

Scenario of Indian Agrarian Librarianship: an evaluative study

Ajay Pratap Singh

Associate Professor & Head
Department of Library & Information Science
Banaras Hindu University, Varanasi, INDIA
apsingh_73@yahoo.co.in

and

Mayank Yuvaraj

Junior Research Fellow
Department of Library & Information Science
Banaras Hindu University, Varanasi, INDIA
mayank.yuvaraj@gmail.com



Copyright © 2013 by **Ajay Pratap Singh and Mayank Yuvaraj**. This work is made available under the terms of the Creative Commons Attribution 3.0 Unported License:

<http://creativecommons.org/licenses/by/3.0/>. The views expressed in this paper are the author's and may not necessarily reflect the official position of ADB.

Abstract:

This paper examines the library users, collections and the services of various agricultural university libraries and research institutes in India on various parameters and the role of apex bodies of Indian agricultural development such as Indian Council of Agricultural Research (ICAR) and Agricultural and Processed Food Products Export Development Authority (APEDA) in shaping the libraries. It examines the contribution of training institutes such as Documentation Research and Training Center and National Institute of Science Communication and Information Resources (NISCAIR) in imparting specialized education and training for careers in agricultural librarianship. Presents the results of data of a survey conducted via stratified random sampling, questionnaire and interview methods. The study revealed that majority of library user preferred electronic resources over print. Many preferred the use of mobile phones for accessing agricultural information from home. A sharp increase in the use of Internet in the libraries was noticed.

INTRODUCTION

Indian agriculture is considered as an aging established profession which is the mainstay of Indian economy. Almost two thirds (65%) of the Indian workforces are engaged in agrarian

profession. Indian agriculture accounts for “14% of the nation`s GDP”, “about 11% of exports” and contributed “250.14 million tonnes of production in 2012-2013” (Govt. of India, 2013).

India is the leading producer of a number of agricultural products and promises for increased agricultural productivity along with increased agricultural income in the long run. However, “Despite the productivity improvements in the Indian agricultural sector over recent decades, yields remain low by international standards and growth in yields has only been marginally higher than the world average” (Cagliarini and Rush, 2011). Moreover, the strides of IT into the agricultural domain has leant technological ubiquity through wireless networks, E-everything (information, reserves), mobile phones and new tools that enhances the agricultural practices and capabilities. “The transformation of agriculture through innovation requires the persuasion of farmers to drop their old beliefs and practices of farming and to adopt scientifically-tested and proven ones” (Womboh, 1999).

In order to innovate and imply new technologies in India, agricultural universities and research centers were established. The establishment of the agricultural universities in India, on the pattern similar to that of the land grant colleges of the United States was a landmark initiation aimed at transforming agriculture through training, research and extension in order to boost food production.

To promote and coordinate education, research and its application in Agriculture and Allied Sciences, ICAR has established 45 state Agricultural Universities, 4 deemed Universities, 4 Central Universities with the Faculty of Agriculture Sciences, 45 ICAR Institutes, 17 National Research Centers, 6 National Bureau and 25 Directorates/Project Directorates. Sustainable agriculture dictates the healthy input of information wherein libraries play a pivotal role that caters to the need of their parent institution. Libraries and Information centres since time immemorial have been catering to the information needs of these universities. However, “the image of the library profession in India is not clearly appreciated in Agricultural Science Universities” (Kannappanavar and Kumbargoudar, 2010). Also, “libraries in developing countries are lagging behind and vary in their ability to provide similar access to knowledge resources, due to poor funding, power supply, Internet access, infrastructure, and human capacity” (Ani, 2005). According to Chisenga (Chisenga, 2000) “libraries need to be properly funded, equipped, and well-staffed in order for their institution and research to be part of the global information infrastructure”.

There is an acute dearth of prospective agricultural librarians leading to an unhealthy state of affairs, whereby non-specialized librarians are currently working in Indian agricultural universities. Womboh (Womboh, 2009) has contrasted agricultural librarian with a general librarian and argues that “a subject agricultural librarian has an intellectual grasp of the field of agriculture as well as librarianship training at the postgraduate level” unlike general librarian “who has an idea of every aspect of library profession”. “Agricultural information professionals must support agriculture by managing and improving access to a proliferating and increasingly complex array of information resources in a climate of shrinking resources and expanding constraints” (Malhan and Rao, 2007). The present paper attempts to unearth the status of agrarian librarianship in India.

STUDY RATIONALE

No value is much more satisfying than the commitment of library and information professionals to serve people with information. Being an important sector of economy, agricultural research, training and innovation has been constantly catalyzed by the libraries for maintaining the information flow equilibrium. ICAR (Indian Council of Agricultural

Research) since 1929 has been coordinating, guiding and managing research education in agriculture. ICAR has established 99 research institutes and 53 agricultural universities in India and have made it mandatory to establish fully computerized library system in each and every center to cater its clientele. Another apex body, APEDA (Agriculture and Processed Food Products Export Development Authority) keeps an eye over the affairs of agricultural products and also plays noteworthy role in shaping the services and library operations. Moreover, in order to develop “subject agricultural librarians” NISCAIR (National Institute of Science Communication and Information Resources) and DRTC (Documentation Research and Training Centre) play an important role. They have been focusing on key themes and have been productive bank for developing specialized librarianship competencies. With so much effort on uplifting the status as well as agrarian library services, it is inevitable to gaze into the status of Indian agrarian librarianship. Huge amount of public and government money is being invested for the purpose. The paper presents a snapshot of users experience in Indian agricultural libraries.

LITERATURE REVIEW

The role of agrarian librarianship as a focal point of agricultural training, research and extension has been a topic of great discussion among researchers throughout the world. Numerous studies have been conducted to find out the impact of library services on agrarian practices. For instance, Lalotra and Gupta studied the information needs and expectations of users of selected agricultural institutes in Northern India (Lalotra & Gupta, 2010). Raman and Francis studied the role of existing information systems in meetings the needs of research, education and extension of Indian agricultural sector (Raman & Francis, 1996). They also depicted various channels used by rural community in information seeking. According to Mangstl “libraries support agricultural research by enhancing access to information through effective management of its resources and provision of a wide range of information services and products to researchers, scientists, and policy maker in the agricultural sector” (Mangstl, 2006).

