED FOR AWARD OF THE DEGREE OF

Master of Philosophy

IN

LIBRARY AND INFORMATION SCIENCE

UNDER THE SUPERVISION OF

Dr. R.K. Choudhary

SUBMITTED BY

Neelam Devi

BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY

LUCKNOW

प्रज्ञा शील करुणा

ESTABLISHED 1996

DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE
(SCHOOL FOR INFORMATION SCIENCE & TECHNOLOGY)
BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY
(A CENTRAL UNIVERSITY)
VIDYA VIHAR, RAEBARELI ROAD LUCKNOW, UTTAR PRADESH

ENROLLMENT NO: 669/18

2019

DEDICATED TO
MY LOVING PARENTS

MY FATHER

LATE SHRI OM PRAKASH TIWARI

& MY MOTHER

LATE SMT. RAMA KANTI TIWARI

DECLARATION

I hereby declare that this dissertation entitled **"IMPACT OF INFORMATION TECHNOLOGY ON THE AGRICULTURAL UNIVERSITY LIBRARIES IN UTTAR PRADESH: A STUDY",** submitted by me for the award of Degree of the Master of Philosophy in Library and Information Science to the Department of Library and Information Science to the Department of Library and Information Science, Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow is an outcome of my own efforts and is an original work. The content of this dissertation did not form a basis for the award of any previous degree to anyone else.

(**Neelam Devi)**

Date:
Place: Lucknow

Department of Library & Information Science
School for Information Science & Technology
Babasaheb Bhimrao Ambedkar University
Lucknow-226025 (U.P)

CERTIFICATE

This is to certify that the dissertation entitled **"IMPACT OF INFORMATION TECHNOLOGY ON THE AGRICULTURAL UNIVERSITY LIBRARIES IN UTTAR PRADESH: A STUDY",** submitted by **Neelam Devi** is an original research work and has not been previously submitted in part or full for the award of any other degree or diploma to this or any other university.

The dissertation submitted to Babasaheb Bhimrao Ambedkar University satisfies all the requirements as stipulated in the Master of Philosophy (M.Phil.) regulations-2016 and it is fit for submission and evaluation for the award of the degree of Master of Philosophy in Library and Information Science of the University.

Date:

Supervisor

Place: Lucknow

Head of the Department

ACKNOWLEDGMENT

First and foremost I would like to thanks almighty God who always blessed and directed me to move on the right path.

I am greatly indebted to my faculty members for being immense support towards me, guiding me in the right direction and giving appropriate suggestions during entire my research work. Mere words will never be able to express the feelings towards them, who not only stimulate the idea of undertaking the dissertation but also interact with us frequently giving valuable advice during the critical stage of work.

Word is too weak to express one's feeling of gratitude. I feel deeply indebted to my Supervisor ***Dr. R. K. Choudhary****, Assistant Professor, for his affection, encouragement, insightful suggestions and inspiration without which it would not have been possible for me to accomplish this task. For his indispensable guidance incessant encouragement & valuable help during the entire period of this dissertation despite his processing scholarly engagement and the busy schedule he has taken great pain in going through the details of the work minutely his valuable suggestion & creative criticism proved to be a boon. I cannot forget to express my thanks for his warm & affectionate hospitality.*

I am grateful to ***all faculty members*** *of the department of Library and Information Science, Babasaheb Bhimrao Ambedkar University, Lucknow for their consistent encouragement and support whenever required.*

I am also thankful to all research scholars and especially to ***Kanchan Lata Bharti****, Department of Library and Information Science, Babasaheb Bhimrao Ambedkar University, Lucknow for their courteousness and genius to irradiate my future. It is all their Virtue that has blessed me.*

I am always thankful to my well-wishers ***Ajay Kumar****,* ***Kalpana Singh, Vibha Mishra, Alambusha Tripathi, Pradeep Kumar Srivastava*** *(Principal, Gautam Buddha Degree College, Lucknow),* ***Dr. Rashmi Sharma*** *(Head of Department, Gautam Buddha Degree College Lucknow),* ***Brajesh Kumar Yadav****,* ***Niharika Tripathi, Dinesh Patel, Durgesh Kumar Verma, Puja Singh, Vivek, Sudhir Kumar, Ambika, Kavita, Swati, Pratibha, Niharika, Mitali, Neeraj, Avinash*** *and my all friends who's always support and motivate me for my study and my good career, and constant help during the period of dissertation.*

At last but not least I also express my sincere gratitude and regards to my beloved parents my father Late ***Shri Om Prakash Tiwari,*** *mother Late* ***Smt. Rama Kanti Tiwari,*** *and my father in Law Late* ***Shri Babu Lal Bajpai,*** *Mother in Law Late* ***Smt. Savitri Bajpai*** *and my husband* ***Mr. Amar Bajpai,*** *younger brother* ***Arpit Tiwari,*** *and my dearest elder sister* ***Ms. Barakha Bajpai*** *for their never-ending blessings, constant encouragement, and moral support, thanks to all family members, friends and well-wishers support me to make my endeavour worthwhile throughout my academic carrier.*

Neelam Devi

PREFACE

The study **"IMPACT OF INFORMATION TECHNOLOGY ON THE AGRICULTURAL UNIVERSITY LIBRARIES OF UTTAR PRADESH: A STUDY"** is done to find out the importance of IT.

IT development brought changes to existing online information recovery systems such as e-libraries, e - databases, software, and search engines. The study is done with the help of questionnaire and interview method on the librarian and library users of the Agricultural University Libraries. The researcher has also identified the problem and reason for the present status of the library. The whole work of study is arranged in five chapters:

Chapter 1: Introduction

The first chapter discusses the concept of Information Technology. After that statement of the problem, need and significance of the study, objectives of the study, as well as hypotheses, scope and research methodology, are discussed.

This chapter gives a brief introduction, gives objectives of the study, its scope; it also gives a briefing of the research methodology, the hypothesis, and references.

Chapter 2: Review of Literature

This chapter gives a brief overview of the previous studies done related to this topic. Various aspects of literature related to Information and Technology (IT), like IT based user studies, Input of IT Applications and use of IT, IT Training in Libraries, etc. are reviewed in this chapter.

Chapter 3: Research Methodology

This chapter gives a brief introduction to research methods, tools, and techniques used in this study.

Chapter 4: Data Analysis and Interpretation

The fourth chapter presents tabulation, statistical analysis, interpretation, and graphical representation of the collected data from the library.

Chapter 5: Findings, Conclusion and Suggestions

The fifth chapter presents the major findings and conclusion of the study. It deals with recommendations of the study and suggestion for further future research.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATION

AU	Agriculture University
AGLINET	Agricultural Libraries Network
AGMARKNET	Agricultural Marketing Information Network
AgNIC	Agriculture Network Information Collaborative
AGREN	Agricultural Research and Extension Network
AGRICOLA	Agricultural Online Access
AGRIS	International System for Agricultural Science and Technology
AIN	Agricultural Information Networks
ARISNET	Agriculture Research Information System Network
BBAU	Babasaheb Bhimrao Ambedkar University
BUAT	Banda University of Agriculture and Technology
CABI	Centre for Agriculture and Bioscience International
CAS	Current Awareness Services
CeRA	Consortium for e-Resources in Agriculture
CGIAR	Consultative Group for International Agricultural Research
CSAUAT	Chandra Shekhar Azad University of Agriculture & Technology
DACNET	Department of Agricultural & Cooperation Network
E-BOOKS	Electronic Books
E-JOURNELS	Electronic Journals
ETDs	Electronic Thesis and Dissertation
IT	Information Technology
NDUAT	Narendra Deva University of Agriculture & Technology
SAU	State Agriculture Universities
SDI	Selective Dissemination of Information
SHUATS	Sam Higginbottom University of Agriculture, Technology & Science
SVPUAT	Sardar Vallabhbhai Patel University of Agriculture & Technology

Chapter 1
Introduction

CHAPTER-1

INTRODUCTION

1.1 PREAMBLE

Today's technology plays an influential part in shaping things more straightforward and more efficient, therefore saving users ' time that was not feasible in previous days. Use of unified internet library mechanisation systems, understanding of classification and cataloguing schemes, access to local, national and global databases, information systems for agricultural research, all of which can be regarded as part of technological innovations in this area. Without computers and information technology, agricultural libraries can hardly operate today. IT helps alleviate the significant difficulties faced by agricultural libraries and their users. It also helps to provide its customers with better quality, increased productivity, more efficient operations, better sharing of resources and more efficient services. With the participation of information technology, agricultural libraries are now able to handle data in a better and more comfortable manner that involves acquiring, processing, storing, retrieving and disseminating data.

Other operations engaged in information management are reprography, printing and publication. Therefore, libraries function as communication channels. Technology implementation enhances libraries ' function in providing appropriate services and data to their customers. Libraries and data centres now face new difficulties in addressing these technological advances in information technology so that they can alter and adapt to survive in this modern world.

Agricultural science is a broad science which has different fields like Agronomy, Plant Breeding, Soil Science, Horticulture, Fisheries, Sericulture, Plant Pathology, Biotechnology. In today's world, this unique branch of science is not limited to farmers alone, but it has expanded its participation into other areas or disciplines as well, thus becoming a multidisciplinary field in itself. Due to the involvement of engineering and technology, this particular field of science has evolved and spread over various forms of other subjects. Therefore, owing to different kinds of agricultural areas, there is a vast amount of literature available, which

includes different kinds of subjects. In assisting customers in gathering information, libraries play a significant role. These agricultural science libraries have a particular focus on agriculture. In addition to the agriculture, agricultural sciences also play an essential role in the field of schooling, education, research and growth. Agricultural libraries contribute to the promotion of agricultural research and development by providing a unique collection of books, publications, pamphlets, studies reports, patents, norms, thesis/dissertations, brochures, movies, CD / DVDs and other materials that serve their users ' data needs within a restricted time.

1.2 INFORMATION TECHNOLOGY

The term IT is described as "in particular, studying, designing, developing, implementing, supporting or managing computer-oriented information systems, software applications and computer hardware." IT is about using electronic computers and computer software to safely transform, store, safeguard, process, communicate and collect data. IT is therefore used as the umbrella term for any communication device or application, including radio, television, cell phones, computer and network hardware and software, satellite systems and so on, as well as the numerous services and apps connected with them, such as video conferencing and distance learning.

Information technology (IT) is emerging as a vital instrument for societal development and as a driving force in the world's economies. IT is no longer restricted to supporting high-end research and development; new technologies have significantly improved the lifestyles and efficiency levels of all commercial industries. In the service sector, where the efficiency rates have considerably increased, the beneficial effect of IT is most noticeable. IT has had a tremendous effect on all elements of people's socio-economic lives due to its multifunctional benefits and services, as well as provisions such as e-commerce, e-governance, e-education, e-medication, e-medical consultation, etc. It has decreased the world's distance, enabled rapid access to data, and created a single global social group.

IT is related to computer networks, knowledge networks, telephone and fax systems, video applications, Internet and email systems, web conferencing, video conferencing, satellite technology, radio and wireless broadcasting, etc. Furthermore, at present, the Geological Information System / Remote Sensing (GIS / RS) have also

become significant IT research fields. Computers are used to process and store information, while telecommunications technology provides communication instruments that enable users to access databases and connect other computer network works at various places.

The computer is beneficial in the processing of data, while telecommunications facilitates the provision of means of communication or transfer of data through networks, Internet infrastructure, www, email, Internet computer FTP that can interact with each other. IT involves networks as well as apps. It involves communications fixed, wireless and satellite, broadcast networks. Web, database management systems and multimedia instruments are well-known applications. IT also includes telephone, fax, television, mobile, Internet, websites, ISDN, email, LAN, WAN, video conferencing, satellite communications, scanners, DVDs, CDs, OPAC, WEBOPAC, printers and computers.

In special libraries, the use of information technology has become even more essential. At an accelerated rate, special libraries switch to IT-based resources and services. The traditional resources of special libraries are rapidly replacing e-journals, CD-ROM databases, internet databases, e-books, web-based resources and a range of other electronic resources. Merely speaking, IT can be described as a basket of techniques that help or support storage, data information processing, or data information dissemination/communication, or both.

Therefore, IT comprises the essential technology for the processing and communication of data, for instance, desktop and laptop computers, software peripherals and internet connections. IT involves the use and use of computers, telecommunications and microelectronics in data acquisition, storage, retrieval, transfer and dissemination. IT are technologies that allow data processing and promote various types of communication. These include technology capture (e.g. camcorders), storage (e.g. CD-ROMS), processing (e.g. application software), communication (e.g. LAN) and display technology (computer monitors).

Information technology is the technology used for information management, which also comprises data acquisition, processing, storage, retrieval, storage and dissemination. All other activities engaged in information management are

reprography, printing and publication. Consequently, the respective techniques also become part of IT. In information technology (IT) involves five different modern technologies, these are:-

1. Electronic Technology,
2. Computer Technology including hardware & software,
3. Communication Technology
4. Artificial intelligence Technology and
5. Human-machine interface Technology

Currently, these five techniques play a dominant position in the world of information technology. It can be claimed that information technology implies the use of personal computers and communications, in general, these days. Information technology connotes innovations and assembles them. They cover in particular the ability of the computer to store and process data; known as information processing and telecommunications technology that can transmit data to distances. Information Technology is the tool and implementation support through which data is transmitted, registered, edited, stored, manipulated and disseminated, or through which that data is transmitted.

1.3 IMPACT OF INFORMATION TECHNOLOGY

The world has been transformed by the information technologies into a global village and is increasingly dependent on creative management and distribution of information. Recently, the world has seen significant changes that are increasingly crucial for the need to acquire, use and share knowledge. In the twenty-first century, the time of understanding and information seeking now takes the leading role in all sectors. The word bank has used the metaphor "knowledge is development". Underdevelopment is mainly liable for lack of understanding. A creative brand becomes economic leaders in our knowledge and information-oriented society, and dedicated knowledge-based staffs are in high demand. Technology progress has produced a tremendous improvement that has affected nearly all walks of life. In particular, in all corners of the global arena, the magnetic term information technology has been chanted and integrated into organisational, managerial, developmental and other industries. The services that are made using IT are quicker and more efficient.

1.4 IMPACT OF IT ON LIBRARIES

The effect of technology has already been profoundly felt on libraries. Access to machinery for word processing and teleconferencing is quite common. Budgeting, forecasting, and planning software packages are easily accessible. The hard library management choices are which products and services to select and whether to purchase or lease equipment. Libraries that were deemed to be data shops have only a fresh perspective in the age of contemporary information technology. Information technology (IT) based services are more productive, the activities that have been carried out manually in libraries with so much pain and strain are carried out smoothly.

Administration and other technical processing in libraries and state libraries have become effective. The effect of information technology is not separated from agricultural university libraries. Authorities are keen to incorporate the recent IT in their tasks of administrative, technical and user services. Implementing IT in libraries had called for the customer to be more satisfied with new types of library services. After the introduction of the information technology (IT) library and data centre, digital library service developed. Using information technology, libraries were enabled to create services that could not have been offered previously. Computers are used in the provision of data facilities in libraries and data centres in two respects. The first is to develop a local (in-house) scheme for storing and retrieving data, which is restricted to the resources available in a specific library. Modern libraries today provide users with a variety of digital data services. In general, these data services can be categories of anticipatory and responsive services. Current awareness services (CAS), selective data dissemination (SDI), online search services, printed indexes, database services and products, document delivery services, and CD-ROM database products are amongst the essential services.

A computer-based library is a digital materials and services library. Digital materials are objects stored, processed and transmitted through digital devices and networks. Digital services are digitally transmitted through computer networks. It retains all or a significant portion of its computer-accessible collection as an option, supplement, or complement to the standard printed and microform products presently dominating library collections. The term digital library used synonymously to depict

the same notion, such as an electronic library, virtual library, web library or internet library.

1.5 COLLECTION DEVELOPMENT

The growth of the collection is the most significant method in the library. For reader perspective and fulfilment, in which library reading materials are improved. The library collection is a total of library products such as books, manuscripts, series, pamphlets, reports, recordings, microfilms, libraries, and internet resources (print and non-print materials) that make up a library holding. Establishing library collection is the method of constructing library equipment to satisfy the information requirements of customers in a timely and cost-effective way, using local data resources and other organisations.

Knowledge is a high power, and libraries ate the force reservoirs in books and other products of reading. Libraries are temples that are accessible to all. By viewing demands, the primary job of a library is to collect, store and distribute data. If the collection of library books is efficient, ideal, and can satisfy the requirements of readers, the library picture will be improved. Library collections are measured in terms of value and user services, not in terms of numbers. Selection and collection of books are becoming the libraries and the main tasks of their staff.

1.6 IT INFRASTRUCTURE

Libraries and information centres and systems are intended to facilitate access to a vast quantity of data in the present situation. Through IT-based products/infrastructure, these systems can be manual or automated. Without desktop and related IT hardware and software, IT-based operations are not feasible because both play a very significant part in IT achievement in libraries. As we understand the IT infrastructure, the hardware is the set of a computer's physical parts, while the software is how the computer system functions overall in order to conduct a particular task. The various kinds of hardware and software equipment such as operating system, digitisation equipment, and networking software show the quality and efficiency of the technology used by university libraries.

1.7 NETWORK AND WEBSITES/PORTALS

Currently sharing resources becomes more and more critical, so libraries ' interdependence with each other becomes very important. In addition to maintaining records of stocks and users, the use of IT in libraries has been of excellent help in the purchase, cataloguing, and serials control. A library network is created when a group of libraries decide to exchange understanding and data. A recent development in the network user population has brought more non-technical individuals into the arena who have understood the benefits of specific network and website apps, such as electronic mails, library networks and websites, data centres, marketing networks, and who want to experience the growing accessibility of network-based data resources. Information may be accessible now sometimes more quickly in electronic form than in written material forms.

Many of the issues in arranging and making this confusing wealth of data resources available seem to be analogous to those encountered with printed materials by traditional librarians, although the alternatives may not be transmitted immediately. IT-based instruments have started to emerge, are currently evolving from the technical and computing fields rather than from the data industry, and tend to lack a complex perspective of the process of information transfer. The librarians were involved in compiling resource guides for network and website equipment, which was a specific characteristic of the study networks setting. Print content or internet text document is not well adapted to cover the rapidly evolving network environment extensively. A database that can be needed from any network node can provide data about altering resources and places quicker and more authoritative. The database's availability and accessibility would imply that staff could concurrently search it irrespective of its geographic place. Agricultural libraries need to move into database management and other information technologies. Integrating librarianship with other tasks such as word processing, data processing, and records management will expand the information management scope.

1.8 IT BASED APPLICATIONS/ SERVICES

Information technology implies a range of technological applications in the data communication system. IT is helpful to accommodate enhanced job pressure,

achieve higher effectiveness, generate new services, and assist in cooperative operations. The implementation and use of information technology (IT) certainly help to improve library and data services ' quality and efficiency. In almost all fields of human activity, information technology is implemented. IT application areas usually involve libraries, medical science, trade, science, education, agriculture, fields of research and innovation. IT-based apps are used in libraries for certain tasks in libraries, such as computer technology, library management, database creation and growth, technologies, library and data networking, classification, cataloguing, CAS / SDI services, reference services, library resource sharing, CD / floppies / DVD storage services, technical processing and writing, audio /video/ microfilms, serial control etc.

1.9 LIBRARY SERVICES/DATABASES

Even the services that all libraries provide are predominantly comparable, but even then at some point, they vary. Some libraries offer specialised services to their users. It is therefore essential to observe the services provided to users in the library, whether or not they are all combined in the software, it is not necessary that all the services are available in all the software.

An organised set of data that is stored on a computer and can be automatically searched called the database. It includes useful raw data such as physical-chemical properties, statistical, numerical, or bibliographic information that includes descriptions of source papers on non-bibliographic information related to universities or organisations, projects, experts, etc. A database relates to machine-readable or bibliographic documents, but a shared collection of structured information managed by a set of unique software can be used in a precise way.

A database is intended to prevent data duplication and to allow information to be retrieved to meet a broad range of user information requirements. Databases are the media that has changed the way information is perceived and disseminated. Databases assist in accessing any information remotely. Databases are used for multiple data processing operations, such as exchanging resources, reference services, abstracting and indexing services, simple retrieval of any data. The databases are also affecting the following library services.

