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USE OF INFORMATION COMMUNICATION TECHNOLOGY IN LIBRARIES OF KRISHI VIGYAN KENDRA IN INDIA: A STUDY

Ph.D. Thesis
Library & Information Science

SHYAMDEO GOND
2018

USE OF INFORMATION COMMUNICATION TECHNOLOGY IN LIBRARIES OF KRISHI VIGYAN KENDRA IN INDIA: A STUDY

Abstract of Thesis

Submitted for the Award of the Degree of

Doctor of Philosophy

in

Library and Information Science

Under the Supervision of

Dr. S. K. SONKAR
Assistant Professor

Submitted by

SHYAMDEO GOND

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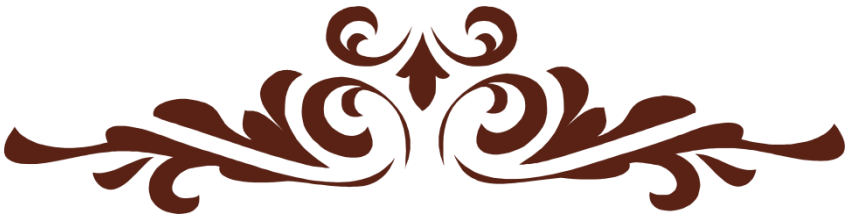

Dedicated to

My Revered Parents

DECLARATION

I, **Shyamdeo Gond,** declare that the work embodied in this thesis entitled **"USE OF INFORMATION COMMUNICATION TECHNOLOGY IN LIBRARIES OF KRISHI VIGYAN KENDRA IN INDIA: A STUDY"** has been carried out by me, under supervision of **Dr S.K. Sonkar,** Department of Library and Information Science, Babasaheb Bhimrao Ambedkar University, Lucknow (A Central University), Lucknow.

The work included in this thesis has not been submitted for any other degree and unless otherwise stated, is all original. I have duly acknowledged all the sources used by me in the preparation of this thesis. I also declare that the thesis is essentially free from all kinds of plagiarism.

Date:

Place: Lucknow

(**Shyamdeo Gond**)
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CERTIFICATE

This is to certify that the thesis titled **"USE OF INFORMATION COMMUNICATION TECHNOLOGY IN LIBRARIES OF KRISHI VIGYAN KENDRA IN INDIA: A STUDY"** submitted by **Mr. Shyamdeo Gond** 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 thesis submitted to Babasaheb Bhimrao Ambedkar University Lucknow satisfies all the requirements as stipulated in the Doctor of Philosophy (PhD) regulations – 1999 as amended in 2013 and it is fit for submission and evaluation for the award of the degree of Doctor of Philosophy of the University.

Date: Supervisor

Head of the Department

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Ph.D. Course Work Certificate

This is to certify that **Mr. Shyamdeo Gond**, Enrollment No. 150/10 Ph.D. Research Scholar, Department of Library and Information Science of this University has successfully completed his Ph.D. Course work in the examination held during May, 2014.

(A.K. Maurya)
Deputy Registrar (Exam.)

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In the end, I would like to thank everybody who was essential to the successful realization of my thesis.

Thank you all once again!

Date:

Place: Lucknow

(Shyamdeo Gond)

PREFACE

The study of "Use of Information Communication Technology In Libraries Of Krishi Vigyan Kendra In India: A Study**,** Information is an indispensable for human development as air is essential for the survival of all living beings. The pace of change brought about by new information technologies has a key effect on the way rural people live, work, and progress. It also examines the increasing role played by information technology in the development of KVK library services for an active reaction to the challenges of farming society. The study attempts to discuss the rapid development of ICT and its application in the KVK library services to fulfil the information needs of the users and deliver it at the right time and place. Following are the contents of the study discussed under the designed chapters.

Chapter I: Introduction:

This deals with objectives, hypothesis, scope, limitations, significance, and research methodology etc. of the study. Nature of collected data as well as statistical techniques used for its analysis is described within this.

Chapter II: Review of Literature:

Empirical studies conducted in Information Communication Technologies and its application in libraries especially in KVK libraries, quality assurance, continuous improvement and its services etc.

Chapter III: Profile of Krishi Vigyan Kendra Libraries:

Brief introduction along with detailed profile of KVK libraries are described in this chapter.

Chapter IV: Information Communication Technology (Research Methodology):

Comprehensive study of various facets of ICT and its application are accessed and evaluated with special reference to KVK libraries are taken into account in this chapter of the study.

Chapter V: Analysis and Interpretation of Data:

Tabulation, statistical analysis, graphical representation and interpretation of the collected data from KVK libraries are taken up in this chapter. It deals with application of ICT in KVK library services, staff and user satisfaction perspective etc. This hints at valuable suggestions and major findings of the study.

Chapter VI: Findings, Conclusion and Suggestions:

It deals with conclusion and recommendations of the study. Valuable suggestions are made for further research activities and application to day to day activities of those involved in agricultural activities.

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CHAPTER 1

Introduction

CHAPTER - I

INTRODUCTION

1.1 Evolution of Knowledge Centers through Ages:

Since dawn of Civilization, agriculture had been a prime concern of human existence and importance of any information related to it were equally significant and ancient. Great Civilizations like Mesopotamia, Mohan-jo-Darao and Harappa are indicative of agricultural activities having valuable agri-based information. that, "The great library at Alexandria undoubtedly had many treatises on agriculture inscribed on papyrus *(a material prepared in ancient Egypt from the pithy stem of a water plant, its sheets used throughout the ancient Mediterranean world for writing or painting)*". Throughout ages many civilizations had libraries that dealt with agricultural information. Later on, during mid-eighteenth century, independent agricultural libraries came into existence throughout Europe and USA. Before independent ,Evolution of infrastructure related to agricultural research was taken up as one of the most important domains . Indian Council of Agricultural Research (ICAR) was established on 16 July, 1929 with a motto *Agri search with a human touch* which nowadays functions as repository of information and provides consultancy on agriculture, horticulture, resource management, animal husbandry, agricultural engineering, agricultural extension, agricultural education, home science, and agricultural communication etc. It has mandated to coordinate agricultural research and development programs to promote linkages at national and international levels with concerned organizations to enhance the quality life of the farming community. ICAR has established various research centers in order to meet out the agricultural research and educational requirements of the country. It is prudently employing

human resource development in the field of agricultural sciences by setting up numerous agricultural universities and institutions spread throughout the country. First agriculture university **Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Uttarakand** was established on 17 November, 1960 with the motto *the prosperity & development of our village is the prosperity of our nation (ग्रामाभ्युद यादेत देशाभ्युदयः).* The Technology Intervention Programs also form an integral part of ICAR's agenda which makes Krishi Vigyan Kendras (KVKs) responsible for training, research, and demonstration of improved technologies to farming. The effort of universities, institutes and extension centers (viz. KVKs) culminated in Green Revolution, White Revolution, and Blue Revolution etc. Thus, state of food scarcity was transformed into self dependency and surplus food reserve to the extent that now we can export it.

Application of Information Communication Technologies for data enrichment in libraries for better research results, sustainable planning, command area development, water shed management, crop catchment area, Planning catchment area impart judicious balancing between practice and knowledge, natural resources sustainable range, surveying land resource use etc. can invigorate present scenario of agricultural community. In recent years, ICTs are increasingly being used to create and disseminate agricultural and climate information to rural regions for *enlightened approach* to over population, climatic condition and contamination free use of pesticides and insecticide. This can be further supplemented by organic farming and energy management. There is need for having a global perspective in any evolutionary effort so that *ease* of a segment of society may be *unease* to another.

1.2 Library:

Latin word *libraria* 'bookshop', feminine (used as a noun) of *libraries* 'relating to books', from *liber, libr-* 'book' whereas, a Latinized Greek word *bibliotheca* is the origin of the word *library* in German, Russian, and Roman languages.

Traditionally, *Library* refers to a building, room or space having collection of books, periodicals, journals, sometimes VCDs and CDs for use or borrowing by public or its members. Currently libraries are equipped with Information Communication Technologies/Tools like- computer, internet, library software, databases, multimedia tools, cloud computing etc. Judicious use of these tools in association with Total Quality Management (TQM) can result in providing efficient service to the users.

1.3 Information Communication Technology (ICT):

ICT is a term having broad perspectives that encompasses any communication or application device viz. radio, television, cellular phones, computer hardware/software, internet, satellite systems as well as the various services and applications associated with it e.g. databases, cloud computing, Modes of distant communication like video-conferencing, e-learning, distance education etc. Relevance of ICT to under privileged communities relies less on technological advancement rather than its compatibility to disseminate easy access of information and communication to them. This is the reason that most of the countries are promotioning organization, related to development of ICT infrastructure and comprehend that only by this they can update with the available facilities. United Nations actively promotes ICTs as tool for development and bridging the digital divide.

1.4 Krishi Vigyan Kendra (KVK):

KVKs were established on the recommendations of the Education Commission (1964-66), which were reviewed by the Planning Commission and Inter-Ministerial Committee. Thereafter, Dr. Mohan Singh Mehta Committee, appointed by ICAR in 1973, proposed further recommendations. The first KVK was established in 1974 at Pondicherry under Tamil Nadu Agricultural University, Coimbatore.

KVK are *Farm Science Centres* or *Agricultural Extension Centres* funded by Indian Council for Agricultural Research (ICAR). KVKs focus to bring latest technology to farming, engage in training farmers and extension functionaries, to inform weather conditions, to impart knowledge about best practices in farming and related activities etc. The KVKs are grass root level institutions designed and devoted to impart need-based and skill-oriented vocational training to the practicing farmers, and to those who intend to go for self-employment through *'learning by doing'* also.

1.5 Objective of Information Communication Technology in Libraries:

ICTs have tremendously rationalized the Management of Resources or House Keeping Operations of the libraries as well as the mode through which services are delivered. IT application tools and Integrated Library Management Systems are largely used in housekeeping operations, like acquisition, cataloguing, circulation control, serials control etc. while Internet is extensively used as resource as well as tool of delivering Library and Information Services (LIS).

One of the prime implications of ICT in specific context to LIS is that Libraries can globally reach out to offer 24-hours services in a cost effective way. It enables users to avail services without intervention, the role of LIS professional is shifting from intermediary to facilitator.

Society has passed through significant changes during last sixty years, specifically in Information and Communication Technology (ICT). It brought revolutionary changes in almost every aspect of life. Through ICT libraries not only witnessed dramatic changes in their daily operations and services but also devised innovative and active roles for librarians, library staff and its users. Automation is an important application of ICT in libraries which facilitates speedy library operations, services, and dissemination of information.

During last few decades, numerous reform initiatives were taken up in agricultural extension services. Agricultural extension literature had been published and circulated by State Agriculture Universities (SAUs) and ICAR institutions in the form of pamphlets, technical bulletins, kisan diaries, popular articles, kisan mela (farmers fair), training programs, subject expert lectures/talks on radio & TV etc. KVKs too organize these.

Glendenning, Babu, & Asenso-Okyere, et al (2010) studied Indian Agricultural Extension activities with special reference to information need of the farmers. The study points out that conventional approach of agriculture extension system has produced numerous success stories, but it also has serious limitations for sustainable agricultural growth and poverty reduction. It failed to percolate to the farmers who need information to improve their productivity and have access to wealth. The study also mentioned that 'the success of an extension approach will depend on how it enhances the *Information Flow* along the agriculture value chain'.

In the present age of ICT, information has become a vital source for world economy, science, technology, education, research and development. ICT has penetrated to village level as most of the villages are inter-connected through

telecom/mobile phones as well as Internet. Community Radio started at KVKs has also been popularized among farmers by the State Agriculture Universities (SAUs).

A comprehensive study of ICAR in 2014 was conducted on the development and analysis of ICT initiatives in agriculture to meet out the information needs. It covered 26 ICT initiatives to sort out the gaps between agricultural research and farmers. The study revealed that Mobile is the most popular ICT gadget followed by TV and Radio. Furthermore, the study suggested complying farmer's queries through multimedia mode i.e. audio mode (in local language) along with text, image and video. Agropedia is such a platform which has been developed by Indian Institute of Technology, Kanpur under an ICAR Project as a semantic web portal for agricultural extension content and interaction.

Under National Agricultural Technology Project (NATP) and National Agricultural Innovative Project (NAIP), ICT infrastructure in all ICAR Institutions, Agricultural Universities and Agricultural Extension centers has been developed. Though Government agencies transfer agriculture information and technology in Rural India through KVKs, Krishi Raksha Ekai, Block Level Offices, and ICT but latest agricultural research information and technology is not timely delivered to the farmers. Farmers access agricultural extension literature through print media too. Information Literacy campaign through ICT can play a vital role in agriculture extension KVKs.

Rapid dissemination of technological information from Agricultural Research System to the farmers and reporting back i.e. for transfer of agriculture technology, Agriculture Research Systems have to serve as a bridge between 'technological information' and 'feedback from farmers'. So far, since independence technological information and communications support had been conventional. For dissemination of

technological messages Department of Agriculture adops manual mode of communication i.e. person to person content among extension personnel and farmers. This mode of transmission had regulated in limiting the spread of information and majority of farmers scattered throughout India could not be reached and posed a challenge to the Contemporary Extension System. Extension personnel responsible to deal at the grassroot level are neither aware of the diversified needs of the farmers nor the knowledge to redress it.

Crick, Noble laureate who decoded the 'molecular structure of DNA' once opined "Communication is the essence of Science" (Crick, 1979). His observation hints to the relevance of understanding the meaning and process of communication. It points to assess two important domains of communication. How and in what form the information is acquired from its various resources; and the mode or process through which it is made available or shared with others. Communication process complete only when one mind successfully shares its ideas and thoughts to another.

1.6 Concept of Information Communication Technology in KVK Libraries:

Agriculture extension centers/KVKs workers cannot reach every farmer and farmers too have limited access to agriculture extension centers/KVKs. Hence there is a restricted flow of latest agricultural technologies and other related information. There are enormous and unlimited modes of information/knowledge sharing because of multiple channels of its transfer from creater of information to its users as variety of Multi-media system based on technology are available. In addition to this, it is pertinent to be aware of the ground reality that majority of farmers scattered in different parts of India are information illiterate and devoid of Internet access. Public libraries too lack useful information. They have to play a crucial role in bridging this gap in technology and information on one hand and its users on other end. Digital

libraries can play a leading role. NICNET (National Information Centre Network) in association with libraries can work together to reach widely catered formers.

No serious thought has even been given about collaborating with library services in improving the transfer of agricultural information. ICT can strengthen Libraries can be of great help in promoting sustainable development farmer training Institutes in collaboration with the libraries can augment function literacy programs conducted at aforesaid institute. Abstracts and summaries of the new arrivals developed at the libraries should be made available to the extension personnel and the farmer. Literacy improved among farmers is core basic need of any development programme at national level.

Various organizations scattered at different parts of India e.g. Gyantdoot.net of District Administration, Dhar (M.P.); National Institute of Agricultural Extension Management (MANAG); M.S. Swaminathan Research Management (MSSRF); Local Loop based Village Kiosks (wireless) EID-Parry's at Cuddalor, M.P. and National Information centers wired villages at Kolhapur - Sangli Districts of Maharashtra etc. are in the process of evolving a network of village level information centres/shops. Initial efforts in this directions indicate that in order to sustain these centres have to incorporate value based information like bus/railways timetable, market price: whether forecast local information too along with agricultural information. Village level kiosks can be self sustainable only when they add e-government services in collaboration with information communication. These can gain additional support if it can generate job opportunities for few local youths.

Problems faced by agricultural research centers and organizations concerned with utilitarian approach of dissemination of its information are identical. Rapid population growth accompanied with limiting natural resources and increasingly more robust and

responsive agricultural sector Agricultural activities should be supported by making relevant information easily and widely accessible to those who can improve there skill and production by applying it. Coordinated multidisuplimanry agricultural development evaluation of resources in terms of quantity and quality as well as contemporarily used and potentially available should be made for enhancing production. Specific information systems devoted to the development of agricultural resources making use of latest information technology is the need of the hour. Hereby, few such systems are referred to as following:-

• Data warehousing (Data Bases & Model Bases)

• Expert Systems & Knowledge Bases

• Networking (Internet, Intranet and Extranet)

• Geographical Information System (GIS)

• Application of Remote Sensing Data

• Multi-media Information System

• Decision Technology System

• E-Commerce & E-Governance, and

• Digital Library / Virtual Library

1.7 Objective of the Study:

This study aims to observe ICT implementation in KVKs Library and its effect to staff and users. Following are the main objectives of the study-

1. To find out the information communication technology infrastructure available at KVKs libraries.
2. To explore the collection and services offered by the KVK libraries to the users.

3. To investigate the use of ICT in the various areas of library operations and services.
4. To explore the process of information collection, storage, retrieval and dissemination.
5. To find out the problems faced by the libraries in the implementation of the Information communication technologies in the KVK libraries.
6. To explore the facilities and opportunities for training and self-development of library staff.

1.8 Hypothesis of the Study:

"The hypothesis is a tentative generalization, the validity of which remains to be tested. In its most elementary stage, the hypothesis may be in hunch, guess, and imaginative idea which become the basis for action or investigation." George A. Lumberg

The following hypotheses are formulated.

1. It is presumed that adequate information communication technology infrastructure is available in KVKs libraries.
2. Majority of libraries use of ICT in the various areas of library operations and services.
3. Few of the libraries faced problems in implementation of the Information communication technologies in the libraries.
4. The facilities and opportunities are available for training and self-development of library staff.

1.9 Need of the Study:

This study aims to assess ICT enabled KVK libraries and Information services. It examines the primary way to learn about ICT enabled KVK library

services, to assess the extent to which users utilize ICT based library services and facilities, various aspects of Internet usage, and related problems. The study also evaluates the satisfaction level of the users and gets suggestions to make the services more beneficial for the library users of KVK.

Information is indispensable for human development as air is essential for the survival of all living beings. The pace of change brought about by new information technologies has a key effect on the way rural people live, work, and progress. It also examines the increasing role played by information technology in the development of KVK library services for an active responce to the challenges of farming society. The study attempts to discuss the rapid development of ICT and its application in the KVK library services to fulfill the information needs of the users and deliver it at the right time and place.

1.10 Scope of the Study:

The scope of the study is to examine the present status of KVK libraries and to suggest a model for their development, so that the libraries can meet out the challenges of information dissemination in the electronic era. The parameters investigated include the professional staff working in libraries, collection, budget, automation and level of computerization existing in the libraries. The data is collected with the help of two different questionnaires- one for librarian and the other for the users.

The scope of the study is limited to the ICT applications in the Krishi Vigyan Kendras libraries of India. There are eight zones having 630 KVKs spread throughout 29 states and 7 Union Territories of the India. The study is confined to collection of data from 3-5% of the population. The following zones have been considered for the study.

ZONE-I

- Punjab
- Haryana
- Delhi
- Himachal Pradesh
- Jammu and Kashmir

ZONE-II

- West Bengal
- Andaman and Nicobar Islands
- Bihar
- Jharkhand

ZONE-III

- Assam
- Arunachal Pradesh
- Manipur
- Mizoram
- Meghalaya
- Nagaland
- Sikkim
- Tripura

ZONE-IV

- Uttar Pradesh
- Uttarakhand

ZONE-V

- Andhra Pradesh
- Telangana
- Maharashtra

ZONE-VI

- Rajasthan
- Gujarat

ZONE-VII

- Madhya Pradesh
- Chhattisgarh
- Orissa

ZONE-VIII

- Karnataka
- Goa
- Tamil Nadu
- Pondicherry
- Kerala
- Lakshadweep

1.11 Importance of the Study:

Agriculture is the core sector of Indian economy. In Indian economy the proportion of different sectors in Gross Domestic Product (GDP) is Agriculture (**17.9%**), Industry (24.2%) and Services (**57.9%**). Hence, it contributes about 17.9% of Gross Domestic Product and 70% population depends on agriculture for their livelihood. So growth in productive capacity of the agricultural sector is vital for development of the country. Technological transformation can boost this sector which

consists of improvements in material inputs, farming techniques, storage technology, marketing and research. Effective integration of these factors is closely linked to adequate information flow, which can only be ensured by an efficient agricultural information system.

Numerous studies were conducted on total quality management, ICT, development of information system, resource sharing and networking in the context of special libraries serving engineering, medical, management, and Information technology etc. In foreign countries, various studies were carried out in agricultural information system but in India there is paucity of research work on agricultural library and information system.

In-depth study of libraries and information services provided by KVKs requires plenty of time to examine it carefully. An evaluation of the achievements and failures of such systems are essential to formulate realistic norms for their healthy growths. This needs a systematic study of the resources, organization, and services of various representative libraries serving different functions related to agriculture and its subsidiaries.

1.12 Limitation of the Study:

In India, most of the ICT enabled agricultural extension projects like KVKs were initiated as *pilot projects* and thereafter with passage of time many of them were never pursued on larger scales. Efforts for furtherance of pilot projects were never seriously implemented by responsible authorities. In India the agricultural advisory services are welfare activity of the state and central governments (Saravanan, 2011). The ICTs for KVKs were implemented in a very limited geographical area. Nevertheless, agricultural and farming communities, as a whole, do not adopt new ICT tools and systems to the extent required for substantial agricultural development.

Exceptionally, a few projects like Kissan Call Centers (KCCs) and e-Soil health card programme encompass entire country. Few web portals are developed for larger farm stakeholder like- e-chaupal, e-Krishi, TNAGRITECH Portal, Agropedia and AGRISNET portals etc. However, continuous updating and maintenance of web portals requires sufficient resources which, in most of the cases, were not ensured persistently. In most of KVKs inclusion of agricultural education and research appeared to be marginal. Most of the KVKs do not have collaboration with other farm research and extension stakeholders. Practical challenges in implementing the ICT projects were seldom disclosed or shared with others. Learning experiences were rarely shared among projects. Most of the projects never disclosed their actual results and reported only positive aspects. Most common constraints such as inadequate rural ICT infrastructure, frequent power cuts, and lack of skilled man force are indicated. In spite of experimenting with hundreds of ICT projects for rural development over the last two decades, there was no trustworthy comprehensive comparative evaluation of KVKs projects in India.

1.13 Research Methodology:

Methodology is a systematic, theoretical analysis of the methods applied to a field of study. It includes the process used to collect information and data for the purpose of arriving at a conclusion. It may include publication of research, interviews, surveys and other research techniques. It consists of both present and historical information. It is applied to most of the fields and beneficial to understand the concept. It means description, explanation and justification of the methods and steps used to collect data, analysis or derivation of results. Research promotes growth of knowledge and expands its boundaries thereby enables to resolve his problems. Progress of society largely depends on it. It aims to critically and

exhaustively investigate to arrive at new facts, interpret, formulate new laws and theories and finally apply the conclusions. Impact of research gets precipitated in collective memory of the society, books etc. It is scientific, calculated and subtle way of reflective thinking utilizing specialized tools, instruments and procedures with an objective to solve a problem. Research on any specific topic poses a basic initial question as to what methodology of research will be most effective and relevant to the issues of research being undertaken.

Questionnaire Method is used in this study. 3-5% of the existing KVK libraries were surveyed by using questionnaire as a survey instrument. The questionnaire was prepared taking into consideration the objectives of the study and it were distributed to the selected KVK Librarians by post or personal contact.

The questionnaire consisted of open and closed ended questions having multiple choice response options. The variables evaluated in questionnaire for librarians include number of books, infrastructure, status of ICT application, facilities provided by library, LMS, stage of automation, budgetary provisions, training programs for users and staff, satisfaction level and problems of the users and staff etc.

The study deals with the analysis and interpretation of data which were collected through Questionnaire. The data analysis means systematic gathering, recoding, manipulating and summarizing of data to obtain answer to the research problems. The collected data has been organized and tabulated and thereafter presented in bar charts, pie charts, and histograms etc. The purpose of this is to shape data to comprehensible and interpretative forms so that the relation of research problems can be studied and tested. Collected data were also put to statistical analysis using frequency counts and percentage etc. to reach at a conclusion.

1.14 Problems in Data Collection and Its Resolution:

While surveying KVK libraries various difficulties were encountered during the data collection. Common problem encountered was paucity of time allocation by KVK librarians to the questionnaire which appeared to them as exhaustive. Few KVKs were located in remote areas where the transportation was not easily available. In spite of having prior appointments, at two KVKs a second round of appointments was necessitated because of absence of the librarian. In south India language barrier was encountered at one KVK. At most of the KVKs, poor and hypothetical documentation was provided by the staff.

1.15 Chapter Plan:

The study consists of *six chapters* inclusive of the present one.

Chapter I: **INTRODUCTION:**

This deals with objectives, hypothesis, scope, limitations, significance, and research methodology etc. of the study. Nature of collected data as well as statistical techniques used for its analysis is described within this.

Chapter II: **REVIEW OF LITERATURE:**

Empirical studies conducted in Information Communication Technologies and its application in libraries especially in KVK libraries, quality assurance, continuous improvement and its services etc.

Chapter III: **PROFILE OF KRISHI VIGYAN KENDRA LIBRARIES:**

Brief introduction along with detailed profile of KVK libraries are described in this chapter.

Chapter IV: **INFORMATION COMMUNICATION TECHNOLOGY (RESEARCH METHODOLOGY):**

Comprehensive study of various facets of ICT and its application are accessed and evaluated with special reference to KVK libraries are taken into account in this chapter of the study.

Chapter V: **ANALYSIS AND INTERPRETATION OF DATA:**

Tabulation, statistical analysis, graphical representation and interpretation of the collected data from KVK libraries are taken up in this chapter. It deals with application of ICT in KVK library services, staff and user satisfaction perspective etc. This hints at valuable suggestions and major findings of the study.

Chapter VI: **FINDINGS, CONCLUSION AND SUGGESTIONS:**

It deals with conclusion and recommendations of the study. Valuable suggestions are made for further research activities and application to day to day activities of those involved in agricultural activities.

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CHAPTER 2

Review of Literature

CHAPTER - 2

REVIEW OF LITERATURE

2.1 Introduction:

Before plunging into **Literature Review**, it is worthwhile to look at what is it? Term **Literature** derives from Latin literatura/litteratura primarily means "written texts out of letters" although sometimes spoken or some text are also included in it. It may or may not have literary merits and can broadly be divided into two sub group viz. fiction or nonfiction. Sub-genre fiction takes into account aesthetic, nonfactual, imaginative, subjective literature e. g. prose, poetry, and novel etc. whereas nonfiction deals with realistic, factual, objective literature e. g. journalism, scientific, academic writing etc. Literature in our context refers to already existing works or information resources pertinent to the research- theoretical (idea based) or empirical (data based).

Earliest civilizations of the world, Egyptian and Sumerian, produced Literature as body of written works in 4000 BC. If spoken or sung texts, pre-existing in oral tradition, are taken into account span of Literature may go beyond 4000 BC. Literature in written form has traversed a long distance starting from clay tablets to electronic printing.

Significant connotations of term **Review** are evaluation, study, look over, examine, critical reporting, retrospective consideration, subjecting to formal inspection etc. Review aims to describe, summarize, evaluate and clarify any specific field of study.

Review of literature dealing with research has specific requirements inclusive of identification and articulation of relationships between the literature and area of research. Strategic approach of literature review may differ but most of the time core

objectives remain the same such as contextual relationship justifying the research, non-replication of the study, correlating with existing subject related knowledge, empowering the researcher, suggesting the line of action to be followed indicative of its strength and weaknesses, utility of the research in hand etc.