On the other hand, Shilpa, Uplaonkar and Mahadevagouda attempted to study the role of AALDI (Association of Agriculture Libraries and Documentalists of India), agriculture library networks and consortia in sharing library resources (Shilpa, Uplaonkar & Mahadevagouda, 2013). Chandrasekharan studied the utilization and satisfaction levels of users accessing e-journals through Consortium for e-Resources in Agriculture (CeRA) (Chandrasekharan, 2012). In contrast, Womboh reported the role of establishment of Universities of agriculture (Uni-Agrics) in Nigeria to transform poor agricultural productivity through training, research and extension (Womboh, 1999). Complimentary studies was done by Oduwole and Okorie who pointed out various strategies to provide better accessibility to agricultural information and meet the millennium development goals from Nigeria perspective (Oduwole & Okorie, 2010). While Kannappanavar and Swamy conducted a survey to find out the status of user education programmes in agricultural science university libraries in south India (Kannappanavar & Swamy, 2010).

On the other hand, Mellinger and Starmer put forth a preservation management program for University of Tennessee's Agriculture and Veterinary medicine library to develop quality practices to conserve materials and stabilize conditions within library funding constraints (Mellinger & Starmer, 2003).

Contrary to the above studies, Fescemyer provided descriptions of most important sites for agriculture ranging from general resources, statistics and agricultural economics, plant

sciences, food sciences to animal and veterinary sciences (Fescemyer, 2005). Similar study was carried out by Teeter, who described the major databases available for finding journal articles and other literatures about water and related fields (Teeter, 2011). Harper describes the strategies used in developing a new branch agriculture “electronic library” at the University of Manitoba. He discusses the action plan used to develop library services, collections as well as the location of the library (Harper, 2002).

While, Kannappanavar and Kumargoudar identified the manpower working and manpower requirements in the agricultural science university libraries in India (Kannappanavar & Kumargouda, 2010). Rokade and Rajyalakshmi study the role of electronic information services and INFLIBNET services in agricultural university libraries in Maharashtra (Rokade & Rajyalakshmi, 2006). Bansal examines the status of the libraries of six ICAR institutes in the state of Haryana on various library aspects (Bansal, 2011). From technological perspective Hori, Kawashima and Yamazaki studied the feasibility studies of latest technologies such as sensors, wireless networks, and cloud computing to revise the approaches to agriculture and establish a hypothetical model of cloud services (Hori, Kawashima & Yamazaki 2010).

OBJECTIVES OF THE STUDY

The objectives of the present study are:

- To study users and their purpose of using agricultural university and research institutes libraries in India.
- To examine the condition which influence usage of agricultural university and research institute's libraries in India.
- To examine the characteristic features of the collections and services offered in agricultural university and research institutes libraries.
- To measure user's satisfaction levels from resources and services offered in the libraries.
- To know user's opinions about user awareness and information literacy related to electronic resources and services.
- To identify tools used by agricultural university and research institutes libraries.
- To determine the usefulness, efficiency and effectiveness of ICT in agricultural university and research institutes libraries in India

METHODOLOGY

There are 44 state agriculture universities, 5 deemed-to-be universities, 4 central universities, 47 ICAR research institutions, and 17 national research centres established in different parts of India. Out of 117 universities and research institutions 42 are in the process of developing library infrastructure, library services & skilled professionals. Therefore, in the study 75 (mentioned in Appendix- II) out of 117 universities and research institutions were considered for the study.

A questionnaire survey was used for collection of data from a purposive sample of 100 users of drawn from a countrywide population of 75 libraries of universities and research institutions. A 15 open ended & closed ended questions based structured questionnaire was designed to gather data on related areas. Questionnaires were mailed & personally administered to the library users over a period of ten months. Out of the 7500 questionnaires administered 7450 respondents (99 per cent) returned completed questionnaires. On close

analysis, the information was found incomplete in 40 responses. Finally, 7410 (98per cent of the sample) valid questionnaires were selected for data analysis & interpretation. The data were interpreted, classified & transferred into coded form, entered into Microsoft Excel & transferred in statistical package for social sciences (SPSS). A frequency analysis was run for detection & removal of errors & missing numbers. The final cleaned & coded data were subjected to analysis using SPSS.

ANALYSIS & FINDINGS

The responses received from the librarians are illustrated in the form of tables, figures. The implications of the findings are discussed below:

Demographic characteristics

The frequency distribution of status of the respondents presented in Table 1 and Table 2 shows that the majority of the respondents are students (53%) which are followed by scientist (46%), faculty members (15%) and staff (8%). Staff members were the least who are using university and research institute's library.

Rank	1	2	3	4	5	Total
Membershi	Scientist	Student	Staff	Faculty	Others	
NIU	8	52	9	13	18	100
VBSTU	13	57	9	12	9	100
AMU	11	59	21	7	2	100
BHU	9	67	7	12	5	100
ALAU	15	49	8	14	14	100
CIEE	9	52	8	17	14	100
NDRI	11	45	20	19	5	100
IVRI	9	56	13	19	3	100
IARI	11	58	9	20	2	100
IBKV	9	56	14	18	3	100
DDUPCV	12	62	8	18	0	100
UASK	14	56	9	11	10	100
UAS	13	49	8	18	12	100
TNAU	11	64	11	14	0	100
SUAST	13	45	17	16	9	100
SDAU	11	56	13	16	4	100
RAU	13	53	14	16	4	100
PAU	12	55	13	18	2	100
OSAT	11	59	10	17	3	100
NAU	13	56	11	19	1	100
MPKV	12	39	18	19	12	100
JAU	11	61	13	14	1	100
JNKV	9	56	30	3	2	100
IGKV	14	49	11	15	11	100
GNDUAV	12	48	10	21	9	100
GBPUAT	11	62	9	16	2	100
YSPU	13	56	14	15	2	100
PDKV	11	56	11	18	4	100
BSKV	13	49	13	15	10	100
CSKHPK	15	55	11	17	2	100
CCSAU	17	42	11	19	11	100
CSAST	18	37	21	16	8	100
CAU	14	56	19	11	0	100
RAU	13	46	11	21	9	100
BCKV	11	39	18	21	11	100
ASAU	6	64	19	11	0	100
AU	17	54	13	16	0	100
AGNRU	18	42	16	12	12	100
Total	463	2017	500	594	226	3800
Percentage	12.18421	53.078947	13.15789	15.63157	5.947368	100