- The online catalogue has a significant impact on the delivery of the document.
- Another importance of the online catalogue is its availability as platforms for other online services.

Databases are classified as bibliographic as well as agricultural databases in the current research.

1.10 STATEMENT OF THE PROBLEM

The study is focused on the status of information technology in the agricultural university libraries of Uttar Pradesh. The problem undertaken for the study is entitled as **"IMPACT OF INFORMATION TECHNOLOGY ON THE AGRICULTURAL UNIVERSITY LIBRARIES IN UTTAR PRADESH: A STUDY"**.

1.11 OBJECTIVES OF THE STUDY

The objectives of the present study are as follows: -

- To find out the status of e-resources available in the SAU libraries of U.P.;
- To find out the awareness of Information Technology among the library staff;
- To evaluate the budget for print and non-print resources;
- To find out the status of IT services provided by the library;
- To identify the awareness of e-resources among the users;
- To identify the types of issues that users face while using IT products and services in the libraries;
- To find out the user satisfaction with the use of IT.

1.12 SIGNIFICANCE OF THE STUDY

The significance of the study is to determine how information technology is used in the libraries of agricultural universities. The present research focuses on the agricultural university libraries of Uttar Pradesh. Focusing on the increasing amount of libraries and implementing information technology in libraries is needed to provide customers with excellent library facilities, comprehend the customer satisfaction

level, and preserve the standard of agricultural university libraries. The study defined current technology and knowledge. It helps recognize the range of library services and facilities used in these libraries and their diversity.

1.13 HYPOTHESES OF THE STUDY

The Hypotheses of this study are as under: -

1. Most of the agricultural university libraries are facing budget crises for subscribing electronic resources;
2. the users of the agricultural libraries are satisfied with the IT-based services provided to them;
3. There is a lack of training opportunities provided to the library staff;
4. The users are not aware of the IT facilities provided by the library.

1.14 SCOPE OF THE STUDY

There are six agricultural universities in Uttar Pradesh, out of which data was retrieved from five libraries which are as follows-

S. No.	UNIVERSITY NAME	PLACE	YEAR OF ESTABLISHMENT
1.	**Sam Higginbottom University of Agriculture, Technology & Sciences**	**Allahabad (Prayagraj)**	**1910**
2.	**Narendra Deva University of Agriculture & Technology**	**Faizabad (Ayodhya)**	**1974**
3.	**Chandra Shekhar Azad University of Agriculture & Technology**	**Kanpur**	**1975**
4.	**Sardar Vallabhbhai Patel University of Agriculture & Technology**	**Meerut**	**2000**
5.	**Banda University of Agriculture and Technology**	**Banda**	**2010**

1.15 CONCLUSION

The present study is concerned with the agricultural university libraries of Uttar Pradesh. Existence of agricultural libraries in society is significant. They promote the agricultural value to the respective society. The information technology in the agricultural libraries is the handling/management of the resources concerned with the system support and providing of information among the users. In this chapter a basic introduction regarding the impact of information technology in the agricultural university libraries, its significance, specific objectives, scope, etc. have been discussed. Whereas, the immediate next chapter discusses the review of the literature regarding the study in order to provide a theoretical base to the study.

REFERENCES

Busha, C. and Harter, S. (1980). *Research methods in librarianship* (pp.25-60). New York: Academic Press.

Datta, H.N. (2014). *Information Communication Technology and Library Management* (pp.15-145). New Delhi: Jnanada Prakashan (P&D).

Ebunuwele Eseohe, G., & Ola, O. (2014). Application of Information Communication Technology in academic libraries in Nigeria. *International Journal Of Education And Research, Vol. 2 No. 12 December 2014,* 420-430. Retrieved from https://ijern.com/journal/2014/December-2014/36.pdf accessed on 12 December 2018.

Galhora, M.(2018). *Information Technology in Library and Information Science* (pp. 22-52). New Delhi: Ess Ess Publisher.

Kaushal, M. (1995). *Library Science and Information Technology* (pp. 22-52). New Delhi: Commonwealth Publisher.

Kothari (1990). *Research Methodology Method and Techniques* (pp. 184-186). New Delhi: New Age International Publisher.

Kumar, P.S.G. (2008). *Kumar's Curriculum Series in Library and Information Science, 13: Agricultural Librarianship* (pp-27-45). Delhi: B.R. Publishing Corporation.

Panigrahi, R.M. (2000). *Impact of Information Technology on the Libraries (pp. 84-96)*. Delhi: Ess Ess Publication.

Sampath, B., & Biradar, B. (2010). Use of ICT in College Libraries in Karnataka, India: A Survey. *Electronic Library And Information Systems*, *44*(3), 3-5.

Sharma, C.K. (2008). *Journal of library and information technology. 4(1), 3-5*.

Silverman, D. (2012). *Qualitative Research* (pp. 12-14). New Delhi: SAGE Publication.

Chapter 2
Review of Literature

CHAPTER- 2

REVIEW OF LITERATURE

2.1 INTRODUCTION

A literature review is an instrument that offers scientists with a proper guideline and concept in many studies, with this perspective being cited here as the literature on the present study subject. It makes the research authentic, stronger and defines the work's foundation. A literature review is an essential component of the method of studies and makes a precious contribution to nearly every operational phase. It has major importance in a research work. It enables one to identify the theoretical origins of your study in the initial phases of studies in order to clarify your thoughts and improve the research methodology.

According to the encyclopedia of library and information science, scholarly libraries represent the growth of the schools and universities they are component of. These libraries are an essential component of the organizations they serve, whereas, their collections and facilities are designed to satisfy the institution's educational programs. The academic library's program differs based on the organization they belong to. It is vital to obtain as much as possible authenticated through published works linked to the subject for a better comprehension of the subject being studied. This review involves an assessment and assessment of the recent developments from a variety of sources including print and digital forms, journal publications, monographs, and internet access. Literature review thus offers a better knowledge of the subject under investigation by drawing valuable content from these data sources. The study effort will strive to provide a better explanation of the ERM in the current job. The literature review was thematically structured and then chronologically structured under the different sub-themes.

2.2 REVIEW OF LITERATURE

Hanchate and Sawant (2018) described in their study that most of the selected libraries have essential ICT equipment and technology available for the use. Most of the librarians of the selected libraries know the software used in the library

for management, whereas, library budget and insufficiently trained staff are some of the problems faced by the libraries under study.

Jaya Singh (2018) revealed in her study about the handiness of digital resources among the faculty members and the students. The paper emphasizes digital resources available through the internet and world-wide-web. The need for digital resources in their specific subject is increasing day by day. Accordingly, the librarians have to acquire a more scientific method to develop a standard collection of digital resources along with the printed documents in fulfilling the requirements of the academic and teaching community.

Kalbande (2018) investigated about the opinion of the librarians in agricultural college libraries under the jurisdiction of Mahatma Phule Krishi Vidyapeeth, regarding networking and resource sharing aspects of various types of resources used in the libraries.

Mondal (2018) in his research, mentioned about the type of library services provided to the users such as e-journals, websites, library websites, CD / DVD services, public service facilities, online database services, web OPACs, e-books and e-theses and dissertations. The main purpose of the study was to identify the current status of ICT services as well find the probable causes of dissatisfaction among the library professionals.

Salve, Dattatraya and Chavan (2018) stated in their study entitled, use of the online public access catalogue in agricultural university, that OPAC is an information retrieval system that has reformed access to bibliographic data through different types of search capabilities. The paper also explores the different components of OPAC, like searching for data.

Abubakar and Akor (2017) investigated in their study the availability and utilization of electronic information database for research by agricultural scientists in federal universities in north central, Nigeria. This study reveals that all agricultural scientists in various universities subscribe to various online databases. The study also recorded that a high percentage of the respondents use electronic databases frequently for their research work to update knowledge in their respective field. The study also

recommended that there should be more considerable publicity available for sources of research information provided.

Kaur and Kathuria (2017) described in their paper the problems related to the use of technologies in the university libraries. The study stated that the majority of the users are aware of the information technologies used in their libraries. Internet is the service that is mostly used by the users for accessing information resources followed by e-mail.

Mittal (2017) in his study entitled, usage and impact of digital resources in agricultural university: a study, stated that Sher-e-Kashmir University of agricultural sciences and technology of Jammu (SKUAST-Jammu) is the best university among agricultural universities in India. The study also states about the usage and impact of digital resources in this agricultural university. With the help of this study, the author has attempted to analyse the purpose for which users visit the library, the purpose for which they use the digital resources and also what are the problems faced by the users in using the digital resources of the library.

Naqvi (2017) in his study, he examined the use of collections and facilities in the Indian Agricultural Research Institute Library. He focused on the views of the customer regarding the usage of IARI library users ' collections and facilities. The research showed that not only in terms of use levels, purposes, library collection and facilities but also about the application of the e-resources and appropriateness of the library's collection, there is an important distinction. It also shows the use and non-use of the collection and facilities of libraries and offers the management of library facilities with an opportunity to review their collection and facilities and policies.

Gamit (2015) he performed a survey called the impact of ICT based library facilities on the users, faculty and researchers in the agricultural University libraries of Gujarat state. It has been proved in the study that ICT plays a significant role in teaching, learning and study instrument.

Mangi (2015) mentioned in his study the importance of management of e-resources and also the role of user initiation program or information literacy to enhance the usage of available databases at agricultural universities mainly in the schools of agricultural business management. The main aim of the study is to find out

the purpose of use of e-resources, to find out the level of use, level of user satisfaction, problems faced by the users.

Chauhan (2014) in his study Information technology for agricultural development in India, pointed out that digital libraries are a vital destination for the coming decade, allowing users to search for resources across multiple extension sites transparently, thereby efficiently creating an extensive library of resources. There is a need to train the library staff of agricultural universities in the latest computerization processes of libraries. The presence of the database in the libraries facilitates not only the researchers but also to the students and faculty members.

Mittal and Sharma (2014) performed a study in which they made an attempt to describe the use of digital resources and services by the users of the library of Punjab Agricultural University. The study mainly focuses on the use of digital resources by the users of the library, their personal views about the digital resources provided by the library and the problems faced by them in using these resources.

Patel and Patel (2014) performed a study entitled, library and information services in agricultural university libraries of Gujarat: a study. The study basically focuses on the present status of agricultural libraries and their information services in the state of Gujarat.

Mittal and Sharma (2013) in their study made an attempt to analyze the user's familiarity with the digital resources and its use by them. The study also reveals the problems faced by the users in using the e-resources in agricultural universities of Himachal Pradesh. According to their study 96% users are aware of the digital resources, and 31% users use the digital resources provided by the libraries, 48% users face problem while searching of information, 24% users don't know how to use the digital resources. Apart from all these significant findings the majority of the users have the opinion that print resources cannot be replaced by the e-resources of the libraries.

Singh and Prasad (2013) performed a study on the Indian agricultural research institutes, New Delhi, to discuss the use of electronic resources. The study states that the users of the agricultural institutes make use of electronic resources mainly for the research purpose because they can access the resources quickly from

any place at any time. The primary purpose of the study was to find out the reason behind using these electronic resources and the kind of problems faced while accessing these resources.

Somerville and Macklin (2013) expressed the functionality of libraries that have changed due to the changes in technology. ICT literacy is the ability to make appropriate use of digital information technology, communication tools and networks to solve information problems in a knowledge society.

Kannappanavar and Swamy (2012) in their study entitled, user education in agricultural science university libraries in India with particular reference to South India, mentioned that agricultural university libraries under the study are in the initial stage of development. Modern technologies are used in order to provide better services to their users. Training and exposure to these modern technologies are required by the staffs working in these universities. The study also confirms that the users of these universities are satisfied with the user education programmes provided to them.

Okorie and Agboola (2012) in their study entitled, availability and use of electronic resources in agricultural university libraries, stated that the main advantage of using e-resources in the agricultural university libraries is the increased level of its accessibility to gather information sources related to their research work, learning and studying. The availability of e-resources has helped the agricultural university libraries to cope up from the significant problem of non-availability of information resources in print format.

Uganneya, Ape and Ugbagir (2012) he carried out a descriptive study in the Nigerian agricultural research libraries to find out the information facilities and user satisfaction. The study tried to examine the extent to which the consumers in the agricultural research libraries in Nigeria are satisfied with reference and circulation facilities provided. According to the study, most customers are satisfied that agricultural research libraries offer both reference and circulation facilities. Instead, the users were disappointed with the referral and shelf administration facilities given to customers by books.

Barkade (2011) conducted a study which stated that there is a need for cross-disciplinary communication of information from related fields such as ethnobotany, biotechnology, environmental sciences for sustainable development in agricultural research.

Singh and Nazim (2008) in their research, outlined the effect on awareness and information society of information technology and the role of libraries. In their article, the issues of the library and data service (LIS) industry in India are also highlighted, and the accomplishments of contemporary information technologies over the years.

2.3 CONCLUSION

After discussing the above studies and relevant literature a descriptive base study has been set by the researcher. Available literature shows that studies on agricultural libraries regarding there IT based services, facilities and uses of information resources are few in numbers. Here, the current study focuses on the impact of information technologies of agricultural libraries. In the next chapter a brief description has been given the concept of research methods and the tools used in this study.

REFERENCES

Adegbore, A. M. . (2010). Automation in Two Nigerian University Libraries. *Library Philosophy & Practice*, (September 2010), 1–12. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=llf&AN=90225553&site=ehost-live accessed on 02 January 2019

Arvind Mittal & B. K. Sharma. (2013). Familiarity and use of digital resources by the library users in \t\nagriculture universities of Himachal Pradesh: a study. *International Journal of Library Science and Research (IJLSR), 3*(3), 31-40\t. Retrieved from http://www.tjprc.org/view_archives.php?year=2013&jtype=2&id=48&details=archives accessed on 05 January 2019

Antherjanam, S.D. & Sheeja, N.K. (2008). Impact of ICT on Library and Information Science: Major Shifts and Practices in CUSAT Central Library. *International Journal CALIBER*, University of Allahabad: Allahabad.

Barkade, A.J. (2011). Impact of globalization information technology in agriculture. *International Referred Research Journal*, 2(25).

Chauhan, N. B. (2014). *Information Technology for Agricultural Development in India*. Retrieved from http://agropedialabs.iitk.ac.in/openaccess/sites/default/files/WS 14.pdf accessed on 12 January 2019.

Gemma,B. and Erin, D. (2016). Share resources through the largest interlibrary loan network. *Interleading & Document Supply,44(4)*,137-140.

Gamit, R.K.M. (2015). Impact of ICT based E-Resource Library Services to users of faculty & researchers in agricultural university Libraries of Gujrat State. *IJAPRR International Peer-Reviewed Refereed Journal, 2(10),* 35-46.

Hanchate, P. D. (2018). *A Study on ICT Based Library Services with Reference to Academic Libraries in Rural Areas*. (2394), 85–89.

Jayasingh, T. (2018). Awareness availability and accessibility of Digital resources in engineering college Libraries in Kanyakumari district. Retrieved from http://hdl.handle.net/10603/186496 11 January 2019

Kannappanavar, B. U. (2014). Use of IT in University of Agricultural Science Libraries of Karnataka: A Comparative Study. *DESIDOC Bulletin of Information Technology*, *21*(1), 21–26. Retrieved from

https://doi.org/10.14429/dbit.21.1.3534 accessed on 08 November 2018.

Kannappanavar, B. U. ., & Swamy, H. M. C. (2012). User Education in Agricultural Science University Libraries in India with Special Reference to South India. *Library Philosophy & Practice*, 48–63. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=llf&AN=77427943&site=ehost-live accessed on 13 November 2018

Mangi, L. D. (2015). *Managing e-resources in higher education by agricultural scientists , veterinarians : A survey of Jammu & Kashmir (India)*. *3*(4), 16–23.

mbolin. (2012). Pnla Quarterly. *The Official Journal of the Pacific Northwest Library Association*, *76*(3), 200. Retrieved from https://pnla.memberclicks.net/assets/documents/Quarterly/pnlaq76-3-spring2012.pdf#page=14 accessed on 28 January 2019.

Mittal, A. (2017). Usage and Impact of Digital Resources in Agriculture University: A Study. *Journal of Advanced Research in Library and Information Science*, *4*(3), 5–12. Retriveived from https://doi.org/10.24321/2395.2288.201702 accessed on 17 October 2018.

Mittal, A., & Sharma, B. K. (2014). *Use of Digital Resources and Services in Punjab Agricultural University Library , Ludhiana : A Study*. *5*(1), 81–92.

Mohammed, S. A., & Akor, P. U. P. C. L. N. (2017). Availability and Utilization of Electronic Information Databases for Research By Agricultural Scientists in Federal University Libraries in North Central Nigeria. *Library Philosophy and Practice*, (November), 1–32. Retrieved from https://search.proquest.com/docview/1969923539?accountid=12653 http://sfx9.usaco.co.jp/nagoya?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&sid=ProQ:ProQ%3Acentral&atitle=AVAILABILITY+AND+UTILIZATION+OF+ELECTRONIC+INFORMATION+ accessed on 19 March 2019.

Mondal, A. (2018). Application of ICT and its impact on job satisfaction among library professionals of the state funded general universities of West Bengal. Retrieved from http://hdl.handle.net/10603/202123 Accessed on 11 January 2019.

Mondal, A.K. and Bandyopadhyay, A. K. (2010). Application of ICT and Related Manpower Problems in the College Libraries of Burdwan. *DESIDOCJournal of Library and Information Technology*. *30(4)*, 44-52.

Naqvi, T. H. (2017). Use of collection and services: A study of Indian agricultural research institute library. *DESIDOC Journal of Library and Information Technology*, *37*(6), 425–431. https://doi.org/10.14429/djlit.37.6.10706 accessed on 27 March 2019.

Okello-Obura, C. (2010). Assessment of the problems LIS postgraduate students face in accessing e-resources in Makerere University, Uganda. *Collection Building, 29*(3), 98-105. doi: 10.1108/01604951011060385

Sampath Kumar, B.T and Biradar,B.S. (2010). Use of ICT in College Libraries in Karnataka, India: A Survey. *Electronic Library and Information Systems, 44(3),* 271-282.

Services, L. (2014). *Library and Information Services in Agricultural University Libraries of Gujarat : A Study*. *2*, 83–89.

Singh, D. K., & Nazim, M. (2008). Impact of Information Technology and Role of Libraries in the Age of Information and Knowledge Societies. *6th International CALIBER-2008, Allahabad*, (4), 28–34. Retrieved from http://hdl.handle.net/1944/1229 accessed on 15April 2019.

Singh, P. K. (n.d.). *Use of Electronic Resources : a Study of Indian Agricultural Research Institute , New Delhi*. 141–168.

Somerville, Mary M, Smith, Gordon W, and Macklin, Alexius Smith. (2013). The ETS SkillsTM Assessment: A Digital Age Tool. *The Electronic Librar, 26(2),* 158-171.

Uganneya, Solomon; Ape, Rebecca; Ugbagir, N. (2012). Information services provision and user satisfaction in agricultural research libraries in Nigeria. *International Journal of Library and Information Science*, *3*(6), 88–93. Retreived from https://doi.org/10.5897/IJLIS11.051 accessed on 27 April 2019.

Chapter 3
Research Methodology

CHAPTER- 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

A research methodology is the specialized procedures or strategies used to recognize, gather, process and evaluate a subject data. The methodology chapter enables the reader to critically assess the general validity and reliability of a study in a study job. Two primary issues are answered by the methodology chapter: how information was gathered or collected and how it was analyzed.

Research methodology, it may be understood as a science of studying how research is done scientifically. In it, we study the various steps that are generally adopted by the researcher in studying his research problem along with the logic behind them. Research in common parlance refers to a search for knowledge. In other terms, research is an in-depth study of the status, to find out an inner truth, inner story, of any subject of interest and also to solve problems that society confronts. It helps the administration to foresee the prospects and to take appropriate decisions. It improves the knowledge of the various aspects of the society with regard to the problems, and prospects in his field of activity. According to Clifford Woody, a research study includes problem definition and redefinition, formulation of assumptions or proposed alternatives, information collection, organization and evaluation, deduction and conclusions, and last but not least closely assessing findings to determine if they are appropriate for hypothesis formulation. Research is a primary contributor to the advancement of the existing stock of knowledge. The research seeks the truth by means of systematic study, knowledge research through aims and a systemic approach to solving an issue. Research is also a systematic approach to generalization and the formation of theory.