Prime objective of review of literature is to focus on a specific subject literature information published in time span. It can simply be just a summary of the sources having an organizational pattern combining summary and synthesis. Summary is a recap of significant information while synthesis is its reorganization and reshuffling. Thus, literary review yields to new interpretation of already existing material. Literature review traces progression of ideas and suggest the most relevant and pertinent ones. Literature review surveys all related, relevant literature of a particular topic to ascertain as to what is known and what is not?

Academic research paper contains literature review as one of its parts attempts to arrive at a new argument using literature as basis for a new insight focusing on to summarizing and synthesizing others arguments without addition of any fresh contribution.

2.2 Purpose and Approach to Literature Review

Prime objective of the literature is to locate the research in hand with the pre-existing research works. It should aim to-

• identify 'the gap' in the existing knowledge.

• indicate where research fits in.

• indicate the necessity of research.

The purpose of literature review is to collect the potential topics and arrive at new ideas for any research with the help of reported published materials, theories, techniques, processes, styles and works of other scholars. At the same time, it should

strive to identify literature which makes important theoretical contributions to the field of study. It helps to align our scope of study and identify various variables. Main purpose of literature review is to grasp comprehensive ideas.

Prior to selection of the material for research literature review it is advisable to think of following aspects-

• Facts already known about the field of investigation.

• The key concepts, factors or variables.

• The existing theories.

• The inconsistencies, limitations or problems in the existing research

• Pre-existing knowledge related to the study.

• Reason of taking up the study.

• Utility of the study.[2]

2.3 Review of Literature

Review of literature is one of the important aspects of research. Generally, literature study is conducted with an objective to comprehend the precedent efforts made and to identify the various untouched facets of the study. It also helps in formulating a suitable research methodology.

Review of literature also reflects the latest trends in research. Review of the literature was made to examine the role of professional associations and institutions, specifically in the development of Library and Information Science. Reviewed literature is enumerated as following:

Concept of application of Knowledge Clouds at the Community Level is considered in depth by **Das, Anup Kumar** (2010) in his Study of *"Library Advocacy in India in the Light of Education for Sustainable Development – Perspectives of an Emerging Economy".* With an objective of minimizing knowledge gap and digital

divide at community level, specifically in rural areas, various community focused initiatives have taken place in last few decades. A comprehensive approach is knowledge cloud With the help of rural/community libraries, KVKs, (Krishi Vigyan Kendra) Agricultural extension centres, VKC (Village Knowledge Centre) CIC (Community Information Centre) etc. Information is being provided in rural/semi-rural area throughout the country. Aforesaid Centers are managed by various organization like NGO's academic institutions and Government Departments. Few of them are operated by public-private partnership/Collaboration (P.P.P.) .

'Providing Urban Amenities in Rural Area' (PURA), a term coined by Dr. A.P.J. Abdul Kalam reflect which, in essence, refers to inclusive growth strategies and a building block for knowledge societies of India. Various social missions like 'Information for All', 'Education for All', 'Health for All', 'Every Village a Library/ Knowledge Centre', 'No School without a Library' are supplemented by it. Several organizations like the United Nations (U.N.) Govt. of India (G.O.I.) and advocacy grows incorporate these core objective with them. Prevailing supportive environmental policy making for public should be utilized by library association and staff leadership.

Sustainable development incorporating woman empowerment and marginalized community making use of education offers new dimensions and strength to youth which is only possible through evolving globalized knowledge economic with the contribution of humanist social thinkers like Abdul Kalam; Sam Pitroda; M.S. Swami Nathan,: Nandan Nilekani; Narain Murthy and Significant personalities of library advocacy programmers with specific reference to rural areas.

The study of **Saravanan, R.** (2010) is a precise review of integration of application of ICT in agricultural research and extension systems, digitization and

specific content generation, research integration, technology solution service provider, traditional extension methods, and innovation and refinement etc. ICT for agricultural extension centres need to be compared and objectively evaluated. Low cost ICT tools like mobile phones are more promising for agricultural extension.

ICTs are moulding several facets of human lives agriculture is no exception to this. ICT enabled extension systems like KVK are going to be key players of changing agrarian society by providing access to relevant information and knowledge sharing. This led to multiple e-initiative pilots related to rural India. Innovative implementation of ICT for delivery of agricultural information is in process of experimentation. Libraries related to agricultural extension centres/KVK should go ahead in integrating ICT and Information and Communication Management (ICM).

ICT is likely to play major role in agribusiness, market information, market intelligence, government schemes, weather forecasting, farming information etc.

. "*On celebration of 50th year of Indian Independence, NCAP (National council for agriculture planning) organised a seminar in 1998 under aegis of ICAR (Indian council for agricultural research)"*- **Barah, B. C.** pointed out the natural advantages of eco-regional approach and appreciated ICAR's initiatives to adopt the concept to tailor research programmes under NARP (national agriculture research program) and now NATP (National Agricultural Technology Programme). It was recognized that political and administrative aspects continue to be the basis of planning while there is minimal analytical capability at lower levels which constrains effective articulation of local needs. The KVKs (Krishi Vigyan Kendra) and zonal research stations should play a pivotal role using ICT in association with Panchayati Raj institutions and NGOs.

Yadav, Kiran et al (2014) in her study under project 'ICTs in Knowledge Management: A Case of Agropedia' dealt with application of ICT in Knowledge Management about Agropedia. In India millions of small and marginal farmers- illiterate, devoid of resources, having no access to modern technologies- are involved in complex enterprise of Agriculture. Agropedia aims to be a single window service for information and knowledge (pedagogic and practical) related to Indian agriculture thereby an audio-visual encyclopaedia, to enchant, educate and transform the process of digital content creation and organization completely. Thus, Agropedia is the knowledge hub for Indian Agriculture.

Knowledge Management (KM) is a challenging task in Indian agriculture as those involved in it must be brought together for information sharing and solving local problems. Connecting people to a common knowledge platform with the help of Information and Communication Technology (ICT) is not that difficult. KVKs are in a way material realisation of these concepts and ideologies. The line of action suggested by Kiran Yadav is highly relevant and application oriented for KVKs library.

In a case study under project eArik, **Heeks, Richard; Ospina, Angelica Valeria;** refer to 'climate smart agriculture'- that increases sustainable productivity, adaptation, diminishes greenhouse gases, and empowers national food security and development objectives. Study suggests usage of local knowledge for climate change adaptation, prioritises appropriate ICT, and convinces farmers. Suggestions can be implemented at KVK in the Indian context where climatic conditions are diverse and highly unpredictable.

Study of Chauhan, Prakash Buddhi (2004) 'ICT Enabled Library and Information Services' states that ICT application in information services can broadly

be explained by 4 Es- economy, ease, extension/expansion, and efficiency. ICT enabled LIS can be categorized into two groups- conventional LIS and ICT enabled services. Conventional LIS considerably improved by making use of OPAC, User Services, Reference Services, Bibliographic Services, Current Awareness Services, Document Delivery, Inter-library loan, Audio-Visual Services etc. Efficient customer relations can be had by providing cost effective, prompt, and time saving, dissemination of information by making innovative use of ICT.

Jayade , K.G.; Khot, P. G. (2013) in their study of 'Information Communication Technology in Agriculture Research in India' refers that in recent times ICT is being used in mechanization, automation, developing specialised support system, GIS, Remote Sensing etc. for making strategic decisions pertaining to boasting agricultural production. Remote Sensing and Geographic Information System play important role in agriculture research especially in enhancement of yield, suitability of soil for specific crop, integrated pest management, water management, agriculture inputs etc. During past six decades significant progress has been made in agriculture but still there are numerous challenges like scarcity of land, resources and high population etc. need to be addressed to make India a developed nation.

Utility of Information Communication Technology (ICT) as a powerful tool of delivery of services having potential to organise information and knowledge in realm of agricultural research and its dissemination to the farmers is well recognised.

The stakeholders are academicians, state extension agencies, agribusiness institutions, media, financial institution, meteorological department, national planners, research managers, scientists, farmers, co-operatives, agricultural consultants, farmer's organizations, unemployed agriculture graduates, non-government

organizations, Krishi Vigyan Kendras (KVKs) etc. This can also lead to global collaboration in research and development in field of agriculture.

Vayyavuru Sreenivasulu; Nandwana, H.B. (2001) point out in their study "Networking of agricultural information system and services in India" that wide range of issues related to Agricultural Research Information System (ARIS) of ICAR. Application of information technology in Agricultural Libraries of India is incorporated in this study. This is highly relevant to KVK libraries.

Four major modules of Agricultural Research Information System Network (ARISNET) - Agricultural Research Personnel Information System (ARPIS), Agricultural Research Financial Information System (ARFIS), Agricultural Research Library Information System (ARLIS), and Agricultural Research Management Information System (ARMIS) - respectively deal with Personnel, Financial, Library and Management Information Systems.

National Agricultural Research System (NARS) with its diversified network of ICAR's Central Institutes, Project Directorates (PDs), National Research Centres (NRCs), All India Coordinated Research Projects (AICRPs), Krishi Vigyan Kendras (KVKs), State Agricultural Universities (SAUs), Zonal Research Stations (ZRS), Central Agricultural University (CAU), numerous regional stations and other research centres have access to information at local, national and international levels. The role of agricultural libraries and information centres is vital for developing a nation-wide agricultural information network having electronic platforms like Digital Libraries at different levels. Kishan Vikas Kendra has to coordinate and disseminate information between farmers and research centres.

Vinita et al (2006) conducted a study on "Impact of Information and Communication Technology on Library and its Services" which cites that the

advancement of science and technology has culminated in overall improvement of quality life. Information technology has become synonymous to modern life and gets globally expressed in all walks of life. Impact of ICT and its innovative application in library services is explicitly expressed in this study. Infrastructure, staff support and budgetary aspects about Indian context are discussed in detail.

Bagga, Meeta's (2010) study entitled 'A way to empower Krishi Vigyan Kendra' is something like a SWOT analysis of KVK which points out that more than 500 KVKs are operative throughout India in various zones but they failed to address farmer issues because of inefficient connectivity to remote areas. Innovative evolution of a solution inform of KVK was jointly developed by Indian Institute of Technology Kanpur (IITK) and Zonal Project Directorate Zone 4 (ZPD) Kanpur to meet out this deficiency.

VKVK- an ICAR initiative to empower India's Krishi Vigyan Kendra- stands for Voice/Virtual Krishi Vigyan Kendra (http://vkvk.in). It aims to help the VKVK scientists and farmers to communicate through cell phones. It is a mobile based advisory system that sends SMS and voice-based messages to field officers and farmers. It empowers Krishi Vigyan Kendra to communicate competently with registered farmers via three mediums- voice, SMS and email. Weather forecasting, answer to FAQ of the farmers by the experts, broadcasting advisories and alerts etc. are possible through it. Concluding part of the study deals with few pertinent initiatives of agriculture like Agropedia (one-stop hub for information on the agriculture ecosystem), Openagri, Agrotags.

Study of Kamani, Krunal; Kathiriya, Dhaval; (2013) *'Cultivate ICT & Networking: The Role of Social Media in Agriculture'* deals with key concepts of social media and its tools in relation to agriculture- a core sector in most of the

developing countries which feeds the citizens. For having significant productivity and livelihood easy access to agricultural research and information to the agriculturist is a must. Traditional modes of disseminating agricultural information like newspapers, television, and magazines etc. are replaced by various ICT enabled forms of social media- Twitter, WhatsApp, LinkedIn, Agropedia, and Facebook etc. Farmers, agricultural scientist, extension staff, KVK and its library can creatively connect and communicate in resolving farming issues making use of social networking sites.

Mohamd, K. Hanefaa (2007) conducted a study "Use of ICT base recourse and services in special libraries of Kerala" which refers to analytical presentation of ICT enabled services and recourses used in special libraries of Kerala.

Thyagaraj, C.R. et al (2009) point out in their study 'KVK Three decades in services of farmers of Ranga Reddy district' that with the application of ICT it is now feasible to reach at large target clientele with the help of web and mobile technology. These can play a vital role in better communication activities between farmers and extension workers at KVK. Study points out that KVK Ranga Reddy was selected by ICAR as one of the 200 KVKs to receive the "e- connectivity- Information hub". It received a server, five desk tops with laser printer, scanner, V-SAT connectivity and ERNET linkage. This study hints at various possibilities of better client-oriented service at KVKs and its libraries.

Study conducted in 2014 by ATMA (Agriculture Technology Management Agency) under NMAET (National Mission on Agricultural Extension & Technology) suggested guidelines of wide applications specifically to agricultural extension staff and KVKs. It pointed out several issues faced by them and makes an effort to integrate problem solving skills of KVKs, feedback provided to State Agriculture

Universities (SAUs) and National Agriculture Research System (NARS), strengthening of district level planning, application of ICT to communicate with the farmers, empowering them to manage livestock and fisheries resources, raising sustainable incomes, support decentralized participatory research, linking marginalised farmers with the market, prudent water resource management etc. KVK plays a linking role between Research System/Research Agencies and farmers by disseminating information with its ICT enabled library and network systems.

The study considers various steps and means of restructuring and strengthening agricultural extension capable to provide meaningful technology and valuable agronomic practices to those involved in agribusiness. Kisan Call Centres (KCCs) are significant integral part of KVK and its diverse activities.

Kumar et al (2009) in the study 'Approach to ICT in Library Training, Education and Technology: Issues and Challenges' discuss various issues related to interplay of ICT and library in digital scenario. Library Information Service (LIS) is being transformed by technology and accommodating to the changes to meet out user needs. Rapid growth of ICT has generated new opportunities and challenges for traditional libraries.

Study of KVK, South Tripura reveals various activities undertaken by it and available infrastructure. It focuses on overall development of agricultural activities and farmers residing in NEH Region. In a way, close study indicates ideal state of functioning and infrastructures at a KVK as it is situated in ICAR Research Complex, Tripura. Study points out that this KVK comprises of training room, audio-visual aids, soil testing laboratory, automated library etc. and carries out Training Programmes, Front Line Demonstrations, Technology Information Spread, and Extension activities

like Kisan Melas, Study Tours, Field Days, Kisan Gosthi, Seminars, Workshops, Technology Week, etc.

A Study published by Kokate, K. D. (2014) dealing with 'MANAGEMENT OF KRISHI VIGYAN KENDRA (KVK)' enumerates various provisions like well-equipped library, laboratory and office equipment's, state-of-the-art ICT enabled communication facilities, effective tools, farm equipment's, machineries, and meteorological support system facilitating efficient daily activities, farming etc. It emphasizes frequent updating library infrastructure and its automation.

Kumar, Sampath (2012) conducted a study on 'Use of ICT in college libraries in Karnataka, India: a survey' which states that application of ICT in Indian college libraries is in a pathetic state. Insufficient budget, inadequate manpower, deficient skilled staff and lack of training are few of the significant constraints of non-automation of library activities. Study deals with investigation of ICT infrastructure, status and barriers of library automation, attitude of library staffs towards application of ICT, Design/methodology/approach, and Data-gathering tools etc.

Study of Sulaiman, R.V. et al (2011) deals with knowledge management which can implicitly be applied to information management related activities of KVKs and its libraries. The study on 'Tacit knowledge and innovation capacity: evidence from the Indian livestock sector' points out that Knowledge Management (KM) refers to generating, capturing and disseminating knowledge which of two types- tacit (context-specific personal knowledge difficult to share) and explicit (easy to articulate and transmit). Tacit knowledge enhances explicit knowledge by providing meaning to it, thereby supporting overall development of new knowledge. Ideas propounded in this study are of immense value to the information management at KVKs.

Study of Balaji, V. (2009) on 'The fate of agriculture' points out that day by day agriculture is getting highly complex, making access to reliable and relevant information in time, a prime necessity of the farmers. Farmers seek varied context specific information from various resources to cope with unpredictable weather conditions, improve crop yield, and handling of post-harvest activities like processing, marketing, storage, etc. Kisan Call Centres and KVKs should aim to make available aforesaid agriculture related information in agro-ecological settings. The study is indicative of role of web portals, VKVKs and KVKs in augmenting farmers and their farm related activities.

Sahoo; Tiwari (2013) conducted a study on 'Infrastructure and Use of ICT in University Libraries of Rajasthan'. It deals with the extent to which ICT has influenced functioning of the libraries. Libraries use ICT in housekeeping operations, services, uniformity and extension of library facilities. University libraries of Rajasthan use computer and associated technologies in library activities.

Samaddar, A. (2006) conducted a study on 'Traditional and post-traditional: a study of agricultural rituals in relation to technological complexity among rice producers in two zones of West Bengal, India.' It reveals that ICT is context specific rather than generic and capable to influence adoption of technologies specifically about functioning of KVKs thereby increasing farm productivity of marginal and small agricultural landholders.

Cecchini, S.; Scott, C. (2003) conducted a study on 'Can information and communications technology applications contribute to poverty reduction? Lessons from Rural India' which reveals that despite the potential cost and time associated with ICT enabled local context-based content, its access to marginalised farmers and empowering them to meet out their information needs is of outmost necessity.

Mittal, S. et al (2010) conducted a study on 'Socio-economic impact of mobile phones on Indian agriculture'. The study indicates that ICT is being extensively used

in information dissemination and training of the farmers in local language. However, farmers complain that information delivered to them through mobile phones is obsolete, generic and routine.

Study of Disterer, G. (2001) on 'Individual and social barriers to knowledge transfer' reveals that sharing of knowledge is not technical but a sociological challenge. There are many blocks which prevents effective knowledge sharing with in as well as out of the organizations. Sufficient empirical results exist to prove that cultural aspects like individual and social barriers are of critical significance for knowledge management initiatives.

Conclusion

India is a country of rural urban divide where maximum population lives in rural area. There are enormous differences between rural and urban on the basis of facilities like educational institutes, electricity, health facilities, road and transport etc. urban people are enjoying these facilities while rural are lacking most of them. Because of this differences are emerging between the regions. This is believed that rural people are facing problems of knowledge about modern tactics of life, these differences has created gaps among them. Government of India, has initiated various programmes to address these problems which are community-based programmes, public libraries, rural centres, Krishi Vigyan Kendra's, N.G.O.'s. Secondly literature high lights various programmes which guarantees urban amenities in rural areas (PURA) which focuses on right to education, right to health, right to information, to cover inclusive pattern of growth in rural areas by implementation of different policies under it. Government of India is targeting women and young youth by providing them opportunities to be self-reliant, development of ICT in libraries of KVK is one among them.

ICT has played pivotal role in executing its benefits to the agricultural sector, by wide innovations of new devices like computers, mobile phone devices, at vey minimum costs available to the public. Digitalization has helped agricultural sector much by promoting competitive marketing and has increased market value of the products. KVK is promoting agriculture by integrating ICT and its management with agriculture, Information communication management(ICM). ICT is likely to play major role in agribusiness, market information, market intelligence, government schemes, weather forecasting, farming information etc.

KVKs and ICT are working on promotion of common ideas at a common plate form at KVKs libraries. Concepts of sustainable agricultural promotion by ICT and KVKs by organising joint programmes on climatic change and food security in Indian context. KVKs are working on four grounds which are economy ease, extension, expansion, and efficiency of agricultural and simultaneously ICT is integrating it with conventional LIS considerably improved by making use of OPAC, user services, reference services, Bibliographic services, current awareness services like documentary etc. which promotes time saving and is also cost effective. ICT has used GIC and remote sensing for boosting agriculture but need of the hour is also to address the land and water scarcity. ICT is proving agricultural utilization services via KVKs libraries.

Lastly, some shortcomings of ICT and KVKs libraries are still prevailing to cover all issues of agriculture in a well-versed approach. The problems are KVKs libraries mostly failed in addressing the common issues of farmers at remote areas. Secondly KVKs has showed regional developments of certain region and average in other regions. KVKs are having budget issues at times to cover all important issues of the agriculture at point of time. Therefore, KVKs and ICT should work in more cooperation to address these issues jointly with proper planning.

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CHAPTER 3

Profile of the study Krishi Vigyan Kendra In India

CHAPTER - 3

PROFILE OF THE STUDY KRISHI VIGYAN KENDRA IN INDIA

3.1 Introduction:

The Indian Council of Agricultural Research (ICAR) is an independent association under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture and Farmers Wellbeing, Government of India. Previously known as Imperial Council of Agricultural Research, it was recognized on 16 July 1929 as a listed society under the Societies Registration Act, 1860 in achievement of the statement of the Royal Commission on Agriculture. The ICAR has its head office at New Delhi. The Council is the top body for organizing, managerial and handling research and education in agriculture as well as horticulture, fisheries and animal sciences in the whole country. Through 101 ICAR institutes and 71 agricultural universities feast across the country this is one of the major nationwide agricultural arrangements in the world. The ICAR has played a ground-breaking role in accompanying Green Revolution and consequent developments in agriculture in India through its exploration and expertise technological development that has allowed the country to increase the production of food grains by 5.4 times, horticultural crops by 10.1 times, fish by 15.2 times, milk 9.7 times and eggs 48.1 times since 1951 to 2017**,** therefore manufacture a visible impression on the state food and nutritious safety. It has played a main part in endorsing excellence in higher education in agriculture. It is involved in cutting edge zones of science and technological advancement and its scientists are globally recognized in their fields.

This study has been carried at all India level. We have designed it as the per zonal schedule of Indian council of agriculture research (ICAR). Below table shows us state wise total number of zones.

Table 3.1 State wise Number of Krishi Vigyan Kendras in India

Krishi Vigyan Kendras	**No.of KVKs**
ATARI, Zone I, Ludhiana – 69 KVKs	
Himachal Pradesh	13
Jammu and Kashmir	21
Punjab	22
Uttarakhand	13
ATARI, Zone II, Jodhpur– 63 KVKs	
Delhi	01
Haryana	18
Rajasthan	44
ATARI, Zone III, Kanpur– 75 KVKs	
Uttar Pradesh	75
ATARI, Zone IV, Patna– 63 KVKs	
Bihar	39
Jharkhand	24
ATARI, Zone V, Kolkata– 59 KVKs	
A & N Islands	03
Odisha	33
West Bengal	23
ATARI, Zone VI, Guwahati- 46 KVKs	
Assam	26

Arunachal Pradesh	16
Sikkim	04
ATARI, Zone VII, Barapani– 43 KVKs	
Manipur	10
Meghalaya	07
Mizoram	08
Nagaland	11
Tripura	07
ATARI, Zone VIII, Pune– 79 KVKs	
Maharashtra	47
Gujarat	30
Goa	02
ATARI, Zone IX, Jabalpur– 77 KVKs	
Chattisgarh	25
Madhya Pradesh	52
ATARI, Zone X, Hyderabad– 73 KVKs	
Tamil Nadu	30
Puducherry	03
Andhra Pradesh	24
Telangana	16
ATARI, Zone XI, Bengaluru– 48 KVKs	
Karnataka	33
Kerala	14
Lakshadweep	01
Total	**695**

In this table the following zones has been taken into consideration to analysis the structure of particular zone and district profile of the areas.

Table 3.2 ATARI, Zone I, Ludhiana – 69 KVKs

Name of state	Address	Year of establishment
Jammu and Kashmir	**Krishi Vigyan Kendra, Malangpura, PB. No. 1228, GPO Srinagar Distt. Pulwama-190 001**	**1983**
Himachal Pradesh	**Krishi Vigyan Kendra, PO. & The. Kandaghat, Distt. Solan 173215**	**2004**
Punjab	**Krishi Vigyan Kendra, Opp. DIPS School Nakodar Road, Noor Mahal, Distt. Jalandhar-144039**	**2006**
Uttarakhand	**Krishi Vigyan Kendra, Dhakrani, PO. Herbertpur, Distt. Dehradun248001**	**2004**

3.2 Jammu and Kashmir

From Jammu and Kashmir, we have chosen district Pulwama. KVK Pulwama was established at Malangpura in the district of Pulwama in the year 1983.It is about 10 km away from district head quarter and 50 Km from SKUAST headquarters located at Shalimar in the district Srinagar. KVKs in India has been promoted as an integral part for the development of agricultural research. National Agricultural research system (NARS) works for assessment of agricultural technologies by refinements and demonstrations. The main motive of KVK is to support as a knowledge power to agricultural centres at public, private sectoral levels. To improve agricultural sector of

the economy. Following are some of the activities which KVK Pulwama is doing for the benefit of agricultural farmers as well as for the development of district agriculture to generate efficiency and yield higher productivity. KVK Malangpura. (2017, January 3).

1. Location assessment and use of specific technologies in different farming systems.
2. Demonstrations to yield higher production from agricultural fields.
3. Capacity building programmes for the awareness of farmers to develop new techniques, skills, and knowledge in them.
4. Use of ICT to develop interest of famers towards new technology and its benefits.

Besides this KVK is providing high level information to the famers about high yielding seeds and other updated modern discoveries in the field of agriculture and helping farmers to get benefits from various government policies and schemes.

3.3 Himachal Pradesh

In Himachal Pradesh the Dr. Y. S. Parmar University of Horticulture and Forestry, Nauni, Solan. In 2004 this university got full-fledged Krishi Vigyan Kendra for Solan district of Himachal Pradesh. The vision of KVK is to work for better socio-economic conditions of farmers and social entrepreneurs on sustainable ground. Empowerment of rural communities by generating means of opportunities to increase their income from agriculture, production and productivity and use of different scientific ways to produce more. For these objectives the KVK is working simultaneously on various project-based schemes. KVK Kandaghat. (2004, February).

1. These programmes are initiated by various vocational trainings to farmers and allied enterprises.
2. Testing of crop production, livestock and horticulture production etc.
3. Frontline demonstration in agriculture and related activities, and
4. Training for in service officer for better understanding of agriculture and allied activities.

3.4 Punjab

Krishi Vigyan Kendra, Jalandhar which is located 40Kms from Ludhiana and 33 Kms from Jalandhar district. KVK Jalandhar is a district level institution mostly using innovative techniques to bridge the gap between production and productivity. This institution is imparting short and long-term training courses for farmers and women farms. This institute is directly interacting with farmers about recent scientific innovations and their practical's in the fields of agriculture and other farming activities. This institute directly works for the upliftment of farming community by applying scientific innovations in agriculture sector. Krishi Vigyan Kendra (KVK), Jalandhar. (2006).

During 10^{th} plan KVK were strengthen by working on technology assessment, demonstration, refinement of technology and its products.

1. Adaptability of new experiments and new methods of cultivation by small farmers.
2. soil and water testing before sowing crops.
3. school drop outs are also doing better by getting vocational trainings which made them self-employed
4. scientific based new seeds doesn't only increase production in agriculture but also improves the nutrient level in food consumption which makes them healthy.

3.5 Uttarakhand

Dehradun state is well known for its diversity, Agriculture including horticulture and animal husbandry is the backbone of Uttarakhand as more than 75% population is dependent on it. The agriculture crop however face challenges of low-productivity and poor quality in comparison to other states. Dehradun is having pleasant weather to increase agriculture and its productivity; therefore, it needs more advancements in technology and other innovative methods to gear up it constantly. The KVK has been established in December 2004.