Table 1: status of respondents in agricultural university libraries

Rank	1	2	3	4	5	Total
Membersh	Scientist	Student	Staff	Faculty	Others	
NRCM	41	28	13	16	2	100
NRCE	44	30	12	10	4	100
NRCC	51	30	10	7	2	100
NRCP	44	37	10	7	2	100
NRCB	46	31	18	4	1	100
NCIPM	52	20	18	8	2	100
NCAP	46	22	18	11	3	100
NAARM	52	23	16	7	2	100
IISR	49	24	17	8	2	100
IHR	46	27	20	5	2	100
IGERI	40	31	25	3	1	100
IASRI	45	27	13	11	4	100
RECR	47	31	15	5	2	100
CTCRI	48	31	11	8	2	100
CTRI	46	29	12	9	4	100
CSSRI	50	24	13	7	6	100
CSWCRTI	47	28	13	8	4	100
CPRI	54	24	14	6	2	100
CPCRI	52	22	16	8	2	100
CMFRI	49	31	10	7	3	100
CIPTT	47	25	13	11	4	100
CTH	41	29	18	8	4	100
CASTH	47	31	10	8	4	100
CIRCT	55	29	8	6	2	100
CIFA	54	21	11	10	4	100
CIFT	45	15	18	13	9	100
CICR	48	26	13	10	3	100
CIAH	47	31	18	3	1	100
CIAE	41	18	13	15	13	100
CIRG	38	25	14	13	10	100
CIRB	43	28	19	6	4	100
CIBA	52	22	11	10	5	100
CFR	37	31	14	10	8	100
CAVRI	49	26	15	8	2	100
CAZRI	42	24	13	12	9	100
CARI	38	28	14	16	4	100
Total	1673	959	516	313	138	3600
Percentage	46.48513	26.64629	14.33731	8.696860	3.834398	100

Table 2: status of respondents in agricultural research institutes

Gender

Analysis shows that among 7410 respondents, the majority were male (5092, 68%), while female respondents were 2318 (31.28%) (Table 3).

S.No	University	Male	Female	Total
1	AGNRU	67	33	100
2	AAU	74	26	100
3	ASAU	65	35	100
4	BCKV	78	22	100
5	BAU	69	31	100
6	CAU	78	22	100
7	CSAST	69	31	100
8	CCSAU	77	23	100
9	CSKHPKV	71	29	100
10	BSKKV	77	23	100
11	PDKV	82	18	100
12	YSPU	74	26	100
13	GBPUAT	79	21	100
14	GNDUAV	75	25	100
15	IGKV	76	24	100
16	JNKV	78	22	100
17	JAU	81	19	100
18	MPKV	72	28	100
19	NAU	76	24	100
20	OSAT	81	19	100
21	PAU	76	24	100
22	RAU	67	33	100
23	SDAU	75	25	100
24	SUAST	78	22	100
25	TNAU	77	33	100
26	UAS	82	18	100
27	UASK	65	35	100

S.No	Research institutes	Male	Female	Total
1	CARI	67	33	100
2	CAZRI	68	32	100
3	CAVRI	74	26	100
4	CIFR	68	32	100
5	CIBA	71	29	100
6	CIRB	68	32	100
7	CIRG	74	26	100
8	CIAE	77	23	100
9	CIAH	69	31	100
10	CICR	73	27	100
11	CIFT	80	20	100
12	CIFA	64	36	100
13	CIRCT	74	26	100
14	CASTH	76	24	100
15	CITH	81	19	100
16	CIPET	75	25	100
17	CMFRI	67	33	100
18	CPCRI	72	28	100
19	CIPRI	66	34	100
20	CSWCRTI	77	23	100
21	CSSRI	64	36	100
22	CTRI	72	28	100
23	CTCRI	77	23	100
24	RECR	65	35	100
25	IASRI	72	28	100
26	IGFRI	74	26	100
27	IIHR	68	32	100

28	DDUPCV V	68	32	100
29	UBKV	74	26	100
30	IARI	79	21	100
31	IVRI	72	28	100
32	NDRI	83	17	100
33	CIFE	69	31	100
34	ALAU	74	26	100
35	BHU	72	28	100
36	AMU	81	19	100
37	VBSU	74	26	100
38	NU	78	22	100
Total		2843	967	3810
Percentage		74.8	25.4	100

28	IISR	75	25	100
29	NAARM	83	17	100
30	NCAP	72	28	100
31	NCIPM	74	26	100
32	NRCB	72	28	100
33	NRCP	79	21	100
34	NRCC	69	31	100
35	NRCE	74	26	100
36	NRCM	78	22	100
Total		2609	991	3600
Percentage		72.6	27.6	100

Table 3: Gender distribution of respondents

Age group

Figure 1 shows that a vast majority (nearly 35%) of the respondents belonged to the age group, Up to 25 years; 2370(31%) were from age group 36-45, 16% belonged to age group 26-35; and only thirteen (13%) were 46 to 55.

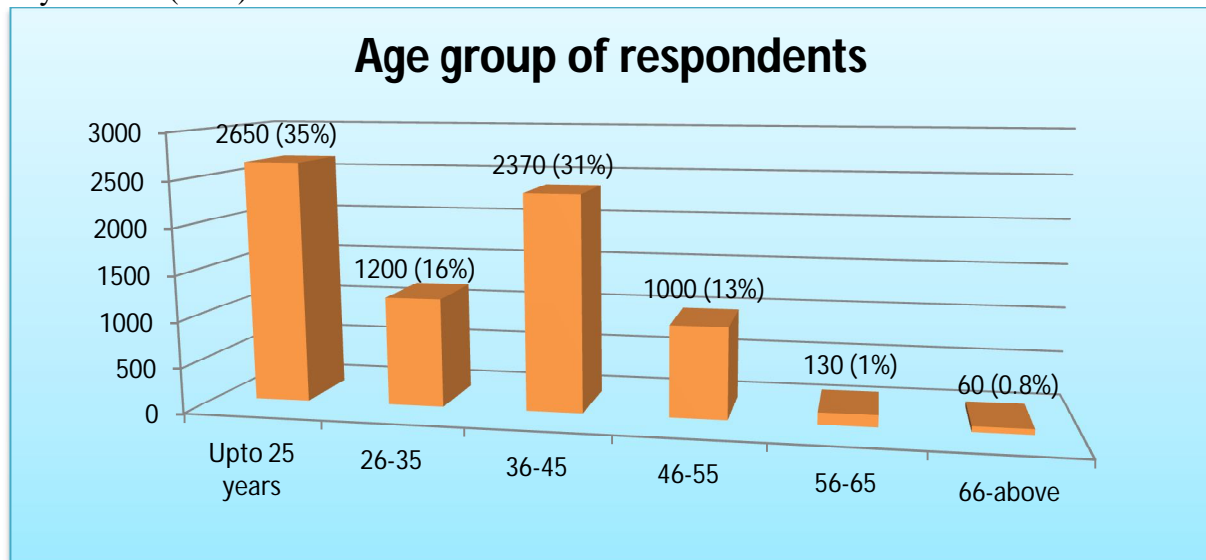


Figure 1: Age group of respondents.