3.2 SAMPLE SIZE OF THE STUDY

It is s very difficult task to cover all the agricultural university libraries in Uttar Pradesh, due to some reasons such as time duration, lack of research facilities, lack of

cooperation, etc. The researcher has selected only six agricultural libraries that are running under ICAR in the state of Uttar Pradesh, which are presented in table 3.2.1.

S. No.	UNIVERSITY NAME	PLACE	YEAR OF ESTABLISHMENT
1.	**Sam Higginbottom University of Agriculture, Technology & Sciences**	**Allahabad**	**1910**
2.	**Narendra Deva University of Agriculture & Technology**	**Faizabad**	**1974**
3.	**Chandra Shekhar Azad University of Agriculture & Technology**	**Kanpur**	**1975**
4.	**Saradar Vallabhbhai Patel University of Agriculture & Technology**	**Meerut**	**2000**
5.	**Banda University of Agricultural and Technology**	**Banda**	**2010**

Table No.: 3.2.1

3.3 DETAILS OF THE TWO QUESTIONNAIRES

3.3.1 Questionnaire A:

Five copies of the questionnaire were distributed to librarians, the five agricultural university libraries available in Uttar Pradesh. This questionnaire contain 31 questions in seven parts are as follows:

Part I: Personal data of the Librarians / Libraries.

Part II: General data and profile of libraries

Part III: Collection of libraries.

Part IV: IT Infrastructure of libraries.

Part V: Network and websites offered by libraries.

Part VI: IT based agricultural information products / services offered by the Agricultural Libraries and problems in managing IT based products and services and also training aspects.

Part VII: Suggestions for strengthening the library, comprehensive IT based in Agricultural Information Services at the university level. All the filled questionnaires were received from the heads of the libraries of the selected universities in Uttar Pradesh.

3.3.2 Questionnaire B:

This questionnaire is for Users. It contains 19 questions in three parts.

Part I: Profile of the Users- it covers the name, designation, gender etc.

Part II: Usage of IT based agricultural information products / services, their awareness and opinion, popularity (preference), frequency of use and reasons for usage.

Part III: Suggestions for improving the effective agricultural information services in the libraries.

The 500 questionnaire-B was distributed to users who use these library services.

3.4 DATA COLLECTION TOOLS/METHODS

The data collection instrument is described as the method of precise study ideas using conventional validated methods, measured and analyzed. A scientist can assess the hypothesis on the basis of the data gathered. Data collection, irrespective of the area of studies, is in most instances the main and most significant phase for studies. During the decision on the information collection technique to be used for the research, two kinds should be taken into consideration, i.e. Primary and secondary information. The main information is that gathered again and for the first time and therefore in characters initial. On the other side, the secondary data are those already gathered and transmitted through the statistical process by somebody else. The techniques of information collection are different because primary data are initially to be collected while the nature of information collection is only the basis of compilation for secondary data.

3.4.1 QUESTIONNAIRE METHOD

A set of printed or written questions with a choice of answers, devised for the purpose of a survey or statistical study. According to oxford dictionaries, a questionnaire is a written list of questions, the answers to which are recorded by respondents. In a questionnaire, respondent read the questions, interpret what is expected and then write down the answers. In the case of a questionnaire, as there is no one to explain the meaning of questions to respondents, it is important that the questions are clear and easy to understand. Also, the layout of a questionnaire should be such that it is easy to read and pleasant to the eye, and the sequence of questions should be easy to follow. A questionnaire should be developed in an interactive style. This means respondents should feel as if someone is talking to them. In a questionnaire, a sensitive question or a question that respondents may feel hesitant about answering should be prefaced by an interactive statement explaining the relevance of the question. It is a good idea to use a different font for these statements to distinguish them from the actual questions. In this method, a questionnaire is sent to the persons concerned with a request to answer the questions and return the questionnaire. A questionnaire consists of a number of questions printed or typed in a definite order on a form or set of forms. The questionnaire is mailed to respondents who are expected to read and comprehend the questionnaire itself. The respondent has to answer the questions on their own.

3.4.2 OBSERVATION METHOD

The observation method is the most commonly used method. Observation becomes a scientific tool and the method of data collection for the researcher, when it serves a formulated research purpose, is systematically planned and recorded and is subjected to checks and controls on validity and reliability. Under the observation method, the information is sought by way of the investigator's own direct observation without asking from the respondent. The main advantage of this method is that subjective biases are eliminated, if the observation is recorded precisely. Secondly, the information obtained under this method relates to what is currently happening; it is not influenced either by past behavior or future intention or attitudes. This method is totally independent irrespective of the willingness of the respondent. Recording of observations, techniques used and its clarity are essential in experimental and non-

experimental, social and anthropological research. In the strict sense, it implies the use of the eyes rather than of the ears and the voice in scrutinizing collective behavior. Under this method the researcher obtains the data by watching and nothing has to do with the phenomena that may occur with regard to their cause and effect or mutual relations. To make an effective observation, the researcher must have a definite goal and hypothesis.

3.4.3 INTERVIEW METHOD

The interview method of collecting data involves the presentation of oral-verbal stimuli and reply in terms of oral-verbal responses. In this method, respondents are either interviewed directly or through telephone. In general, the interview method is more effective for the collection of information from the people. However, there are other ways and means to obtain data also could be implied like interaction with individuals or in a group. There are many definitions of interviews. According to Monette et.al. (1986:156), 'an interview involves interviewer reading questions to respondents and recording their answers'. According to Burns (1997: 329), 'an interview is a verbal interchange, often face to face, though the telephone may be used, in which an interviewer tries to elicit information, beliefs or opinions from another person'. Any person-to-person interaction, either face to face or otherwise, between two or more individuals with a specific purpose in mind, is called an interview or interview method.

3.5 SOURCES OF DATA

Data can be defined as the quantitative or qualitative values of a variable. Data is thought to be the lowest unit of information from which other measurements and analysis can be done. Data can be numbers, images, words, figures, facts or ideas. Data in itself cannot be understood and to get various kind of information from the data, one must interpret it into meaningful information. There are various methods of interpreting data. Data sources are broadly classified into primary and secondary data. Primary data is used for this study. Primary data source is an original data source, that is, one which the data are collected first-hand by the researcher for a specific research purpose. Primary data can be collected in a number of ways. However, the most common techniques are questionnaires, observations, interview and survey.

3.6 ANALYSIS AND PRESENTATION OF DATA

The term analysis refers to the computation of certain measures along with searching for patterns of relationship that exist among data-groups. Technically speaking, processing implies editing, coding, classification and tabulation of collected data so that they are amenable to analysis. In the process of analysis, relationship or differences supporting or conflicting with original or new hypotheses should be subjected to statistical tests of significance to determine with what validity data can be said to indicate any conclusion. Analysis, particularly in case of survey or experimental data, involves estimating the values of unknown parameters of the population and testing of hypotheses for drawing inferences. Analysis may, therefore, be categorized as descriptive analysis and inferential analysis.

The analysis of data and presentation of the finding of study with supporting data in the form of tables and charts be fully narrated. Presentation of the results of the study is considered adequate, particularly in cases where policy recommendations are indicated by project results. The merit of this approach lies in the fact that it provides an opportunity for giving and takes decisions which generally lead to a better understanding of the findings and their implications. Presentation is effective when supplemented by various visual devices. Use of slides, wall charts and blackboards is quite helpful in contributing to the clarity and in reducing the boredom, if any. Distributing a board outline, with a few essential tables and charts concerning the research results, make the listeners attentive who have a quick outline on which to focus their thinking.

Collected data were coded, tabulated and analyzed by the simple statistical method on the basis of nature of data. The data was analyzed and presented through table and graphs supported by its interpretation. The table, charts and diagrams were drawn by using Microsoft Word and Excel.

3.7 REFERENCE STYLE

The bibliography reference cited by the researcher for every chapter is given at the end and is arranged according to the American Psychological Association (APA) style of 6^{th} edition available on www.apastyle.org.

3.8 STRUCTURE OF THE THESES

This study comprises of five chapters. Each and every chapter deals with different aspects of the research work explained below-

CHAPTER-1: INTRODUCTION

This chapter gives a brief introduction, gives objectives of the study, its scope; it also gives a briefing of the research methodology, the hypothesis and references.

CHAPTER 2: REVIEW OF LITERATURE

This chapter gives a brief overview about the previous studies done related to this topic. Various aspects of literature related to Information and Technology (IT), like IT based user studies, Input of IT Applications and use of IT, IT Training in Libraries etc. are reviewed in this chapter.

CHAPTER-3: RESEARCH METHODOLOGY

This chapter gives a brief introduction about research methods, tools and techniques used in this study.

CHAPTER-4: DATA ANALYSIS AND INTERPRETATION

This chapter includes the analysis and interpretation of data collected with the help of questionnaires and other research methods. The acquired data presented through charts, bar, graphs etc.

CHAPTER-5: DISCUSSION AND SUGGESTIONS

This chapter includes the findings, conclusion and suggestions for improving the status of agricultural university libraries.

Bibliography: Refers to the citations which are used in the dissertation.

Appendices: Enclose the questionnaire that was framed and used as data collection tools for the study.

3.9 ANALYSIS AND DATA INTERPRETATION

After collecting data, interpretation refers to the task of drawing inferences from the collected facts after an analytical or experimental study. In fact, it is a search for the broader meaning of research findings. The task of interpretation has two significant aspects, first is the effort to establish continuity in research through linking the results of a given study with those of another and second, the establishment of some critical concepts. Interpretation is concerned with relationships within the collected data, partially overlapping analysis. Interpretation also extends beyond the data of the study to include the factors that seem to explain what has been observed by researchers in the course of the study can be better understood and it also provides a theoretical concept which can serve as a guide for further researches. Interpretation is essential for the simple reason that the usefulness and utility of research finding lie in proper interpretation. It is being considered an essential component of the research process because interpretation leads to the establishment of explanatory concepts that can serve as a guide for future research studies; it opens new avenues of intellectual adventure and stimulates the quest for more knowledge. The interpretation of the findings of exploratory research study often results in hypotheses for experimental research and as such interpretation is involved in the transition from exploratory to experimental research.

3.10 CONCLUSION

Research methodology is the most critical aspect of any research work. It clearly describes the process and methods used for performing the research work. Similarly, this chapter discusses about the method used for performing this particular research work. Data collection process including different methods of data collection (such as, interview method, observation method), tools used for collecting data from various respondents of the university libraries, etc. have also been described in this chapter. The above chapter also gives a chapter-wise distribution of the whole research work performed. Further, in the next chapter analysis and interpretation of the data collected from different agricultural universities has been discussed in order to achieve the main objectives of the study.

REFERENCES

Busha, C. and Harter, S. (1980). *Research methods in librarianship*. New York: Academic Press.

IGNOU study material. Research methodology. Block-1, p.10.

Jackson, S. L. (2013). *Research Methods and Statistics: A Critical Thinking Approach (3rd ed.).* USA: Macmillan Publishing Solution.

Kothari (1990). *Research Methodology Method and Techniques* (pp. 184-186). New Delhi: New Age International Publisher.

Kumar, Krishna. (1999). *Research Methods in Library and Information Science*. (pp. 12-14). New Delhi: Har Anand Publication.

Kumar, Ranjeet. (2011). *Research Methodology: A step by step guide for beginners* (pp. 10-65). New Delhi: SAGE Publication Ltd.

Neuman, W. L. (2014). Social Research Methods: Qualitative and Quantiative Approach. (7th ed.). USA: Pearson Education Limited.

Panigrahi, R.M. (2000). *Impact of Information Technology on the Libraries (pp. 84-96)*. Delhi: Ess Ess Publication.

Silverman, D. (2012). *Qualitative Research* (12-14). New Delhi: SAGE Publication.

Singh, Y. K. (2006). *Fundamental Research Methodology Statistics* (pp. 25-35). New Delhi: New Age Publication.

https://academic.oup.com

shodhganga.inflibnet.ac.in

Chapter 4
Data Analysis & Interpretation

CHAPTER- 4

DATA ANALYSIS AND INTERPRETATION

4.1 INTRODUCTION

The term analysis refers to the computation of specific measures along with searching for patterns of relationship that exist among data-groups. Technically speaking, processing implies editing, coding, classification and tabulation of collected data so that they are amenable to analysis. In the process of analysis, relationship or differences supporting or conflicting with original or new hypotheses should be subjected to statistical tests of significance to determine with what validity data can be said to indicate any conclusions. Analysis, particularly in case of survey or experimental data, involves estimating the values of unknown parameters of the population and testing of hypotheses for drawing inferences. After collecting data, interpretation refers to the task of drawing inferences from the collected facts after an analytical or experimental study. In fact, it is a search for the broader meaning of research findings. The task of interpretation has two significant aspects, first is the effort to establish continuity in research through linking the results of a given study with those of another and second, the establishment of some critical concepts.

Interpretation: Interpretation is concerned with relationships within the collected data, partially overlapping analysis. Interpretation also extends beyond the data of the study to include the factors that seem to explain what has been observed by researchers in the course of the study can be better understood and it also provides a theoretical conception which can serve as a guide for further researches. Interpretation is essential for the simple reason that the usefulness and utility of research finding lie in proper interpretation. It is being considered a primary component of the research process because interpretation leads to the establishment of explanatory concepts that can serve as a guide for future research studies; it opens new avenues of intellectual adventure and stimulates the quest for more knowledge. The interpretation of the findings of exploratory research study often results in hypotheses for experimental research and as such interpretation is involved in the transition from exploratory to experimental research.

The questionnaire tool was used for data collection, which was circulated among 5 agricultural universities out of 6 agricultural universities, as mentioned in chapter-2. The data for the research work was collected during the period from 25th February 2019 to 11th April 2019.

The study is based on the objectives and hypotheses whereas, the statistical tables have been prepared based on various parameters such as year of establishment, library collection, IT infrastructure, nature of services and its types, librarian opinion towards the implementation of IT in libraries etc. The study also covers the library automation, networking facilities and e-resources provided by agricultural libraries. In the current chapter, data has been analysed using MS Excel for preplanning the chart, table and diagrams.

List of abbreviations of selected agricultural universities

S. No.	Name of the University	Abbreviations
1	Sam Higginbottom University of Agriculture, Technology & Sciences, Allahabad.	SHUATS
2	Narendra Deva University of Agriculture & Technology, Faizabad.	NDUAT
3	Chandra Shekhar Azad University of Agriculture & Technology, Kanpur.	CSAUK
4	Sardar Vallabhbhai Patel University of Agriculture & Technology, Meerut.	SVPUAT
5	Banda University of Agricultural and Technology, Banda.	BUAT

Table No.: 4.1.1

4.2 Analysis of Responses Received by Librarians

Library profile

Name of University	Place	Year of Establishment	Name of Library	Name of Librarian/Lib. In.	Qualification
SHUATS	**Allahabad (Prayagraj)**	**1910**	**Central Library**	**Mr. S.P. Mallick**	**M.Sc., M.Lib.**
NDUAT	**Faizabad (Ayodhya)**	**1976**	**Nehru Library**	**I/C. Dr. P.C. Pramanik**	**M.Sc., Ph.D.**
CSAUK	**Kanpur**	**1975**	**Central Library**	**I/C. Y.P. Malik**	**Ph.D.**
SVPUAT	**Meerut**	**2000**	**Central Library**	**I/C. Dr. Rachana Verma**	**Ph.D., PDF**
BUAT	**Banda**	**2010**	**Central Library**	**I/C. Dr. Kamaluddin**	**Ph.D.**

Table No.: 4.2.1

Library opening hours

Name of University	Opening Time	Closing Time	Hours
SHUATS	**08.00AM**	**08.00PM**	**12 Hours**
NDUAT	**09.00AM**	**05.00PM**	**8 Hours**
CSAUK	**09.00AM**	**06.00PM**	**9 Hours**
SVPUAT	**10.00AM**	**07.00PM**	**9 Hours**
BUAT	**08.00AM**	**10.00PM**	**14 Hours**

Table No.: 4.2.2

The above table clearly shows the number of hours every library works. The BUAT and SHUATS libraries work 14 hours and 12 hours a day, respectively. Whereas, the rest of the libraries work 8 to 9 hours a day.

Library Staff

Name of the University	Library Professional	Non-Professional
SHUATS	**6**	**9**
NDUAT	**3**	**7**
CSAUK	**2**	**18**
SVPUAT	**2**	**6**
BUAT	**0**	**4**

Table No.: 4.2.3

The above table describes the number of staffs available in the libraries. It is clear from the table that CSAUK library has the maximum number of staff, i.e. 18, followed by SHUATS and NDUAT library, which has 15 and 10 number of staffs, respectively.

Library user statistics

Name of the University	Students	Research Scholars	Agricultural Scientists	Teaching Staff	Non-Teaching Staff	Total
SHUATS	2300	560	400	2890	500	6650
NDUAT	2000	150	80	60	40	2330
CSAUK	2500	250	210		300	3260
SVPUAT	1191	00	00	103	00	1294
BUAT	630	44	65	65	15	819

Table No.: 4.2.4

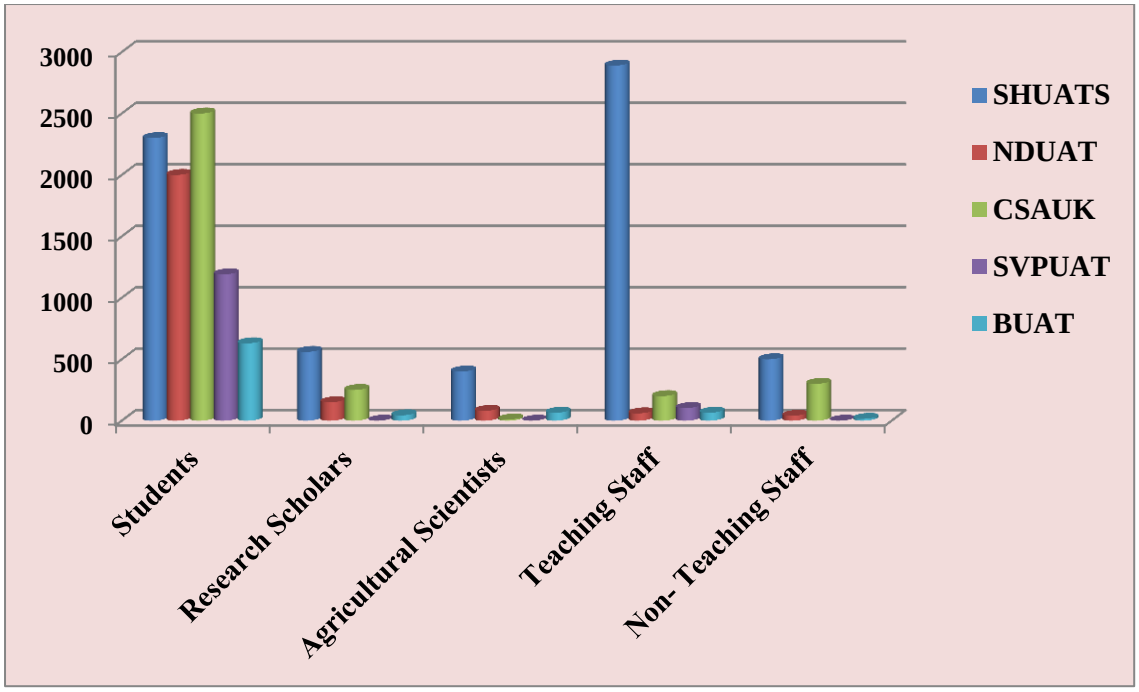


Figure No.: 4.2.4

The above table shows that SHUATS has the maximum number of library users i.e. 6650 including students, research scholars, agricultural scientists, teaching and non-teaching staffs. CSAUK has the second highest number of 3260 users, followed by NDUAT and SVPUAT having 2330 and 1294 number of users, respectively.

4.3 COLLECTION DEVELOPMENT

Collection available in the libraries

Name of University	Text Books	Reference Books	Thesis/Dissertation	Journals	Project Reports	Govt. Reports	Total
SHUATS	30,050	12,390	4700	125	3005	0	50270
NDUAT	20,000	50,000	8000	32	0	0	78032
CSAUK	40000	2197	6000	26667	0	0	74864
SVPUAT	7703	4248	794	1342	130	363	14580
BUAT	6,116	0	0	212	157	250	6735

Table No.: 4.3.1.