The main aim of KVK is to promote and advance agriculture and its allied sectors in Dehradun district. The activities are based on assessment, refinement, demonstration and validation of training programmes in agriculture sector. The methods used are based on leaning by doing and learning by seeing in nature in crop production, vegetables etc. Agriculture is promoted by various means and techniques which is covering horticulture, fishery, product management, live stock to engaged all the related activities in agriculture on productivity grounds and ensure their full potential and efficiency. Which directly benefits farmer beneficiaries and improve the over all condition of the state. Welcome Krishi Vigyan Kendra, Dehradun. (2015, February).

Now we will discuss zone II which consists Haryana, Delhi and Rajasthan as per the designed schedule of (ICAR). This zone consists 62 KVKs. But for our analysis purpose we have chosen only three to check their workings progress and objectives for the promotion of agriculture in the country.

Table 3.3 ATARI, Zone II, Jodhpur– 62 KVKs

Name of state	Address	Year of establishment
Haryana	**Krishi Vigyan Kendra, IARI, Shikohpur, Distt. Gurgaon-122 001**	**1983**
Delhi	**Krishi Vigyan Kendra, Ujwa, New Delhi-110 073**	**1995**
Rajasthan	**Krishi Vigyan Kendra, Agricultural Research Station, Rajasthan Agricultural University Distt. Srigangangnagar-335 001**	**2004**

3.6 Haryana

KVK Shikohpur Gurgaon has been established in 1983 under Indian council of agriculture research. It has started function from1984. The main target of this KVK remained on particle. From time to time they have addressed many trainings on vocational grounds which are Vermicompost production technology, Commercial dairy farming, Mushroom cultivation Motor rewinding, Commercial cultivation of ornamental plants and flowers, Commercial nursery raising for fruits, flowers and vegetables, Dress designing, stitching & embroidery for better home management and to supplement the income etc. supportive trainings for Inservice agriculture field officers and farmers. KVK Shikohpur. (1984, February).

3.7 Delhi

Krishi Vigyan Kendra, Delhi was established by National Horticultural Research and Development Foundation (NHRDF) in February 1995 at Ujwa, Nazafgarh, Delhi. The main functions of KVK Delhi. To conduct inspection of location based specific technologies in agricultural land use. Front line

demonstrations to improve production. On regular basis organising trainings on advanced agriculture. Similarly, they are also focussing on short and long-term training courses to achieve higher growth rates and are generating self employed avenues for thee farmers. KVK Delhi beside training and other activities works as a knowledge centre which helps private, public and other involved sectors in agricultural economy at district level. Delhi KVK is working on Farm Trial, trainings and laboratory based praticles to motivate farms to adopt new farming techniques in the field of agriculture. KVK Ujwa New Delhi. (1995, February).

3.8 Rajasthan

Krishi Vigyan Kendra Rajasthan works for enhancement of agriculture Productivity by using optimum use of inputs on rationale costs of production. Awareness of IDM, IPM, INM water management in crops. It also supports unemployed youth. New agriculture techniques of organic forming and conservation of natural resources like soil and human sustainability. Use of Hi-technology in horticulture crops like micro irrigation and other cultivated technologies. Promotion of rural women and their income generations via entrepreneurship. Besides this use of communication technology and strength of agricultural development by enhancement of behaviour, leadership and attitude of working group.Swami Keshwanand Rajasthan Agricultural University, Bikaner. Rajasthan - Agriculture Education, Training, Research and Management Education. (1983, February).

Similarly zone III of the ICAR is the biggest state of India which consists Uttar Pradesh.

3.9 Uttar Pradesh.

Krishi Vigyan Kendra Lucknow Uttar Pradesh is promoting Indian Institute of Sugarcane Research, Lucknow. Lucknow KVK is working as one of the most scientific institute working on new innovations to improve socio economic conditions

of agricultural farming community. KVK was given to sugarcane research institute on 25th October 1999 with the aim to accelerate production and allied activities which will not only improve economic status of agarin community in the district but it will increase avenues for farming and agricultural beneficiaries in the area. KVK has been using improved technical programmes on the demands of farmers. Farmers wants to learn about new technology and wants to understand technical dealings. Welcome Krishi Vigyan Kendra, Lucknow. (1999, February)

KVK Lucknow side by side acts as a facilitator to the extension activities of other in line departments for the wellbeing of the farmers.

Table 3.4 District Profile Demographic features of the (District Lucknow)

Geographical area	2528 sq Km
Population	51.47 lakh
Population density	1816 per sq Km
Literacy rate	77.29%
Sex ratio	909:1000
Development blocks	08
Talukas (Tehsil)	04
Panchayats	511
Total villages	807
Total cultivated area	215280 ha
Net cultivated area	138148 ha
Net irrigated area	124000 ha
Small & Marginal Farmers	92.9% of total population
Average Land holding of Small & Marginal Farmers	0.8 ha
Cropping intensity	158 %

Table 3.5 ATARI, Zone IV, Patna– 63 KVKs

Name of state	Address	Year of establishment
Bihar	**Krishi Vigyan Kendra, Distt. Gopalganj**	**2005**
Jharkhand	**Krishi Vigyan Kendra, PO. Petawar, (Near block) Distt. Bokaro-829 121**	**2004**

3.10 Bihar

Krishi Vigyan Kendra established by Indian Council of Agricultural Research New Delhi in 2005 at Gopalganj district bhiar.follwing the government schemes and policies to reach people easily. The mandate given KVK Gopalganji is to transformer technology and its uses to the farmers. They are working on assessment, refinement and demonstration to up bring technology in agriculture sector and to ehance the farmers of the rural economy, women and school dropt outs. Krishi Vigyan Kendra, Gopalganj. (2005).

Table 3.6 District Profile Bihar

Heading	Description	Heading	Description
Area	2033 Sq Km	No. of Sub-Divisions	2
No. of Gram Panchayats	234	No. of Revenue Circles	14
No. of Blocks	14	No. of Halkas	101
No. of Towns	04	No. of Nagar Parishad (Gopalganj)	01
No. of Nagar Panchayats (Barauli, Kateya & Mirganj)	03	No. of Police Stations	18
No. of Police Out Posts	04	M.P. Constituency	01

3.11 Jharkhand

Krishi Vigyan Kendra Bihar and Jharkhand have a frontline programme on innovative models of ICAR. All KVK institutions have been ordered to follow up technology and evaluate it on the bases of refinement, dissemination and timely assessment. One more focused thing which KVK are following as per the guidelines of ICAR are to have farm testing, demonstrations, vocational tannings to farmers and engage rural youth and to facilitate the farms about digital services etc. KVK are stressing on localization of technologies and adopts new farming techniques and are using specific technologies to increase farmers productivity. Trainings for farmers on learning and doing theories. Organization of trainings on vocational grounds to increase their incomes. Organizing the kisan melas, farmer-scientist, field days and interface programmes. And lastly to conduct programmes via mass media like radio, T.V and other social media sites. Following are some of the major activities which KVK Bokaro is following. KVK Bokaro. (2018).

- Demonstrations on numerous crops to produce more production and literate them about ICT.
- short- and long-term vocational trainings for generating self-employment for rural youth and school dropouts.
- Organising new techniques of snowing seeds for better outputs.
- To act as a centre for knowledge and resource centre to promote agriculture in the district.

Table 3.7 ATARI, Zone V, Kolkata– 59 KVKs

Name of state	Address	Year of establishment
Odisha	**At. Krishna Chranpur, PO. Gopapur, Via Baramba, Distt. Cuttack**	**2006**
West Bengal	**Krishi Vigyan Kendra, PO.Jagatballavpur, Distt. Howrah-711408**	**2005**

3.12 Odisha

The Krishi Vigyan Kendra Cuttack was established at Santhapur in 1992.The KVK Cuttack, works under National Rice Research Institute (ICAR). KVK Cuttack main motive was to uplift the socio- economic conditions of the farmers of the district. Again, as per ICAR KVK Cuttack is working for refinement, demonstration and assessment on the bases of localization, farm productivity vocational trainings and knowledge sharing about various programmes to have over all development in the field of agriculture at district level. Trainings for farmers and field officers, knowledge awareness about new government initiatives and use of new technologies in the field of agriculture and allied activities and so on. Krishi Vigyan Kendra. (1992).

3.13 West Bengal

Howrah Krishi Vigyan Kendra established in 2005 by Indian Council of Agricultural Research (ICAR). KVK Howrah is following all most all the similar guidelines as that of other KVK in the state.

Table 3.8 District Profile West Bengal

Particulars	**Population**
Male	2241898
Female	2031201
Total Population	4273099
Rural	2121109
Population density/ Sq. km.	2913
Literates	
Male (%)	83.22
Female (%)	70.11

They are working for employment generation for dropout youths by utilizing technology on innovative bases. the bases of technology localization are done through a three-stage process 1) Assessment 2) Refinement 3) Demonstration besides this they are providing need-based trainings to field officers and farmers to increase farm productivity. New schemes have been launched to empower women entrepreneurs.

This zone consists of 45 KVKs but we have taken only two KVKs in our research which are Assam and Arunchhal Pradesh following are the working of these two KVKs. Howrah Krishi Vigyan Kendra. (2005).

Table 3.9 ATARI, Zone VI, Guwahati- 45 KVKs

Name of state	Address	Year of establishment
Assam	**Krishi Vigyan Kendra, Kaliapani near Teok, Fidy. Distt. Jorhat**	**2006**
Arunachal Pradesh	**Krishi Vigyan Kendra, At Metengliang Village, Metengliang Circle, Changlongam C.D. Block, Hayuliang P.O., Anjaw Distt. (Arunachal Pradesh)**	**22/11/2013**

3.14 Assam

Krishi Vigyan Kendra Kaliapani, an agro-based educational institution established by Indian Council of Agricultural Research is providing need-based trainings to the farming community on agriculture and allied sectors. KVK are providing vocational training to the farmers and field visiting officers. They are also conducting front line demonstrations and are providing latest knowledge of technology in agriculture. They are initiating approaches on "learning by doing". they are working for rural development. Every KVK must use innovative technologies to

bring changes in the lives of rural people especially young youth and women entrepreneurs. Krishi Vigyan Kendra, Jorhat. (2006, February).

Table 3.10 Assam District at a Glance

Total Sub-Division	3 Nos, Jorhat (Sadar), Majuli &Titabor
Legislative Assembly Constituency	6nos, Jorhat, Titabor, Mariani, Teok, Dergaon & Majuli
Population Density	383 Per Sq. Km. (2011 Census)
Total Revenue Circle	6 -Namely Jorhat East, Jorhat West, Titabor, Teok, Mariani &Majuli.
Total Development Block	8 -Namely Jorhat Dev. Block (Baghchung), North West Dev. Block (Dhekorgarah), Titabor Dev. Block, East Jorhat Dev. Block (Selenghat), Kaliapani Dev. Block, Central Jorhat Dev. Block (Chipahikhola), Majuli Dev. Block, Ujani Majuli Dev. Block.
Total Gaon Panchayat	111
Total Tea Estate	135
Total Police Station	10
Total Police Outpost	17
No. of Lp School	1526
No. of Me School	318
No of High School	227
No of Higher Secondary School	19
No of College	14

No of University	3 (Assam Agricultural University, Kaziranga University (Private), Womens' University (Proposed))
No of Engineering College	1 (Jorhat Engineering College)
Length of Border Area	101 Km
Name of Border State	Nagaland
Total Air Port	1 (Rowriah)

3.15 Arunachal Pradesh

In Arunachal Pradesh Anjaw district has been chosen which is situated at the corner of the country. Anjaw covers an area of 6190 sq.km with a population of 21,167 (as per 2011 census). This district is having plenty of water resources. People are mostly dependent on agriculture. This has been established in 2013 under Indian council of agriculture research. Therefore, it is working on demonstration, refinement and assessment of agriculture and use of technology at different locations. Activities are followed on "learning by doing" approach. vocational trainings to farmers, agricultural officers to up bring agriculture sector and increase productivity. Employment creation, welfarement of rural people, empowerment of women all are supported by government schemes in agriculture and allied sectors in the district. Welcome to KVK Anjaw. (2004, February).

This zone contains 43 KVKs, from this we have chosen four states and one each KVK to represent agriculture situation in the specified areas.

Table 3.11 ATARI, Zone VII, Barapani– 43 KVKs

Name of state	Address	Year of establishment
Manipur	**Krishi Vigyan Kendra,ICAR Manipur Centre, Lamphelpat, Distt. Imphal West-795004**	**1979**
Mizoram	**Krishi Vigyan Kendra, N. Vanlaiphai, Distt. Serchhip**	**2005**
Meghalaya	**Krishi Vigyan Kendra, Fruits Garden, Dhankheti, Shillong, Distt. Jaintia Hills-793001**	**2004**
Nagaland	**Krishi Vigyan Kendra, Tesophenyu, Distt. Kohima-**	**2005**
Tripura	**Krishi Vigyan Kendra, Divyodaya, Chebri, Distt. West Tripura-799207**	**1979**

3.16 Manipur

Krishi Vigyan Kendra Manipur centre, Lamphelpat, is functioning under (ICAR). KVK Lamphelpat has been established in 1979. The main objective of Lamphelpat is as follows. Krishi Vigyan Kendra, Imphal West, Manipur. (2011, August).

- To deportment On-Farm Testing for detecting technologies in terms of area specific sustainable land use systems.
- To establish training to inform the extension personnel with evolving advances in agricultural research on systematic basis.
- To establish short- and long-term training paths in agriculture and allied inclinations for the farmers and rural youths with prominence on Learning by doing for higher manufacture on farms and producing self-employment.

- To establish Front Line Demos (FLDs) on various crops to create production data and feedback information.

Table 3.12 District profile Imphal West District

Geographical area	519 sq. km
Population	(Census 2011)
District Head quarter	Imphal
Subdivisions	03
CD/TD Blocks	02
Towns	10
Inhabited villages	117
Zilla Parishads	1
Density	847 per sq. km.
Horticultural Potential Area	15267 ha
Area under vegetables	1106 ha
Vegetable production	8490 MT
Area under spices	1265 ha
Gross cropped area	28241.46 ha
Net Area sown	21236.40 ha

3.17 Mizoram

Krishi Vigyan Kendra an innovative Science based institution was established in 2005 to impart vocational training to the farmers and field level workers. This is located at N. Vanlaiphai which is 65 Kms from the District Headquarter. The infrastructure development has been completed. KVK complex covers 78.88 bigha (10.55 ha.). KVK Serchhip - Home. (2005).

Table 3.13 District Profile of Serchhip

Geographical area of Serchhip District	1421.60 Sq Km
population of Serchhip District	53,861
Urban Population	30%
Rural Population	70%

The main objectives of KVK is to demonstrate the new agricultural technologies to the farmers as well as field officers of the State to promote Agriculture and allied sector and to reduce the technology generation gap and its adoption. To identify the needs of technological and training for farming. Participatory Rural Appraisal (PRA) and conduct of scientific survey, interviews and visits to the famers. To assess farmers socio-economic conditions and the production constraints. Trainings of famers to develop technological skills in them and use of technologies as per suitable geographies and needs of the agriculture sector of the region. This all has been imparted on praticles grounds by learning and doing principles etc.

3.18 Meghalaya

Krishi Vigyan Kendra, Jaintia Hills is a science research institute sponsored by Indian agricultural research council. Works for growth and development of agriculture sector and its allied activities, by promoting leaning by doing and leaning by seeing activities. Mostly they thrust on innovative technology and its utilization on specific areas of production as per the demands of farming system in the district. Concept of Rural Appraisal methodology is followed by generating awareness about new agriculture technology. Following are the main objectives of KVK Jaintia. KVK Jaiñtia Hills. (2018, May).

1) To promote vocational trainings to the farmers in agriculture and allied activities.
2) To assess the innovative agriculture technology
3) Frontline demonstration to aware farmers and field extensive workers about new sowing techniques in the field of agriculture and allied activities.
4) Refinement of agriculture seeds to increase productivity and encouraging agriculture farmers for different crops to yield more benefits. Etc.

Table 3.14 District profile of Jaintia

Sl. No.	**Title**	**Units**
1	Total geographic area	1693 sq. Km
2	Total Population	2,70,352(2001 census)
3	Male	1,34,406
4	Female	1,35,946
5	Rural Population	-
6	Urban Population	28,420
7	Population density	159.69 per Sq.Km
8	Literacy %	63.23%
9	Male	59.75%
10	Female	66.71%
11	No of towns	1
12	No. of Sub-divisions	1
13	No of Blocks	3
14	No of Villages	293
15	No. of households	34,401
16	No. of Banks	-
17	No of Assembly constituencies	5

3.19 Nagaland

Krishi Vigyan Kendra's, Tesophenyu-Kohima function under department of agriculture government of Nagaland and is funded by Indian council agriculture research. KVKs – DEPARTMENT OF AGRICULTURE. (2018). There are total 16 KVK s in the district. the main objectives of KVK is

i. identifying technologies for location specific.
ii. Front Line Demonstrations on technology for production and farmers' fields.
iii. Training to the extension personnel with use of innovative advances in agricultural.
iv. Short and Long run trainings for farmers and rural youth to enhance them by learning and doing and to develop employment opportunities.

3.20 Tripura

KVK Tripura established under Indian council of agriculture research in 1979 in the district of west Tripura. Mostly they thrust on innovative technology and its utilization on specific areas of production as per the demands of farming system in the district. Concept of Rural Appraisal methodology is followed by generating awareness about new agriculture technology. Works for growth and development of agriculture sector and its allied activities, by promoting leaning by doing and leaning by seeing activities. Following are the main objectives of KVK Tripura

1) To assess the innovative agriculture technology
2) Refinement of agriculture seeds to increase productivity and encouraging agriculture farmers for different crops to yield more benefits. Etc.
3) Frontline demonstration to aware farmers and field extensive workers about new sowing techniques in the field of agriculture and allied activities.
4) To promote vocational trainings to the farmers in agriculture and allied activities.

Table 3.15 District Profile of Tripura

Sl No	PARAMETER	NORTH TRIPURA	UNAKOTI	TOTAL
1.	No of Gram Panchayat	52	53	105
2.	No of ADC Village	51	28	79
3.	No of VLW Circle	96	80	176
4.	No of Sub Seed store	37	35	72
5	No of Agri. main Seed Store including District Store	4	1	5
6	No of Sector Office	7	7	14
7	No of Superintendent of Agriculture office	3	1	4
8	No of Superintendent of Horticulture office	1	1	2
9	No of Agri Engineer office	1 (EE)	1 (AE)	2
10	No of Dy. Director of Horticulture Office	-	1	1
11	No of Dy. Project Officer Office	-	1	1
12	No of KVK	1	-	1
13	No of Agri Farm	1	1	2
14	No of Orchard	2	1	3
15	No of Cold Store	1(under construction)	1	2
16	No of Seed Processing Plant	-	1	1
17	No of Mushroom Spawn Production Center	1	1	2
18	No of Soil Testing Lab.	1(MobileVan)	-	1

Table 3.16 ATARI, Zone VIII, Pune– 79 KVKs

Name of state	Address	Year of establishment
Maharashtra	**Krishi Vigyan Kendra, PO. Kosbad Hill, Distt. Thane-401703**	**1976**
Gujarat	**Krishi Vigyan Kendra, Arnej. Ta-Dholka, Distt. Ahemedabad-382 230**	**2004**

3.21 Maharashtra

Krishi Vigyan Kendra Kosbad district Thane has been established in 1976 by Indian council of agriculture research the main focus of these institutions is to provide vocational trainings to the farmers, rural youth, and other workers working in the field of agriculture and allied sectors. The main aim of these trainings is to make farmers self-reliant and self employed by increasing agricultural productivity. Demonstration process is being conducted all over the country by these institutions KVKs institute to develop skill and knowledge among rural youth and farmers. Krishi Vigyan Kendra, Thane. (2017, February).

3.22 Gujarat

Randheja, Krishi Vigyan Kendra, Gandhinagar was recognized in 1977 by Indian Council of Agricultural Research (ICAR), New Delhi and working with Gujarat Vidyapith (university) for quick transmission of technology to the farmers' fields. Krishi Vigyan Kendra has to reduce the time lag and technological gaps in the field of agriculture to achieve increasing production, productivity and income from the agriculture and allied sectors on a sustained basis. KVK conducts various activities like front line demonstration, training, on farm testing. And To test and

refine technological inputs for various farming system. Gandhinagar district total geographical area is 2.15 lakhs hectares. People of Gandhinagar are mostly dependent on Agriculture. Krishi Vigyan Kendra, Arnej. (2010).

In this zone we have selected two states namely Chhattisgarh and Madhya Pradesh which contains total 76 KVKs in these states, we analysis purpose we have taken only two KVKs from these states which are KVK Raipur and KVK Etawa.

Table 3.17 ATARI, Zone IX, Jabalpur– 76 KVKs

Name of state	Address	Year of establishment
Chhattisgarh	**Krishi Vigyan Kendra Raipur (Chhattisgarh)**	**12/09/2016**
Madhya Pradesh	**Krishi Vigyan Kendra, Etawa Road, Distt. Bhind-477001**	**1997**

3.23 Chhattisgarh

Krishi Vigyan Kendra (KVK), Raipur is one new KVK in Chhattisgarh established on 5th December, 2016.Indian Council of Agricultural Research (ICAR) has almost provided same guidelines for each and every KVK in the state to transfer technology usages and knowledge with farmers and to identify locations with specific needs of technological inputs to increase productivity etc. KVKs are having sufficient sources for the farmers in different training programmes, demonstrations and need based refinement by providing vocational skill bases trainings. Transfer of knowledge, soil-based technologies covering horticulture, agriculture, animal husbandry, floriculture, bee keeping and others. Krishi Vigyan Kendra, Raipur. (2008).

3.24 Madhya Pradesh

Krishi Vigyan Kendra Etawah came in to existence 1997 working under (ICAR). The horticulture, agriculture and animal husbandry are the main sources of the farmers of the district. This district is located at central plain area. New research-based technologies are used to make farmers self-reliant specially to empower women enterprises by trainings, demonstrations and skill-based knowledge to cover the technological gaps in the field of agriculture. Krishi Vigyan Kendra, Bhind. (2005).

Table 3.18 ATARI, Zone X, Hyderabad– 73 KVKs

Name of State	Address	Year of establishment
Andhra Pradesh	**Dr. K. L. Rao Krishi Vigyan, Kendra Garikapadu- 521 175, Krishna District,**	**2002**

3.25 Andhra Pradesh

The Krishi Vigyan Kendra, working on scientific approaches on agricultural farming in the district. KVK Garikapadu at Krishna district, has been established in 2002 and is funded by the Indian Council of Agricultural Research (ICAR). Woking with a mission to transfer technological awareness among farmers, youth from rural areas especially school drop outs. Promotion of streaming technological innovations to generate entrepreneurs. Technology usages with specific agricultural locations. Bringing agriculture upgradation by aware people about new schemes and their uses for them. Front line demonstration on various seeds like cereals, pulses, and other varieties. Continuously checking technology assessments and suggestive refinement are followed to bring changes in productivity and agricultural efficiency in the region. Welcome To Garikapadu KVK. (2013).

Table 3.19 ATARI, Zone XI, Bengaluru– 48 KVKs

Name of state	Address	Year of establishment
Karnataka	**Krishi Vigyan Kendra VC Farm, Distt. Mandya-571405**	**2004**
Kerala	**Agriculture Engineering & Technology, Tavanur, Distt. Malappuram-679 573**	**2004**

3.26 Karnataka

Krishi vigyan Kendra VC farm district Mandya established in 2004 to support increase agriculture productivity so that the social and economic condition of farmers in rural area would be better. Time to time they are following different types of methods to produce more and more output from agriculture and allied activities. Demonstration is done on the bases of learning and doing phenomenon and front-line face to face interactions are held with farmers. Similarly, technological assessment followed by refinements of various policies and whose impetus is to use more and more technical inputs to achieve growth in the sector. Which will automatically generate employment, and income of the rural farmers of the area. KVK-V.C Farm. (1992).

3.27 Kerala

KVK Malappuram is the district level Farm science function from 2004 working at Kerala Agricultural University under the guidance of Indian Council of Agricultural Research (ICAR). They are working to cover the technological and time gap in agriculture. They support maximum use of technologies to yield higher agriculture produce in productivity. To support the rural poor of the district so that

their economic and social status get improved. Agriculture is targeted with enamours methods like seed refinements, technological refinement. New methods of the cultivations by helping farmers with demonstration. Soil testing to check soil content's and its fertility power. Vocational trainings, learning by doing activities with short and long-term trainings to cover all bottle neck of the sector. KVK Malappuram. (2004).

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CHAPTER-4

Information Communication Technology (ICT) and Agricultural Information System

CHAPTER - 4

INFORMATION COMMUNICATION TECHNOLOGY (ICT) AND AGRICULTURAL INFORMATION SYSTEM

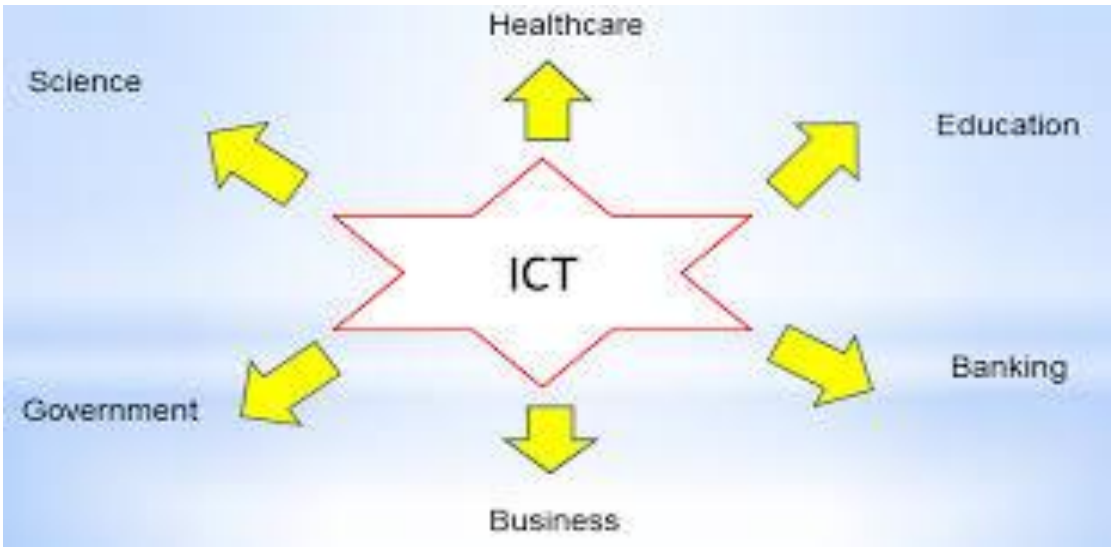
4.1 Introduction:

ICT, an umbrella term is an acronym that stands for Information and Communications Technology**.** It is the integration of information processing, computing, and communication technologies that includes any communication device or application, encompassing: radio, television, cellular phones, computer hardware-software-internet, satellite systems etc. as well as various services and applications associated with them such as SMS, Email, social media, videoconferencing and distance learning etc. Nowadays, the term ICT is universally accepted and as per European Commission the importance of ICTs lies less in the technology itself than in its ability to create greater access to information and communication in underserved populations. Many countries around the world have established organizations for the promotion of ICTs as it is feared that till technologically less advanced areas have an opportunity to catch up, the increasing technological advances in developed nations will only serve to exacerbate the already-existing economic gap between technological *'have'* and *'have not'* areas. Internationally, the United Nations actively promotes *ICTs for Development* (ICT4D) in the millennium goals as a means of bridging up the digital divide. (Austin and Hughes)

According to Crede & Mansell (1998), ICTs is crucial for sustainable development in developing countries. Thioune (2003) notes that for the past two decades most developed countries have witnessed significant changes that can be traced back to ICTs. These multidimensional changes have been observed in almost

every aspect of life like governance, economics, health, education, communication, and transportation etc.