Qualification

Figure 2 presents the frequency distribution of the respondents' qualification. Analysis describes that 1800 (24%) respondents were Graduate; 232 (29%) were Intermediate; 214 (26.75%) were Masters; 47 (5.88%) were M.Phil. 14 (1.75%) were Ph.D. and only two listed their qualification as Post Doctorate.

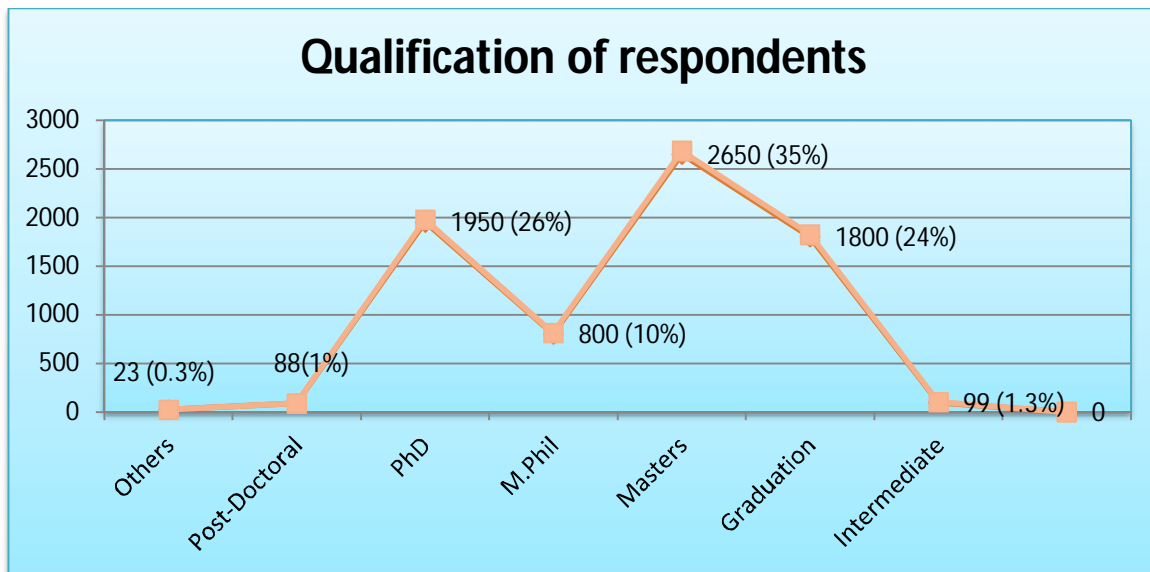


Figure 2: Qualification of respondents

Purpose of use of libraries

Table 4 indicates that a vast majority of the respondents (nearly 97%) indicated that their purpose of library use was Study & Research; 15 (1.88%) respondents were using the library for Official Work; and also 15 for Recreation purpose. Only five mentioned any other purpose. Further, majority of the users were highly impressed with the collection and accessibility of electronic resources.

S.No	Purpose of Library usage	Number of users	Percentage
1	Study	1500	20.24291
2	Research	2100	28.34008
3	Official	500	6.7476
4	Recreational	400	5.398
5	Internet-access	1200	16.194
6	CD-ROM access	1600	21.592
7	Others	110	1.48

Table 4: Purpose of library users

Time spent in libraries

Responses to the question regarding time spent in libraries varied. The questionnaire provided five options for how much time is spent by users in libraries and the responses received are presented in Figure 3. As shown in the figure, 42 percent of respondents said that they use libraries for 2-3 hours and 17% use the library for 3-4 hour, whereas 16 percent use them for 1-2 hour.

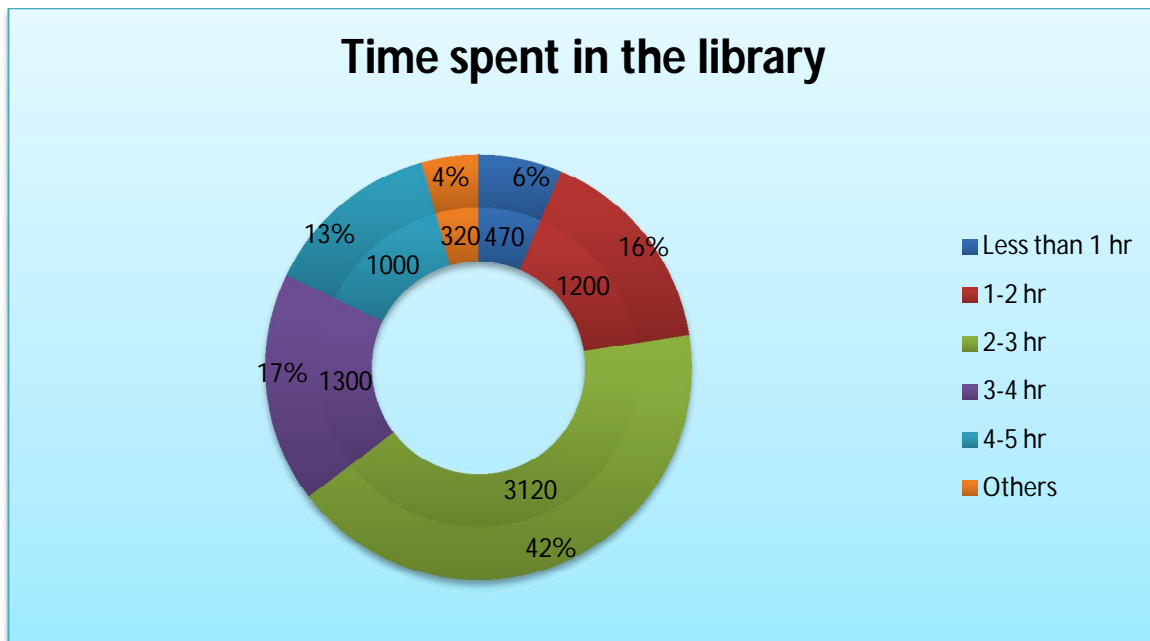


Figure 3: Time spent in the library

Services used in libraries

Users were asked to rate the services offered by the libraries. Responses that user are using great deal of OPACs, online databases, CD-ROMs, journals and electronic response to satisfy their information need. The results are presented in Table 5.