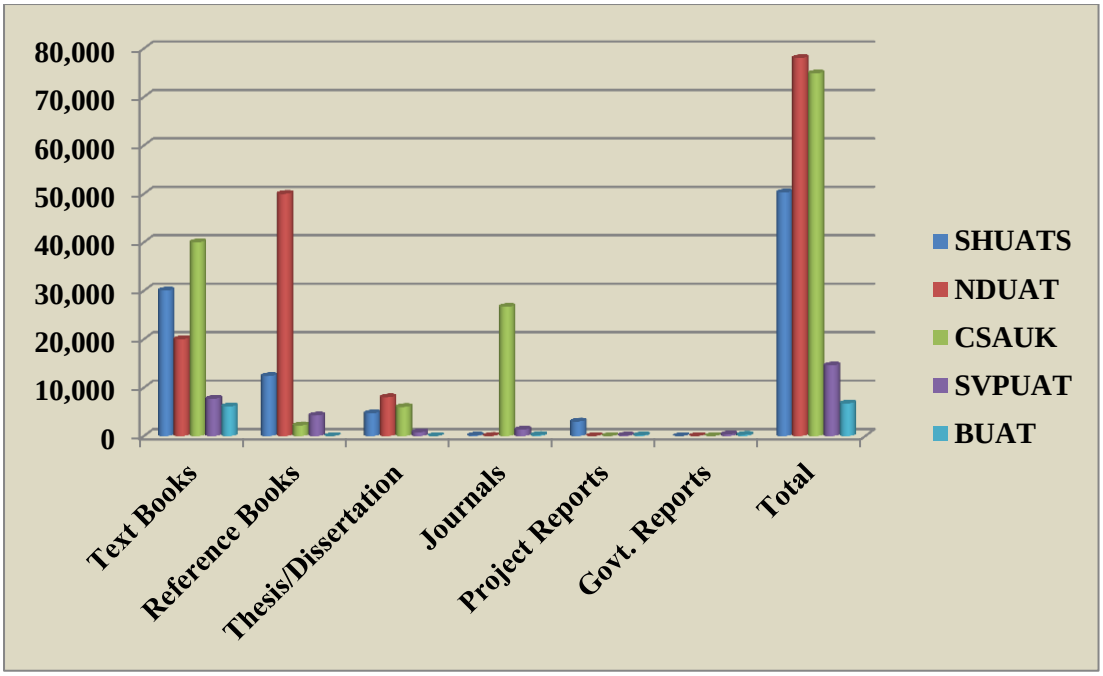


Figure No.: 4.3.1

It is clear from the above table shows that NDUAT library houses 78,032 number of total collections including reference books, textbooks, thesis/dissertations and journals; CSAUK library has 74,864 numbers of total collections, SHUATS library has 50,270 numbers of total collections etc.

Electronic resources of Agricultural university libraries

Name of Library	E-Journals (Full Text)	E-Books	CD/DVD/ Floppies	E-Thesis/ Dissertation	Total
SHUATS	8,364	1,710	420	1060	11554
NDUAT	0	550	100	0	650
CSAUK	0	31	0	6000	6031
SVPUAT	0	0	0	70	70
BUAT	0	0	20	0	20

Table No.: 4.3.2

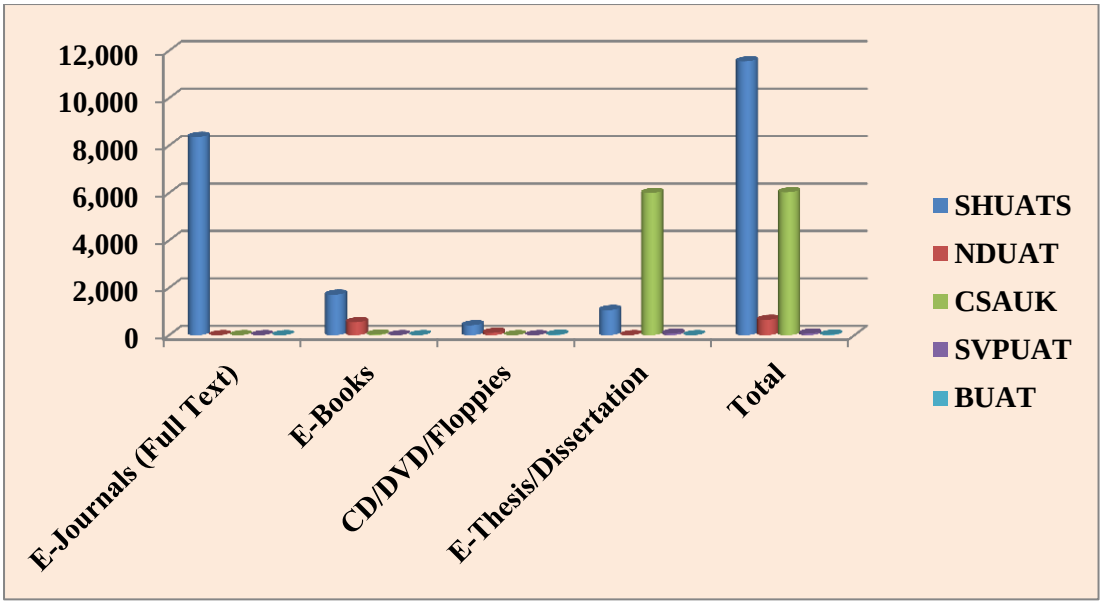


Figure No.: 4.3.2

The above table shows that SHUATS library has a maximum number of e-resources out of the other four libraries i.e. 11,554 including e-journals, e-books, e-thesis/dissertation, etc.

4.4 IT INFRASTRUCTURE

IT Infrastructure available in libraries

Name of IT Infrastructure	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT
Desktops	Yes	Yes	Yes	No	Yes
Printers	Yes	Yes	Yes	No	Yes
Digitization Equipment	Yes	Yes	Yes	Yes	No
Network	Yes	Yes	Yes	Yes	Yes
Servers	Yes	No	Yes	Yes	No
CD- Server Network	No	Yes	Yes	Yes	No
Web servers (Intranet/Internet)	Yes	Yes	Yes	No	Yes
UPS	No	No	Yes	No	Yes
Video Conferencing	Yes	No	No	No	No
Wi-Fi	Yes	No	Yes	Yes	Yes
Internet	Yes	Yes	Yes	Yes	Yes

Table No.: 4.4.1

The above table shows the availability of ICT Infrastructures in the selected libraries. It is clear that CSAUK library provides all types of ICT infrastructures as mentioned above in the table.

Digitization software facilities available in Library

Digitization Software	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT
Digitization software (CD-Writer, OCR, Scanners etc.)	Yes	No	Yes	No	No
E-BOOK reader software	Yes	No	No	No	No
Digital Library software	Yes	Yes	Yes	No	No
Space, Greenstone, Fedora, Koha	Yes	Koha	No	No	No

Table No.: 4.4.2

The table above describes that only NDUAT library has Koha software facility available in its library whereas, SHUATS library has other equipment also related to digitization as mentioned in the above table.

Connectivity to the Library Networks

Name of University	Own Library Networks	
	Yes	**No**
SHUATS	Yes	
NDUAT	Yes	
CSAUK	Yes	
SVPUAT		No
BUAT		No

Table No.: 4.4.3

The above table shows connectivity to the own Library Networks. In this table 60% of university libraries have their own library network, and 40% of university libraries have not owned Library Networks.

Nature of network connectivity of library

Name of University	Dial-up	Wi-Fi	Leased Line	Any Other
SHUATS	No	Yes	No	No
NDUAT	No	Yes	No	No
CSAUK	No	No	Yes	No
SVPUAT	No	No	No	BSNL
BUAT	No	Yes	No	No

Table No.: 4.4.4

The above table shows that SHUATS, NDUAT and BUAT libraries provide Wi-Fi connectivity whereas, CSAUK and SVPUAT provide leased line and BSNL connectivity, respectively.

4.5 NETWORK AND WEBSITES/PORTALS-

Network and Websites/Portals available in Libraries

Name of University	AGLINET	CGIAR	AGNIC	AGMARKNET	ARISNET	DACNET	AGREN
SHUATS	Yes	No	Yes	No	No	No	No
NDUAT	Yes	No	No	No	No	No	No
CSAUK	No	No	No	No	YES	No	No
SVPUAT	Yes	No	No	No	No	No	No
BUAT	No	No	No	No	No	No	No

Table No.: 4.5.1

The above table shows the availability of Agricultural Information Networks in SAU Libraries of Uttar Pradesh. In this table SHUATS has AGLINET and AGNIC Agricultural Information Network (under process). NDUAT has ALIGNET

Agricultural Information Network. CSAUK has ARISNET Agricultural Information Network. SVPUAT has AGLINET Agricultural Information Network, and BUAT have not any Agricultural Information Networks and Websites/portals.

4.6 IT BASED APPLICATIONS

Training required on IT based applications

Name of University	Yes	No
SHUATS		No
NDUAT	Yes	
CSAUK	Yes	
SVPUAT	Yes	
BUAT	Yes	

Table No.: 4.6.1

The above table shows the training required on IT applications for providing services to the users. In this table, 80% of Agricultural University Libraries has required training on IT applications for providing services to the users, but SHUATS does not require training on IT applications for providing services to users.

4.7 IT BASED SERVICES

Required training areas for adequate provision of IT based services

IT Based Services Training Areas	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT
Development and administration of databases and library systems	Yes		Yes		Yes
		No		No	
Hardware Maintenance	Yes		Yes		Yes
		No		No	
Digital content management including digital and virtual libraries	Yes	Yes	Yes		Yes
				No	
Knowledge management	Yes	Yes	Yes		Yes
				No	
Development and management of bibliographic databases	Yes	Yes	Yes		Yes
				No	
Network administration	Yes		Yes		Yes
		No		No	
Metadata management, including MARK	Yes		Yes		Yes
		No		No	
Computer programming	Yes		Yes		Yes
		No		No	
Website/portal development and maintenance	Yes		Yes		Yes
		No		No	
Any Other	Yes		Yes		Yes
		No		No	

Table No.: 4.7.1

It is clear from the table that libraries of SHUATS, CSAUK and BUAT require training in the field of IT services for their respective library staffs.

4.8 LIBRARY SERVICES

Status of IT on the operations and services of the library

Operation & Services	Status of IT	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT
Acquisition	Manually	Yes	Yes	No	Yes	Yes
	Automated	Yes	No	Yes	No	No
Technical Processing	Manually	Yes	Yes	No	Yes	Yes
	Automated	Yes	No	Yes	No	No
Budgeting	Manually	Yes	Yes	Yes	Yes	Yes
	Automated	Yes	No	No	No	No
Library Resource Sharing	Manually	Yes	Yes	No	Yes	Yes
	Automated	Yes	No	Yes	No	No
Circulation	Manually	Yes	Yes	No	Yes	Yes
	Automated	Yes	No	Yes	No	No
Serial Control	Manually	Yes	Yes	No	Yes	Yes
	Automated	Yes	No	Yes	No	No
CAS/SDI Services	Manually	Yes	Yes	Yes	Yes	Yes
	Automated	Yes	No	No	No	No
Bibliographical services	Manually	Yes	Yes	Yes	Yes	Yes
	Automated	Yes	No	No	No	No
Reference Services	Manually	Yes	Yes	No	Yes	Yes
	Automated	Yes	No	Yes	No	No
Communication with users	Manually	Yes	Yes	Yes	Yes	Yes
	Automated	Yes	No	No	No	No
Any Other	Manually	Yes	Yes	No	Yes	Yes
	Automated	Yes	No	No	No	No

Table No.: 4.8.1

The table shows the status of automation of the library services provided by the libraries. SHUATS has all the services automated in its library such as, acquisition, technical processing, budgeting, library resource sharing, circulation, serial control, etc.

4.9 AGRICULTURAL DATABASES

Agricultural Bibliographical Databases (Offline/Online)

S. No.	Name of Database	Offline/ Online	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT
1	AGRIS (International)	Offline	No	Yes	No	No	No
		Online	Yes	No	No	No	No
2	PROWESS (CMIE, India)	Offline	No	No	No	No	No
		Online	No	No	No	No	No
3	CABI Abstracts (International)	Offline	No	Yes	No	Yes	No
		Online	Yes	No	No	No	No
4	CROP SCIENCE ABSTRACTS	Offline	No	No	No	No	No
		Online	No	No	No	No	No
5	AGRICOLA (International)	Offline	Yes	Yes	No	Yes	No
		Online	No	No	No	No	No
6	SOIL SCIENCE ABSTRACTS	Offline	No	No	No	No	No
		Online	No	No	No	No	No
7	SCIENCE DIRECT (India)	Offline	No	No	No	No	No
		Online	Yes	No	No	No	No
8	INDIAN HARVEST (CMIE, India)	Offline	No	No	No	No	No
		Online	No	No	No	No	No
9	EBSCO (India)	Offline	No	No	No	No	No
		Online	Yes	No	No	No	No
10	CeRA (ICAR, India)	Offline	No	No	No	No	No
		Online	Yes	Yes	Yes	Yes	No
11	BIOLOGICAL & AGRICULTURE INDEX	Offline	No	No	No	No	No
		Online	No	No	No	No	No
12	PEST MANAGEMENT ABSTRACTS	Offline	No	No	No	No	No
		Online	No	No	No	No	No

Table No.: 4.9.1

The above table shows the subscribed Agricultural Bibliographic Databases (Offline/Online) in Agricultural University Libraries of Uttar Pradesh. SHUATS have subscribed five online databases; AGRIS (International), CABI Abstracts (International), SCIENCE DIRECT (India), EBSCO (India), CeRA (ICAR, India) and one offline Database AGRICOLA (International). NDUAT have subscribed only one online Database; CeRA (ICAR, India), and three offline databases AGRIS (International), CABI Abstracts (International) and AGRICOLA (International). CSAUK have subscribed only one online Database CeRA (ICAR, India). SVPUAT have subscribed one online Database CeRa (ICAR, India) and two offline Databases CABI Abstracts (International) and AGRICOLA (International). And BUAT have not subscribed any online or offline Databases.

4.10 BARRIERS OF IT

Barriers for implementation of IT

Barriers of IT	Parameters	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT
Inadequate IT hardware & software	Strongly disagree					
	Disagree	Yes				
	Neither agree					
	Agree		Yes	Yes		Yes
	Strongly agree					
Lack of budget for IT	Strongly disagree				Yes	
	Disagree	Yes				
	Neither agree		Yes			
	Agree			Yes		Yes
	Strongly agree					
Low skill levels of library users	Strongly disagree				Yes	
	Disagree	Yes	Yes			
	Neither agree					Yes
	Agree					
	Strongly agree			Yes		

Lack of staff qualified in IT among library personnel	Strongly disagree				Yes	
	Disagree	Yes				
	Neither agree					Yes
	Agree			Yes		
	Strongly agree		Yes			
Reluctance among staff to use IT	Strongly disagree					
	Disagree					
	Neither agree	Yes				Yes
	Agree		Yes	Yes		
	Strongly agree					
Library lacks updated IT strategy	Strongly disagree					
	Disagree	Yes				
	Neither agree					Yes
	Agree			Yes		
	Strongly agree					
Lack of commitment by top management of our Institution	Strongly disagree					
	Disagree	Yes				Yes
	Neither agree		Yes			
	Agree					
	Strongly agree			Yes		

Table No.: 4.10.1

The above table shows that 60% are agree for Inadequate IT hardware & software, 40% are agree, 20% are strongly agree for Lack of budget for IT, 20% are strongly agree for Low skill levels of library users, 20% are agree and 20% are strongly agree for Lack of staff qualified in IT among library personnel, 40% are agree for Reluctance among staff to use IT, 20% are Library lacks updated IT strategy, and 20% are strongly agree for Lack of communication by top management of our Institution.

4.11 LIBRARY BUDGET

Budget allotment to the Library for the Print & Non-Print Material

Type of Material	Years	CSAUK	BUAT
Print Materials	2015-2016	N/A	3 Lakhs
	2016-2017	22 Lakhs	5 lakhs
	2017-2018	8 Lakhs	10 lakhs
Non-Print Material	2015-2016	N/A	N/A
	2016-2017	2 Lac	N/A
	2017-2018	8 Lac	N/A
IT Infrastructure	2015-2016	N/A	N/A
	2016-2017	5.50 Lakhs	N/A
	2017-2018	N/A	N/A

Table No.: 4.11.1

The above table shows the library budget for the various materials of the libraries. According to the table library budget of CSAUK for the session, 2016-2017 was Rs. 22 Lakhs in 2017-2018 it was Rs. 08 Lakhs (for print materials). For non-print materials, it was Rs. 02 Lakhs for 2016-2017 and Rs. 08 Lakhs for 2017-2018. For IT infrastructures it was Rs. 5.50 Lakhs for 2016-2017. In the case of BUAT the budget was Rs. 03 Lakhs for 2015-2016, Rs. 05 Lakhs for 2016-2017 and Rs. 10 Lakhs for 2017-2018 for Print Materials. Whereas, SHAUTS, NDUAT and SVPUAT gave no response regarding the library budget. All Librarians and Library In-charge said that library budget provided to them is insufficient.

4.12 Analysis of Responses Received by Users:

User Response Statistics

Name of the University	Questionnaire Distributed	Questionnaire Received	Percentage
SHUATS	100	100	22%
NDUAT	100	100	22%
CSAUK	100	56	12%
SVPUAT	100	100	22%
BUAT	100	100	22%
TOTAL	500	456	100%

Table No.: 4.12.1

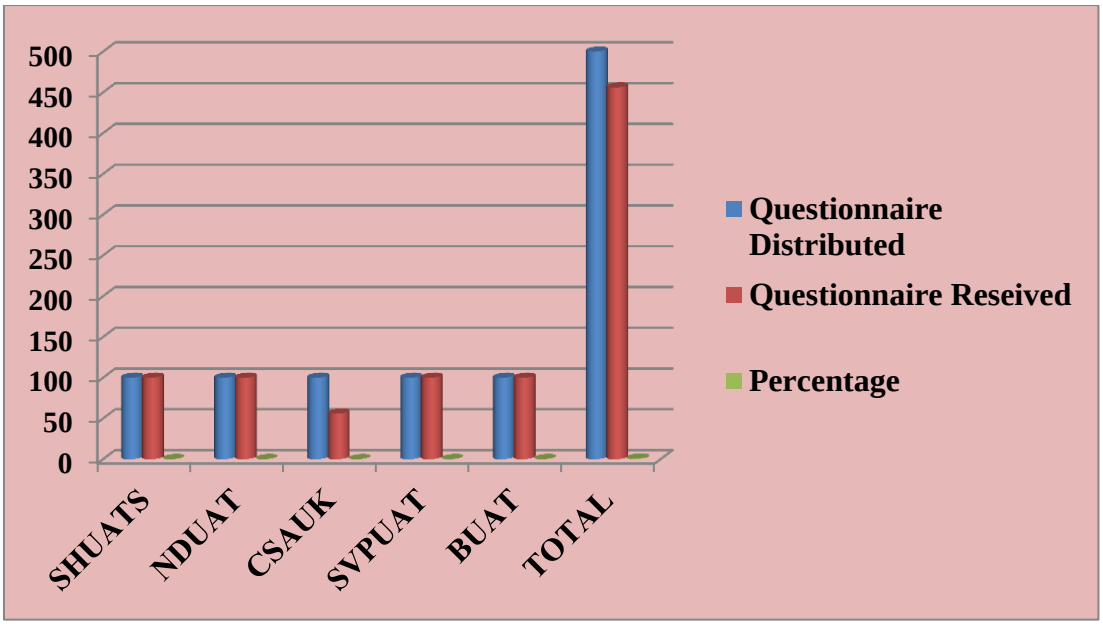


Figure No.: 4.12.1

The above table shows the distribution of the questionnaire in the State Agricultural University Libraries of Uttar Pradesh. Total of 500 questionnaires were distributed and 456 (100%) questionnaires were received from the respondents.