ICT is altering the way we learn, work, and live in society and often referred to in specific contexts like governance, banking, transportation, education, healthcare, and libraries etc. A right way to think of ICT is to consider all the uses of digital technology that already exist to help individuals, businesses and organizations etc. (Yeo and Oh)



ICT covers any product that can store, retrieve, manipulate, transmit or receive information electronically in a digital form and is concerned with these products. Importantly, it is also concerned with the way these diverse uses can function together e.g. personal computers, digital television, smart phones, e-mail, robots, social media, and SMS etc. Before we proceed to further description of the ICT, we need to elaborate upon the terms *Information*, *Communication*, and *Technology* independently in steps. (Annan, K.)

4.1.1 Information:

The term *information* is derived from Latin *informare* which means 'to give form to the mind'. Allen & Selander (1985) have analysed the way word is used in

Swedish language and point that it is probably the most widely accepted meaning of the term. Most of us tend to think of information as disjointed little bundle of 'facts'. In the Oxford definition, the word is related to both the knowledge and communication. Thus, the word *information* refers to *both 'facts' in themselves and the transmission of the facts*. The magazine Wired (March 1994) quotes it as (Crede, A.; & Mansell, R. 1998).

"Information is an activity. Information is a life form. Information is a relationship. Information is a verb not a noun, it is something that happens in the field of interaction between minds or objects or other pieces of information. Information is an action which occupies time rather than a state of being which occupies physical space."

Information is prime source of development of a society. Society can progress only with proper information. Hence, the libraries being the information centres preserve and disseminate the information to new generations for research and development. It is therefore considered to be a basic need of man, ranking after air, water, food, clothing, and shelter. Modern means of transport, computers, and telecommunications have reduced the world to a global village wherein one needs only to plug in to be connected to entire world. Therefore, the information has recently been recognized as a valuable commodity and it is not far off when information will function as a global currency to be exchanged for goods and services. It is therefore imperative that everybody realize the importance of information and have easy access to it. (Jumarie G., 1990)

4.1.2 Communication:

The term *Communication* originates from Latin root *commūnicāre,* meaning 'to share'. It is the act of conveying intended meanings from one entity or group to another through the use of mutually understood signs, symbols and semiotic rules.

The basic steps of communication are the forming of communicative intent, message composition, message encoding, transmission of signals using a specific channel or medium; reception of signal, message decoding and finally interpretation of the message by the recipient. Some definitions of communication are as follows- (Claudia Sarrocco, 2009)

"Communication is transfer of information from one person to another, whether or not it elicits confidence. But the information transferred must be understandable to the receiver."-G.G. Brown.

"Communication is the intercourse by words, letters or messages."- Fred G. Meyer.

Therefore, communication is a process of imparting information to fulfil the need of common masses for development of self and society.

4.1.3 Technology:

The term *technology* is derived from two Greek root words, transliterated *techne* and *logos*. *Techne* means art, skill, craft, the way, manner, or means by which a thing is gained. *Logos* means the Word of God, or the principle of divine reason and creative order, the utterance by which inward thought is expressed, a saying, or an expression. So, literally technology means words or discourse of the way things are gained.

Technology can be the knowledge of techniques, processes etc. or it can be embedded in machines, computers, devices, factories, and many others part of daily activities which can be operated by individuals without detailed knowledge of the workings of such things. (Anyakoha, M.W. (1991).

Technology is basically human knowledge that is used to create products and artefacts with the help of innovative tools, systems and materials. Technology is used

for communication, manufacturing, learning, securing data and transportation etc. It is often a consequence of science and engineering.

4.2 History:

ICT originates from Information Technology. Information technology has been around us along with the existence of the people as there had always been means of communicating through the technology available to them. There are 4 main ages that classify the history of information technology. Only the latest age (electronic) and some of the electromechanical age really affects us today, but it is important to be aware of as to how we came to the point of recent state of technology. (Karl Erik Sveiby, 1994)

4.2.1 Pre-mechanical Age:

The pre-mechanical age is the earliest age or prehistoric age of information technology. It can be taken up as the time span between 3000B.C. to 1450A.D. When humans first started communicating, they attempted to use sign language or simple picture drawings known as *petroglyth* which were usually carved on the rocks. Early alphabets were developed such as the *Phoenician alphabet* (the first alphabetic script).

As alphabets gained popularity, more people started writing down information resulting in development of pen and paper. It started off simply as marks in wet clay, but later on paper was created from papyrus plant. The most popular form of paper was probably invented by the Chinese who made it from rags.

As people were writing down plenty of information, they felt the need of preserving it in permanent storage. At this point, firstly the books and later on libraries came into existence. *Egyptian scrolls* were popular means of saving writing down information. Some groups of people were actually binding together leaves of paper into a book form. During this period, *number system (1-9)* was introduced by

Aryabhata, and later on *Brahmagupta* introduced the number *'0'.* Thus, with the need to do the stuffs with the numbers, people developed calculators. A calculator was the initial sign of an information processor, the popular model prevalent at that time was the *abacus.*

4.2.2 Mechanical Age:

The mechanical age starts with the search for looking at connections between our current technology and its ancestors. The mechanical age can be ascertained as the time span of 1450-1840. Plenty of new technologies evolved during this era as there was a huge explosion of interest in this domain. Technologies like the *printing press* by Johann Guntenberg in 1455, the *slide rule* (an analog computer used for multiplying and dividing) were invented. French mathematician Blaise Pascal invented the *Pascaline* which was a very popular calculating machine (mechanical computer). Charles Babbage developed the *Difference Engine* which tabulated polynomial equations using the method of finite differences. Charles Babbage is also reckoned as 'father of the computer'.

Different types of machines were created during this era, yet they could not arrive to a machine that can execute more than one type of calculation in one like our modern-day calculators. If we look at the size of the machines invented during this period, compared to the power behind them, it seems absolutely ridiculous to comprehend as to why anyone would like to use them, but for the people of that era these inventions were huge enough.

4.2.3 Electro-mechanical Age:

Now, we are finally getting closer to some of technologies that resemble our present-day technologies. The *electromechanical age* can be traced back to the time span of 1840- 1940. It was the beginning of *telecommunication*. The telegraph was

invented by Samuel Morse in the early 1800s. Morse code language was developed by Samuel Morse along with Sir William Cook and Sir Charles Wheatstone who sent messages electronically between two parties at distant locations through cable. The telephone (one of the most popular forms of communication) was created by Alexander Graham Bell in 1876. The first radio was developed by Guglielmo Marconi in 1894. These were the extremely crucial emerging technologies that led to big advances in the information communication technology.

The IBM Automatic Sequence Controlled Calculator (ASCC), called Mark-I by Harvard University's staff was the first large-scale automatic digital computer. The original concept was presented to IBM by Howard Aiken in November 1937. After a feasible study by IBM engineers, the company chairman Thomas Watson Sr. personally approved the project and issued its fund in February 1939. The ASCC was developed and built by IBM at their Endicott plant and shipped to Harvard in February 1944. It began computations for the U.S. Navy Bureau of Ships in May and was officially presented to the university on August 24, 1944. It was 8ft high, 50ft long, 2ft wide, and weighed 5 tons, and was programmed using punch cards. It is worthwhile to compare it from present PCs. Because of the enormity of these huge machines people began to look at downsizing all the parts to initially make them usable for business activities and eventually to the home.

4.2.4 Electronic Age:

Period from 1940 till today is reckoned as Electronic age . ENIAC (Electronic Numerical Integrator and Computer) was the first high-speed, digital computer capable of being reprogrammed to solve a full range of computing problems. This computer was designed to be used by the U.S. Army for artillery firing tables. This

machine was even bigger than the Mark-I taking up 680 square feet and weighing 30 tons. It mainly used vacuum tubes to do its calculations.

There are 4 main sub-ages of digital computing. The first was the *era of vacuum tubes* and *punch cards* like the ENIAC and Mark-I. Rotating magnetic drums were used for internal storage. The second generation replaced vacuum tubes with *transistors*, punch cards were replaced with *magnetic tape*, and *rotating magnetic drums* were replaced by *magnetic cores* for internal storage. High-level programming languages such as FORTRAN and COBOL were developed during this time. In third generation computers, *transistors* were replaced by *integrated circuits*, magnetic tape was used throughout all computers, and *magnetic core* turned into *metal oxide semiconductors*. An actual operating system came up around this period along with the advanced programming language BASIC. The fourth and latest generation ushered in *CPUs (central processing units)* which contained memory, logic, and control circuits, all on a single chip.

4.3 Information Technology:

Information technology (IT) is the application of computers to store, retrieve, transmit and manipulate data. *IT is considered a subset of Information and Communications Technology (ICT).* In 2012, Zuppo proposed an ICT hierarchy where each hierarchy level 'contains some degree of commonality in that they are related to technologies that facilitate the transfer of information and various types of electronically mediated communications.'

The term is commonly used as a synonym for computers and computer networks but it also encompasses other information distribution technologies such as television, multimedia, satellites, smart phone and telephones etc.

Several industries are associated with information technology including computer hardware-software, electronics, semiconductors, internet, telecommunication, engineering, healthcare, e-commerce, transportation, libraries and education etc.

In the 1970s, the term *Information Technology* was coined by the Harvard Business Review in order to make a distinction between *purpose-built machines* designed to perform a limited scope of functions and *general-purpose computing machines* that could program for various tasks.

But its basic concept can be traced back to the World War II alliance of the military and industry in the development of electronics, computers, and information theory. Since the 1940s, four generations of computers have evolved. Each generation reflected a decreased size hardware and increased capabilities to control computer operations. The first generation used vacuum tubes, the second used transistors, the third used integrated circuits, and the fourth used integrated circuits on a single computer chip. The fifth generation of computers, still in the experimental stage, with the advances in artificial intelligence will minimize the need for complex programming.

The first commercial computer was the UNIVAC I, developed by John Eckert and John W. Mauchly in 1951. It was used by the Census Bureau of USA to predict the outcome of the 1952 presidential election. For the next twenty-five years, mainframe computers were used in large corporations to do calculations and manipulate large amounts of information stored in databases. Supercomputers were used in science and engineering for designing aircraft, in army operations, nuclear reactors, and for predicting worldwide weather patterns. Minicomputers entered into

the scene in the early 1980s with the application in small businesses, manufacturing plants, and factories etc.

In 1975, the Massachusetts Institute of Technology developed microcomputers followed by Tandy Corporation's first Radio Shack microcomputer, in 1976. The Apple microcomputer was introduced in 1977. The market for microcomputers increased dramatically when IBM introduced the first personal computer in 1981. Because of dramatic improvements in computer components and manufacturing, present personal computers do more than the largest computers of the mid-1960s at a thousandth of the cost.

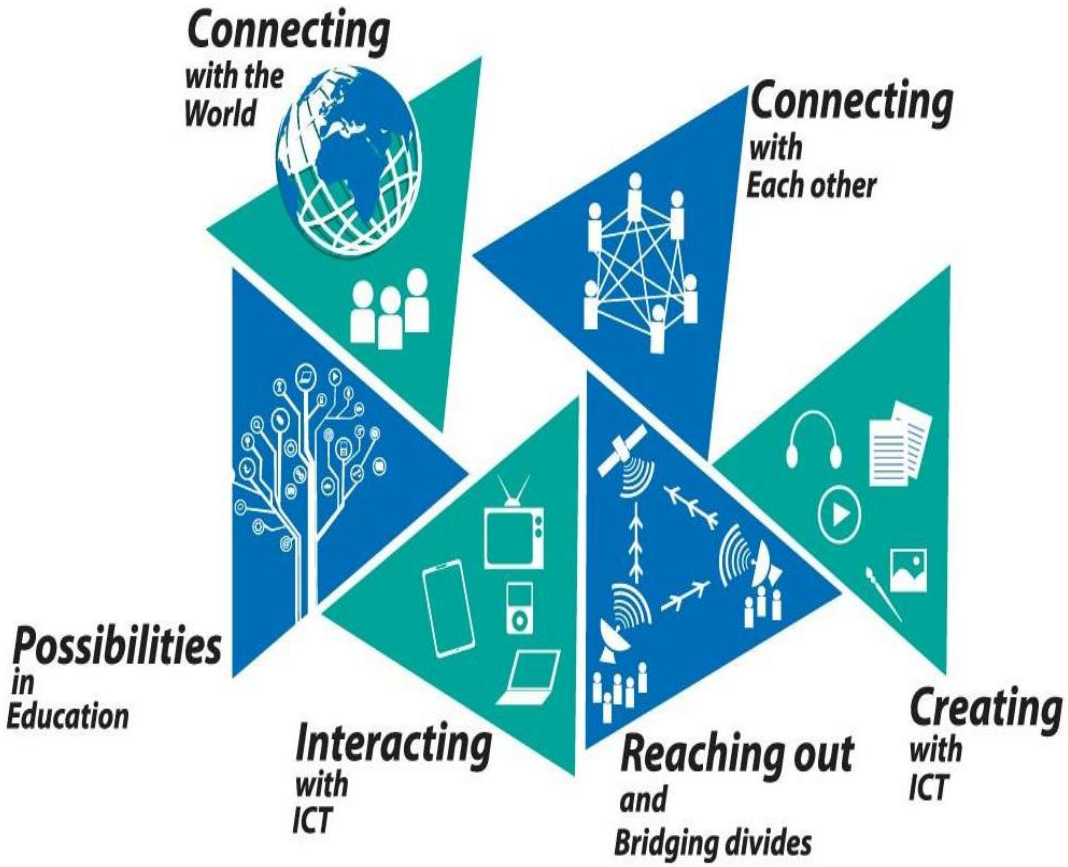
On the basis of size, cost, and processing ability computers can be classified into four categories- supercomputer, mainframe, minicomputer, and microcomputer more commonly known as a personal computer. Personal computer categories include desktop, network, laptop, and handheld. People use computers in day today life in numerous ways. Computers are increasingly affordable as they continue to be more powerful as information-processing tools as well and handy to use.

4.4 Elements of ICT:

With technological advancement, expectation level of the users has also gone up thereby necessitating the ICT. Basic elements of ICTs are as following.

- Communication Devices: Standards and Procedures Communication devices are those pieces of hardware that are needed to turn stand-alone computers into networked computers.
- Networking Software: Software help devices in communication.
- Data Transfer Media: Computers are working under the mechanism of data transfer media and it also helps them in to travel datas,from one computer to other computers. For small, simple networks, this is usually wire, especially

the cost of installing them. The main forms of data transfer media are- Metal Wires, Optical Fibre Cable, and Wireless Connectivity etc. Standards are important because without them one device could be sending data to another device in a form that the other device doesn't understand. In order to properly run a network, it is necessary to adopt certain procedures and ensure that all users are aware of that. (Archibald, C., 2011)



Elements of ICT

4.5 Applications of ICT:

Connectivity, Capability and Accessibility are the preliminary steps to the creation of an *information society*. The use of ICTs can enhance a large number of applications: from electronic commerce and establishment of small and medium-sized enterprises to the empowerment of small communities and groups, they can help in the promotion of good governance and decentralization, the observance of human

rights, allow long-distance education and telemedicine, and help in the environmental management and monitoring. In other words, it can help the creation of a balanced and efficient society based on the free flow and access to information. (Claudia Sarrocco, 2009)

In order to allow ICT to provide the benefits of speedier and more efficient economic and social interaction, it is essential to develop its various applications. There is strong agreement on the potential of ICT applications to help reduce poverty, foster sustainable development, improve health, education and skills, and facilitate new and transparent governance mechanisms and reinforce popular participation and informed decision-making.

ICT represents a tremendous opportunity for emerging and developing economies. The international community is apprehensive of employing certain applications in developing countries by means of mobilizing collaboration, resource sharing, cooperation, information exchange, technology transfer new initiative and projects etc. O' Brian, J.A. (1996).

Comprehension of impact and benefits can be had only through experience sharing of innovative applications. Common public interest is another domain where further application development can be undertaken by public authorities who can play a catalytic role in furthering research and basic services. International Collaboration in joint projects can display the benefits information sharing.

4.5.1 E-commerce:

Emergence of new business models, annihilation of distance as a impediment to participate in international market is explicitly visible because of availability of new technologies Role of SME (Small Medium Enterprises) in employment and income generation is widely recognized and ICT can play a major role in their

globalization and entry in global market. It allows them to participate in global trade through e-commerce. They get introduced to global trade, investment and commerce, Policy makers have recognized that in addition to supporting private initiatives, there is dire necessity to support growth, involvement and participation of SMEs. It will offer balanced and holistic growth of business and society. Rich-Poor divide will also get minimized with this approach. ICT application by SMEs will open up new opportunities for them and make them better equipped to enter into new business deals and competent enough to compete in global market.

4.5.2 E-education:

Education is the back bone of all kind of development may it be social, economic or psychological. ICT can play a crucial role in promotion of education which provides cost effective, comprehensive solutions to various issues and problems faced by society. New information communication technologies, if implemented judiciously will facilitate and strengthen the efforts to achieve educational goals as it has flexibility and interactive potential. UN Millennium Declaration highlighted the importance of ICT application in innovative approaches to education. It look 'distance learning', teacher training, and non-formal education etc as core strength and pillar for integration of populace to play a vital role in knowledge based production. It will promote access and application of ICT in innovative methodologies educational processed Marginalized groups living in extreme penury will be highly beneficiated by this.

For sustainable social prosperity and economic growth, harnessing human potential and resources is of vital significance. For development of human resources, education is of utmost importance. Application of ICT tools in distance learning will minimize opportunities gap; make the education, learning and skill development open

to all. It will make education an life long process and spread it to wide spread scattered groups of people in developing countries..

4.5.3 E-health:

Next to business sector, health is one of the most prominent user and propagator of ICT tools for collection and dissemination to the professionals and researchers for accessing, rapid information exchange distance learning, diagnosis, etc., and should be part of national health care reforms and strategies. (Otabor, L.N. (2006).

African countries have underlined the capacity of ICTs to enhance regional approaches to major social issues as the struggle against HIV/AIDS, and the Heads of G7 States consider *global health care applications* to be one of the main areas of concern, re-affirming the great potential of the application of telematic technologies in the field of telemedicine to fight against the major health scourges.

4.5.4 E-governance:

Poor networks and infrastructure exacerbate the difficulties encountered during interaction between Governments and Citizens in many parts of the world. E-governance allows fresh opportunities for social justice and economic development. The use of ICTs as a tool of governance can augment to foster democracy, efficiency, accountability, transparency, and may lead to enhanced possibilities of attracting foreign investment and financial assistance. Enhanced information access, broadened political participation are the potential of ICT. for efficient functioning of the governments and, at the same time, facilitating knowledge acquisition and its utilization.

Administrative use of ICT should be encouraged, specifically with the help of e-governance as well as upgrade the e business efficiencies rural public services and

public services too. E-governance can be be taken up broad administrative reforms and developing a conductive environment having connectivity and capacity constitute core elements.

4.5.5 E-library:

ICT makes library operation easier, faster, cheaper and more effective. It helps in managing information overload as information retrieval is made easier with the help of computerization. Remote access is enabled through networked systems as it minimises space requirement and reduces paper usage. (Oketunji, I., 2000).

Libraries utilize software designed to manage different library routines and processes. Mostly, the software is integrated and have modules for the different activities or tasks carried out within the library like cataloguing, statistics, acquisition, serials control etc. The librarian's preference of ICT should include all those technologies which are expected to be used in the library activities/operations and other library services for collection, processing, storage, retrieval and dissemination of recorded information, the fast-developing information technologies have encompassed almost every domain of the libraries. Few of these are as following-

- a) Library Management: Library management activities like Classification, Cataloguing, Database Creation, and Database Indexing etc. are geared up by rapid IT developments.
- b) Library Automation: Library automation is the concept of reducing the human intervention in all the library services so that a user can access the required information with least effort and at minimal cost. Prominent areas of automation can be classified into two broad categories- organization of all library databases and housekeeping operations of library.

- c) Library Networking: Library networking refers to a group of Libraries and Information Centres that are interconnected in some common pattern or design for information exchange and communication with a view to improve efficiency.
- d) Audio-Video Technology: It includes photography, microfilms, microfiches, audio and tapes, printing, optical disk etc.
- e) Technical Communication: Technical Communication consisting of technical writing, editing, publishing, DTP (Desktop Publishing) systems etc.

4.6 Library Information System (LIS):

Libraries utilize software designed to manage different library routines and processes. Most of the software are integrated and have modules for the different activities or tasks carried out in the library like cataloguing, statistics, acquisition processes, and serials control etc. Some examples of such software are CDS/ISIS, GLAS, ALICE for Windows, X-Lib and SLAM. SLAM (Strategic Library Automation Management) is used in most of the Libraries. The LIS has the following operations-

- OPAC: This means Online Public Access Catalogue and is Computerized version of library catalogue or library holdings database is OPAC often known as 'Online Public Access Catalogue. This system is space saving as well as easy to use compared to manual method. Access to library catalogue is available through local internet, exlarnet or internet in this system.
- Office Operations: ICT application in library enable e-mail communication, word processing, database management, accounting etc.
- Multiple information can be accessed by library users - online databases, e-journals, e- books, government publications digitally through networked

systems. Online access may be allowed remotely through the internet or intranets.

- Electronic Document Delivery: Libraries need not to rely anymore on postal services to send documents to the users or carry out interlibrary lending. Libraries deliver documents through electronic networks that can be transmitted directly to the user's desktops in numerous formats e.g. Word, PDF, Notepad, E-book etc.
- Online User Education or Tutorials: Libraries can use the internet or CD – ROMS to educate their users or carry out information literacy programmes. Virtual tours can be offered online making it convenient to all.
- E-reference Services: Some services such as SDI (Selective Dissemination of Information) or Current Awareness Services (CAS) and virtual reference desks, announcements of new acquisitions and other reader advisory services can be made easier through the internet. Users can have online interaction with the reference staff.
- Library Cooperation and Resource Sharing: A central union catalogue can be better managed through ICT, wherefore libraries can create and share bibliographic records and other information resources in digital format.
- Institutional Repositories: Institutional repositories are publications that originate locally within the university community such as thesis, dissertations, reports, conference papers, and seminar papers etc. ICT has made it possible not only to provide better access to these resources but also to ensure the preservation of the resources.

- E- libraries: Digital libraries depend on information recorded on digital formats like CD-ROMS. Virtual libraries are libraries that do not exist in physical space or structure but can be accessed via networks.
- Social Media Networks: Social media networks like twitter, Facebook and LinkedIn, are some interactive internet services that are presently serving as communication forum for librarians and its users. These networks can be deployed for educational uses. Discussion groups serve the communities as well as library services.
- E- mails: This is a means of communication among the library and the users.
- Library websites: A medium of communication for libraries to their users. It is also used to promote the library and publicize it.
- Online searching: Searching of online databases like AGORA, ERIC. Browsing and surfing the internet through search engines, and subject directories to supplement library sources.

4.7 Application of ICT in Agricultural Libraries:

In NARES (*National Agricultural Research and Education System*), Agricultural Universities, SAU and ICAR institute has individual library to support teaching, research and extension activities of agricultural science. Web based technologies have rapidly been developing and it facilitates the access to digital resources. Digital resources too have been immensely increased in Agricultural Libraries which are as follows-

4.7.1 IDEAL (Indian Digital Ensemble of Agricultural Libraries):

It is a platform for Agricultural Libraries of Indian National Agricultural Research & Education System (NARES) which enables them to adopt Integrated Library Management System for day to day operations of the library functionality. It is a software platform built on 'Software as a Service' (SaaS) concept to provide hassle free, ready to use, international standards-based platform for sharing library holdings through a union catalogue (AgriCat). An integrated digital library delivered at the desk of researchers, faculty and students of NARES can definitely boost the quality of research output and saves time. Libraries can minimise cost incurred in procuring books & other library resources by sharing through this digital portal.

Presently 38 libraries of NARES have joined *eGranth project* supported by National Agriculture Innovation Project (NAIP) of Indian Council of Agricultural Research (ICAR) as an endeavour to establish IDEAL platform which is easily extendible to more libraries encompassing whole NARES. Vast resources spread all over NARES can be accessed by few clicks. For library users of NARES an Online Public Access Catalogue (OPAC) of their own library provides easy and enhanced experience of using library online, sitting at their desk either in lab or at home. Even while on move, they can access the library through the smart phone. Integrated catalogue of entire NARES (AgriCat) provides access to holdings of other libraries of

NARES. A robust set of servers along with failover servers operational at the data centre of Indian Agricultural Research Institute (IARI), Pusa, New Delhi provide hosting facilities for customized Koha open source software operating independently. Local mirror servers as individual libraries, in sync with their Koha instance, at central library ensure redundancy and high availability. However, those who do not have own local server may run offline Koha module on desktop to ensure uninterrupted circulation services in the event of connectivity failure. Complete circulation data can easily be uploaded to central server for maintaining full record as soon as connectivity is restored. Any library under NARES willing to be part of IDEAL needs to bring its catalogue data to standard format and learn how to use Koha ILMS for library functioning. It is not necessary to run any local server or Koha software.

4.7.2 Consortium for e-Resources in Agriculture (CeRA):

*Under NAIP (*National Agricultural Innovation Project) *"CeRA" has been established at Indian Agricultural Research Institute (IARI) for providing access to online journals of 126 Agricultural Libraries in the first phase. The main objectives of CeRA are as following:*

- To develop the existing Research & Development information resource base of ICAR institutes/SAUs, etc., comparable to that existing in leading institutions/organizations of the world.
- To create an e-access culture among scientists/teachers in ICAR institutes/agricultural universities.
- To develop a Science Citation Index (SCI) facility at IARI for evaluation of scientific publications.

- To assess the impact of CeRA on the quality of research publications measured through SCI.

4.7.3 Krishi Prabha:

It is an Indian Agricultural Dissertations Repository. The project has been completed under the leadership of University Library, CCS Haryana Agricultural University Library, Hisar with the aim to digitize all Dissertations and Ph.D. thesis submitted during the year 2000 to 2007 in all Agricultural Universities including SAUs and Deemed Universities (DUs). The main objectives of KrishiPrabha are-

- To develop, organize and sustain knowledge base of Indian Agricultural Dissertations in digital form and make it accessible on-line.
- To develop a standard format for submission of e-theses to the SAUs/DUs.
- To upgrade skills of human resources of SAUs/DUs.
- To publish a journal in electronic form/ hard copy from the Database. (Goria, 2011)

4.7.4 KrishiKosh http://krishikosh.egranth.ac.in/:

It is an institutional repository of NARES which is developed with the purpose to provide the access of intellectual outputs of the Indian NARES system. It includes digitized institutional publications, technical reports, annual reports, lectures, etc. in the form of preprints, reprints, old books etc. These contents which have open access, essentially captures all the intellectual work carried out under NARES. Thus, institutional repository serves as an alternative source of scientific information to support quality research and teaching in line with objectives of open learning. KrishiKosh has been created under the National Agricultural Innovation Project (NAIP) and digitization of the valuable content was taken up by four major institutions of NARS.