S.No	Service	Number of users	Percentage
1	OPAC (Online Public Access Catalogue)	2100	13.592233
2	Online databases	1800	11.6504854
3	CD-ROM databases	1500	9.70873786
4	Internet Service	1300	8.41423948
5	Theses	1800	11.6504854
6	Books	900	5.82524272
7	Journals/ Books/ Newspapers	1500	9.70873786
8	Email	1250	8.09061489
9	Electronic reference service	1000	6.47249191
10	SDI	700	4.53074434
11	CAS	650	4.20711974
12	Scanning	450	2.91262136
13	Printing	500	3.23624595
Total		15450	100

Table 5: Use of library services

Devices used to access library web services

In order to keep pace with technology libraries need to provide services that can run on the media used by the library users. Fig 4 reveals the use of PC, tablets, Mobile devices, tablets, & iPad in libraries to access library web services.

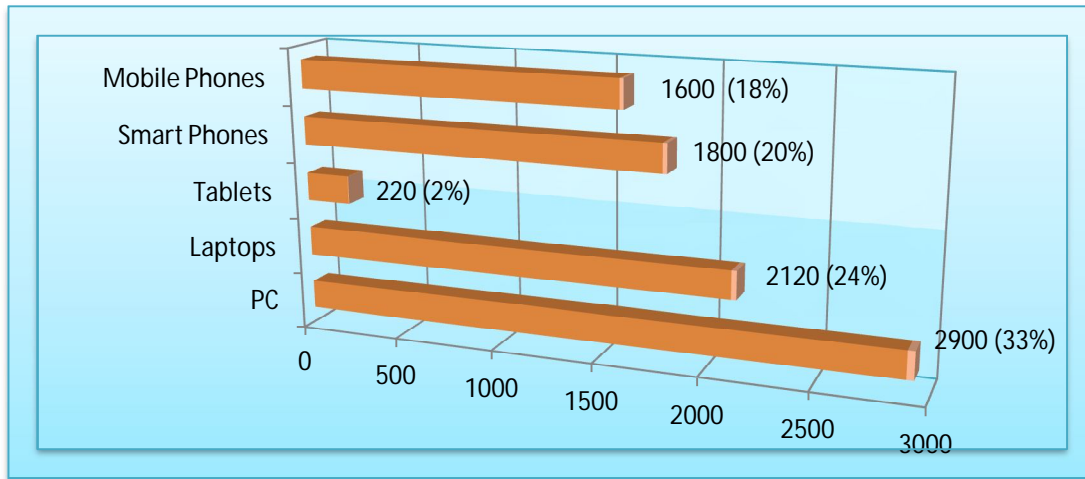


Figure 4: Devices used to access library web services

Information seeking in libraries

The fundamental goal of library is to serve its users with desired information. In order to find out the information seeking strategy of library user questions were asked regarding their preferred channel during searching. The question was aimed to find out the percentage usage of library resources.

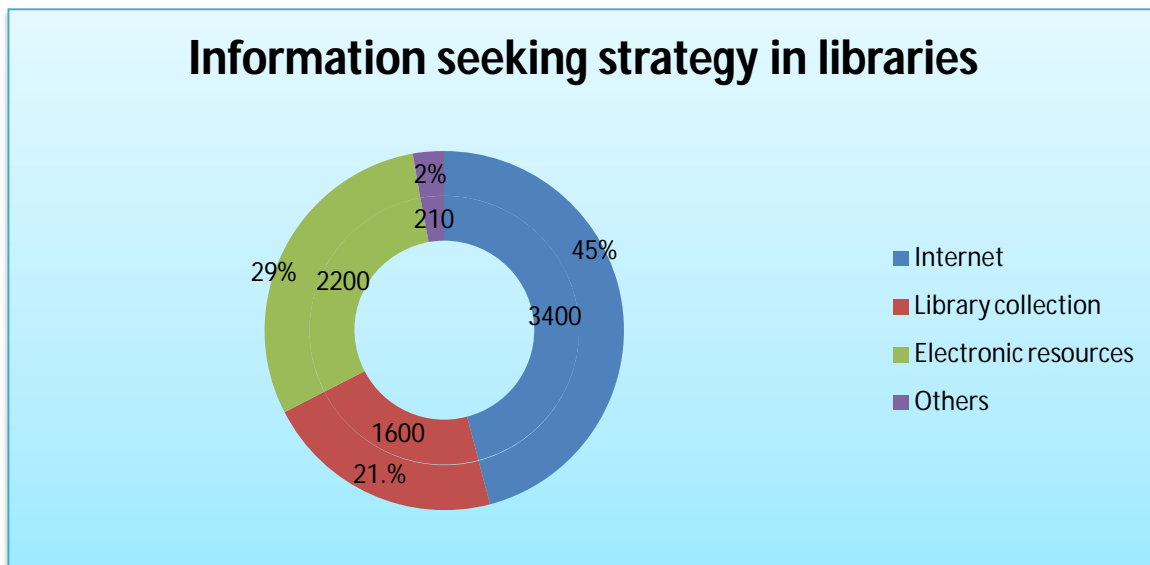


Figure 5: Information seeking strategy in libraries

Training in libraries

Majority of library users are deprived of formal training and do not possess enough competency to be able to use the library users. About 5998 (84%) of the library users showed their interest in library training.

Status of libraries

Agricultural libraries have a rich collection of resources and, the services offered by the librarians are also very satisfying for the users. But there are symptoms of stagnancy when it comes to technological implementations. Many Indian agricultural libraries (Appendix –II) are still automating or computerizing (78%) themselves. It needs to be kept at top priority to keep pace with time.