Types of Respondents

Name of University	Student	Research Scholar	Teaching Staff	Non-Teaching Staff
SHUATS	**94**	**2**	**0**	**4**
NDUAT	**97**	**3**	**0**	**0**
CSAUK	**46**	**7**	**3**	**0**
SVPUAT	**95**	**5**	**0**	**0**
BUAT	**99**	**1**	**0**	**0**

Table No.: 4.12.2

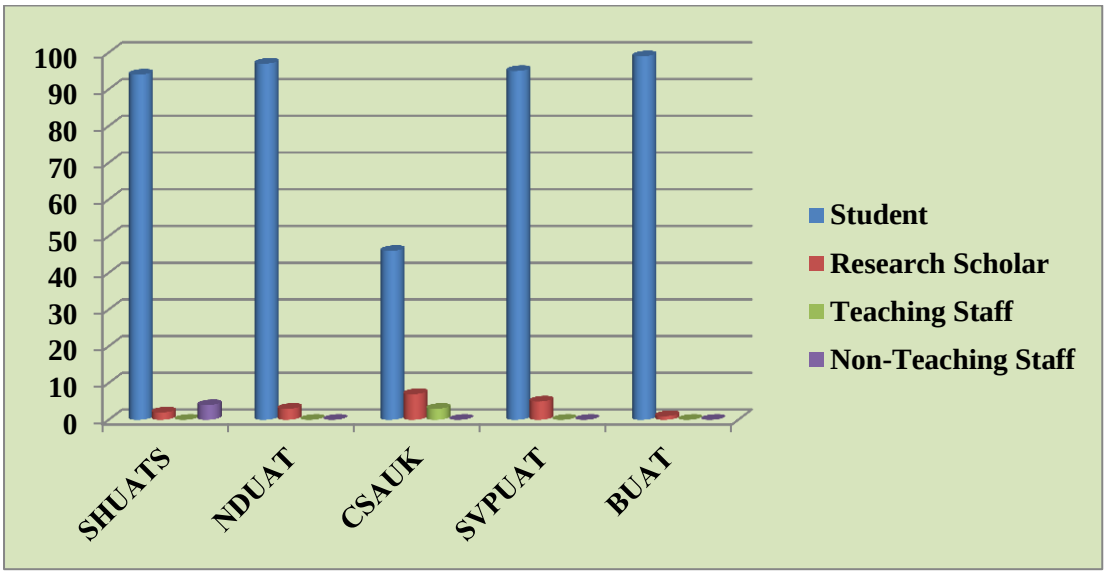


Figure No.: 4.12.2

The above table shows the Type of Respondents statistics in the libraries. From the table it is clear that SHUATS has 96 Students, 02 Research scholars and 04 Non-Teaching staff as respondents, NDUAT has 97 Students and 03 Research Scholars as respondents, CSAUK has 46 Students, 07 Research scholars and 03 Teaching staff as respondents, SVPUAT has 95 Students and 05 Research scholars as respondents, and BUAT has 99 Students and 01 Research scholar as respondents who responded to the questionnaires.

Frequency of visit of the library users

Frequency	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT
Daily	56 (56%)	65 (65.65%)	9 (19.56%)	72 (72%)	54 (56.25%)
Once in a week	21 (21%)	22 (22.22%)	25 (54.34%)	18 (18%)	31 (32.29%)
Once in a two week	10 (10%)	0	3 (6.52%)	0	3 (3.12%)
Occasionally	13 (13%)	12 (12.12%)	9 (19.56%)	10 (10%)	8 (8.33%)

Table No.: 4.12.3

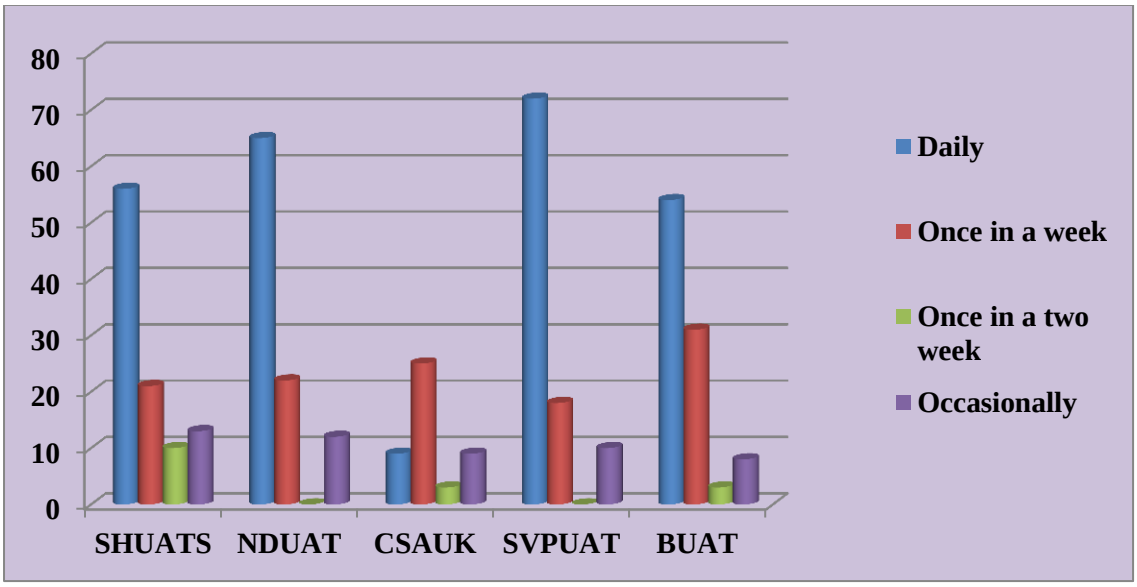


Figure No.: 4.12.3

The above table describes the frequency of visit to the library. The table shows that 5 of6% users of SHUATS, 65% users of NDUAT, 72% users of SVPUAT and 56.25% users of BUAT visit the library daily. Whereas, 54.34% users of CSAUK visit the library once in a week.

IT Based Services used by users

Services	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT
OPAC	18 (6.25%)	23 (6.57%)	7 (6.54%)	6 (3.63%)	23 (8.45%)
Information services	45 (15.6%)	50 (14.28%)	29 (27.10%)	36 (21.81%)	29 (10.66%)
Reference Services	44 (15.27%)	35 (10%)	16 (14.95%)	27 (16.36%)	41 (15.07%)
Bibliographical Services	43 (14.93%)	40 (11.42%)	9 (8.41%)	23 (13.93%)	28 (10.29%)
Current Awareness services	34 (11.80%)	34 (9.71%)	13 (12.14%)	34 (20.60%)	55 (20.22%)
Document Delivery Services	20 (6.94%)	32 (9.14%)	7 (6.54%)	5 (3.03%)	18 (6.61%)
Inter Library Loan Services	10 (3.47%)	19 (5.42%)	2 (1.86%)	7 (4.24%)	7 (2.57%)
Union Catalogue services	13 (4.51%)	20 (5.71%)	3 (2.80%)	9 (5.45%)	6 (2.20%)
Audio-visual services	15 (5.20%)	26 (7.42%)	2 (1.86%)	14 (8.48%)	19 (6.98%)
User Education	46 (15.97%)	71 (20.28%)	19 (17.15%)	4 (2.42%)	46 (16.91%)

Table No.: 4.12.4

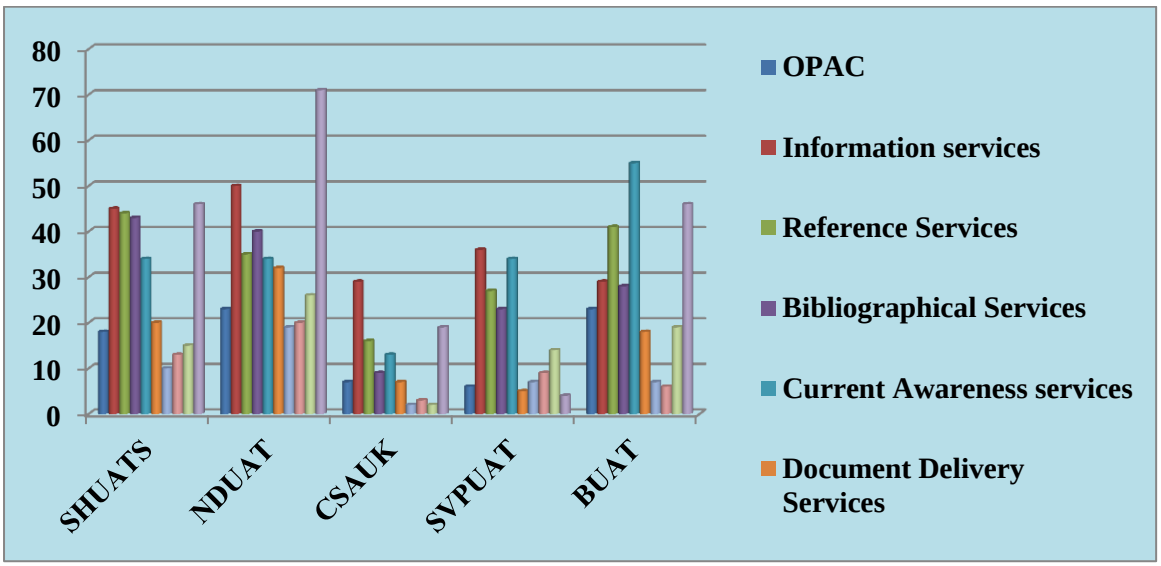


Figure No.: 4.12.4

The above table describes the IT based services used by the users. The table shows that reference services (15.27%), information services (15.06%), and user education (15.97%) services are mostly used by the users in SHUATS; user education services (20.28%) are mostly used by users in NDUAT; information services (27.10%) are mostly used by users in CSAUK; information services (21.81%) used by users in SVPUAT; current awareness services (15.07%) are mostly used by the users in BUAT.

Awareness Level of the IT Based Information Services among the users

Services	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT
Web-OPAC	17 (7.5%)	14 (10%)	7 (10.76%)	5 (2.77%)	20 (11.04%)
Access to web-based resources	28 (12.5%)	15 (10.71%)	9 (13.84%)	21 (11.66%)	39 (21.54%)
E-journals	43 (19.19%)	16 (11.42%)	10 (15.38%)	33 (18.33%)	22 (12.15%)
E-Books	50 (22.32%)	17 (12.14%)	10 (15.38%)	48 (26.66%)	36 (19.88%)
ETDs	15 (6.69%)	18 (12.85%)	1 (1.53%)	9 (5%)	9 (4.97%)
Subject gateway	21 (9.37%)	19 (13.57%)	8 (12.30%)	21 (11.66%)	21 (11.60%)
Digital Libraries	40 (17.85%)	20 (14.28%)	15 (23.07%)	21 (11.66%)	22 (12.15%)
Institutional Repositories/ Archives	10 (4.46%)	21 (15%)	5 (7.69%)	22 (12.22%)	12 (6.62%)

Table No.: 4.12.5

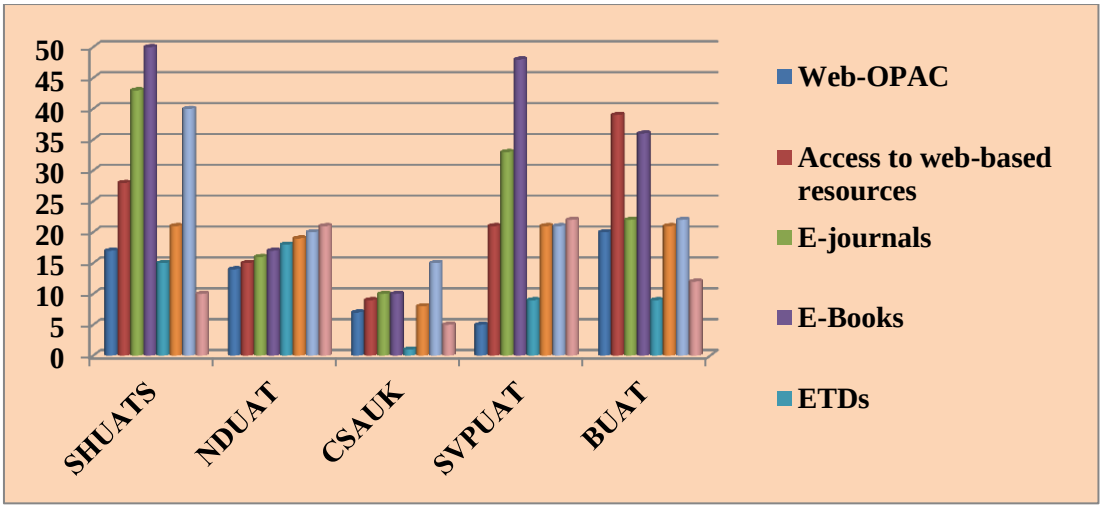


Figure No. 4.12.5

The above table shows the awareness level of IT based information services among the users in the Agricultural University Libraries of Uttar Pradesh. The table describes that the level of awareness among the users in SHUATS is highest for e-book services (22.32%) and least for institutional repository services (4.46%), in NDUAT it is highest for institutional repository services (15%) and least in Web OPAC (10%), in CSAUK it is highest for digital library services (23.07%) and least for ETDs (1.53%), in SVPUAT it is highest for e-book services (26.66%) and least for Web OPAC (2.77%), in BUAT it is highest for access to web-based resource services (21.54%) and least for ETD services (4.97%).

Purpose of Using IT Based Services by the users

Purpose of Using IT Based Services	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT
For updating knowledge	54 (42.18%)	51 (61.44%)	20 (44.44%)	40 (37.73%)	66 (47.14%)
For research purpose	29 (22.65%)	14 (16.86%)	10 (22.22%)	20 (18.86%)	11 (7.85%)
For attending seminars, workshops	12 (9.37%)	2 (2.40%)	5 (11.11%)	14 (13.20%)	8 (5.71%)
For academic work	33 (25.78%)	16 (19.27%)	10 (22.22%)	32 (30.18%)	55 (39.28%)

Table No.: 4.12.6

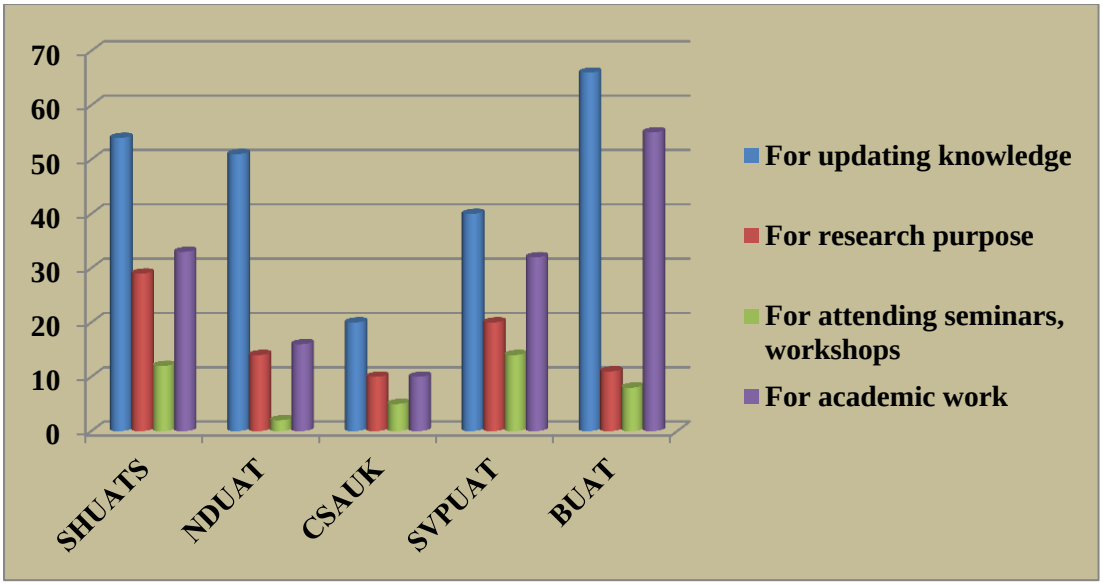


Figure No.: 4.12.6

The above table shows the purpose of using IT based services by the users of SAU libraries of Uttar Pradesh. The table shows that the primary purpose of using IT based services among the users in SHUATS is for updating knowledge (42.18%), in NDUAT is for updating knowledge (61.44%), in CSAUK is for updating knowledge (44.44%), SVPUAT is for updating knowledge (37.73%) and in BUAT is also for updating knowledge (47.14%) using IT based services.

Popular Databases

Databases	Popularity	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT
AGRIS	Popular	22 (3.12%)	4 (0.89%)	2 (0.97%)	4 (1.10%)	12 (3.52%)
	More Popular	13 (1.84%)	6 (1.33%)	0	2 (0.55%)	2 (0.58%)
	Less Popular	13 (1.84%)	3 (0.66%)	0	2 (0.55%)	4 (1.17%)
	Do not know	17 (2.41%)	23 (5.12%)	21 (10.24%)	13 (3.58%)	13 (3.82%)
CABI	Popular	23 (3.26%)	0	0	1 (0.27%)	4 (1.17%)
	More Popular	4 (0.56%)	2 (0.44%)	0	2 (0.55%)	4 (1.17%)
	Less	12	4	2	1	3

	Popular	(1.70%)	(0.89%)	(0.97%)	(0.27%)	(0.88%)
	Do not know	28 (3.97%)	24 (5.34%)	13 (6.34%)	18 (4.95%)	14 (4.11%)
AGRICOLA	Popular	12 (1.70%)	1 (0.22%)	6 (2.92%)	2 (0.55%)	2 (0.58%)
	More Popular	8 (1.13%)	4 (0.89%)	0	9 (2.47%)	1 (0.29%)
	Less Popular	10 (1.41%)	3 (0.66%)	0	4 (1.10%)	3 (0.88%)
	Do not know	24 (3.40%)	26 (5.79%)	13 (6.34%)	15 (4.13%)	16 (4.70%)
CeRA	Popular	9 (1.27%)	5 (1.11%)	2 (0.97%)	5 (1.37%)	1 (0.29%)
	More Popular	8 (1.13%)	1 (0.22%)	0	5 (1.37%)	1 (0.29%)
	Less Popular	11 (1.56%)	5 (1.11%)	1 (0.48%)	3 (0.82%)	4 (1.17%)
	Do not know	24 (3.40%)	24 (5.34%)	10 (4.87%)	11 (3.03%)	14 (4.11%)
SCIENCE DIRECT	Popular	20 (2.83%)	1 (0.22%)	1 (0.48%)	17 (4.68%)	6 (1.76%)
	More Popular	16 (2.26%)	2 (0.44%)	0	5 (1.37%)	2 (0.58%)
	Less Popular	5 (0.70%)	5 (1.11%)	2 (0.97%)	1 (0.27%)	2 (0.58%)
	Do not know	17 (2.41%)	24 (5.34%)	11 (5.36%)	6 (1.65%)	11 (3.23%)
EBSCO	Popular	9 (1.27%)	1 (0.22%)	0	20 (5.50%)	1 (0.29%)
	More Popular	9 (1.27%)	4 (0.89%)	0	10 (2.75%)	1 (0.29%)
	Less Popular	12 (1.70%)	5 (1.11%)	0	3 (0.82%)	2 (0.58%)
	Do not know	22 (3.12%)	20 (4.45%)	11 (5.36%)	10 (2.75%)	12 (3.52%)
CROP SCIENCE ABSTRACTS	Popular	21 (2.97%)	7 (1.55%)	8 (3.90%)	1 (0.27%)	23 (6.76%)
	More Popular	19 (2.69%)	13 (2.89%)	2 (0.97%)	2 (0.55%)	13 (3.82%)
	Less Popular	8 (1.13%)	3 (0.66%)	1 (0.48%)	1 (0.27%)	1 (0.29%)
	Do not know	16 (2.26%)	18 (4.00%)	9 (4.39%)	15 (4.13%)	6 (1.76%)