4.7.5 e-GRANTH:

It is a Digital Library and Information Management system under NAERS. It is a sub-project under component-1 of NAIP launched under the leadership of IARI. e-Granth provides digital access to resources of 12 libraries which include OPAC (Online Public Access Catalogue), important institutional repositories, rare documents and makes them publicly accessible over internet under NAERS. The major objectives of the project were (Indian Council of Agricultural Research, 2015):

- To create OPAC under "Indian Agricultural Research Group Catalogue" of all 12 library resources with (OCLC partnership).
- To digitize important institutional repositories (limited to IARI, New Delhi; IVRI, Izatnagar; ANGRAU, Hyderabad and UAS, Bangalore) including rare books and old journals and make them open access under NARES.
- To strengthen capacity building for library and information management system (open to all libraries of NARES).

4.7.6 Agropedia:

It is a comprehensive, seamlessly integrated model of digital content organisation in the agriculture domain. It aims to bring together a community operating through an ICT mediating knowledge creating and organising platform with an effort to leverage the existing agriculture system. Agropedia is an online knowledge repository for information related to agriculture. It includes universally acknowledged models and localized content for a variety of users with appropriate interfaces built in collaborative mode in multiple languages. This national portal designed as an agricultural Wikipedia, hosts wide range of agricultural information on a variety of crops with an objective to empower farmers with crop and weather information.

4.8 Application of ICT in Agriculture Sector:

In India, number of reform initiatives have been taken up in agricultural extension during last decade. Agricultural extension literature has been published by SAUs and ICAR institutions in the form of pamphlets, technical bulletins, Kisan diaries, popular articles etc. Kisan Mela (Farmers fair), training programs, subject expert lectures/talks, radio & TV talks etc. have also been organized for agricultural extension in India. In 2010, Indian Agricultural Extension activities were reviewed with special reference to the farmer's information need (Glendenning, Babu, &Asenso-Okyere, 2010). The study found that in the conventional approach of agriculture extension system, research is performed by researchers and the results are turned over to extension staff for dissemination to farmers, has produced numerous success stories, but it has serious limitations for sustained agricultural growth and poverty reduction. It has failed to reach many of the farmers who need information to improve their productivity and production, achieve food security, and create wealth. The study also mentioned that 'the success of an extension approach will depend on how it enhances the *Information Flow* along the agriculture value chain' (Glendenning, Babu, &Asenso-Okyere, 2010).

In the present age of ICT, information has become a vital source for world economy, science, technology, education, research and development. ICT in India is penetrated to village level; most of the villages are now connected through mobile phones and millions of them are connected through Internet as well. Community Radio has also been started in agricultural extension by the SAUs for Indian farmers. In India, various initiatives have been taken in the area of ICT applications in agriculture extension by Government of India and various State Governments. A comprehensive study (Indian Council of Agricultural Research, 2014) on

development and analysis of ICT initiatives in agriculture to meet the information need of the Indian farmers covered 26 ICT initiatives in agriculture. The study found wide information gaps between agricultural research and farmers in India. The study also found that Mobile is the most popular ICT gadget followed by TV and Radio. Further, the study suggested a need to provide farmer queries in multimedia mode i.e. audio mode in local language, along with text, image and video. Agropedia has been developed in Indian Institute of Technology, Kanpur under an ICAR Project as a semantic web portal for agricultural extension content and interaction. It incorporates very limited and selected contents.

Under NATP (National Agricultural Technology Project) and NAIP (National Agricultural Innovative Project), ICT infrastructure in all ICAR Institutions/Agricultural Universities of NARES including KVK has been developed. Though Government agencies/NAERS transfer agriculture information and technology in Rural India through KVK, AEW (Agricultural Extension Workers) and ICT but latest agricultural research information and technology is not timely transferred among Indian farmers. Presently ASE (Agricultural subject experts), AEW and farmers access agricultural extension literature (mostly outdated literature) through print media (except few). Information Literacy campaign can play significant role in agriculture extension. Most of the ASEs and AEWs need Information Literacy training.

Farmers having easy access to ICT have better lives because of the following:

- **Access to price information:**

Farmers will be informed of the accurate current prices and the demands of the products. Hence, they will be able to competitively negotiate in the agricultural economy and their income gets improved.

- **Access to agriculture information:**

According to the review of global and national agricultural information systems done by IICD with support from DFID in 2003, there is a need for coordination and streamlining of existing agriculture information sources, both internationally and within the developing countries. The information provided is usually too scientific that farmers cannot comprehend. Therefore, it is vital that the local information relayed to the farmers must be simplified.

- **Access to national and international markets:**

Improving the level of access of the farmers is crucial for simplifying contacts between the sellers and the buyers, to publicize agricultural exports, facilitate online trading, and increase the awareness of producers on potential market opportunities including consumer and price trends.

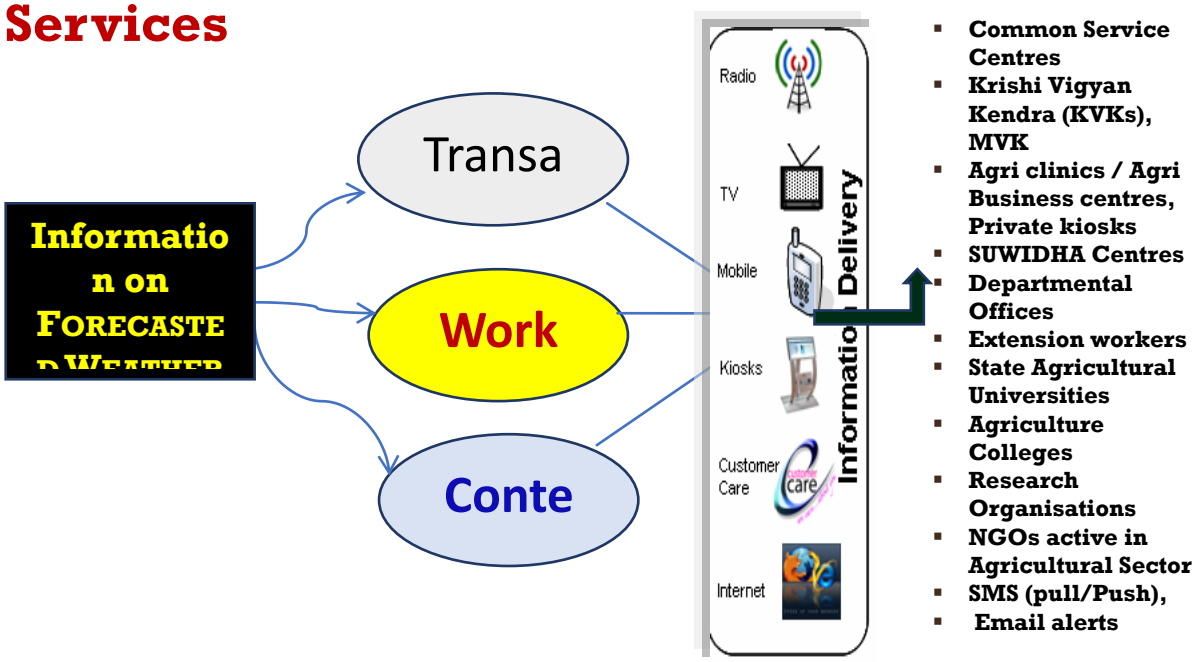
- **Increasing production efficiency:**

Due to several environmental threats such as climate change, drought, poor soil, erosion and pests, the livelihood of farmers is unstable. Thus, the flow of information regarding new techniques in production would open up new opportunities to farmers by documenting and sharing their experiences.

- **Creating conducive policy environment:**

With the smooth flow of information from the farmers to policy makers, a favorable policy for sustainable growth of the agriculture sector can be achieved.

- Access to weather forecast: It helps farmers to plane their cultivation. This system works as following-



Transaction Based services:

- Master data management
- Agro-ecological regions/sub-regions
- Farmers, Agro Climatic Parameters
- Weather Summary, Forecast Summary
- Collecting Rainfall data (Indian Meteorological Department/Automatic Weather Stations/Rain gages/other sources)
- Impact on Crop, Livestock, Agriculture etc.

Work Flow Based Services:

- GIS - Mapping of location with resources
- Expert advisory
- Grievance redemption

Content Based Services:

- Actual weather details.

- Forecast weather details.
- Fertilizer and manure application, scheduling of cultural operations.
- Agro-met advisories based on forecasted weather on-
    - Crop variety selection.
    - Crop field selection.
    - Sowing time, Crop health.
    - Harvest, Post-harvest.
    - Preventive measures on pest, Disease forecast.
    - Agriculture operation, Livestock management activities.

The agricultural sector will profit through ICT4D since we can think of better ways to grow and produce our resources efficiently and effectively. Fusing modern technology with agricultural sector will surely reap better results. We will be able to produce more and better products in a short span of time than before. Better means protecting crops makes it more resistant to extreme weather changes and pests. Through ICT, new information and updates on the agricultural sector can easily be disseminated. Farmers can easily access such information and implement it right away. Not only it saves time and effort but provides greater outcome.

The advances in agricultural technology created wonders for the agricultural industry e.g. the use of tractors can drive itself through the field which eliminates the problem of overlapping and uneven distribution of crops. It saves time and fuel. Smartphone apps can remotely display information about the status of crops and irrigation system. In livestock farming, cattle-breeding now includes scientific crossbreeding techniques that produce cattle with immensely improved fertility. Having a local radio/TV show will be of great help in informing the community on updates from the agricultural sector.

These advances may not yet be available all over the world; however, the continued progress in the agricultural industry will be the witness of the revelation of ICT4D globally. ICT4D in agriculture will ensure stability for a larger and more diverse population. Its impact will prepare us for further agricultural development and bridge the gap of the traditional and modern practices.

4.9 ICTs for Informing Citizens:

One of the identified domains through which the society constantly experiences the change is technology. The business of making information available in the right form, to the right user, both at the personal and organizational levels, and at the right time, has led to more sophisticated means of rapidly handling the information. According to Anyakoha (1991), information technology is 'the use of man-made tools for the collection, generation, communication, recording, re-management and exploitation of information. It is inclusive of those applications and commodities out of which information is transferred, recorded, edited, stored, manipulated or disseminated.' Hawkridge (1983) describes information technology as a revolution which penetrated almost all aspects of human activity thereby transforming economic and social life. UNDP (2001) asserts that even if sustainable economic growth facilitates the creation and diffusion of useful innovations, technology is not only the result of growth but can be used to support growth and development. ICTs are credited with the ability to transform deep and significant changes that are expected from its widespread application. From this stand point, we can have optimum advantage of the new technologies, even if major challenges persist. These challenges incorporate adapting ICTs to local conditions and uses in developing countries and allowing each country to understand the innovations and adjust accordingly to the process of development. Therefore, development depends on

the society's capacity to reduce poverty and improve its capacity to create a sustainable wealth. In June 1996, the United Nations Commission on Science and Technology Development (UNCSTD) proposed five development indicators that focused on the improvement of the quality of life: education, health, income, governance, and technology (Crede and Mansell, 1998). If we consider these five as key indicators of development for any society, ICTs can be socially beneficial only if they contribute to eradicate poverty, improve health and education, efficient usages and equitable resource sharing, enhanced participation in decision making.

Surviving in the information age depends on access to national and global information networks. ICTs are the bedrock for the survival and development of any nation in a rapidly changing global environment, and it challenges us to devise initiatives to address a host of other issues such as reliable infrastructure, skilled human resources, open government, capacity building etc.

4.10 ICTs- A Multipurpose Instrument…:

The United Nation Millennium Declaration stressed on the importance of ICTs to help achieving its goals and affirmed the need to ensure that the benefits of new technologies, especially information and communication technologies should be available to all.

The recent Durban Declaration on Racism, Racial Discrimination, Xenophobia and Related Intolerance encompassed entire section dealing with 'Information, Communication and The Media, including new technologies.' It recognizes the positive aspects of ICTs, along with the potential risks involved with its abuse. Participants expressed concern over the use of the Internet for the dissemination of racist and discriminatory ideas and called upon governments to take necessary action on these issues. However, they also recognized that 'new technologies can assist the

promotion of tolerance and respect for human dignity, and the principles of equality and non-discrimination.'

ICT is also a vital component for environmental information assessment and for early warning mechanisms. World Meteorological Organization (WMO) recently suggested a universal and equitable access to meteorological, hydrological and related information which is essential for the mitigation of dangerous weather and related phenomena. Access to climatologic information also affects social and economic development. It is of crucial importance for the sustainable development of developing countries.

The diffusion and application of ICTs will also have a major impact on global employment. Tele-work (or e-Work) allows companies to source work independently of location and offers adequate infrastructure and skills which promotes cooperation and benefits in the new global economy. It can restrict migration to the urban areas. Tele-work, however, could have negative impacts as it contributes to the digital divide by excluding locations that are not connected to this context. The development of infrastructure and skills, as well as the establishment of new laws and regulations for the protection of online workers should be emphasized.

As mentioned above, ICTs are the instrument for the realization of the expectations of the information society, and its application depends on societal requirements. The information society is evolving and has to open up to the new opportunities for the growth of Human Development Index.

4.11 ICTs and Rural Development:

Few important modes of rural development are as following:

- Efficient services for Health Care and Education.
- Access to vast content of Education for improving literacy.

- Help farmers with value-based information for improvement in productivity and provide timely information to traders, artisans etc.
- Entertainment through broadcasting and multimedia services at doorsteps of the farmers.
- Relevant News accessible to everyone.

4.12 e-Learning:

Most commonly associated with distance education and training making use of electronic devices. E-learning encompasses learning at multiple levels, both formal and non-formal, that uses an information network—the Internet, Intranet (LAN) or Extranet (WAN)—whether wholly or in part, for course delivery, interaction, evaluation and/or facilitation. There are few who prefer the term online learning. Web-based learning is a subset of e-learning and refers to learning using an Internet, mainly by means of a browser like Chrome or Firefox or Internet Explorer etc.

4.13 Access and Users of ICT:

Common perception is that people having access to ICT will benefit from it while those devoid of it would not get the benefits. Theoretically, benefits include boundless information sharing, connectivity, decentralization, and globalization. Those who don't have access to technology, run the risk of being marginalized and bypassed. Richard Heek's further categorizes the users and non-users of ICTs into Non-Users, Indirect Users, Shared Users, and Owner-Users.

Non-Users: Those who have no access to either ICTs or ICT-based information and services.

Indirect Users: Those who do not get hands-on themselves but gain access to digital information and services via those who are direct users.

Shared Users: Those who do not own the technology, but who directly use ICT owned by someone else (a friend, workplace, ICT business, community, etc.).

Owner-Users: Those who own and use the technology.

Heeks says that non-users of technology can benefit from ICT4D in what he calls spill over benefits. Spill over benefits are "situations in which some category of users gains a benefit from ICT while non-users have a (lesser) benefit."

ICT4D projects need to be properly monitored and implemented, as the system's design and user interface should be suitable to the target users. ICT4D projects installed without proper coordination with its beneficiary community have a tendency to fall short of the main objectives. For example, in the usage of ICT4D projects in farming sectors where a majority of the population are considered to be technologically illiterate, projects remain idle, sometimes materials gets damaged or obsolete.

4.14 Barriers of ICT:

There are several factors that prevent from actively adopting and using ICT to the people. The reasons can considerably vary across different sectors, societies and countries. Based on our literature review, specific barriers to ICT adaptation can be cited out as following:

- Literacy
- Infrastructure, lack of standardized ICT related applications, cost factors etc.
- Political and administrative will to establish ICT Infrastructure.
- Awareness of access to ICT.
- Lack of ICT skilled man force.
- Lack of trust for using new technology.
- Legal uncertainties.

4.15 Conclusion

Information Communication Technology and KVKs libraries has achieved milestones in addressing agricultural issues in the country. ICT has its own history and has developed from time to time with incredible innovations beneficial for the society. Modern age is the age of technology without which sustainability of life is difficult. From invention and discoveries in the field of ICT life has changed much. Therefore, technology is followed every where in this world whether it is education, Hospitals, Libraries, Administrative offices, Universities, Defence etc. It is largely used everywhere. Modern age considered age of digitalization where education is based on information technology, banking, and other services. Similarly, information and communication technology has made drastic changes in the field of agriculture by easy communication, information, transfer of knowledge about various predictions related to agriculture, like weather report, rain fall prediction, environmental changes and utilization of various essential developments.

Some of the issues with ICT are they don't have developed literacy too much to help every farmer equally. They are facing challenges in Infrastructure, lack of standardized ICT related applications, cost factors etc. ICT are promoted by government to help people but sometimes they are facing security problems, therefore, Political and administrative will to establish ICT Infrastructure. Awareness of access to ICT. Lack of ICT skilled man force. Lack of trust for using new technology. Legal uncertainties. These are the things to be taken in to care to provide sustainable and helpful servicers to the farmers to promote agriculture development in the country.

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CHAPTER-5

Analysis and Interpretation of Data

CHAPTER - 5

ANALYSIS AND INTERPRETATION OF DATA

5.1 Introduction:

This study has analysed by both the qualitative and quantitative data to examine the research questions and objectives. The quantitative analysis had been done through descriptive statistics. The data was collected with the primary survey of 28 samples of KVK'S libraries. simple random sampling has been used for collection of data. A structured questionnaire was used to collect the data. Use of some secondary sources, like books, journals, magazines have been used for the study.

5.2. Data Analysis and Discussions:

Different parameters have been selected for the study. the parameters are in facilities at KVK'S libraries and its services for its users. On these two grounds this chapter had been designed and evaluation was done on the field survey across the country. Following the below section will discuss them briefly with ground level facts.

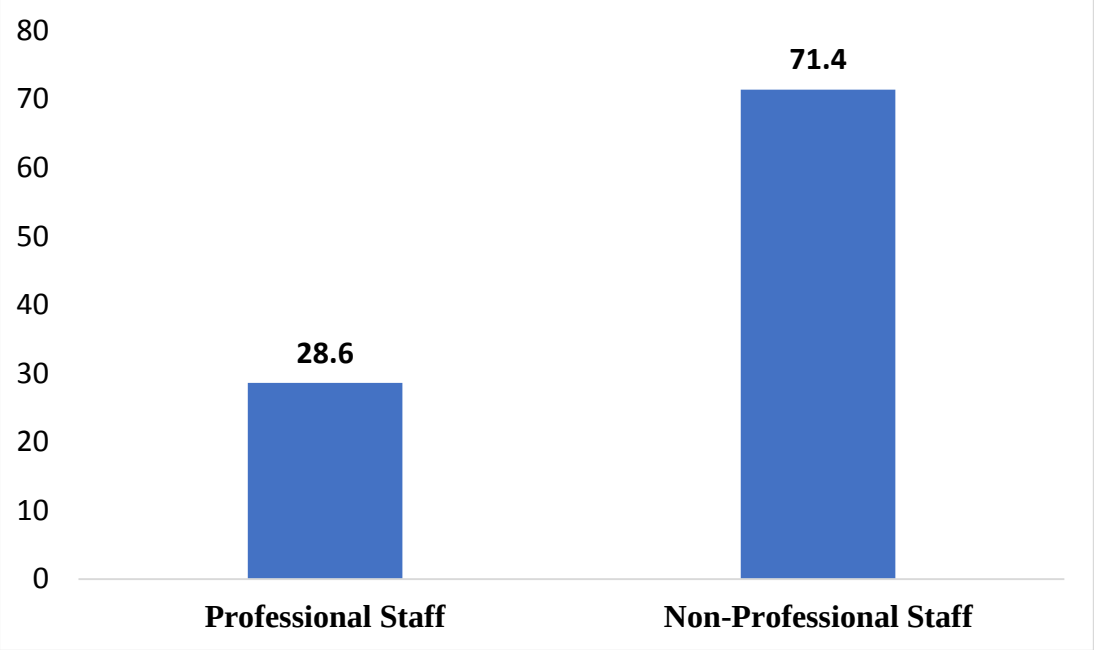
Table 5.1 Professional and Non-Professional Staff in KVK's.

Nature of staff	Frequency	Percent
Professional Staff	8	28.6
Non-Professional Staff	20	71.4
Total	28	100

Source: Estimated from Field Survey
Note: Figure in parenthesis are percentage in Total

Table 5.1 shows distribution of professional and non-professional staff in Krishi Vigyan Kendra Libraries, 28.6 percent employees are professional and 71.4 percent non-professional staff. Therefore, both professional and non-professional staff is very limited in these libraries.

Figure 5.1 Professional and Non-Professional Staff in KVK's



Source: Estimated from Field Survey Note: Figure in parenthesis are percentage in Total

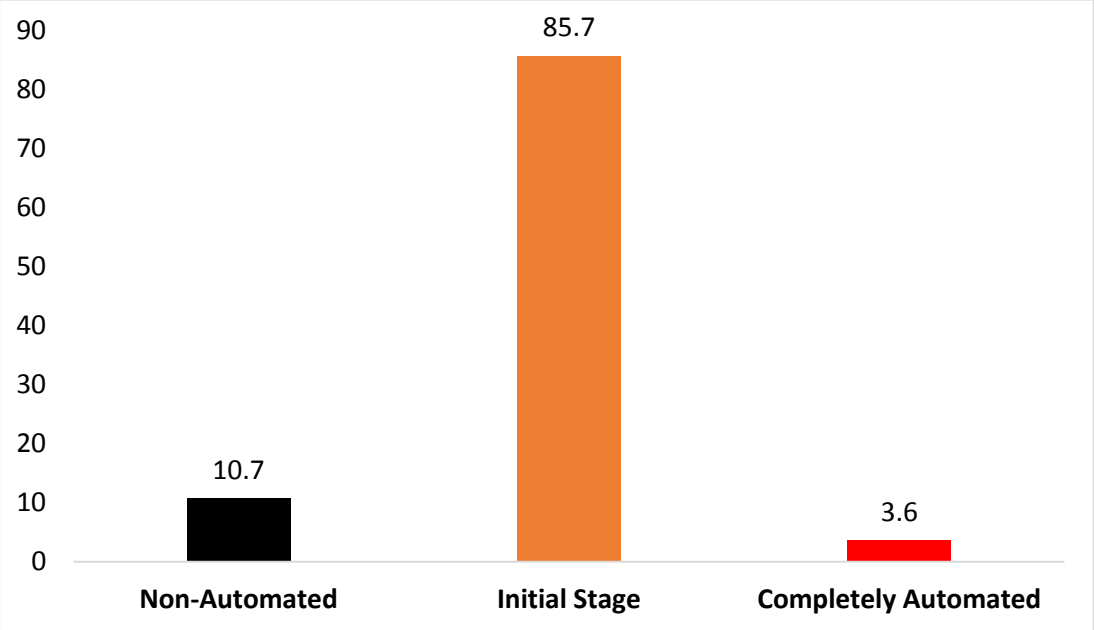
Table 5.2 Status of ICT application in Library Management System (LMS).

	Frequency	**Percent**
Non-Automated	3	10.7
Initial Stage	24	85.7
Completely Automated	1	3.6
Total	28	100.0

Source: Estimated from Field Survey **Note:** Figure in parenthesis are percentage in Total

Table 5.2 Library Management System and status of ICT applications in these libraries are 10.2 percent having non-automated facilities, initial level facilities 85.7 percent and lastly very less 3.6 percentage of completely automated.

Figure 5.2 Status of ICT application in Library Management System (LMS).



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

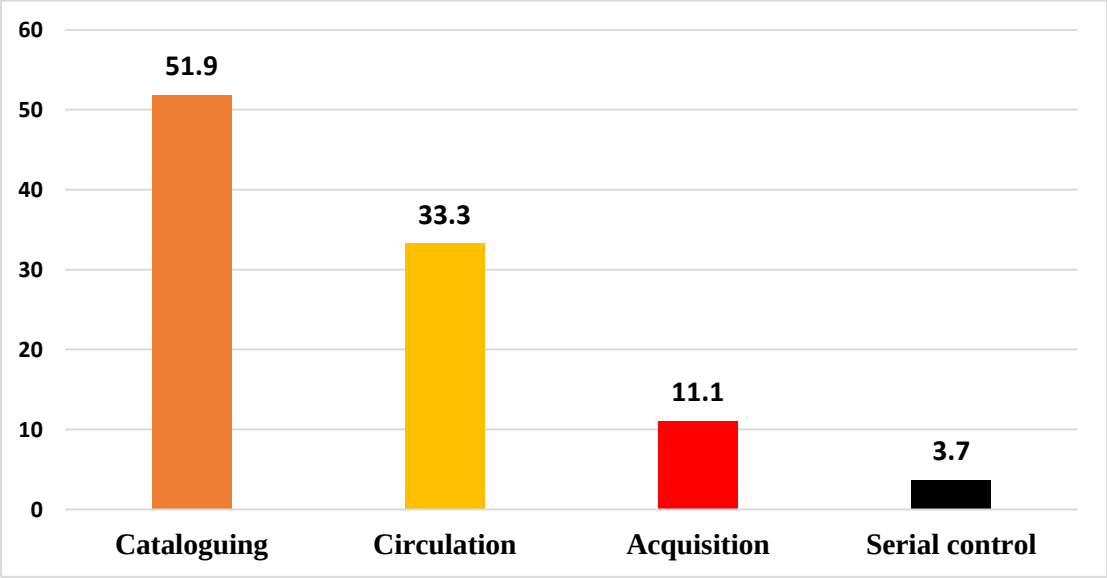
Table 5.3 Specify Automation used for operational (Housekeeping) services at your library.

Housekeeping operations	Frequency	Percent
Cataloguing	14	51.9
Circulation	9	33.3
Acquisition	3	11.1
Serial control	1	3.7
Total	27	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.3 shows operational services at Krishi Vigyan Kendra libraries and the figures are as follows Cataloguing 51.9 Percent, Circulation 33.3 Percent, Acquisition 11.1 Percent, Serial control 3.7 Percent. So above the automation facility shows these libraries need more facilities to grow up and benefits both farmers as well as academicians.