Use of technology in libraries

With the infestation of web 2.0 technology in the libraries the very nature of library services as well as library marketing has changed. Users and librarians have developed a tendency to maintain virtual profiles and interact via social media. Most often for their technological queries they come to librarians they are highly satisfied with them. Table 6 presents the usage level of technology tools in libraries.

Use of technology in libraries				
1	IT based needs (software, apps, email)		2000	65.14658
2	Web 2.0 technology (Bookmarking, Tagging,)		1800	58.631922
3	Social networking tools			
	a)	Blogs	1600	52.117264
	b)	Podcast	400	13.029316
	c)	Vodcast	250	8.143325
	d)	IM	180	5.8631922
	e)	Wikis	160	5.2117264
4	Use of RSS feeds		300	9.771987
5	Do not use		180	5.8631922

Table 6: Use of technology in libraries

CONCLUSION

The results of this study shows that majority of library users from academic community of agricultural sciences are using the agricultural libraries. However, most of the library users are male who have varied reasons of using the libraries. Research scholars and post graduates are the heaviest users who spent a quality time of 2-3 hr daily in the library. Most of the users are using IT based agricultural tools and products in the libraries. It is prominently observed that there has been a change in the preference of tools to access the web based services offered in the libraries with the development of wireless and mobile technology. Further, Electronic resources and Internet are the preferred medium of accessing information in the agricultural libraries. Most of the users demanded for library training to keep themselves abreast of technology and library tools. It was also astonishing to note the implementation and usage of Web 2.0 and social networking tools in these agricultural libraries.

Most noteworthy is the status of the libraries under study. A number of libraries are still automating or digitizing their collections and services. There is a tremendous need of improvement to keep pace with time. Although, it is found that there has been a high level of satisfaction among users due to the rich library collection and quality services, yet many things were identified which are still requiring their complete implementation. Moreover, there is a need to develop skilled manpower which holds core competencies of library affairs along with agricultural grounding for serving the libraries in a better way.

APPENDIX- I

List of Agricultural Libraries in India

State Agricultural Universities/Central University						
S.N O	Name of University or research centres	Name of library	Year of establishmen t	Collections	Services	Computerization
1.	Acharya NG Ranga Agricultural Univ. (AGNRU), Rajendranagar, Hyderabad-A.P.	Central Library	1980	1 Lakh books. 7800 dissertations, 600 periodicals	Reprography and access to e- resources	Automated through Libsys, Thesis digitized
2.	Anand Agricultural University (AAU), Anand- 388110, Gujarat	M.D. Patel Library	1942	229 Journals, 8 databases, 70403 books , 3091 thesis, 132 rare books	e-circulation, reprography and inter-library loan	Automated through Libsys, Digitized thesis and rare books
3.	Assam Agricultural University (ASAU), Jorhat- 785013, Assam	Central Library	1969	89559 books, 226 thesis, 1340 dissertations 7269 periodicals 22 newspaper and magazines	Lending, reference, display, reprography, CAS, inter- library loan, Internet and documentation	Automation and digitization is on- going
4.	Bidhan Chandra KrishiViswavidyalaya (BCKV), P.O KrishiViswavidyalaya, Mohanpur, Nadia-741252, West Bengal	Central Library	1974	69460 books 350 Indian standards and specifications 2600 thesis and dissertations 24576 periodicals 125 non-book materials 175 e-documents	Lending facility, book bank facility, reference services, audio- visual and consultancy services	In-house database of books, serials, theses and dissertations using CDS/ISIS & SOUL.

5.	Birsa Agricultural University (BAU), Kanke, Ranchi-834006, Jharkhand	Central Library	1987	Collection of Books - 14,077 Thesis - 1,256 Bound Journals - 1,682 Indian Journals - 17,519 Books donated - 84 Periodicals/Magazines - 21	Reprography, Internet and multimedia facilities	Computerization of library operations is being carried out.
6.	Central Agricultural University (CAU), Imphal - 795004, Manipur	Central Library	1993	5232 books, 28 journals, 11 magazines and 132 CD-ROMs	Lending, reference, reprography, Internet.	Computerization of library operations is being carried out.
7.	Chandra Shekar Azad Univ. of Agriculture & Technology (CASAT), Kanpur- 208002, U.P	Central Library	1907	65278 books 4534 periodicals 474 thesis 1903 dissertations 12 newspapers 23 magazines	Lending, reference, reprography, CAS, inter-library loan, Internet and documentation	Computerization of library is on-going. Providing online abstract searching and content page service is on pipeline. 963 thesis have been digitized.
8.	Chaudhary Charan Singh Haryana Agricultural University (CCSAU) , Hissar-125004,Haryana	Nehru Library	1948	225826 books, 99382 periodicals, 11283 theses, 146 CD-ROM databases and 2970 books and theses on CDs.	Video conferencing, reference, bar-code based circulation, CD-ROM databases, Book bank, HAU bookshop, Internet surfing.	Fully bar-coded library, Maintaining KrishiPrabha (e-theses) database, Automated using Libsys
9.	Chaudhary Sarwan Kumar Himachal Pradesh KrishiVishvavidhalaya (CSKHPKV), Palampur,	University Library	1966	51423 books, 29030 periodicals, 4077 theses, 5360 current journals	Reprography and access to e-resources	Digitization of institutional repositories, automation of library resources in

	Kangra- 176062, Himachal Pradesh					collaboration with OCLC is under process.
10	Dr Balasaheb Sawant Konkan Krishi Vidyapeeth (BSKKV), Dapoli, Ratnagiri-415712, Maharashtra	University Library	1972	32384 books, 8705 periodicals, 3306 thesis, 526 atlases and gazetteers and 2010 reference books	Lending, reference, reprography, Internet.	Computerization of library operations is being carried out.
11	Dr Panjabrao Deshmukh Krishi Vidyapeeth (PDKV), Krishi Nagar, Akola-444104, Maharashtra	University Library	1969	114280 books 242 periodicals 6682 theses 28683 back volumes	Reference, Lending, Reprography, Bibliographical, CAS, SDI, Press clipping, Inter-library loan, computerized services.	Computerization of library operations is being carried out.
12	Dr Yashwant Singh Parmar Univ. of Horticulture & Forestry(YSPU) , Solan, Nauni – 173230, Himachal Pradesh	Satyanand Stokes Library	1989	65000 documents, subscription of 90 periodicals	Book Bank, Inter library loan, document lamination and reprographic services	Computerized library collection
13	GovindBallabh Pant University of Agriculture & Technology (GBPUAT), Pantnagar, Udhamsingh Nagar-263145, Uttarakhand	University library	1960	3.9 lakh documents (Books, theses, periodicals, standards, reprints, maps, toposheets, globes, microfilms, microfiches, records, tapes and CD-ROMs.	Reference, rental text book and book bank scheme, CD-ROM bibliographical search, Preparation of Indian agricultural index,	Access to online full text journals and computerized library collection