SOIL SCIENCE ABSTRACTS	Popular	21 (2.97%)	8 (1.78%)	8 (3.90%)	8 (2.20%)	27 (7.94%)
	More Popular	20 (2.83%)	11 (2.44%)	0	5 (1.37%)	10 (2.94%)
	Less Popular	10 (1.41%)	6 (1.33%)	0	8 (2.20%)	2 (0.58%)
	Do not know	14 (1.98%)	19 (4.23%)	12 (5.85%)	10 (2.75%)	6 (1.76%)
PROWESS	Popular	10 (1.41%)	3 (0.66%)	1 (0.48%)	18 (4.95%)	2 (0.58%)
	More Popular	3 (0.42%)	7 (1.55%)	0	7 (1.92%)	0
	Less Popular	18 (2.55%)	5 (1.11%)	0	2 (0.55%)	7 (2.05%)
	Do not know	19 (2.69%)	23 (5.12%)	15 (7.31%)	6 (1.65%)	10 (2.94%)
INDIAN HARVEST	Popular	18 (2.55%)	9 (2.00%)	7 (3.41%)	18 (4.95%)	16 (4.70%)
	More Popular	15 (2.12%)	9 (2.00%)	1 (0.48%)	8 (2.20%)	8 (2.35%)
	Less Popular	9 (1.27%)	4 (0.89%)	0	3 (0.82%)	2 (0.58%)
	Do not know	14 (1.98%)	18 (4.00%)	11 (5.36%)	5 (1.37%)	6 (1.76%)
BIOLOGICAL & AGRICULTURE INDEX	Popular	21 (2.97%)	8 (1.78%)	6 (2.92%)	8 (2.20%)	15 (4.41%)
	More Popular	21 (2.97%)	14 (3.11%)	0	10 (2.75%)	8 (2.35%)
	Less Popular	12 (1.90%)	3 (0.66%)	2 (0.97%)	18 (4.95%)	3 (0.88%)
	Do not know	8 (1.13%)	18 (4.00%)	10 (4.87%)	7 (1.92%)	4 (1.17%)
PEST MANAGEMENT ABSTRACTS	Popular	18 (2.55%)	17 (3.78%)	7 (3.41%)	2 (0.55%)	19 (5.58%)
	More Popular	22 (3.12%)	9 (2.00%)	0	6 (1.65%)	13 (3.82%)
	Less Popular	9 (1.27%)	2 (0.44%)	0	18 (4.95%)	3 (0.88%)
	Do not know	11 (1.56%)	18 (4.00%)	10 (4.87%)	8 (2.20%)	1 (0.29%)

Table No.: 4.12.7

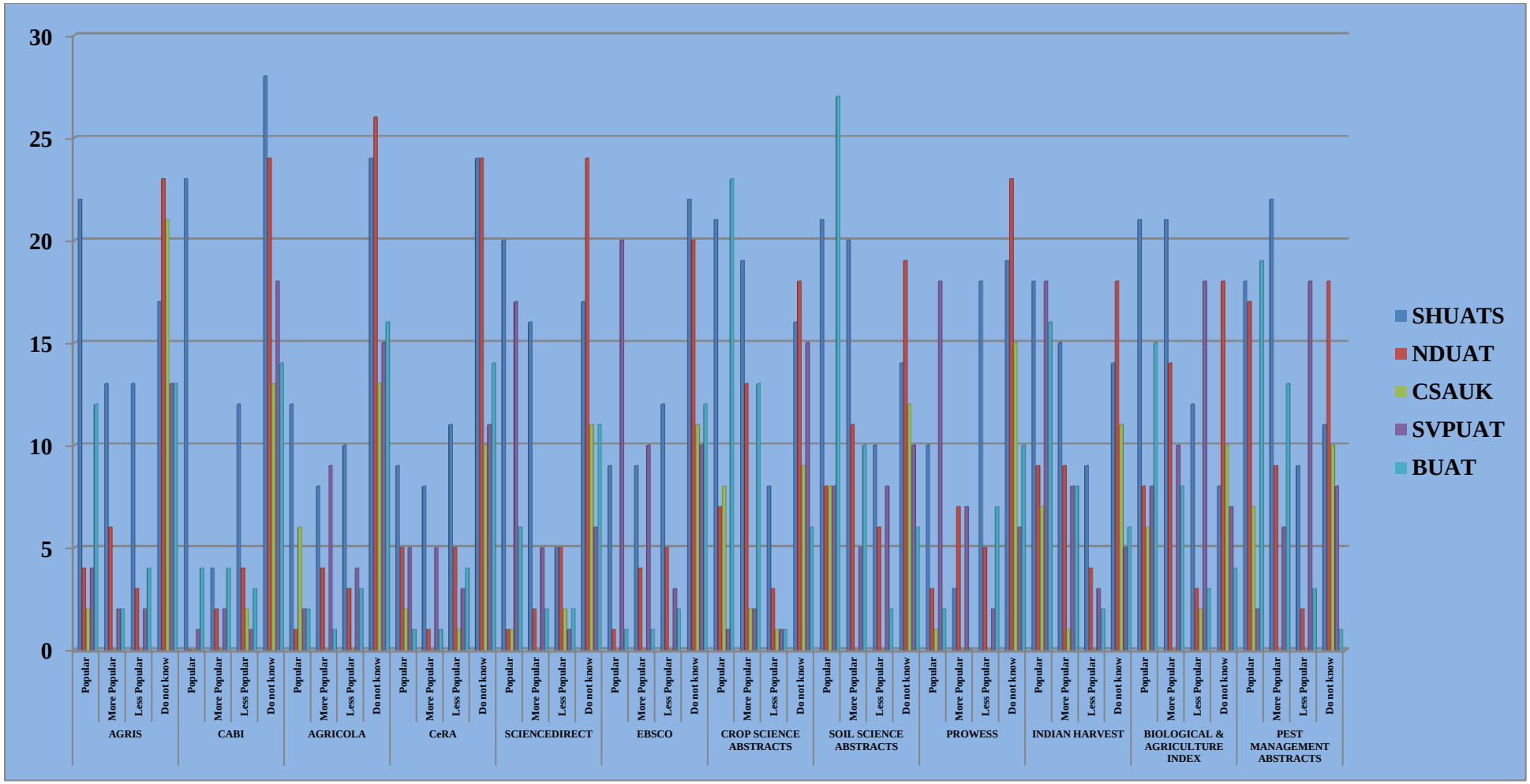


Figure No. 4.12.7

The above table shows the list of databases popular among the users in SAU libraries. The table shows that in SHUATS, SVPUAT and BUAT library AGRIS, CABI, SCIENCEDIRECT, CROP SCIENCE ABSTRACTS, SOIL SCIENCE ABSTRACTS, BIOLOGICAL & AGRICULTURE INDEX, PEST MANAGEMENT ABSTRACTS are some of the popular databases used among the users.

Awareness level of the Agricultural Information Networks among the users

Networks	Awareness	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT
AGNIC	Aware	25 (5.31%)	20 (5.54%)	17 (5.82%)	12 (6.18%)	15 (6.04%)
	Not Aware	40 (8.51%)	37 (10.24%)	24 (8.21%)	13 (6.70%)	16 (6.45%)
AGLINET of FAO	Aware	21 (4.46%)	15 (4.15%)	10 (3.42%)	11 (5.67%)	29 (11.69%)
	Not Aware	42 (8.93%)	32 (8.86%)	29 (9.93%)	16 (8.24%)	15 (6.04%)
AGREN	Aware	21 (4.46%)	19 (5.26%)	15 (5.13%)	11 (5.67%)	20 (8.06%)
	Not Aware	44 (9.36%)	32 (8.86%)	26 (8.90%)	13 (6.70%)	15 (6.04%)
AGMARKNET	Aware	34 (7.23%)	28 (7.75%)	19 (6.50%)	10 (5.15%)	30 (12.09%)
	Not Aware	33 (7.02%)	25 (6.92%)	23 (7.87%)	13 (6.70%)	11 (4.43%)
ARISNET	Aware	41 (8.72%)	28 (7.75%)	23 (7.87%)	29 (14.94%)	29 (11.69%)
	Not Aware	32 (6.80%)	26 (7.20%)	25 (8.56%)	9 (4.63%)	10 (4.03%)
DACNET	Aware	30 (6.38%)	23 (6.37%)	16 (5.47%)	20 (10.30%)	24 (9.67%)
	Not Aware	39 (8.29%)	30 (8.31%)	26 (8.90%)	13 (6.70%)	13 (5.24%)
CGIAR	Aware	22 (4.68%)	12 (3.32%)	11 (3.76%)	8 (4.12%)	2 (0.80%)
	Not Aware	46 (9.78%)	34 (9.41%)	28 (9.58%)	16 (8.24%)	19 (7.66%)

Table No.: 4.12.8

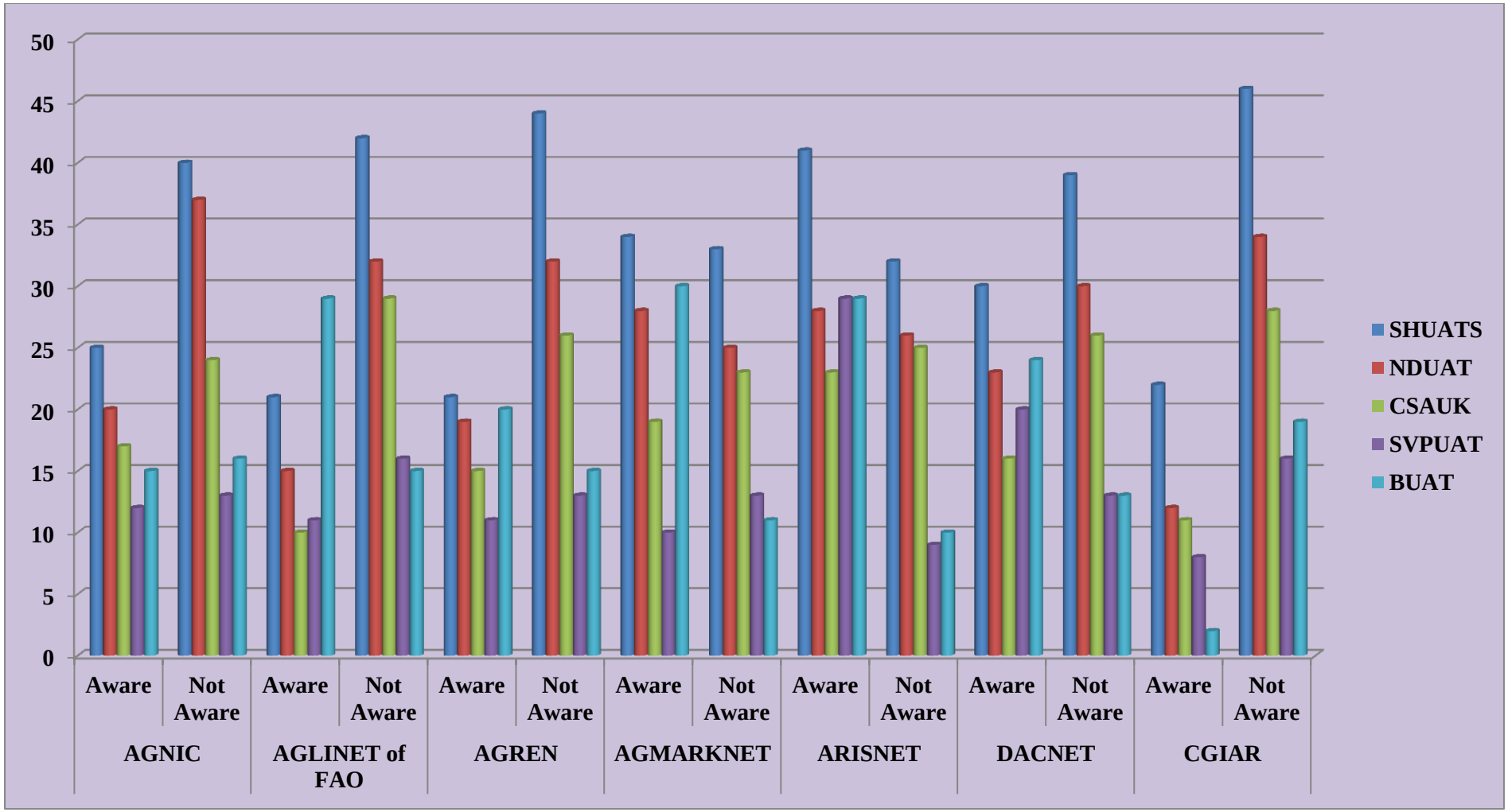


Figure No.: 4.12.8

The above table shows the awareness level of agricultural information networks in agricultural university libraries in Uttar Pradesh. The table describes that the level of awareness about the agricultural information networks among the users in SHUATS is highest for ARISNET (8.72%) and least for AGLINET of FAO and AGREEN (4.46%), NDUAT it is highest for AGMARKNET & ARISNET (7.75%) and least for CGIAR (3.32%), CSAUK it is highest for ARISNET (7.87%) and least for AGLINET of FAO (3.42%), SVPUAT it is highest for ARISNET (14.94%) and least for CGIAR (4.12%), and in BUAT it is highest for AGMARKNET (12.09%) & least for CGIAR (0.80%).

Sufficiency level for e-resources and online databases

Sufficiency	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT
Sufficient	31 (33.69%)	13 (15.11%)	13 (26%)	32 (43.24%)	65 (68.42%)
Insufficient	40 (43.47%)	51 (59.30%)	12 (24%)	27 (36.48%)	21 (22.10%)
Not known	21 (22.82%)	22 (25.58%)	25 (50%)	15 (20.27%)	9 (9.47%)

Table No.: 4.12.9

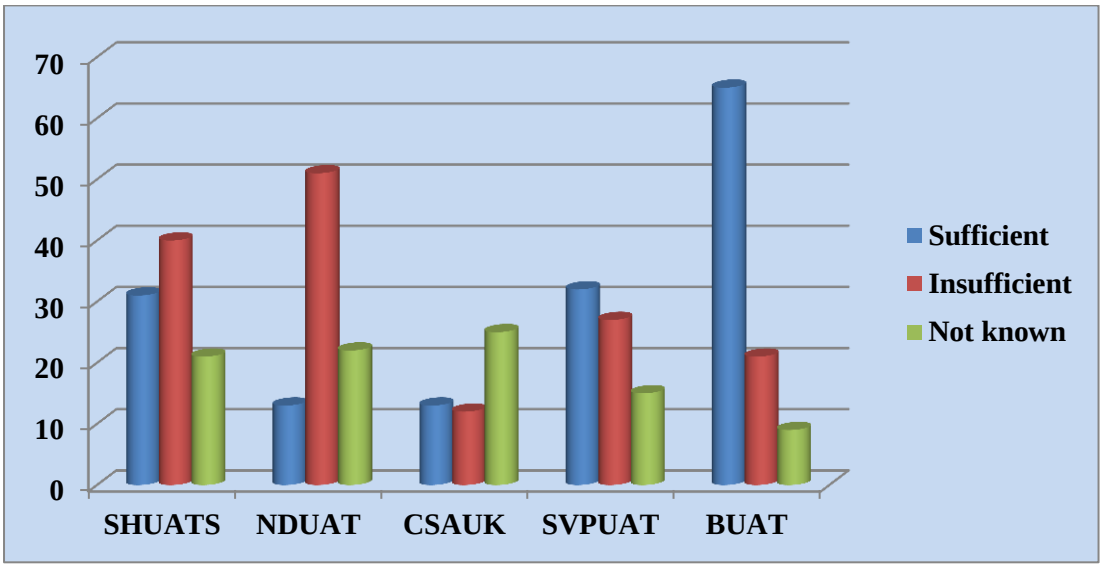


Figure No.: 4.12.9

The above table shows the sufficiency level of e-resources and online database services provided by the library to its users. The table shows that according to 38.79% of users the e-resources and online database services provided to them by the library

of BUAT are sufficient whereas, it is insufficient according to maximum no. of users 59.30% in the library of NDUAT.

Satisfaction level for IT based services

Satisfaction level	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT	TOTAL
Fully satisfied	16 (16%)	18 (20.22%)	9 (18.75%)	17 (23.28%)	11 (11.11%)	71 (17.35%)
Partly satisfied	40 (40%)	24 (26.96%)	7 (14.58%)	28 (38.35%)	39 (39.39%)	138 (33.74%)
Uncertain	18 (18%)	1 (1.12%)	1 (2.08%)	14 (19.17%)	4 (4.04%)	38 (9.29%)
Not satisfied	26 (26%)	46 (50.56%)	31 (64.58%)	14 (19.17%)	45 (45.45%)	162 (39.60%)

Table No.: 4.12.10

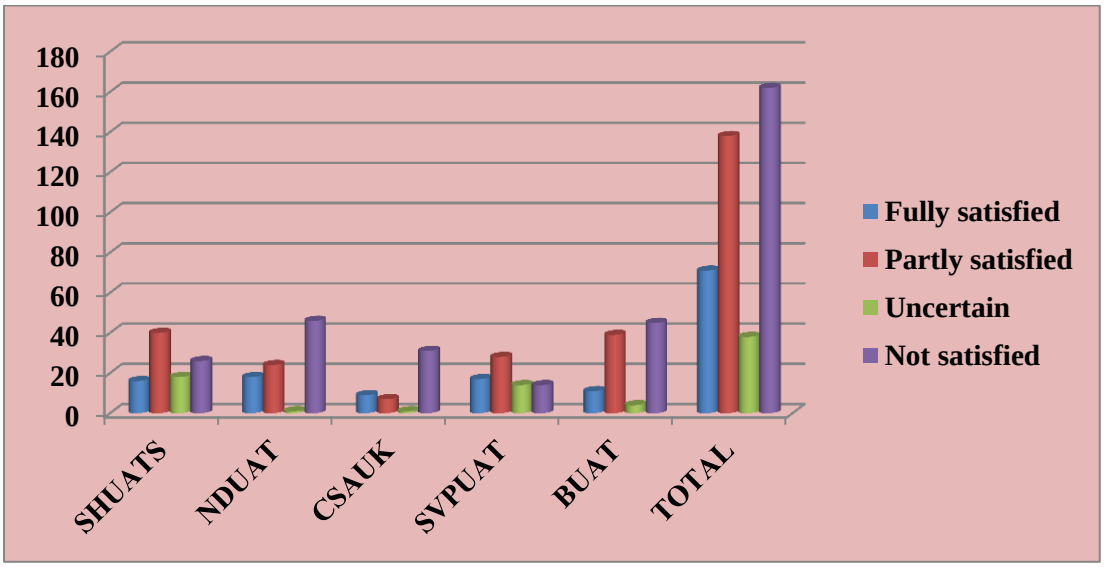


Figure No.: 4.12.10

The above table shows the satisfaction level for IT based services among the users. According to the table 39.60% users are not satisfied with IT based services, 33.74% users are partly satisfied with IT based services, 9.29% users are uncertain and only 17.35 % users are satisfied with IT based services who provided by libraries.

Problems faced by users while using Information Technology Tools

Problems	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT	TOTAL
Lack of software knowledge	30 (14.21%)	59 (16.36%)	33 (15.78%)	16 (8.33%)	50 (21.92%)	188 (15.98%)
Lack of hardware knowledge	27 (12.79%)	52 (15.47%)	28 (13.39%)	20 (10.41%)	38 (16.66%)	165 (14.03%)
Lack of time	38 (18.00%)	41 (12.20%)	26 (12.44%)	25 (13.02%)	24 (10.52%)	154 (13.09%)
Lack of training	26 (12.32%)	48 (14.28%)	32 (15.31%)	33 (17.18%)	45 (19.73%)	184 (15.64%)
Lack of information	40 (18.97%)	49 (14.58%)	30 (14.35%)	23 (11.97%)	26 (11.40%)	168 (14.28%)
Lack of trained staff in library	36 (17.06%)	48 (14.28%)	29 (13.87%)	30 (15.62%)	35 (15.35%)	178 (15.13%)
Lack of patience to sit & work on computer	14 (6.63%)	39 (11.60%)	31 (14.83%)	45 (23.43%)	10 (4.38%)	139 (11.81%)

Table No.: 4.12.11

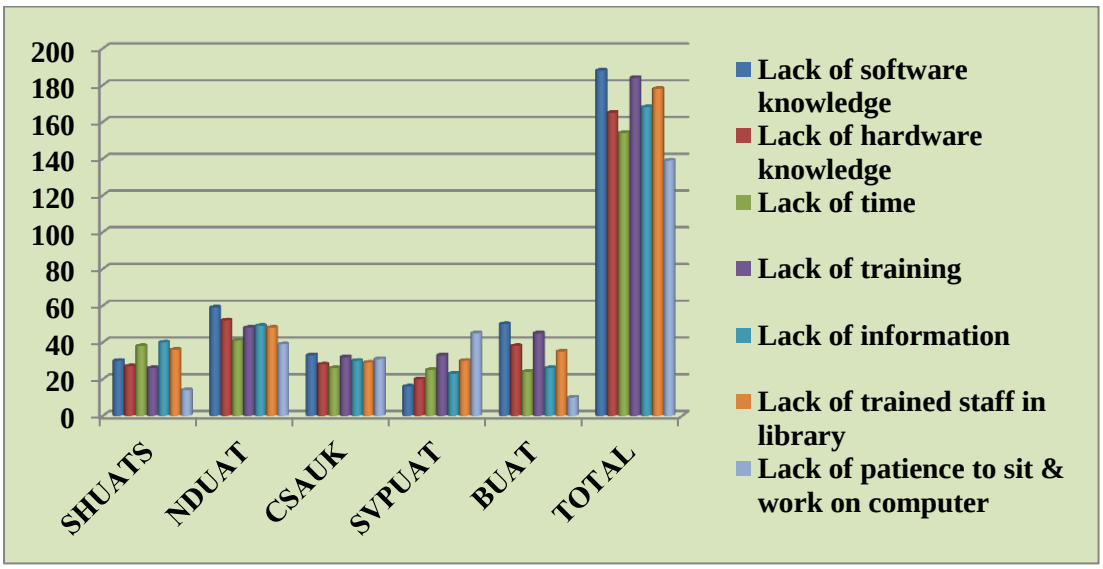


Figure No.: 4.12.11

The above table shows that 15.98% of the respondents mostly faced lack of software knowledge, 14.03% faced a lack of hardware knowledge, 13.09% faced lack of time, 15.64% faced lack of training, and 14.28% faced lack of information, 15.13% faced lack of trained staff in the library and 11.81% faced lack of patience to sit & work on computer.