Figure 5.3 Specify automation used for operational (Housekeeping) services at your library



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

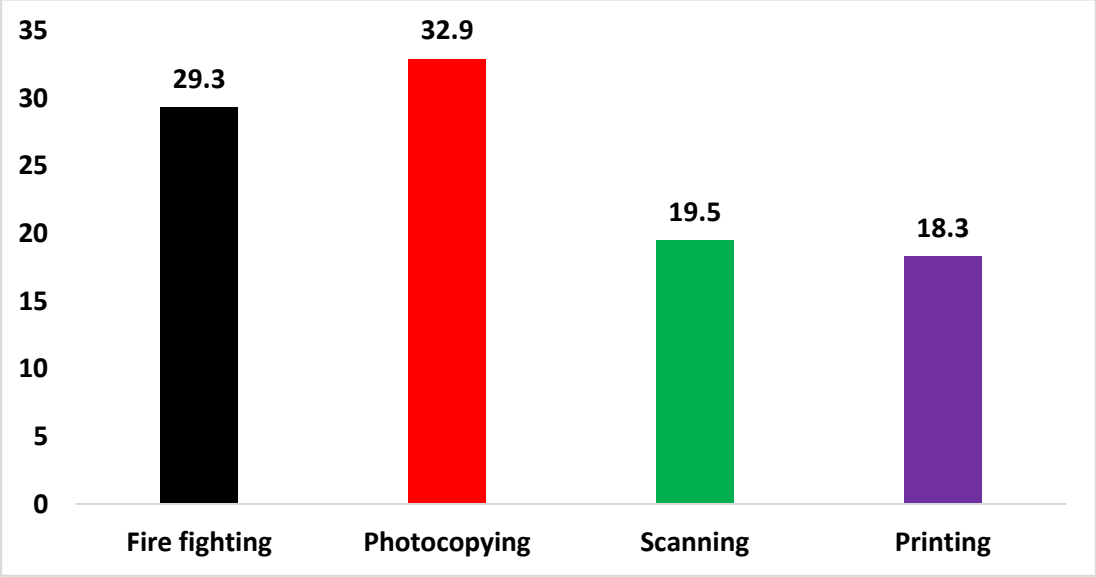
Table 5.4 Facilities provided at Krishi Vigyan Kendra libraries

Facilities provided at your library	Frequency	Percent
Fire fighting	24	29.3
Photocopying	27	32.9
Scanning	16	19.5
Printing	15	18.3
Total	82	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.4 shows facilities provided by Krishi Vigyan Kendra libraries to its visitors which are farmers, professionals, academicians etc the services are as Firefighting 29.3 percent, Photocopying 32.9 percent, Scanning19.5 percent, and Printing percent18.3,

Figure 5.4 Facilities provided at Krishi Vigyan Kendra libraries



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

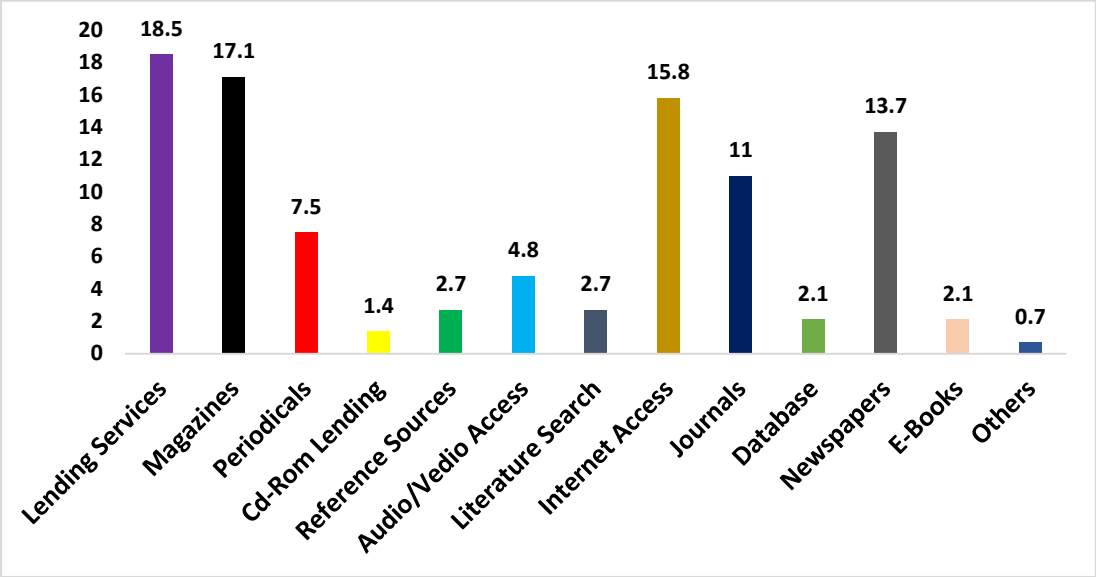
Table 5.5 Services Offered at KVK Libraries

Services offered at your library	**Frequency**	**Percent**
Lending Services	27	18.5
Magazines	25	17.1
Periodicals	11	7.5
CD-ROM Lending	2	1.4
Reference Sources	4	2.7
Audio/Video Access	7	4.8
Literature Search	4	2.7
Internet Access	23	15.8
Journals	16	11.0
Database	3	2.1
Newspapers	20	13.7
E-Books	3	2.1
Others	1	.7
Total	146	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.5 shows services provided by libraries across India are the highest is Lending Service with 18.5 percent, followed by Magazines17.1 percent, Internet Access15.8 percent, Journals 11.0 percent, Newspapers 13.7 percent and other services like E-Books, Literature Search, Database and other more are available at very less percentage.

Figure 5.5 Services offered at KVK Libraries



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

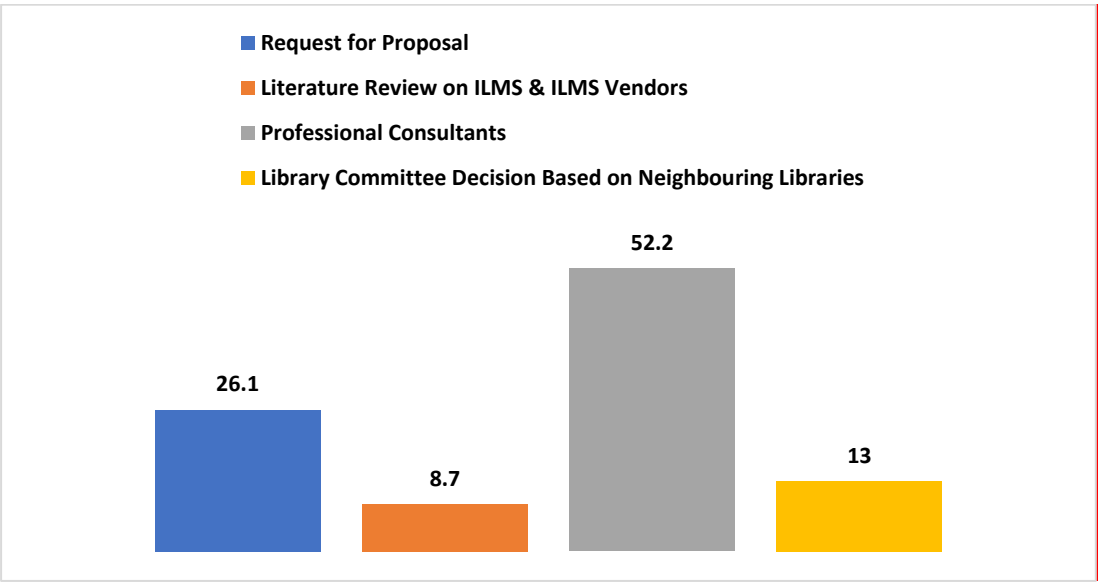
Table 5.6 Selection process for finalising LMS

	Frequency	**Percent**
Request for Proposal	6	26.1
Literature Review on ILMS & ILMS Vendors	2	8.7
Professional Consultants	12	52.2
Library Committee Decision Based on Neighbouring Libraries	3	13.0
Total	23	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.6 shows us distribution of LMS and its selection processes, there is 26.1 percent from Request for proposal, 8.7 percent, Literature Review on ILMS & ILMS Vendors, 52.2 Professional Consultants which is a beauty in developing these libraries by consulting professionals in decision making and lastly 13.0 percent is decided by following Library Committee Decision Based on Neighbouring Libraries.

Figure 5.6 Selection process for finalising LMS



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

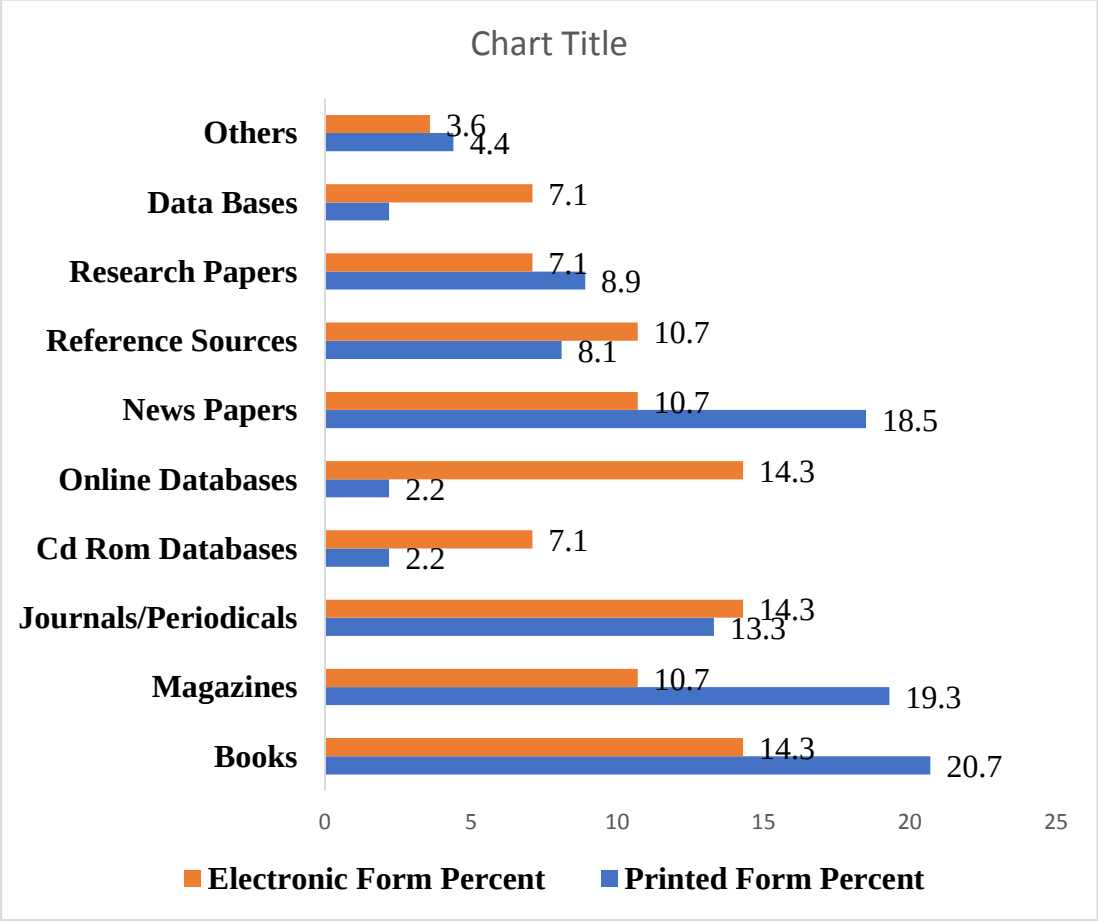
Table 5.7 Library collection available at your centre in printed and Electronic form

Collections	**Printed Form Percent**	**Electronic Form Percent**
Books	20.7	14.3
Magazines	19.3	10.7
Journals/Periodicals	13.3	14.3
Cd Rom Databases	2.2	7.1
Online Databases	2.2	14.3
News Papers	18.5	10.7
Reference Sources	8.1	10.7
Research Papers	8.9	7.1
Data Bases	-	7.1
Others	4.4	3.6
Total	100.0	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.7 shows collections of materials in the form of print and electronic forms are books in printed form are 20.7 percent while in electronic form only 14.3 percent, secondly Magazines 19.3 percent in print form and 10.7 percent in electronic form, and News Papers 18.5 percent in print form and 10.7 percent in electronic only, so the collection in these libraries are very less, we need to develop them so that benefits of these libraries will helpful for the farmers and academicians too, the primary thing to develop them by investing in collections of different forms as per the needs of the visitors and demands of our society as general.

Figure 5.7 Library collection available at your centre in printed and Electronic form



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

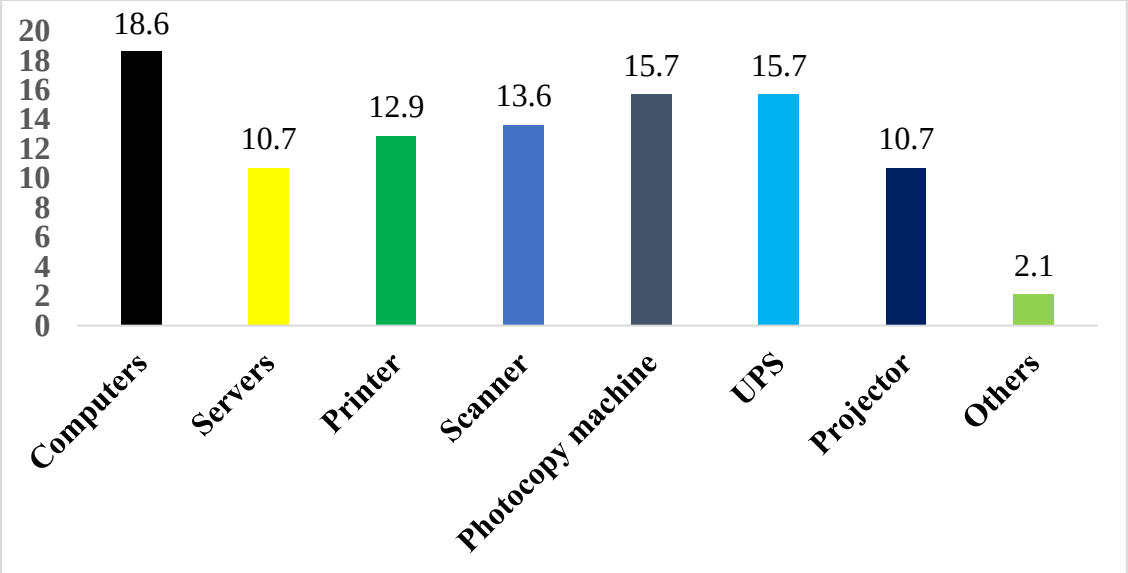
Table 5.8 Library support equipment's available at your centre

Availability of equipment's	Frequency	Percent
Computers	26	18.6
Servers	15	10.7
Printer	18	12.9
Scanner	19	13.6
Photocopy machine	22	15.7
UPS	22	15.7
Projector	15	10.7
Others	3	2.1
Total	140	100.0

Source: Estimated from Field Survey Note: Figure in parenthesis are percentage in Total

Table 5.8 shows percentage wise distribution of equipment's available in libraries, the percentage of computers is 18.6 percent, servers 10.7 percent, printers 12.9 percent, Scanners 13.6 percent, photocopy machine's 15.7 percent, UPS 15.7percent, Projectors 10.7 percent and other facility 2.1 percent. Which is also showing that these libraries are having average facilities, so need of the hour is to develop these libraries to increase all the necessary facilities.

Figure 5.8 Library support equipment's available at your centre



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

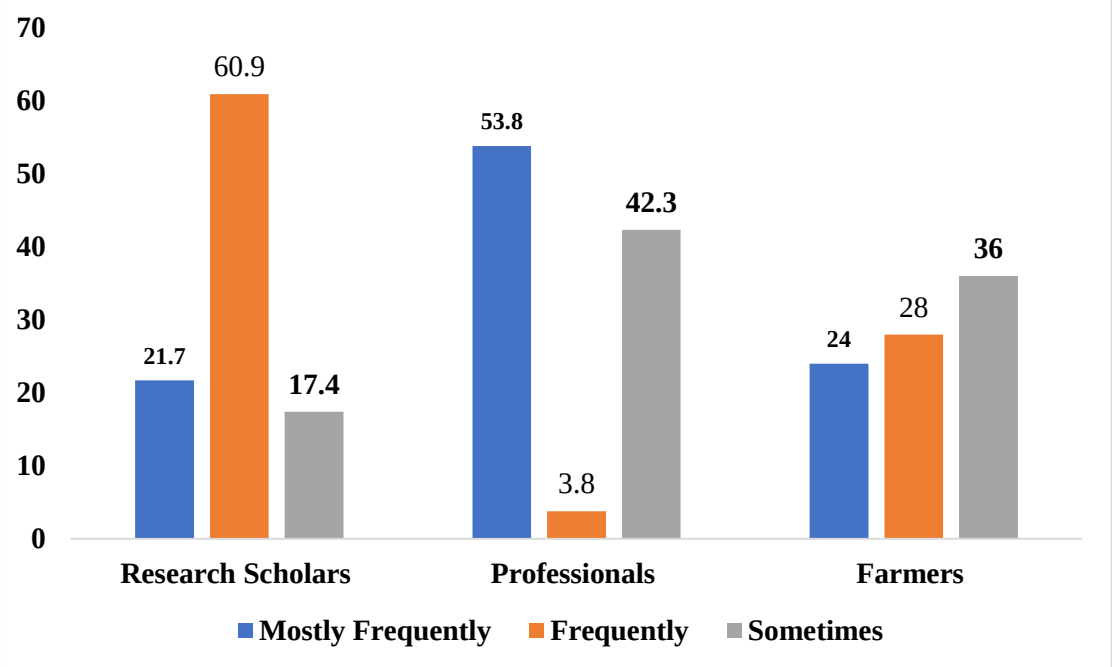
Table 5.9 Percentage wise Distribution of visitors

Users	Research Scholars	Professionals	Farmers
Mostly Frequently	21.7	53.8	24.0
Frequently	60.9	3.8	28.0
Sometimes	17.4	42.3	36.0
Total	100.0	100.0	12.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.9 shows percentage of visitors and their usage of libraries are research scholars visiting mostly frequently only 21.7 percent times, professionals are utilizing at a higher percentage with 53.8 percent and farmers with only 24 percent. Frequently using libraries by research scholars, professionals and farmers are 60.9,3.8, and 28 percent respectively. Lastly the visitors attending only sometimes bases by research scholars, professionals and farmers 17.4 ,42.3 and 36 percent respectively.

Figure 5.9 percentage wise Distribution of visitors



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

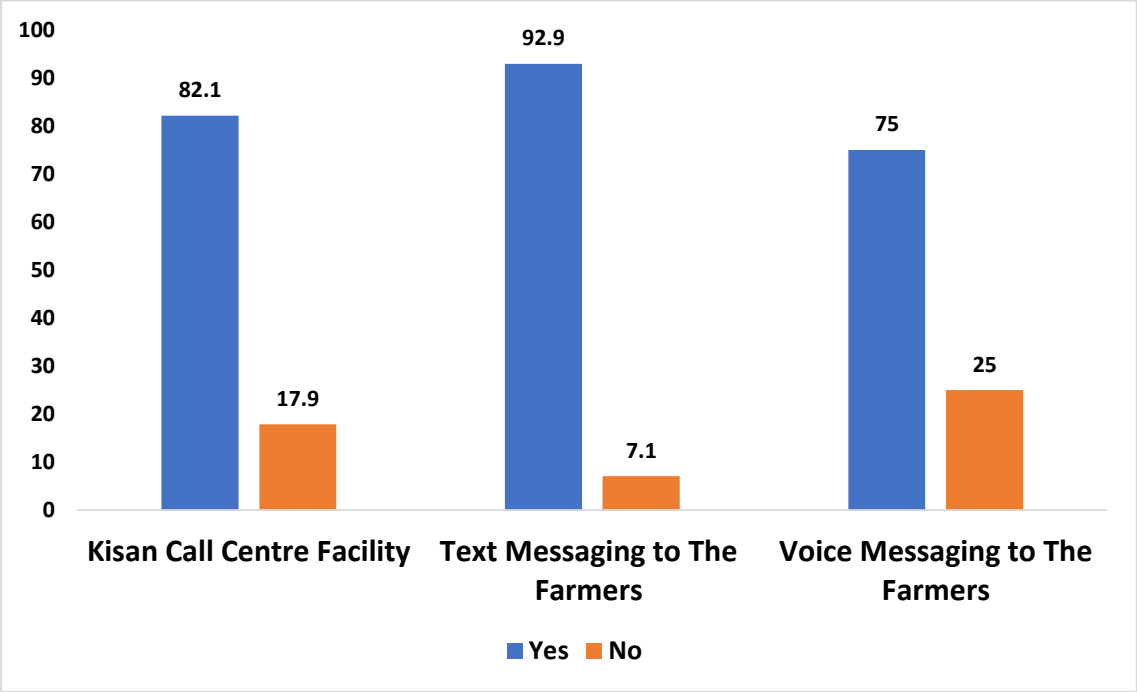
Table 5.10 Facilities for Farmers in Krishi Vigyan Kendra Libraries

	Yes	No
Kisan Call Centre Facility	82.1	17.9
Text Messaging to The Farmers	92.9	7.1
Voice Messaging to The Farmers	75.0	25.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.10 shows distribution of facilities for farmers in Krishi Vigyan Kendra libraries are Kisan Call Centre Facility 82.1 percent and 17.9 percent are lacking this facility. Text Messaging facility with 92.9 percent and 7.1 percent libraries are lacking this facility, and lastly the voice messaging facility is 75 percent and 25 percent are also lacking it. Therefore, it shows better conditioning of these libraries in providing necessary information to the farmers via different means.

Figure 5.10 Facilities for Farmers in Krishi Vigyan Kendra Libraries



Source: Estimated from Field Survey **Note:** Figure in parenthesis are percentage in Total

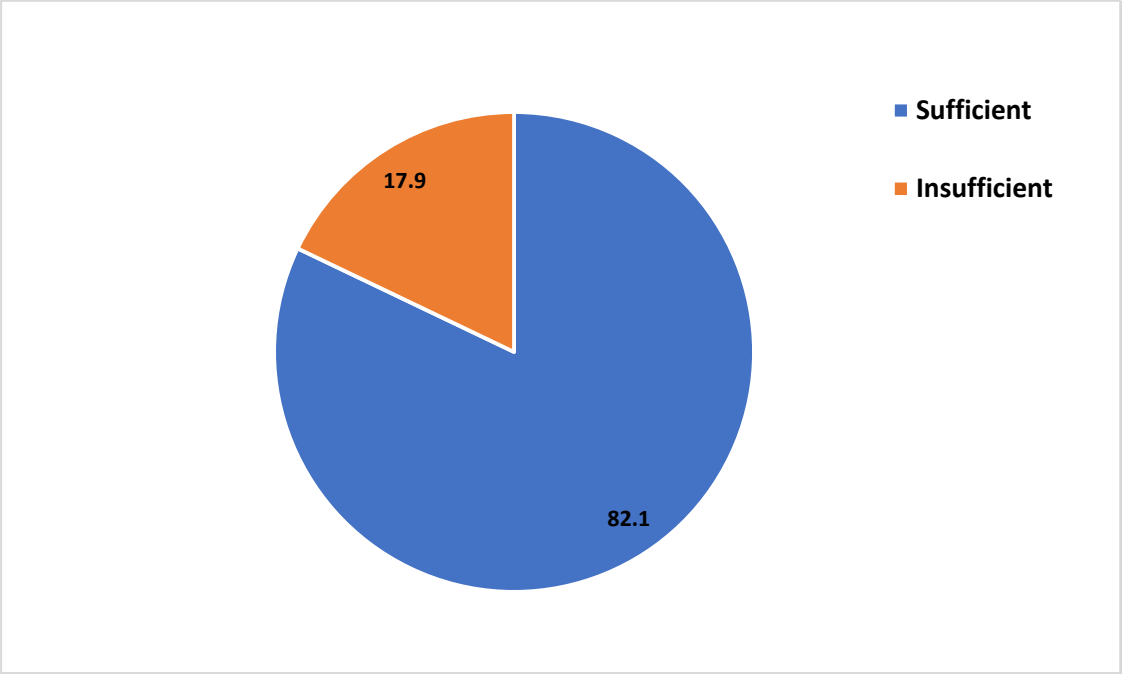
Table 5.11 Percentage wise status of allocation of funds to carryout core library activities

	Frequency	**Percent**
Sufficient	23	82.1
Insufficient	5	17.9
Total	28	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.11 shows status of allocation of funds to carry out core library activities among 28 libraries across India are satisfied with funds, 82.1 Percent of libraries are having sufficient funds only 17.9 percent argued lack of funds in these libraries.

Figure 5.11 Percentage wise status of allocation of funds to carryout core library activities



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

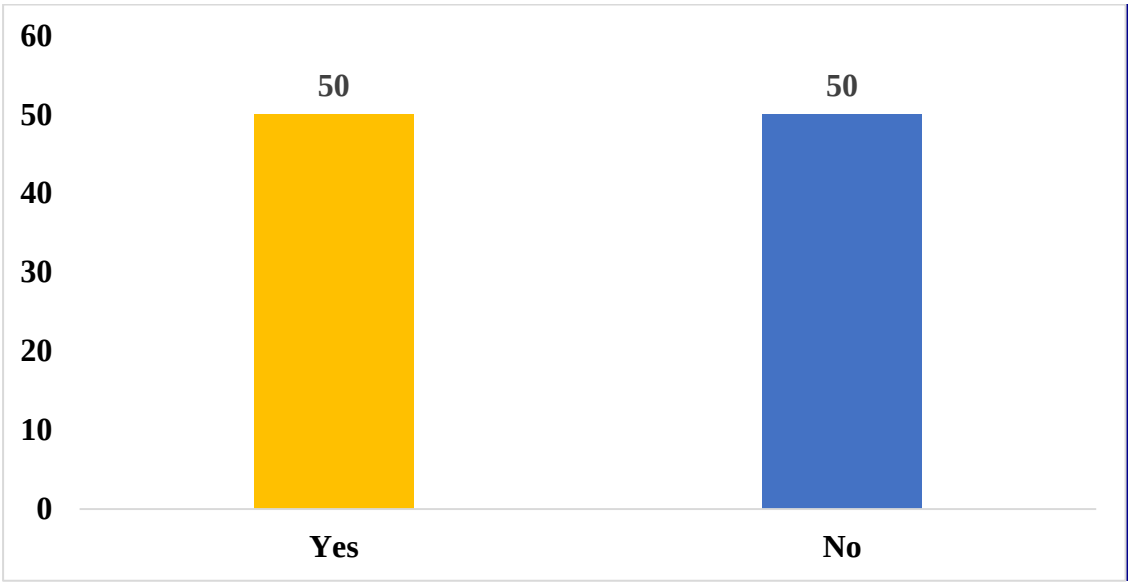
Table 5.12 Percentage wise implementation and motivational/training programmes for the staff at your library? (Organized)

Motivational/Training Programmes	Frequency	Percent
Yes	14	50.0
No	14	50.0
Total	28	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.12 shows distribution wise implementation and motivational/training programmes for the staff at your library. The field survey showed that 50 percent libraries are conducting trainings and motivational programmes for their staff and 50 percent are not conducting any such programmes.