					reprography, resource sharing, user education	
14	Guru Angad Dev University of Veterinary and Animal Sciences (GNDUVA), Ludhiana-141004, Punjab	University library	2006	15000 books, 38 foreign and 14 Indian journals, 2 databases, 11 magazines and 13 newspapers	Lending, online access to journals and databases, subsidy scheme, reference, books reservation and photocopying.	Automated library through Libsys, Digitization of library collections is under process.
15	Indira Gandhi Krishi Vishwavidyalaya (IGKV), Krishak Nagar, Raipur-492006, Chhattisgarh	Nehru Library	1987	More than 60000 collections and 250 periodicals	Lending, reference, reprography, Internet.	e-services, digitization is being done
16	Jawaharlal Nehru Krishi Vishwavidyalaya (JNKV), Krishi Nagar, Jabalpur-482004, M.P.	Central Library	1965	60000 books, 16000 periodicals, 8000 theses, 2300 online journals and 100 audio-visual materials	Circulation, Internet, Document delivery and reprography services, user education, newspaper clipping	Creation of digital library is under top priority
17	Junagadh Agriculture University (JAU), MotiBaug, Agril. Campus, Junagadh-362001, Gujarat	University Library	1960	42000 books, 150 Indian and 42 foreign journals, 132 theses	Book Bank, Inter library loan, document lamination and reprographic services	Automation and digitization is under process

18	Kerala Agricultural University, P.O Vellanikkara, Thrissur-680656, Kerala	University Library System	1998	25000 books, 6500 journals, and 1500 theses and dissertations	Reprography, Lending and computerized information services	Developed their own e-library and infrastructure for computer based training facilities
19	Mahatma Phule Krishi Vidyapeeth (MPKV), Rahuri-413722, Maharashtra	University Library	1971	62864 books, 24049 journals, 4988 thesis, 1950 reprints, 5500 annual reports, 8 CD-ROM databases and 115 video cassettes	Lending, Xerox, Inter-Library Loan, Computer and Internet facility	Developed online thesis database, automation and digitization is being done
20	Navsari Agricultural University (NAU), Vijalpore, Navsari-396450, Gujarat	Central Library	1965	41595 books, 9667 periodicals, 1287 theses, 4300 reports and 349 CD/DVDs.	Lending, reference, reprography, Internet.	Digitization and automation is under process.
21	Orissa Univ. of Agriculture & Technology (OSAT) , Siripur, Bhubaneswar-751003, Orissa	Central Library	1960	90781 lakhs books, 133 subscribed journals, 3374 theses and dissertations and 8243 reports	Online access to resources and Internet facility	Developed electronic library
22	Punjab Agricultural University (PAU), Ludhiana - 141004, Punjab	Mohinder Singh Randhwa Library	1959	246148 books, 36628 theses, 103191 periodicals and 2724 electronic documents	Online access to resources and Internet facility	Digitization and automation is under process.
23	Rajendra Agricultural University (RAU), Pusa, Samastipur-848125, Bihar	University Library	1978	54000 documents	Reference, book bank textbook services, CD-ROM bibliographical services, reprographic services and user education programmes	Digitization and automation is under process.

24	Sardarkrushinagar-Dantiwada Agricultural University (SDAU), Sardarkrushinagar, Dantiwada, Banaskantha-385506, Gujarat	Central Library	1976	45600 books, 4150 journals, 5650 theses, 5440 research reports, 200 encyclopaedia, 225 scientific journals, 280 periodicals, 71 CD-ROM databases	CAS, bibliographic services, photocopying, network printing, reference, access to electronic resources.	Total library software solution through cloud computing is being carried out. Maintain Indian harvest database, Developed fully automated and digitized library
25	Sher-E-Kashmir Univ. of Agricultural Sciences & Technology (SUAST), Railway Road, Jammu-180012 (J&K)	University Library system	1999	5691 books, 2900 journals, 550 theses and dissertations	Online access to e-journals and e-references	Digitization and automation is under process.
26	Tamil Nadu Agricultural University (TNAU), Coimbatore-641003, Tamil Nadu	University Library	1910	160000 books, 17000 text and reference books and 4500 theses and dissertations and 380 journals	Online access to electronic resources	Automation of library is being done through Libsys 4.
27	University of Agricultural Sciences (UAS), Dharwad, Karnataka	University Library	1986	1 Lakh books, 437 subscribed journals, 117 online journals and 9000 theses	Book bank, computer based services, reference, inter-library loans, orientation, newspaper clipping and reprography services	Digitized theses.
28	University of Agricultural Sciences (UASK), Bangalore-560065, Karnataka	University Library	1967	191192 documents	Book borrowing facilities, CAS, database accessibility, reprography,	Digitization and automation is under process.

					reference services, e-notes and user education programmes	
29	UP Pandit DeenDayal Upadhaya PashuChikitsa Vigyan VishwaVidhyalaya (DDUPCVV) Evam Go Anusandhan Sansthan, Mathura- 281001, Uttar Pradesh	University Library	1947	25000 books, 22136 journals and CD-ROM databases	Lending, Xerox, Inter-Library Loan, Computer and Internet facility	Digitization and automation is under process.
30	Uttar Banga Krishi Vishwavidyalaya (UBKV), P.O. Pundibari, Distt. Cooch Behar-736165, West Bengal	University Library	1979	22564 books, 2120 journals, 200 reports, 23 theses and 100 dissertations	Lending, reference, Online access to electronic resources, Printed list of documents procured	Using CDS/ISIS, automation using SOUL is on pipeline.
Deemed-to-be Universities						
31.	Indian Agricultural Research Institute (IARI), Pusa- 110012, New Delhi	IARI Library	1905	1 lakh books, 350000journals, 45000 bulletins, 15000 P.G. theses, 10000 pamphlets, 30000 new clippings, 30000 reports.	Documentation, resource management, reprography, nodal centre of AGRIS and CDAC projects	Focal point for decision over implementation and development of IT in agriculture
32.	Indian Veterinary Research Institute (IVRI), Izatnagar, Bareilly-243122, Uttar Pradesh	National Library of Veterinary Science	1889	54731 books, 4572 theses, 3835 reports and 194750 journals and serials publications.	Issue & return of publication, OPAC facility for searching publications,	Fully digitized and Libsys automated library, Member of CeRA, and computer controlled electronic