Problems faced by users while using IT based information services

Problems	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT	TOTAL
Shortage of computers	33 (13.98%)	57 (16.96%)	30 (19.35%)	24 (16.66%)	55 (28.20%)	199 (18.66%)
Availability of needed information	33 (13.98%)	45 (13.39%)	22 (14.19%)	23 (15.97%)	19 (9.74%)	142 (13.32%)
Lack of orientation in using IT	33 (13.98%)	43 (12.79%)	26 (16.77%)	12 (8.33%)	13 (6.66%)	127 (11.91%)
Lack of awareness about IT services/products	39 (16.52%)	46 (13.69%)	24 (15.48%)	33 (22.91%)	23 (11.79%)	165 (15.47%)
Lack of computer knowledge	26 (11.01%)	50 (14.88%)	22 (14.19%)	19 (13.19%)	31 (15.89%)	148 (13.88%)
Speed of internet	42 (17.79%)	51 (15.17%)	22 (14.19%)	16 (11.11%)	30 (15.38%)	161 (15.10%)
Lack of support from staff	30 (12.71%)	44 (13.09%)	9 (5.80%)	17 (11.80%)	24 (12.30%)	124 (11.63%)

Table No.: 4.12.12

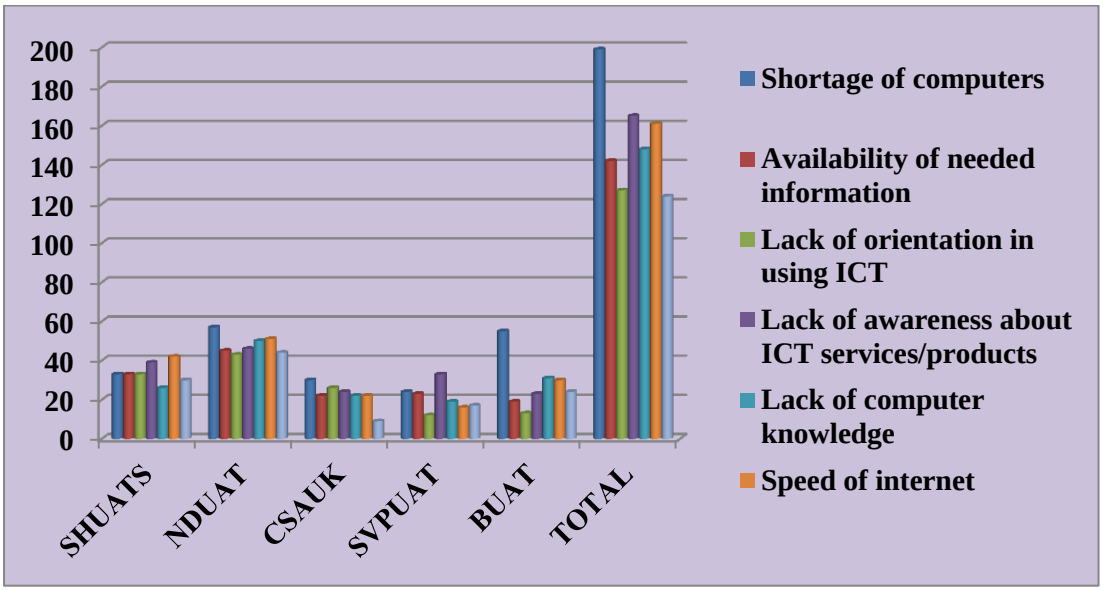


Figure No.: 4.12.12

The above table shows that 18.66% of the respondents mostly faced a shortage of computer, 15.47% respondents faced lack of awareness about IT services/products,

15.10% respondents faced slow speed of internet, 13.88% respondents faced lack of computer knowledge, 13.32% respondents faced availability of needed information, 11.91% respondents faced lack of orientation in using IT, and 11.63% respondents faced lack of support from staff.

Training required to access IT based products by the users

Response	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT	TOTAL
Yes	73(81.11%)	75 (80.64%)	47 (95.91%)	72 (72%)	96 (96%)	363 (84.02%)
No	17(18.88%)	18 (19.35%)	2 (4.08%)	28 (28%)	4 (4%)	69 (15.97%)

Table No.: 4.12.13

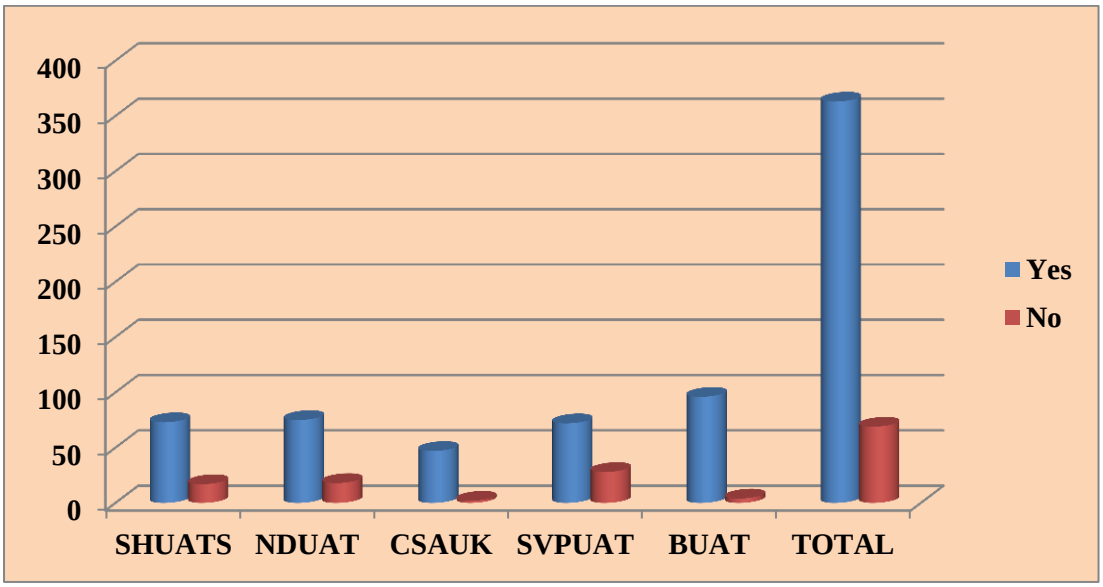


Figure No.: 4.12.13

The above table shows that 84.02% of the users require training for accessing IT based products provided by the library.

Comprehensive IT based Agricultural Information System needed at National Level

Requirement	SHUATS	NDUAT	CSAUK	SVPUAT	BUAT	TOTAL
Yes	80 (80%)	84 (84%)	47 (83.92%)	96 (96%)	90 (90%)	397 (87.06%)
No	20 (20%)	16 (16%)	9 (16.07%)	4 (4%)	10 (10%)	59 (12.93%)

Table No.: 4.12.14

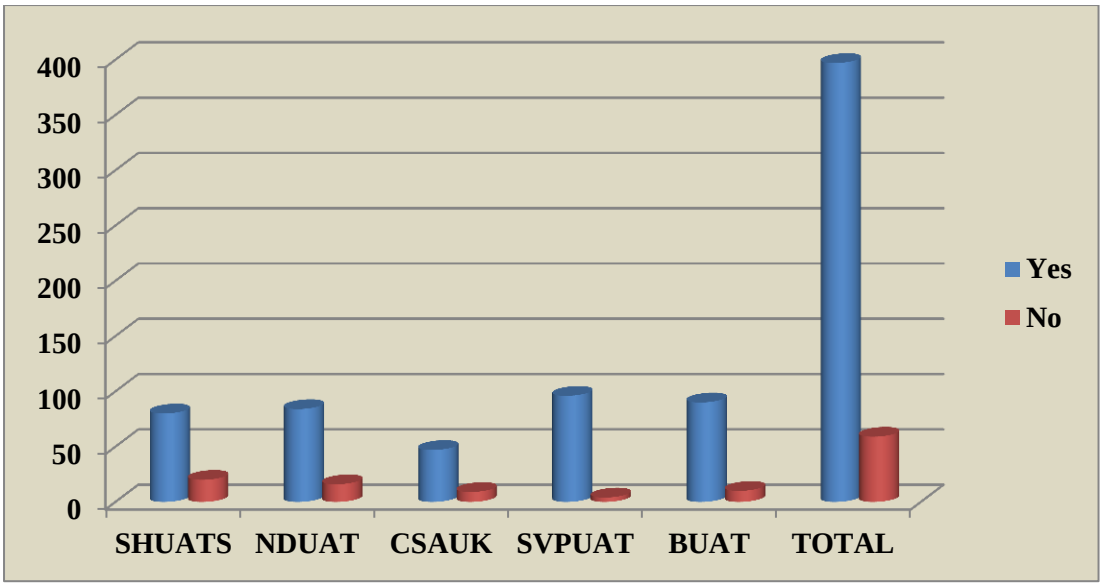


Figure No.: 4.12.14

The above table describes the need of comprehensive IT based agricultural information systems by the users of the selected libraries at the national level. According to the table it is clear that 87.06% of the users are highly in need of this IT based service at the national level.

Chapter 5
Findings, Conclusion & Suggestions

CHAPTER- 5

FINDINGS, CONCLUSION AND SUGGESTIONS

5.1 INTRODUCTION

The findings based on the study such as physical infrastructure, library users, library staff, library collection, electronic resources, IT infrastructures, digitization (operational) software facilities, connectivity to the library networks, network and websites/portals, IT based applications, IT based services, status of IT, agricultural databases, library budget and barriers of IT are presented in this chapter.

5.2 FINDINGS

The major findings of the study are given below:

- The result shows that the mostly 60% libraries are working manually and 40% libraries are partially automated.
- The result indicates that the most of 80% libraries require IT application-based training for providing services to its users.
- The study reveals that the allotment of the budget is not sufficient for implementing IT in the agricultural university libraries.
- The result shoes that the total number of library staffs (professional + non-professional) is highest in SHUAT'S university library i.e. 32, followed by 18 staff in CSAUK university library. Whereas the number of staff is very less for the rest of the university libraries.
- The study shows that the total number of users is highest in SHUAT'S library i.e. 6650, followed by CSAUK with 3260 number of users, NDUAT has 2330 number of users, SVPUAT has 1294 number of users and BUAT has least number of users i.e. 819.
- The study reveals that NDUAT has comparatively a rich collection in its library with 78032 numbers of total collections. CSAUK and SHUATS have 74864 and

50270 number of collections respectively in their libraries. With BUAT having least number of collections i.e. 6735.

- The study shows that the total number of electronic resources is highest in SHUATS university library i.e. 11554, followed by CSAUK library with 6031 number of resources. Whereas, the rest of the libraries have very less number of resources including BUAT, SVPUAT and NDUAT libraries.

- The study reveals that SHUATS's library has various types of infrastructures such as desktops, printers, digitization equipment network, servers, video conferencing, Wi-Fi and internet. NDUAT library has infrastructures including desktops, printers, digitization equipment, network, CD-Server network, web servers and internet. CSAUK library has infrastructures like desktops, printers, digitization equipment, network, servers, CD-Server network, and web servers, Wi-Fi and internet. SVPUAT library has infrastructures like digitization equipment, network, servers, CD-Server network, Wi-Fi, and internet. BUAT library has infrastructures like desktops, printers, network, web server, UPS, Wi-Fi, and internet.

- The study reveals that the digitization software facilities are available in the SHUATS library such as CD-Writer, OCR, scanners etc., e-book reader software, digital library software and Koha software has use in the library. NDUAT has the e-book reader software, and Koha software facilities in the library. CSAUK has digitization software (CD-Writer, OCR, Scanners etc.) and digital library software in its library. Whereas, SVPUAT and BUAT libraries have no digitization software facilities available in their library.

- The study reveals that SHUATS library has subscribed five online databases like AGRIS (International), CABI Abstracts (International), SCIENCE DIRECT (India), EBSCO (India), CeRA (ICAR, India) and one offline database AGRICOLA (International). NDUAT library has subscribed only one online database i.e. CeRA (ICAR, India) and three offline databases AGRIS (International), CABI Abstracts (International) and AGRICOLA (International). CSAUK library has subscribed only one online database i.e. CeRA (ICAR, India). SVPUAT library has subscribed one online database CeRa (ICAR, India)

and two offline databases CABI Abstracts (International) and AGRICOLA (International). BUAT library has subscribed no databases services.

- The result indicates that most of the respondents are visiting the library daily, where 72% of library visitors have been recorded in the SVPUAT Library.
- The result shows that the maximum no. of users 61.44% use IT based services for the purpose of updating knowledge in the NDUAT Library.
- The study shows that the maximum no. of user 26.66% is aware of e-books in the CSAUK Library.
- The study reveals that the Maximum users who faced problems due to lack of software knowledge are 15.98%, 14.03% faced lack of hardware knowledge, 13.09% faced lack of time, 15.64% faced lack of training, and 14.28% faced a lack of information, 15.13% faced a lack of trained staff in the library and 11.81% faced lack of patience to sit & work on computer.
- Maximum no. of users 27.10% used information services in the CSAUK Library.
- Most of the 84.02% users require training for accessing IT based products provided by the library.
- The study reveals that 39.60% users are not satisfied with IT based services, 33.74% users are partly satisfied with IT based services, 9.29% users are uncertain and only 17.35 % users are satisfied with IT based services provided by libraries.
- The e-resources and online database services provided by the library are sufficient according to maximum no. of users 38.79% in the library of BUAT.
- The study shows that 18.66% faced shortage of computer, 15.47% faced lack of awareness about IT services/products, 15.10% faced slow speed of internet, 13.88% faced lack of computer knowledge, 13.32% faced availability of needed information, 11.91% faced lack of orientation in using IT, and 11.63% faced lack of support from staff.
- The study reveals that the users of these agricultural university libraries require comprehensive IT based agricultural information systems to be provided by their

respective libraries that may work at the national level. The finding shows that 87.06% of the users are highly in need of this IT based service at a national level.

5.3 TESTING OF HYPOTHESES

H1: Most of the agricultural university libraries are facing a budget crisis for subscribing electronic resources;

This hypothesis has been accepted because according to the table 4.11.1 clearly shows that Agricultural University Libraries of Uttar Pradesh are facing a budget crisis for subscribing electronic resources, for maintaining IT infrastructures and print resources.

H2: The users of the agricultural university libraries are satisfied with the IT-based services provided to them;

This hypothesis has been not accepted because the table 4.12.10 shows that 39.60% of users are mostly not satisfied with the IT based services provided by the agricultural university libraries.

H3: There is lack of training opportunities provided to the library staff;

This hypothesis is accepted because according to the table 4.7.1, it is clear that SHAUTS, CSAUK and BUAT require all trainings for IT-based services.

H4: The users are not aware with the IT facilities provided by the library.

This hypothesis is rejected, according to the table 4.12.5 shows that the 99% of users are aware about IT facilities provided by the library.

5.4 CONCLUSION

The present study aims at displaying the status of information technology in the agricultural university libraries of Uttar Pradesh. Information technology plays a vital role in the functioning of the libraries. It has become a greater challenge to overcome this barrier, in order to provide an updated service to its users. Only when a library

achieves the satisfaction of its user, it is considered as prosperous. It is therefore essential for library staff to embrace with open hands the improvements in the technology and provide better service to its users. In view of the findings of the study it is clear that agricultural universities in Uttar Pradesh are striving for making services better for their users with the help of technologies. The libraries of these universities need to make use of advance technologies to improve their status.

The present work was performed keeping in mind the major objectives of the study. The objectives were formulated and have been achieved with the help of data collected from different agricultural university libraries. The data collected from the users and librarians of the respective university libraries was analyzed with the help of tables and graphs. The condition of all the libraries was observed and it has been found that not all the libraries are well developed. Very few amounts of computers are available for the users of all the libraries. The libraries lack well qualified and trained staffs. The insufficient availability of electronic resources, databases, and IT based infrastructure should be overcome. Despite of all odds, the staffs and users of these libraries are satisfied with their libraries.

5.5 SUGGESTIONS

Based on the findings, the following suggestions have been made for further improvement in the Agricultural University Libraries of Uttar Pradesh:

- There should be an appointment of librarian and adequate qualified staff and in-service training should be provided to the working staff so that they may offer maximum services to their library users with the help of latest technologies.
- Services of the library should be improved with the help of information technology tools and services.
- Library timing should be extended according to the convenience of the library users.
- Sufficient fund should be provided to the library for digitization.
- Libraries should subscribe to more electronic resources, databases, software, information services and networks for users.

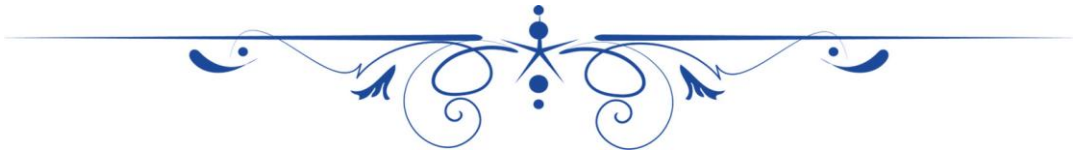
- There should be an awareness programme for library staff and students so that they should be aware of IT-based products and services.
- All library computers should be connected through the internet and connectivity of the Internet and Wi-Fi must be appropriate.
- Most of the users are dissatisfied with IT-based Infrastructure and services, so users should be provided with technical assistance and orientation programmes.
- The libraries should develop library services with the help of IT tools and techniques.
- IT Infrastructure should be increased.
- Library user suggestions must be included while preparing the list of study materials to acquire.

5.6 SUGGESTIONS FOR FURTHER STUDY

The present study has shown the Impact of Information Technology on the Agricultural University Libraries in Uttar Pradesh. Similar, type of studies can also be conducted on the following topics:

- Effectiveness of Information Technology among the research scholars in Agricultural University Libraries of Uttar Pradesh: A Study.
- Awareness of Information Technology among the Library Staff in Agricultural University Libraries of Uttar Pradesh: A Study.
- Impact of Information and Communication Technology on the Agriculture University Libraries of Uttar Pradesh and Madhya Pradesh: A Comparative Study.

Bibliography



BIBLIOGRAPHY

Adegbore, A. M. . (2010). Automation in Two Nigerian University Libraries. *Library Philosophy & Practice*, (September 2010), 1–12. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=llf&AN=90225553&site=ehost-live accessed on 02 January 2019.

Antherjanam, S.D. & Sheeja, N.K. (2008). Impact of ICT on Library and Information Science: Major Shifts and Practices in CUSAT Central Library. *International Journal CALIBER*, University of Allahabad: Allahabad.