Figure 5.12 Percentage wise implementation and motivational/training programmes for the staff at your library? (Organized)



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

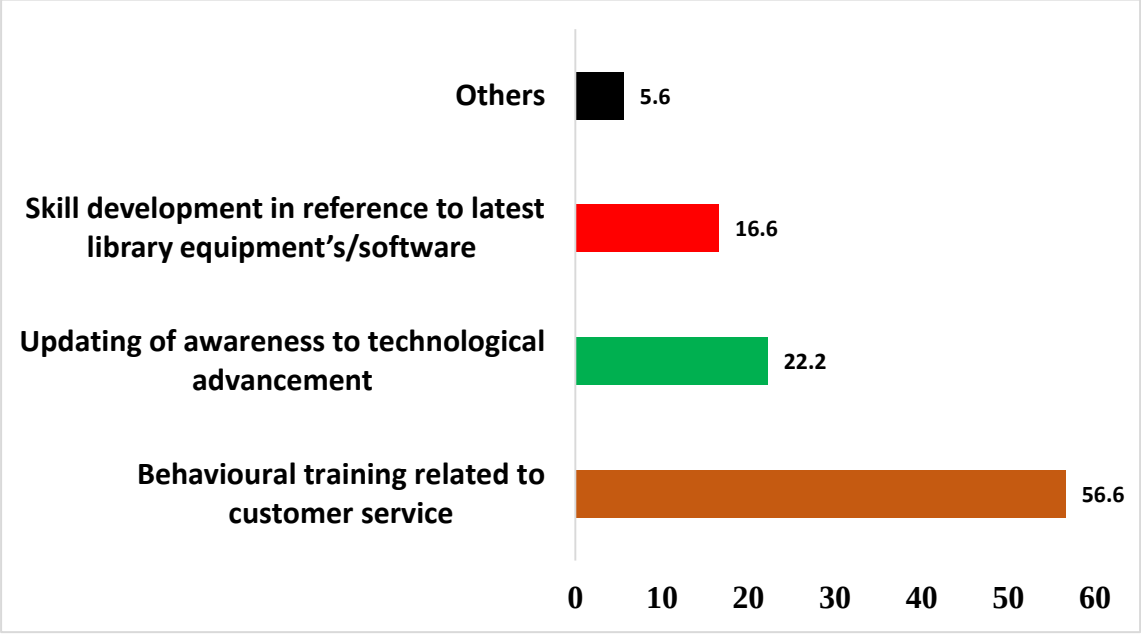
Table 5.13 Percentage wise Enumeration of training programmes

	Frequency	**Percent**
Behavioural Training Related to Customer Service	10	56.6
Updating of Awareness to Technological Advancement	4	22.2
Skill Development in Reference to Latest Library Equipment's/Software	3	16.6
Others	1	5.6
Total	18	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.13 shows enumeration of training programmes for the staff in these libraries are as follows, for Behavioural Training Related to Customer Service 56.6 percent, Updating of Awareness to Technological Advancement 22.2 percent, Skill Development in Reference to Latest Library Equipment's/Software 16.6 percent and Others 5.6 percent respectively.

Figure 5.13 Percentage wise Enumeration of training programmes



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

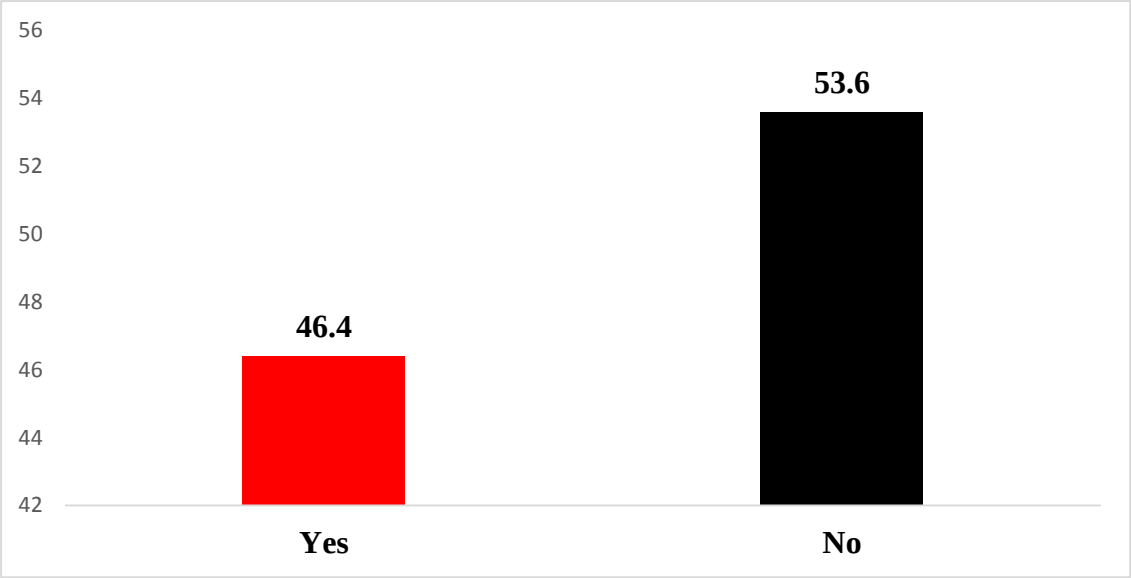
Table 5.14 Percentage wise organisation and offer user orientation /training programmes at your library for users

User Orientation /Training Programmes	Frequency	Percent
Yes	13	46.4
No	15	53.6
Total	28	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.14 shows organisation and orientation training programs for users in libraries are as follows 46.4 percent libraries are hosting these programs for its users and 53.6 percent have no idea about these programmes at all.

Figure 5.14 Percentage wise organisation and offer user orientation /training programmes at your library for users



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

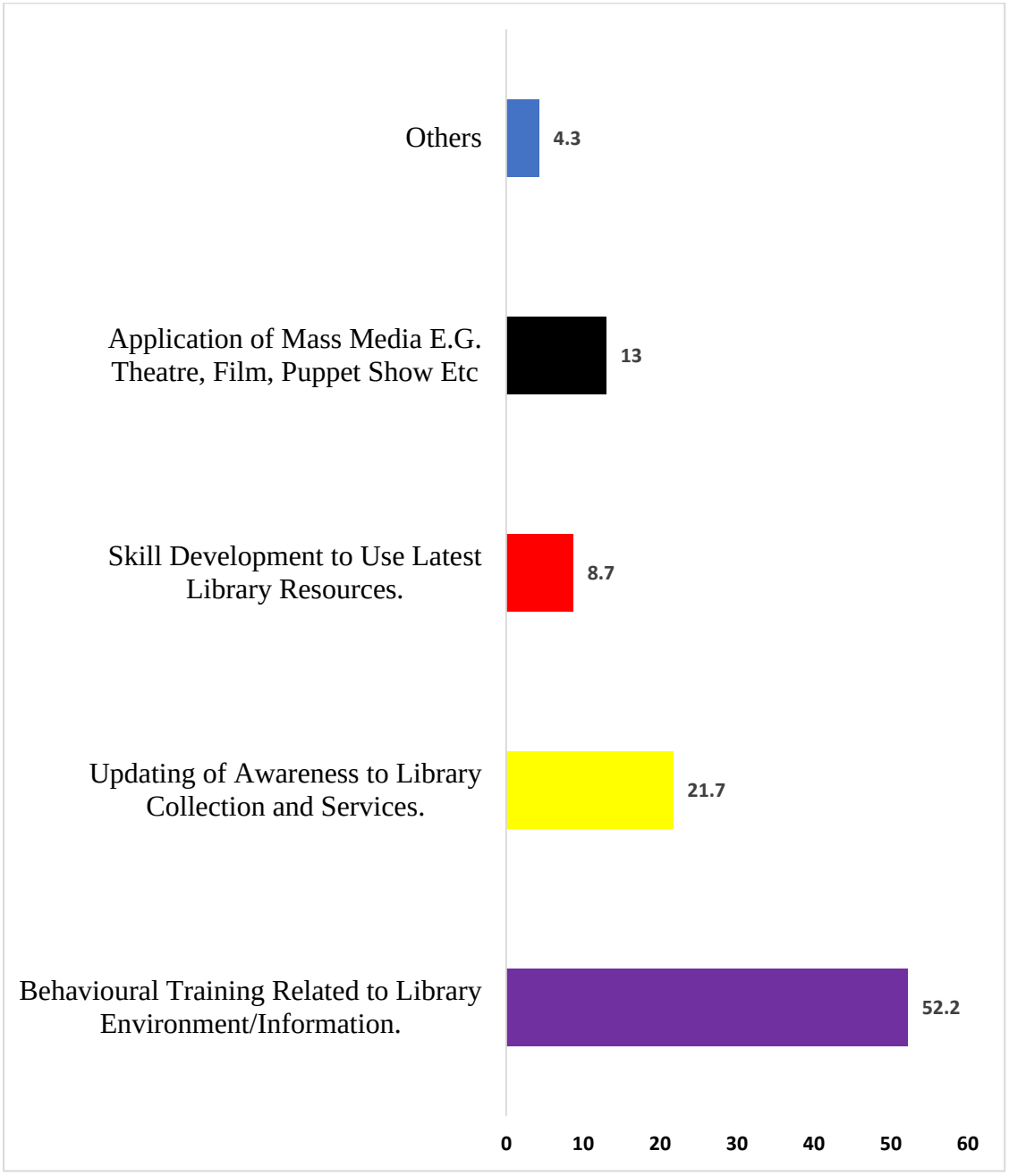
Table 5.15 Percentage wise organisation and enumeration of trainings for users in libraries

If Yes, Enumerate-	**Frequency**	**Percent**
Behavioural Training Related to Library Environment/Information.	12	52.2
Updating of Awareness to Library Collection and Services.	5	21.7
Skill Development to Use Latest Library Resources.	2	8.7
Application of Mass Media E.G. Theatre, Film, Puppet Show Etc	3	13.0
Others	1	4.3
Total	23	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.15 shows us enumeration of trainings and other programs for libraries users. Which are in percentage terms as follows Behavioural Training Related to Library Environment/Information 52.2 percent, Updating of Awareness to Library Collection and Services 21.7 percent, Skill Development to Use Latest Library Resources 8.7 percent, Application of Mass Media E.G. Theatre, Film, Puppet Show Etc 13.0 percent and Other 4.3 percent respectively.

Figure 5.15 percentage wise organisation and enumeration of trainings for users in libraries



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

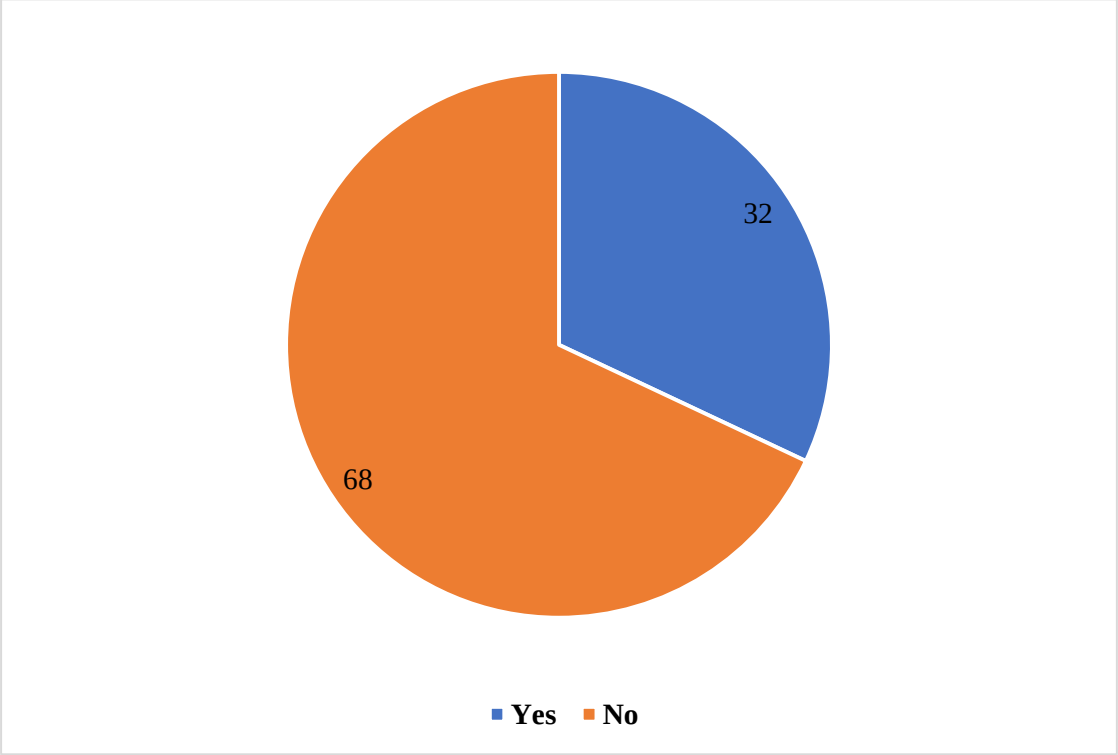
Table 5.16 Do your Information Management Centre/Library organise programmes to make the users aware of various facilities available.

User Orientation /Training Programmes	Frequency	Percent
Yes	8	32.0
No	17	68.0
Total	25	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.16 shows awareness of different facilities for users in these Krishi libraries, 32 percent libraries are providing awareness programmes for its users and 68 percent are not providing any information to its users at all.

Figure 5.16 Do your Information Management Centre/Library organise programmes to make the users aware of various facilities available



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

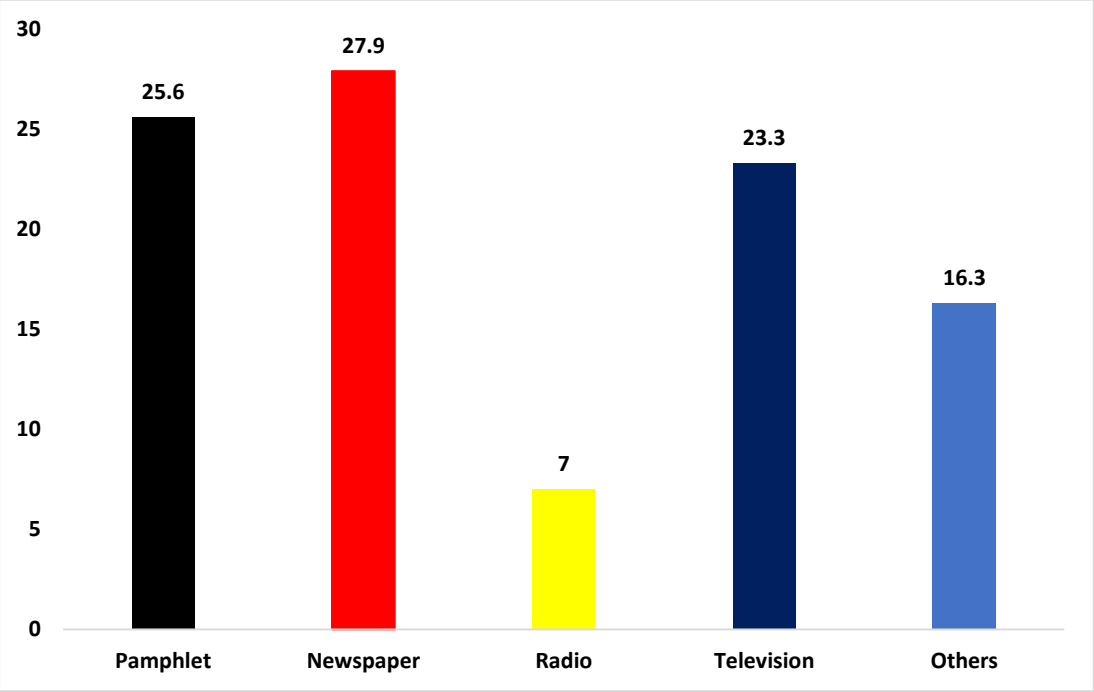
Table 5.17 Percentage wise mode of organised awareness programmes

Organised Awareness	Frequency	Percent
Pamphlet	11	25.6
Newspaper	12	27.9
Radio	3	7.0
Television	10	23.3
Others	7	16.3
Total	43	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.17 shows us percentage wise mode of organised awareness programmes, Pamphlet 25.6 percent, Newspaper 27.9percent, Radio 7 percent, Television 23.3 percent and other 16.3 percent and so on.

Figure 5.17 Percentage wise mode of organised awareness programmes



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

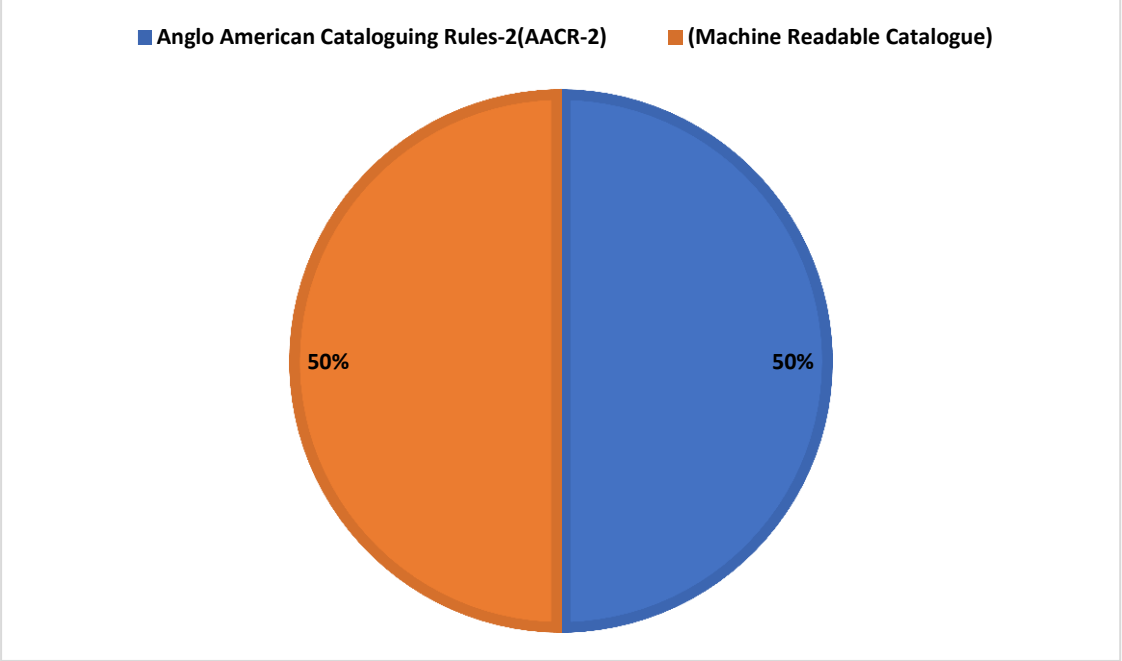
Table 5.18 Enumerate applications of globally recognised data standard and protocols at your library /information centre

Organised Awareness	Frequency	Percent
Anglo American Cataloguing Rules-2(AACR-2)	1	50
(Machine Readable Catalogue)	1	50
Total	2	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.18 shows globally recognised data standard and protocols at libraries are Anglo American Cataloguing Rules-2(AACR-2) 50 percent and Machine-Readable Catalogue 50 percent respectively.

Figure 5.18 Enumerate applications of globally recognised data standard and protocols at your library /information centre



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

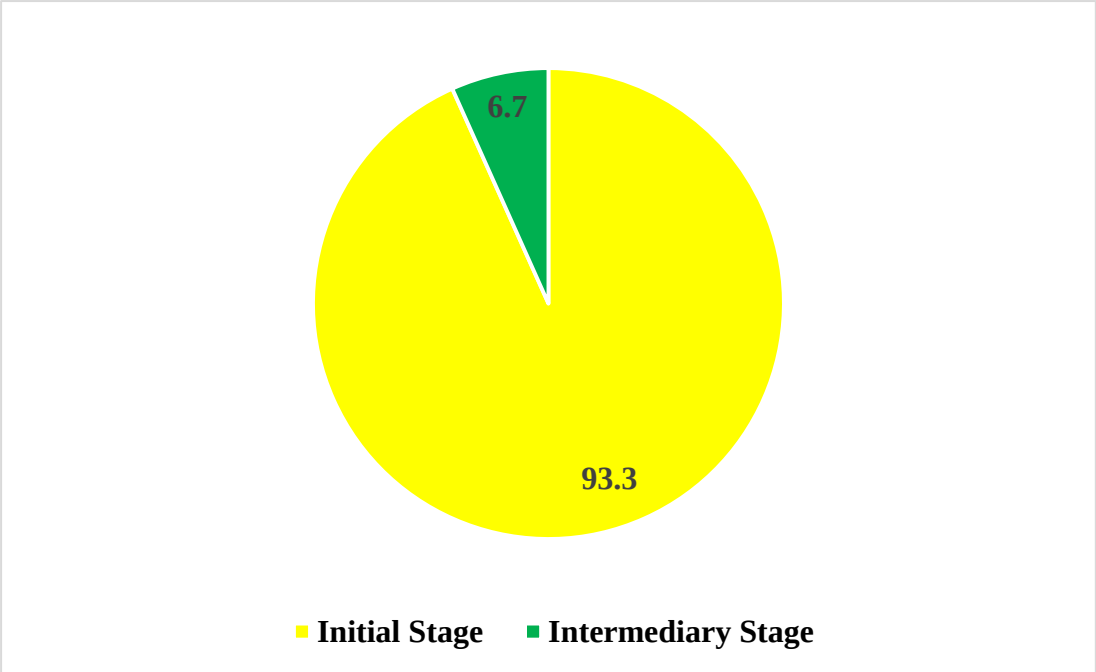
Table 5.19 Percentage of total quality management (TQM) in your organization to improve infrastructure and operations

Total Quality Management (TQM)	Frequency	Percent
Initial Stage	14	93.3
Intermediary Stage	1	6.7
Total	15	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.19 shows total quality management (TQM) to improve infrastructure and operations mostly libraries are following initial stage with 93.3 percent and 6 .7 libraries are following intermediary stage to improve quality management in libraries.

Figure 5.19 Percentage of total quality management(TQM) in your organization to improve infrastructure and operations



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

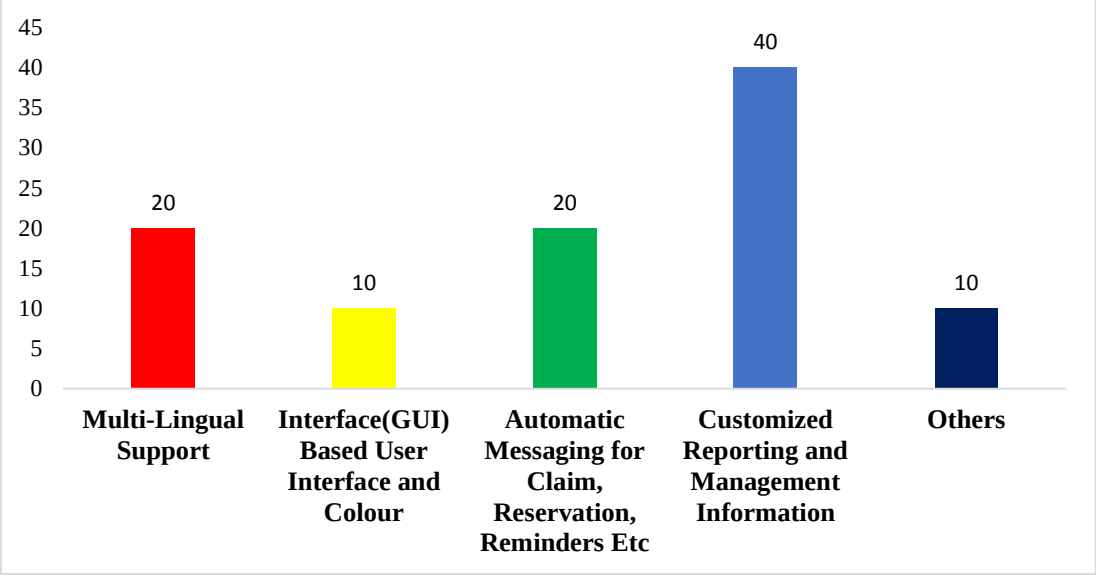
Table 5.20 Enumerate state of ICT implementation for effective retrieval of information?

ICT Implementation	Frequency	Percent
Multi-Lingual Support	2	20.0
Interface (GUI) Based User Interface and Colour	1	10.0
Automatic Messaging for Claim, Reser vation, Reminders Etc	2	20.0
Customized Reporting and Management Information	4	40.0
Others	1	10.0
Total	10	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.20 shows ICT implementation and retrieval information in Krishi Vigyan libraries and the information is as follows for Multi-Lingual Support 20 percent, Interface(GUI) Based User Interface and Colour 10 percent, Automatic Messaging for Claim, Reservation, Reminders Etc 20 percent, Customized Reporting and Management Information 40 percent and for other 10 percent.

Figure 5.20 Enumerate state of ICT implementation for effective retrieval of information?



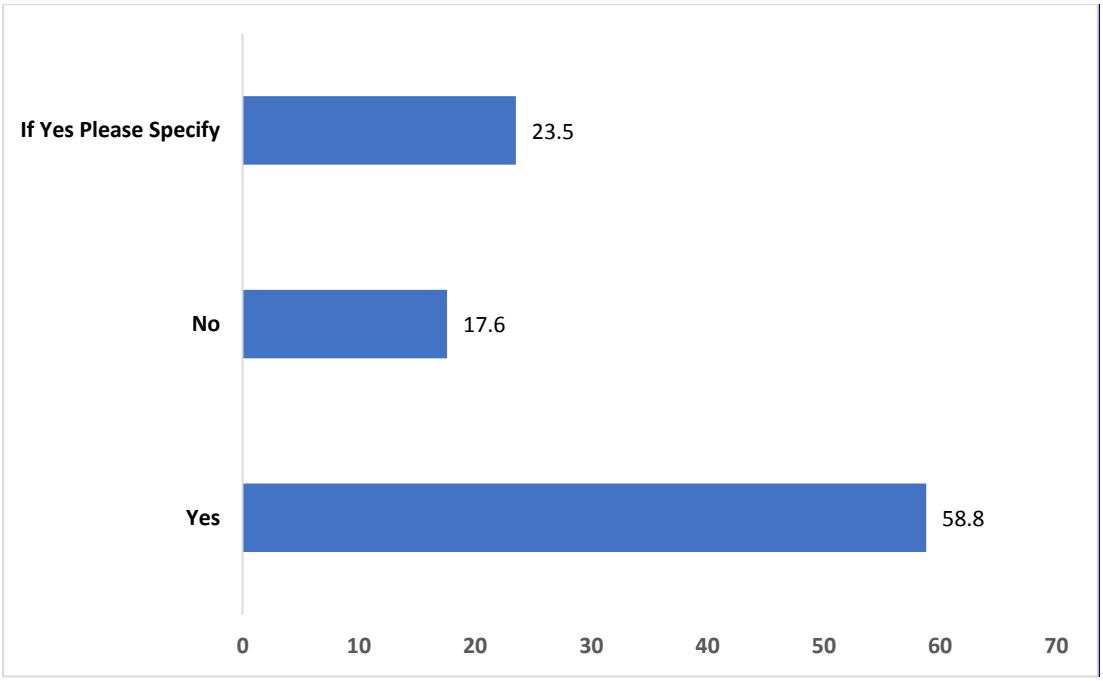
Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.21 Percentage wise interactions with farmers and other users do you develop any data base at information centre of KVK?

Information Centre Of KVK	Frequency	Percent
Yes	10	58.8
No	3	17.6
If Yes Please Specify	4	23.5
Total	17	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Figure 5.21 Percentage wise interactions with farmers and other users do you develop any data base at information centre of KVK?



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

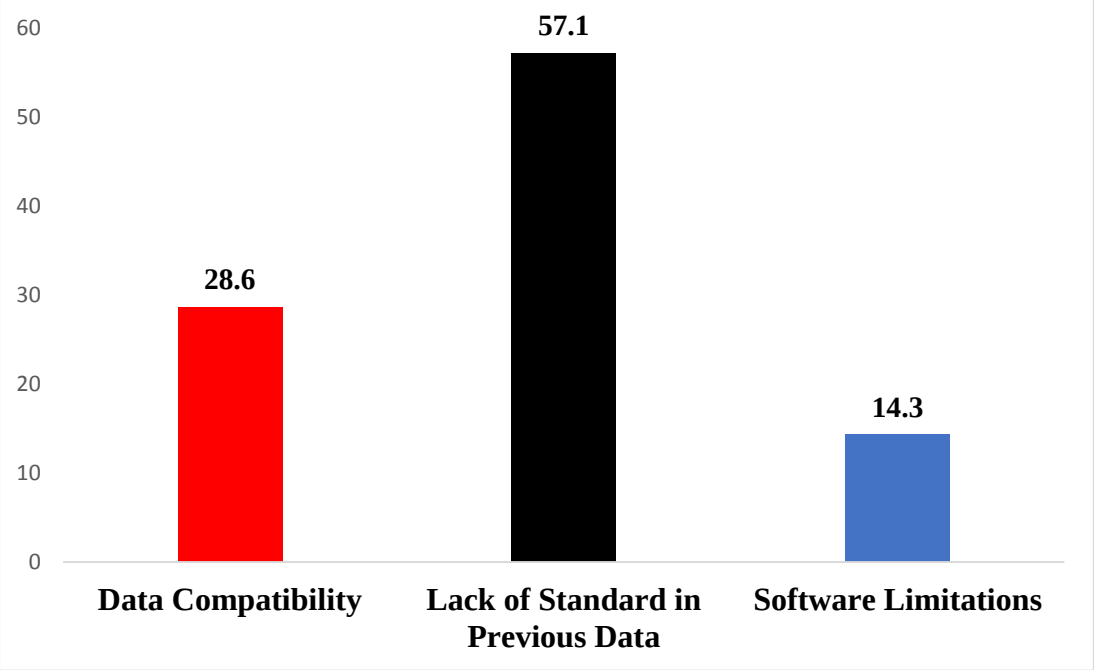
Table 5.22 Percentage wise distribution of data conversation and inhibiting factors

Inhibiting Factors	Frequency	Percent
Data Compatibility	2	28.6
Lack of Standard in Previous Data	4	57.1
Software Limitations	1	14.3
Total	7	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.22 shows percentage wise distribution of data conversation and inhibiting factors. The Data Compatibility composes 28.6 percent, Lack of Standard in Previous Data 57.1 percent and software limitations 14.3 percent respectively.

Figure 5.22 Percentage wise distribution of data conversation and inhibiting factors



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

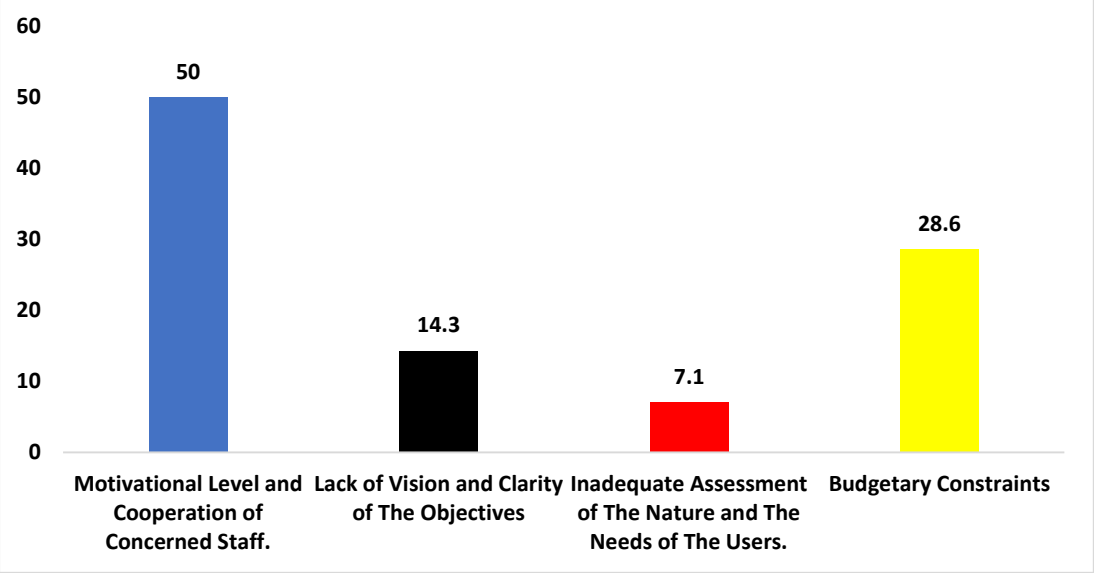
Table 5.23 Enumerate the problems blocking the functioning, updating and implementation of ICT at KVK library.

Implementation of ICT At KVK Library.	**Frequency**	**Percent**
Motivational Level and Cooperation of Concerned Staff.	7	50
Lack of Vision and Clarity of The Objectives	2	14.3
Inadequate Assessment of The Nature and The Needs of The Users.	1	7.1
Budgetary Constraints	4	28.6
Total	14	100.0

Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

Table 5.23 shows us problems of blocking function in updating and implementing ICT at KVK libraries and the percentage is as Motivational Level and Cooperation of Concerned Staff 50 percent, Lack of Vision and Clarity of The Objectives 14.3 percent, Inadequate Assessment of The Nature and The Needs of The Users 7.1 percentage and Budgetary Constraints 28.6 percent.

Figure 5.23 Enumerate the problems blocking the functioning, updating and implementation of ICT at KVK library



Source: Estimated from Field Survey **Note**: Figure in parenthesis are percentage in Total

5.3 Conclusion:

KVKs libraries has been established for the welfare-meant of agriculture in rural India. The information technology in KVKs libraries is not full-fledged, these libraries are working with average facilities likewise the Status of ICT application in Library Management System (LMS), Professional Staff 28.6 % and Non-Professional Staff 71.4 %only.

Status of ICT application in Library Management System (LMS) is very much less, therefore these should be developed to its fullest level. If we check Automation used for operational (Housekeeping) services in KVKs libraries is Cataloguing 51.9 Percent, Circulation 33.3 Percent, Acquisition 11.1 Percent, Serial control 3.7 Percent, they are all showing average percentages.

Facilities provided at Krishi Vigyan Kendra libraries are very limited. LMS and its selection processes, there is 26.1 percent from Request for proposal, 8.7 percent, Literature Review on ILMS & ILMS Vendors, 52.2 Professional Consultants which is a beauty in developing these libraries by consulting professionals in decision making and lastly 13.0 percent is decided by following Library Committee Decision Based on Neighbouring Libraries.

collections of materials in the form of print and electronic forms are books in printed form are 20.7 percent while in electronic form only 14.3 percent which is against very less. visitors and their usage of libraries are research scholars visiting mostly frequently only 21.7 percent times, professionals are utilizing at a higher percentage with 53.8 percent and farmers with only 24 percent. Frequently using libraries by visitors in which farmers are less than 30 percent connected with KVKs libraries. Facilities for farmers in Krishi Vigyan Kendra libraries are Kisan Call Centre Facility 82.1 percent and 17.9 percent are lacking this facility,

which is an appreciating thing. Training programmes for the staff in these libraries are as follows, for Behavioural Training Related to Customer Service 56.6 percent, Updating of Awareness to Technological Advancement 22.2 percent, Skill Development about Latest Library Equipment's/Software 16.6 percent and Other 5.6 percent respectively Problems of blocking function in updating and implementing ICT at KVK libraries and the percentage is as Motivational Level and Cooperation of Concerned Staff 50 percent, Lack of Vision and Clarity of The Objectives 14.3 percent, Inadequate Assessment of The Nature and The Needs of The Users 7.1 percentage and Budgetary Constraints 28.6 percent. So, from over all analysis we found that KVKs libraries are at a developing stage. They are facing many challenges like shortage of budgets, lack of proper infrastructure to provide services, facilities to the visitors and farmers generally. These libraries are facing the challenge of insufficient professional and non- professional man force.

CHAPTER-6

Conclusion, Findings and Suggestions

CHAPTER - 6

CONCLUSION, FINDINGS AND SUGGESTIONS

6.1 Conclusion

India is a country of rural urban divide where maximum population lives in rural area. There are enormous defences between rural and urban on the bases of facilities like educational institutes, electricity, health facilities, road and transport etc. urban people are enjoying these facilities while rural are lacking most of them. Due to which differences are emerging between the regions. This is believed that rural people are facing problems of knowledge about modern tactics of life, these differences has created gaps among them. Government of India has initiated various programmes to address these problems which are community-based programmes, public libraries, rural centres, Krishi Vigyan Kendra's, N.G.O.'s. Secondly literature high lights various programmes which guarantees urban amenities in rural areas (PURA) which focuses on right to education, right to health, right to information, to cover inclusive pattern of growth in rural areas by implementation different policies under it. Government of India is targeting women and young youth by providing them opportunities to be self-reliant, development of ICT in libraries of KVK is one among them.

ICT has played pivotal role in executing its benefits to the agricultural sector, by wide innovations of new devices like computers, mobile phone devices, at vey minimum costs available to the public. Digitalization has helped agricultural sector much by promoting competitive marketing and has increased market value of the products. KVK is promoting agriculture by integrating ICT and its management with

agriculture, Information communication management(ICM). ICT is likely to play major role in agribusiness, market information, market intelligence, government schemes, weather forecasting, farming information etc.

KVKs and ICT are working on promotion of common ideas at a common platform at KVKs libraries. Concepts of sustainable agricultural promotion by ICT and KVKs by organising joint programmes on climatic change and food security in Indian context. KVKs are working on four grounds which are economy ease, extension, expansion, and efficiency of agricultural and simultaneously ICT is integrating it with conventional LIS considerably improved by making use of OPAC, user services, reference services, Bibliographic services, current awareness services like documentary etc. which promotes time saving and is also cost effective. ICT has used GIC and remote sensing for boosting agriculture but need of the hour is also to address the land and water scarcity. ICT is proving agricultural utilization services via KVKs libraries.

Lastly, some shortcomings of ICT and KVKs libraries are still prevailing to cover all issues of agriculture in a well-versed approach. The problems are KVKs libraries mostly failed in addressing the common issues of farmers at remote areas. Secondly KVKs has showed regional developments of certain region and average in other regions. KVKs are having budget issues at times to cover all important issues of the agriculture at point of time. Therefore, KVKs and ICT should work in more cooperation to address these issues jointly with proper planning.

Information Communication Technology and KVKs libraries has achieved milestones in addressing agricultural issues in the country. ICT has its own history and has developed from time to time with incredible innovations beneficial for the

society. Modern age is the age of technology without which sustainability of life is difficult. From invention and discoveries in the field of ICT life has changed much. Therefore, technology is followed everywhere in this world whether it is education, Hospitals, Libraries, Administrative offices, Universities, Defences and much more technology is largely used everywhere. Modern age considered age of digitalization where education is based on information technology, banking, and other services. Similarly, information and communication technology has made drastic changes in the field of agriculture by easy communication, information, transfer of knowledge about various predictions related to agriculture, like weather report, rain fall prediction, environmental changes and utilization of various essential developments.

Some of the issues with ICT are they don't have developed literacy too much to help every farmer equally. They are facing challenges in Infrastructure, lack of standardized ICT related applications, cost factors etc. ICT are promoted by government to help people but sometimes they are facing security problems, therefore, Political and administrative will to establish ICT Infrastructure. Awareness of access to ICT. Lack of ICT skilled man force. Lack of trust for using new technology. Legal uncertainties. These are the things to be taken in to care to provide sustainable and helpful servicers to the farmers to promote agriculture development in the country.

KVKs libraries has been established for the welfare-meant of agriculture in rural India. The information technology in KVKs libraries is not full-fledged, these libraries are working with average facilities likewise the Status of ICT application in Library Management System (LMS), Professional Staff 28.6 % and Non-Professional Staff 71.4 %only.

Status of ICT application in Library Management System (LMS) is very much less, therefore these should be developed to its fullest level. If we check Automation used for operational (Housekeeping) services in KVKs libraries is Cataloguing 51.9 Percent, Circulation 33.3 Percent, Acquisition 11.1 Percent, Serial control 3.7 Percent, they are all showing average percentages.

Facilities provided at Krishi Vigyan Kendra libraries are very limited. LMS and its selection processes, there is 26.1 percent from Request for proposal, 8.7 percent, Literature Review on ILMS & ILMS Vendors, 52.2 Professional Consultants which is a beauty in developing these libraries by consulting professionals in decision making and lastly 13.0 percent is decided by following Library Committee Decision Based on Neighbouring Libraries.

Collections of materials in the form of print and electronic forms are books in printed form are 20.7 percent while in electronic form only 14.3 percent which is against very less. visitors and their usage of libraries are research scholars visiting mostly frequently only 21.7 percent times, professionals are utilizing at a higher percentage with 53.8 percent and farmers with only 24 percent. Frequently using libraries by visitors in which farmers are less than 30 percent connected with KVKs libraries. Facilities for farmers in Krishi Vigyan Kendra libraries are Kisan Call Centre Facility 82.1 percent and 17.9 percent are lacking this facility, which is an appreciating thing. Training programmes for the staff in these libraries are as follows, for Behavioural Training Related to Customer Service 56.6 percent, Updating of Awareness to Technological Advancement 22.2 percent, Skill Development about Latest Library Equipment's/Software 16.6 percent and Other 5.6 percent respectively Problems of blocking function in updating and implementing ICT at KVK libraries and the percentage is as Motivational Level and Cooperation of

Concerned Staff 50 percent, Lack of Vision and Clarity of The Objectives 14.3 percent, Inadequate Assessment of The Nature and The Needs of The Users 7.1 percentage and Budgetary Constraints 28.6 percent. So, from over all analysis we found that KVKs libraries are at a developing stage. They are facing many challenges like shortage of budgets, lack of proper infrastructure to provide services, facilities to the visitors and farmers generally. These libraries are facing the challenge of insufficient professional and non- professional man force.

6.2 Findings of the Study:

- KVK'S are working with only 28.6 percent professional employees and 71.4 percent non-professional. Therefore, both professional and non-professional staff is very limited in these libraries.
- ICT applications in these KVK'S libraries are 10.2 percent of non-automated facilities, initial level facilities 85.7 percent and 3.6 percentage of completely automated.
- Automation used for operational (Housekeeping) services at Krishi Vigyan Kendra libraries are Cataloguing 51.9 Percent, Circulation 33.3 Percent, Acquisition 11.1 Percent, Serial control 3.7 Percent.
- The facilities provided by Krishi Vigyan Kendra libraries to its visitors, (Farmers, Professionals, Academicians etc) are as Firefighting 29.3 percent, Photocopying 32.9 percent, Scanning19.5 percent, and Printing percent 18.3 percent.
- Services offered at KVK'S Libraries are Lending Service with 18.5 percent, followed by Magazines17.1 percent, Internet Access15.8 percent, Journals

11.0 percent, Newspapers 13.7 percent and other services like E-Books, Literature Search, Database and other more are available at very less percentage.

- The Execution of LMS and its selection processes, is 26.1 percent from Request for proposal, 8.7 percent, Literature Review on ILMS & ILMS Vendors, 52.2 percent and 13.0 percent is decided by following Library Committee Decision Based on Neighbouring Libraries.

- KVK'S collections of materials in the form of print and electronic forms are, Books in printed form are 20.7 percent while in Electronic form only 14.3 percent, secondly Magazines 19.3 percent in print form and 10.7 percent in Electronic form, and News Papers 18.5 percent in print form and 10.7 percent in Electronic form.

- The equipment's available in KVK'S libraries are, computers is 18.6 percent, server's 10.7 percent, Printer's 12.9 percent, Scanners 13.6 percent, photocopy machine's 15.7 percent, UPS 15.7percent, Projectors 10.7 percent and other facility 2.1 percent.

- KVK'S Library visitors and their usage of in these libraries are, research scholars visiting mostly frequently only 21.7 percent times, Professionals are utilizing at a higher percentage with 53.8 percent and farmers with only 24 percent.

- Krishi Vigyan Kendra libraries are supporting, Kisan Call Centre Facility 82.1 percent and 17.9 percent are lacking this facility. Text Messaging facility with

92.9 percent and 7.1 percent libraries are lacking this facility, and lastly the voice messaging facility is 75 percent and 25 percent are also lacking it.

- The allocation of funds to carry out core library activities among 28 selected libraries across India are satisfied with funds. 82.1 Percent of libraries are having sufficient funds only 17.9 percent argued lack of funds in these libraries.

- KVK'S implementation and motivational/training programmes for the Professional as well as well non- professional staff, showed that 50 percent libraries are conducting trainings and motivational programmes for their staff.

- KVK'S Enumeration of training programmes for the staff is found as, For Behavioural Training Related to Customer Service 56.6 percent, Updating of Awareness to Technological Advancement 22.2 percent, Skill Development and Latest Library Equipment's/Software 16.6 percent and Other 5.6 percent respectively.

- The organization and orientation training programs for users in KVK'S libraries is found 46.4 percent libraries are hosting these programs for its users and 53.6 percent have no idea about these programmes at all.

- KVK'S Enumeration of trainings and other programs for libraries users. Behavioural Training Related to Library Environment/Information 52.2 percent, Updating of Awareness to Library Collection and Services 21.7 percent, Skill Development to Use Latest Library Resources 8.7 percent, Application of Mass Media E.G. Theatre, Film, Puppet Show Etc. 13.0 percent and Other 4.3 percent respectively.

- KVK'S facilities for users and their awareness only 32 percent libraries are providing awareness programmes for its users and 68 percent are not providing any information to its users at all.

- KVK'S organized awareness programmes for its users in different modes is as follows, Pamphlet 25.6 percent, Newspaper 27.9percent, Radio 7 percent, Television 23.3 percent and other 16.3 percent and so on.

- KVK'S globally recognized data standard and protocols at libraries are Anglo American Cataloguing Rules-2(AACR-2) 50 percent and Machine-Readable Catalogue 50 percent respectively.

- The total quality management (TQM) to improve infrastructure and operations in KVK'S libraries are initial stage with 93.3 percent and 6 .7 libraries.

- ICT implementation and retrieval information in Krishi Vigyan libraries and the information is, for Multi-Lingual Support 20 percent, Interface(GUI) Based User Interface and Colour 10 percent, Automatic Messaging for Claim, Reservation, Reminders Etc 20 percent, Customized Reporting and Management Information 40 percent and for other 10 percent.

- 58.8 percent of KVK'S Libraries who are developing data on interactions with farmers and other users.

- KVK'S data conversation and inhibiting factors are fond that Data Compatibility composes 28.6 percent, Lack of Standard in Previous Data 57.1 percent and software limitations 14.3 percent respectively.

- The problems of blocking function in updating and implementing ICT at KVK libraries and is as Motivational Level and Cooperation of Concerned Staff 50

percent, Lack of Vision and Clarity of The Objectives 14.3 percent, Inadequate Assessment of The Nature and The Needs of The Users 7.1 percentage and Budgetary Constraints 28.6 percent.

6.3 Suggestions of the Study:

- Execution of KVK'S libraries should be more accessible to the farmers with all affordable facilities.
- ICT should be made more viable to support the services of KVK'S libraries to the visitors.
- Pre-planned budget should be properly managed in advance, so that KVK'S libraries could function smoothly without any hurdles in their working mechanisms.
- Man force professional as well as non- professional should be employed as be the requirements of these libraries.
- Training programmes for both professional and not professional staff should be provided as per specialization of the individual staff, so that they could be utilized for the betterment of these libraries.
- KVK'S libraries should be facilitated with maximum investment on infrastructure, so that they could function well in particular regions.
- KVK'S libraries should mostly work as per environmental conditions of the existing regions like Geography, climatic conditions, culture of communities, knowledge, etc.

6.4 Area of further Research:

- This study will take into account all Zones of the Country to have a deep and Comprehensive Benchmark Analysis of KVKS Libraries in India.
- This study will further focus on "rising demands of innovations in information and communication technology" to over view its positivity and negativity on its users in KVKS libraries.
- This study will be made comparative by making a joint effort to check regional differences on the bases of Geography, language, education, urban and rural differences across the country.
- This study could be analysed on the basis of government policies related to KVKS and their workings by analysing them on development and promotional grounds of KVKS.

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Appendix

BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY
• LUCKNOW •
प्रज्ञा शील करुणा
ESTABLISHED 1996

Babasaheb Bhimrao Ambedkar University
(A Central University)
Vidya Vihar, Raebareli Road, Lucknow-226 025

Letter No.: /DLIS/BBAU/2017

Dated:

To,

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Sub: Request for filling up of the questionnaire

Sir/Madam,

Mr Shyamdeo Gond is a Research Scholar in the Department of Library and Information Science, Babasaheb Bhimrao Ambedkar University, Lucknow. His research topic is **"USE OF INFORMATION COMMUNICATION TECHNOLOGY IN LIBRARIES OF KRISHI VIGYAN KENDRA IN INDIA: A STUDY".**

Therefore, the research requires him to collect the filled questionnaire from the Librarian or Library In charge of your esteemed Library. If you could kindly fill the questionnaire. It would be a great support for him.

Recognizing the apprehension with respect to this request, let me assure you that the information made available by you would be used purely for the purpose of the research only.

Thanking you,
Yours Sincerely,

(**Shyamdeo Gond**)
Research Scholar
Department of Library and Information Science
Babasaheb Bhimrao Ambedkar, Central University
Vidya Vihar, Raebareli Road, Lucknow, Uttar Pradesh.

Questionnaire

Title: Use of Information Communication Technology (ICT) IN Libraries of Krishi Vigyan Kendra: A Study

GENERAL INFORMATION:

Name of the KVK:

Year of Establishment:

Name of Chief Librarian:

No. of staff: i) Professional [ ] ii) Non professional [ ]

No. of registered Users:

Types of users:

Professionals [ ] Subject Specialist [ ] Formers [ ]

Any others.....

Frequency of visiting users at your library.

Serial No.	**Users**	**Most frequently**	**Frequently**	**Sometimes**	**Never**
i	Professionals				
ii	Subject Specialist				
iii	Farmers				
iv	Others				

LIBRARY COLLECTION:

1. **Library collections available at your centre**

Sl. No.	**Reading Materials**	**Print**	**Electronic**	**Total**
1	Books			
2	Journals/periodicals			
3	Reports			
4	CD Rom Databases			
5	Online Databases			
6	Microfilm/Microfiche			
7	Tape/castes			
8	Magazines			
9	Reference sources			
10	News papers			
Other				

LIBRARY SERVICES

2) Services offered at your library.(Please tick, if more than one)

a) lending services [ ]e) reprographic service [ ]

e) Reference service [ ]f) Internet access [ ]

g) Literature search [ ]h) online resource access [ ]

i) Inter Library loans [ ]m) instant messaging services[ ]

n) Others (Specify)…….

LIBRARY INFRASTRUCTURE

3. Library support equipments available at your centre.

Serial No.	**Collection**	**No.**
1.	Computers	
2.	Servers	
3.	Printer	
5.	Scanner	
6.	Photocopy machine	
7.	UPS	
8.	Projector	
9.	Others	

4. Facilities provided at your library. (Please tick, if more than one)

a) Fire fighting [ ] b) Photocopying [ ]

c) Scanning [ ] d) Printing [ ]

5. Facilities provided at your library for PWD. (Please tick, if more than one)

a) Fire fighting [ ] b) Photocopying [ ]

c) Scanning [ ] d) Printing [ ]

6. Do your library have following facility to the farmers?

a) kisan call centre [ ] b)voice-messaging

c) text-massaging [ ] d) any other.....

INFORMATION TECHNOLOGY APPLICATIONS

9. Status of ICT application in Library Management System (LMS).

a) Non automated [ ] b) Migratory stage [ ]

c) Initial stage [ ] d) completely automated [ ]

If it is non automated please mentioned the reasons

a) Need not required [ ] b) Fund problems [ ]

c) Technical man power [ ] d) No administrative support [ ]

10. Enumerate the LMS use at your Library.

a) LibSuite [ ] b) Sanjay [ ]

c) SOUL [ ] d) SLIM [ ]

e) Librarian [ ] f) Granthalaya [ ]

g) LibSys [ ] h) Others (Specify)…….

11. Specify automation used for operational (Housekeeping) services at your library. (Please tick, if more than one)

a) Cataloguing [ ] b) Circulation [ ]

c) Acquisition [ ] d) Serial control [ ]

e) Library security [ ] f) Others (Specify)……..

12. Enumerate state of ICT implementation for effective Library services

a) Information retrieval [ ]

b) Reprographic (photocopy, printout etc.) [ ]

c) Inter-library loan & reservation [ ]

d) Automatic messaging for claim, reservations, reminders etc. [ ]

e) Reference / referral [ ]

f) Others (specify)……

13. Which of the following advanced technology used in KVK library?

a) Barcode [ ]

b) RFID [ ]

c) Mobile technology [ ]

d) Cloud computing [ ]

e) Any other……

If yes for what purpose it has been used?

a) Barcode [ ]lending [ ]stock verification [ ]other……

b) RFID [ ]lending [ ]stock verification [ ]security

c) Mobile technology [ ]Notification [ ]alert service [ ]other……

d) Cloud computing [ ]infrastructure [ ]software [ ]Data storage

14. Which type of internet connectivity available in library. (Please tick)

a) Dialup [ ] b) leased line [ ]

c) WiFi [ ] d) LiFi [ ]

e) Any other.....

15. Which kind of security technology used by the library?

a) RFID [ ] b) CCTV [ ]

c) Smart cards [ ] d) Biometrics [ ]

e) Any other.....

16. Does your library have initiated development of Digital library?

a) Yes [ ] b) No [ ]

If yes please specify the status: ……

17. Have you installed and implemented institutional repository at your library?

a) Yes [ ] b) No [ ]

If yes please specify the status: ……

18. Based on interactions with farmers and other users do you develop any data base at information centre of KVK?

a) Yes [ ] b) No [ ]

If yes please specify: ……

19. Status of ICT allocation of funds to carry out core library activities.

a) Sufficient [ ] b) Insufficient [ ]

c) Full of constraints [ ] d) Others (specify)……

20. Do you implement and offer motivational/training programmes for the staff at your library? (Organized)

a) Yes [ ] b) No [ ]

14a. If yes, enumerate-

a) Behavioural training related to customer service. [ ]

b) Updating of awareness to technological advancement. [ ]

c) Skill development in reference to latest library equipments/software.[ ]

d) Others…….

21. Do you organise and offer user orientation /training programmes at your library?

a) Yes [ ] b) No [ ]

15a. If yes, enumerate-

a) Behavioural training related to library environment/information. [ ]

b) Updating of awareness to library collection and services. [ ]

c) Skill development to use latest library resources. [ ]

e) Others…….

22. Do your Information Management Centre/Library organise programmes to make the users aware of various facilities available.

a) Yes [ ] b) No [ ]

22a. If yes, mention the mode of organised awareness programmes.

a) Pamphlet	[ ]	b) Newspaper	[ ]
c) Radio	[ ]	d) Television	[ ]
e) Ad. Films	[ ]	f) Field programmes	[ ]
g) Interaction	[ ]	h) Others……..	

23. Enumerate the problems blocking the functioning, updating and implementation of ICT at KVK library.

a) Motivational level and cooperation of concerned staff. [ ]

b) Lack of vision and clarity of the objectives. [ ]

c) Transparency of the organisation. [ ]

d) Inadequate assessment of the nature and the needs of the users. [ ]

e) Budgetary constraints [ ]

f) Lack of Technical staff [ ]

f) Others (Specify)……

(Chief Librarian)