Arvind Mittal & B. K. Sharma. (2013). Familiarity and use of digital resources by the library users in \t\nagriculture universities of himachal pradesh: a study. *International Journal of Library Science and Research (IJLSR), 3*(3), 31-40\t. Retrieved from http://www.tjprc.org/view_archives.php?year=2013&jtype=2&id=48&details=archives accessed on 05 January 2019

Ball, D. (2005). Signing away our freedom: The implications of electronic resources licenses. The *Acquisitions Librarians, 18(35*), 7-18.

Babafemi, B. (1998). Resources and Services of a Special Library: Case of a Medical Library in Nigeria. *Library Herald, 34 (3)*, 203-220.

Baker, P. (1994). Electronic libraries. *Visions of the future, 12(4),* 221-229.

Barkade, A.J. (2011). Impact of globalization information technology in agriculture. *International Referred Research Journal*, 2(25).

Busha, C. and Harter, S. (1980). *Research methods in librarianship*. New York: Academic Press.

Celik, H. (1994). Using automation and electronic services to build support for the parliamentary slibrary, 25-30.

Chauhan, N. B. (2014). *Information Technology for Agricultural Development in India*. Retrieved from http://agropedialabs.iitk.ac.in/openaccess/

sites/default/files/WS 14.pdf accessed on 12 January 2019.

Collins, M. (2005). Electronics resource management systems: Understanding the players' and how to make the right choice for your library. *Serials Review, 31(2),* 120-136.

Collins, M. (2008). Electronics resource management systems (ERMs). *Serial Review, 34(4),* 251-281.

Datta, H.N. (2014). *Information Communication Technology and Library Management* (pp.15-145). New Delhi: Jnanada Prakashan (P&D)

Ebunuwele Eseohe, G., & Ola, O. (2014). Application of information Communication Technology in academic libraries in Nigeria. *International Journal Of Education And Research, Vol. 2 No. 12 December 2014,* 420-430. Retrieved from https://ijern.com/journal/2014/December-2014/36.pdf

Galhora, M. (2018). *Information Technology in Library and Information Science* (pp. 22-52). New Delhi: Ess Ess Publisher.

Gamit, R.K.M. (2015). Impact of ICT based E-Resource Library Services to users of faculty & researchers in agricultural university Libraries of Gujrat State. *IJAPRR International Peer Reviewed Refereed Journal, 2(10),* 35-46.

Gemma,B. and Erin, D. (2016). Share resources through the largest interlibrary loan network. *Interleading & Document Supply,44(4),*137-140.

Hanchate, P. D. (2018). *A Study on ICT Based Library Services with Reference to Academic Libraries in Rural Area*. (2394), 85–89.

Jackson, S. L. (2013). *Research Methods and Statistics: A Critical Thinking Approach (3rd edi).* USA: Macmillan Publishing Solution.

Jayasingh, T. (2018). Awareness availability and accessibility of Digital resources in engineering college Libraries in kanyakumari district. Retrieved from http://hdl.handle.net/10603/186496 11 January 2019.

Kannappanavar, B. U. (2014). Use of IT in University of Agricultural Science

Libraries of Karnataka: A Comparative Study. *DESIDOC Bulletin of Information Technology*, *21*(1), 21–26. https://doi.org/10.14429/dbit.21.1.3534 accessed on 08 November 2018.

Kannappanavar, B. U. ., & Swamy, H. M. C. (2012). User Education in Agricultural Science University Libraries in India with Special reference to South India. *Library Philosophy & Practice*, 48–63. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=llf&AN=77427943&site=ehost-live accessed on 13 November 2018

Kaushal, M. (1995). *Library Science and Information Technology* (pp. 22-52). New Delhi: Commonwealth Publisher.

Kothari (1990). *Research Methodology Method and Techniques* (pp. 184-186). New Delhi: New Age International Publisher.

Kumar, Krishna. (1999). *Research Methods in Library and Information Science*. (pp. 12-14). New Delhi: Har Anand Publication.

Kumar, P.S.G. (2008). *Kumar's Curriculum Series in Library and Information Science*, *13: Agricultural Librarianship* (pp-27-45). Delhi: B.R. Publishing Corporation.

Kumar, Ranjeet. (2011). *Research Methodology: A step by step guide for beginners* (pp. 10-65). New Delhi: SAGE Publication Ltd.

Mangi, L. D. (2015). Managing e-resources in higher education by agricultural scientists , veterinarians *: A survey of Jammu & Kashmir (India)*. *3*(4), 16–23.

mbolin. (2012). Pnla Quarterly. *The Official Journal of the Pacific Northwest Library Association*, *76*(3), 200. Retrieved from https://pnla.memberclicks.net/assets/documents/Quarterly/pnlaq76-3-spring2012.pdf#page=14 accessed on 28 January 2019.

Mittal, A. (2017). Usage and Impact of Digital Resources in Agriculture University: A Study. *Journal of Advanced Research in Library and Information Science*, *4*(3), 5–12. https://doi.org/10.24321/2395.2288.201702 accessed on 17

October 2018.

Mittal, A., & Sharma, B. K. (2014). *Use of Digital Resources and Services in Punjab Agricultural University Library , Ludhiana : A Study*. *5*(1), 81–92.

Mohammed, S. A., & Akor, P. U. P. C. L. N. (2017). Availability and Utilization of Electronic Information Databases for Research By Agricultural Scientists in Federal University Libraries in North Central Nigeria. *Library Philosophy and Practice*, (November), 1–32. Retrieved from https://search.proquest.com/docview/1969923539?accountid=12653 http://sfx9.usaco.co.jp/nagoya?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article&sid=ProQ:ProQ%3Acentral&atitle=AVAILABILITY+AND+UTILIZATION+OF+ELECTRONIC+INFORMATION+ accessed on 19 March 2019.

Mondal, A. (2018). Application of ICT and its impact on job satisfaction among library professionals of the state funded general universities of West Bengal. Retrieved from http://hdl.handle.net/10603/202123 dated 11 January 2019.

Mondal, A.K. and Bandyopadhyay, A. K. (2010). Application of ICT and Related Manpower Problems in the College Libraries of Burdwan. *DESIDOC Journal of Library and Information Technology*,*30(4)*, 44-52.

Naqvi, T. H. (2017). Use of collection and services: A study of Indian agricultural research institute library. *DESIDOC Journal of Library and Information Technology*, *37*(6), 425–431. https://doi.org/10.14429/djlit.37.6.10706. accessedon 27 March 2019.

Neuman, W. L. (2014). Social Research Methods: Qualitative and Quantiative Approach. (7^{th} edi.). USA: Pearson Education Limited.

Ningli, Yang (2003). Principles and Strategies of Selecting the Topics of Characteristic Databases in University Libraries. Retrieved from en.cnki.com.cn/Article-en/CJFDTOTAL-DXTS200306015.html. accessed on 11/3/2019.

Okello□Obura, C. (2010). Assessment of the problems LIS postgraduate students face in accessing e□resources in Makerere University, Uganda. *Collection Building*, *29*(3), 98-105. doi: 10.1108/01604951011060385

Oduwole, A.A. (2006). Utilisation and Impact of the Essential Electronic Agricultural Database (TEEAL) on Library Services in a Nigerian University of Agriculture. Retrieved from https:// www. Emerald dinsight.com/doi/abs/10.1108/0030330610669271. Accessed on 22/02/2019.

Oduwale, A.A. (2003). Accessibility and retrival of electronic information at the University of Agricultural Library, Abeokuto, Nigeria. Retrieved from https:// www. Emerald dinsight.com/doi/abs/10.1108/0030330610669264. Accessed on 12/02/2019.

Panigrahi, R.M. (2000). *Impact of Information Technology on the Libraries (pp. 84-96)*. Delhi: EssEss Publication.

Sampath, B., & Biradar, B. (2010). Use of ICT in College Libraries in Karnataka, India: A Survey. *Electronic Library And Information Systems*, *44*(3), 3-5.

Services, L. (2014). *Library and Information Services in Agricultural University Libraries of Gujarat : A Study*. *2*, 83–89.

Sharma, C.K. (2008). *Journal of library and information technology. 4(1), 3-5*.

Silverman, D. (2012). *Qualitative Research* (12-14). New Delhi: SAGE Publication.

Singh, D. K., & Nazim, M. (2008). Impact of Information Technology and Role of Libraries in the Age of Information and Knowledge Societies. *6th International CALIBER-2008, Allahabad*, (4), 28–34. Retrieved from http://hdl.handle.net/1944/1229 accessed on 15th April 2019.

Singh, P. K. (n.d.). *Use of Electronic Resources : a Study of Indian Agricultural Research Institute* , New Delhi. 141–168.

Singh, Y. K. (2006). *Fundamental Research Methodology & Ststidtics* (pp. 25-35). New Delhi: New Age Publication.

Somerville, Mary M, Smith, Gordon W, and Macklin, Alexius Smith. (2013). The ETS SkillsTM Assessment: A Digital Age Tool. *The Electronic Library 26(2),* 158-171.

Uganneya, Solomon; Ape, Rebecca; Ugbagir, N. (2012). Information services provision and user satisfaction in agricultural research libraries in Nigeria. *International Journal of Library and Information Science*, *3*(6), 88–93. https://doi.org/10.5897/IJLIS11.051 accessed on 27 April 2019.

csauk.ac.in

https://digitalcommons.unl.edu

https://buat.edu.in

https://nduat.org

https://icar.org.in

https://academic.oup.com

https://www.upvetuniv.edu.in

https://en.wikkipedia.org/wiki/Information_technology

https://usain.org/links-for-Agricultural Librarians

Shodhganga.inflibnet.ac.in

www.shuats.edu.in/the _University.asp

www.svbpmeerut.ac.in

https://en.wikipedia.org/wiki/Collection_development

https://en.wikkipedia.org/wiki/Information_Technology

https://usain.org/links-for-Agricultural

https://icar.org.in

https://academic.oup.com

Appendix

APPENDIX

IMPACT OF INFORMATION TECHNOLOGY ON THE AGRICULTURAL UNIVAERSITY LIBRARIES IN UTTAR PRADESH: A STUDY

Questionnaire for librarian

A. Personal Data:

1. Name of the Librarian: -……
2. Educational Qualification: -……
3. Mobile No.:-……..
4. E-mail address:-……
5. Experience: -……
6. Name of the University: -……
7. Name of the Library: -……
8. Year of Establishment:-……
9. Gender: - Male [ ] Female [ ]

B. General Data:

10. Total number of library staff:-……
11. Professional staff:-……
12. Non-professional staff:-……
    If any other (please specify):-……
13. Timing of the library: -……
14. Working days of the library:-……
15. User statistics:

S. No.	Category of user	No. of User
1.	Students	
2.	Research Scholars	
3.	Agricultural Scientists	
4.	Teaching staff	
5.	Non-teaching staff	

C. Collection Development:

16. A. Collection of the library:

S. No.	Collection of Library	Total No. of collection
1.	Text Books	
2.	Reference Books	
3.	Thesis/Dissertation	
4.	Journals	
5.	Project Reports	
6.	Patents	
7.	Government Reports	
8.	Others	

B. Electronic- Resources of the library:

Electronic-Resources		
S. No.	**Collection**	**Total no. of E-Collection**
1.	E-Journals (Full Text)	
2.	E-Journals (Abstracts)	
3.	E-Books	
4.	Database (Bibliographic)	
5.	Database (Full Text)	
6.	CD/DVD/Floppies	
7.	Audio/Video taps	
8.	E-Thesis/Dissertations	
9.	Others	

Any other (Please specify) ……

17. Does your library subscribe to the following agricultural bibliographical databases (Offline / Online)? Please tick(√).

S. No.	**Bibliographical Database**	**Offline**	**Online**
1.	AGRIS (International)		
2.	PROWESS (CMIE, India)		
3.	CABI Abstracts (International)		
4.	CROP SCIENCE ABSTRACTS		
5.	AGRICOLA (International)		
6.	SOIL SCIENCE ABSTRACTS		
7.	SCIENCE DIRECT (India)		
8.	INDIAN HARVEST (CMIE, India)		
9.	EBSCO (India)		
10.	CeRA (ICAR, India)		
11.	BIOLOGICAL & AGRICULTURE INDEX		
12.	PEST MANAGEMENT ABSTRACTS		

D. IT Infrastructure of Library:

18. Does your library have the following IT infrastructure facilities? Please tick(√).

a) Desktops [ ]
b) Printers [ ]
c) Digitization equipment [ ]
d) Network [ ]
e) Servers [ ]
f) CD-Server Network [ ]
g) Web servers (Intranet/Internet) [ ]
h) UPS [ ]
i) Video Conferencing [ ]
j) Wi-Fi [ ]
k) Internet [ ]

19. Does your library have the following Digitization (operational) software facilities? Please tick (√).

a) Digitization software (CD-Writer, OCR, Scanners etc) [ ]
b) E-book reader software [ ]
c) Digital Library software [ ]
d) Space, Greenstone, Fedora) [ ]

20. Do you have own library network?
a) Yes [ ] b) No [ ]
If yes, please specify……

21. Nature of connectivity:
a) Dial-up [ ]
b) WI-FI [ ]
c) Leased line [ ]
Any other (Please specify)
……

E. Networks & Websites /Portals:

22. Does your library provide access to the following agricultural information networks by the users? Please tick(√).
a. AGLINET (Agricultural Libraries Network) [ ]
b. CGIAR (The Consultative Group on International Agricultural Research)[ ]
c. AGNIC (Agricultural Network Information Centre) [ ]
d. AGMARKNET (Agricultural Marketing Network) [ ]
e. ARISNET [ ]
f. DACNET [ ]
g. AGREN [ ]
Any other (Please specify) ……

23. Do you require any training on IT applications for providing services to the users?
a) Yes [ ] b) No [ ]

24. Kindly tick (√) mark the training areas required for effective provision of IT based Services- IT based Training areas required:

	[Yes]	[No]
a) Development and administration of databases and library systems	[ ]	[ ]
b) Hardware maintenance	[ ]	[ ]
c) Digital content management, including digital and virtual libraries	[ ]	[ ]
d) Knowledge management	[ ]	[ ]
e) Development and management of bibliographic databases	[ ]	[ ]
f) Network administration	[ ]	[ ]
g) Metadata management, including MARC	[ ]	[ ]
h) Computer programming	[ ]	[ ]
i) Website/portal development and maintenance	[ ]	[ ]

Any other……

F. Services:

25. Please indicate status of IT on the following operations and services of your library- (Please tick (√) mark in the box)

S. No.	Operations &Services	Manually	Automated	S. No.	Operations & Services	Manually	Automated
1.	Acquisition			6.	Serial Control		
2.	Technical Processing			7.	CAS/SDI Services		
3.	Budgeting			8.	Bibliographic services		

4.	Library resource sharing			9.	Reference services		
5.	Circulation			10.	Communication with the users		

Any other (Please specify) ……

26. Budget allotment to the Library for print and non-print material:

Budget of library (Year wise)	**Rupees only (Lacs) For Print Material**	**Rupees only (Lacs) For Non-Print Material**	**Rupees only (Lacs) For IT Infrastructure**
2015-2016			
2016-2017			
2017-2018			

G. Barriers of ICT:

27. Please indicate (√) the barriers encountered in using ITs in your Library: -

S. No.	**Barriers of IT**	**Strongly Disagree**	**Disagree**	**Neither Agree**	**Agree**	**Strongly Agree**
1.	Inadequate IT hardware and software					
2.	Lack of budget for IT					
3.	Low skill levels of library users					
4.	Lack of staff qualified in IT among library personnel					
5.	Reluctance among staff to use IT					
6.	Library lacks updated IT strategy					
7.	Lack of commitment by top management of our Institution					

Any other (Please specify) ……

28. Please suggest the latest IT applications intended to be introduced in your library in near future.

_____

_____

_____

Librarian

(Signature & Stamp)

Questionnaire for users

Dear Sir/Madam,

I am requesting your good self to kindly spare few minutes to fill up this questionnaire on the topic **"IMPACT OF INFORMATION TECHNOLOGY ON THE AGRICULTURAL UNIVERSITY LIBRARIES IN UTTAR PRADESH: A STUDY".** All information/data provided by you will be remained confidential and shall be used for thesis/research purpose only.

I solicit your kind co-operation please.

Thanking You

A. Personal Data:

1. Name of the user:-……
2. Qualifications: -……
3. Name of the University:-……
4. Age: - 21-30 yrs[ ] 31-40 yrs [ ] 41-50 yrs [ ] More than 50 yrs [ ]
5. Gender:-Male [ ] Female [ ]
6. Type of User:-
   i-Student[ ] ii- Research scholar [ ] iii-Teaching staff[ ]
   iii- Non-teaching staff [ ] iv- Agricultural Scientist [ ]
7. How frequently you use the library-
   i.- Daily [ ] ii- Once in a week [ ]
   iii- Once in a two week [ ] iv- Occasionally [ ]

B. IT Based Services:

8. Which of the Information Technology based tools and services you use in your library: Please tick(√).
   a) OPAC [ ]
   b) Information services [ ]
   c) Reference services (E-mail, Chat room, Ask Librarian etc.) [ ]
   d) Bibliographical services (offline / online databases) [ ]
   e) Current awareness services (weblogs, webzines, mobile technology) [ ]
   f) Document Delivery services [ ]
   g) Inter Library Loan service [ ]
   h) Union Catalogue service [ ]
   i) Audio Visual service [ ]
   j) User Education [ ]

9. Are you aware of the following New IT based information services provided by your library? Please tick(√).
   a) Web-OPAC [ ]
   b) Access to web-based resources [ ]
   c) E-journals [ ]
   d) E-Books [ ]
   e) ETDs [ ]
   f) Subject gateways [ ]
   g) Digital Libraries [ ]
   h) Institutional Repositories /Achieves [ ]

10. Please indicate (√) the purpose of usage of IT based information products-
    a) For updating knowledge [ ] b) For research purpose [ ]
    c) For attending seminars, workshops [ ] d) For academic work [ ]

11. Please indicate (√) Popularity of the following Agricultural Databases-

S. No.	Agricultural Databases	Popular	More Popular	Less Popular	Do not know
1.	AGRIS				
2.	CABI				
3.	AGRICOLA				
4.	CeRA				
5.	SCIENCEDIRECT				
6.	EBSCO				
7.	CROP SCIENCE ABSTRACTS				
8.	SOIL SCIENCE ABSTRACTS				
9.	PROWESS				
10.	INDIAN HARVEST				
11.	BIOLOGICAL & AGRICULTURE INDEX				
12.	PEST MANAGEMENT ABSTRACTS				

C. IT based Agricultural Networks:

12. Are you aware of the following Agricultural Information Networks? Please tick(√).

S. No.	Agricultural Information Networks	Aware	Not Aware
1.	AGNIC (Agricultural Information Network Centre)		
2.	AGLINET of FAO		
3.	AGREN (Agricultural Research & Extension Network) ODI, UK		
4.	AGMARKNET (Agricultural Marketing Information Network)		
5.	ARISNET (ICAR)		
6.	DACNET (Ministry of Agriculture, Govt. of India)		
7.	CGIAR Network		

13. Does your library provide sufficient e-resources and online databases for your need? Please tick(√).

a) Sufficient [ ] b)Insufficient [ ] c) Not known [ ]

14. Are you satisfied with your library IT based information services? Please tick(√).

a) Fully satisfied [ ] b)Partly satisfied [ ]
c) Uncertain [ ] d)Not satisfied [ ]

15. What are the problems faced by you while using information technology tools available in the library? Please tick(√).

Problems	Response
Lack of software knowledge	
Lack of hardware knowledge	
Lack of time	
Lack of training	
Lack of information	
Lack of trained staff in library	
Lack of patience to sit and work on computer	

16. Please indicate (√) the problems in using IT based information services-

a) Shortage of computers [ ]
b) Availability of needed information [ ]
c) Lack of orientation in using IT [ ]
d) Lack of awareness about IT services/products [ ]

e) Lack of computer knowledge [ ]
f) Speed of internet [ ]
g) Lack of support from staff [ ]

17. Do you feel any training is required for accessing IT based products? Please tick(√).
a) Yes [ ] b) No [ ]

18. Do you feel any comprehensive IT based agricultural information system needed at National level? Please tick (√).
a) Yes [ ] b) No [ ]

19. Suggestions for improving the IT based agricultural information services in your Library.

……

……

……