					Online access of journals, CD-ROM, E-mail, Internet & photocopy services, Document delivery service.	surveillance facility.
33.	National Dairy Research Institute (NDRI), Karnal-132001, Haryana	National Library in Dairying	1923	50145 books, 350 journals, 8200 bulletins, 3247 theses, 268 microfiches and 1200 CD.	Internet, Email, Documentation, Reference, Current Awareness Services, photocopying CD-ROM Literature scanning services, Periodical content, Press clipping	Fully automated and digitized library
34.	Central Institute of Fisheries Education (CIFE), Mumbai-400061, Maharashtra	Library	1979	98000 documents	Online access to electronic resources	Digitization and automation is under process.
35.	Sam Higginbottom Institute of Agriculture, Technology & Sciences	SHIATS Library	1910	85000 documents	Online access of journals, CD-ROM, E-mail, Internet & photocopy services,	Computerization of library is being done.

Central Universities with Agriculture Faculty						
36.	Banaras Hindu University (BHU), Varanasi, U.P.	Institute Library	1982	28000 documents	Lending, Bibliographic, Reprographic	Automation is being done.
37.	Aligarh Muslim University (AMU), Aligarh, U.P.	Department Library	1965	36000 documents	Lending, Bibliographic, Reprographic, access to e-resources	Computerization has been done. Automation is under process
38.	Vishwa Bharti, Shantiniketan University (VBSU) West Bengal	Sectional Library	1901	32000 documents	Lending, Bibliographic, Reprographic, access to e-resources	Automated library
39.	Nagaland University (NU), Medizipherma, Nagaland	SASRD Library	1979	20247 books, 4095 bound journals and subscribing 137 journals, 126 thesis	Literature search, online access to e-resources, Lending and reference	Automation using Libsys is being done.
ICAR Research Institutions						
40.	Central Agricultural Research Institute (CARI), Port Blair	CARI Library	1978	6141 books, 2520 miscellaneous publications in addition to journals by subscription, gratis, on exchange basis and technical books	On and off line information retrieval, networking and other accessories,	Digitization and automation is under process.
41.	Central Arid Zone Research Institute (CAZRI), Jodhpur	CAZR Library	1952	21716 books and 56500 back volumes of journals, 5327 reports and 2141 reprints	Bibliographical search, e-mail and internet services	They are using CDS/ISIS.

42.	Central Avian Research Institute (CAVRI), Izatnagar	CARI Library	1939	5587 books and 16 journals	Literature search, online access to e-resources and computerization of CARI Library data	Automation is on pipeline.
43.	Central Inland Fisheries Research Institute (CIFR), Barrackpore	CIFRI Library	1947	9050 books, 5277 bound journals, 4256 reprints, 1252 maps, 4102 miscellaneous publications and 53 theses	Online access to electronic resources	Computerised database of all available books in the form of CDS/ISIS.
44.	Central Institute Brackishwater Aquaculture (CIBA), Chennai	Institute Library	1987	2,300 reference books, 2,750 Back Volumes, 700 Numbers of reprints and photocopies, 4,500 Numbers of Reports / Bulletins and 7,500 numbers of miscellaneous publications, 500 numbers of Hindi Books ,35 Numbers PhD thesis and 50 Numbers CD-ROMs, Subscribed 58 journals.	Information and exchange services	Automated library using Libsys and digitized the institute's publication.
45.	Central Institute for Research on Buffaloes (CIRB), Hissar	CIRB Library	1985	890 books, 29 journals	Internet and accessibility to e-resources	Digitization and automation is under process.
46.	Central Institute for Research on Goats (CIRG), Makhdoom	CIRG Library	1989	2400 documents	Online access of journals, CD-ROM, E-mail, Internet & photocopy services,	Computerization of library is being done.
47.	Central Institute of Agricultural Engineering (CIAE), Bhopal	CIAE Library	1976	11921 books, 4169 bound journals, 3405 reports/ bulletins, 98 CIAE publications, and 245	E-services to the users	Fully computerized library

				CD-ROM's. At present Library subscribes 135 journals, out of which 87 are Indian and 48 Foreign journals		
48.	Central Institute of Arid Horticulture (CIAH), Bikaner	CIAH Library	1990	844 books, 2 journals, 18 periodicals and 12 newspapers	Photocopy and database accessibility of agriculture resources	Digitization and automation is under process.
49.	Central Institute of Cotton Research (CICR), Nagpur	CICR Library	1976	3200 books, 4000 periodicals, 3000 reports & bulletins and 60 journals	CAS, Documentation, Lending, Bibliographic	Developed computerized research database on cotton.
50.	Central Institute of Fisheries Technology (CIFT), Cochin	CIFT Library	1957	6400 books, accessing and subscribing journals	CAS, Bibliographic service, access to electronic resources, Internet facility	Digitization and automation is under process.
51.	Central Institute of Freshwater Aquaculture (CIFA), Bhubneshwar	CIFA Library	1987	6991 books, 2500 bound volumes of journals, and other reference materials. The library has subscribed to 24 International current journals and 44 Indian current Journals	FAO depository library, reference services, access to CeRA, and document delivery services	Fully Libsys automated and bar-coded library
52.	Central Institute of Research on Cotton Technology (CIRCT), Mumbai	CIRCOT Library	1957	7424 books, 36 journals, subscribing various databases and journals	CAS, Bibliographic service, access to electronic resources, Internet facility	Digitization and automation is under process.

53.	Central Institute of Sub Tropical Horticulture (CASTH), Lucknow	CISH Library	1972	3112 scientific and technical books and 7,458 back volumes of periodicals. Subscribing 111 National and International journals. 42 Masters and Ph. D. thesis	reprography services and internet surfing, exploring literature search through CD ROMs	Digitization and automation is on top priority.
54.	Central Institute of Temperate Horticulture (CITH), Srinagar	CITH Library	1991	800 books, 7 magazines, 20 journals	Access to databases	Digitization and automation is under process.
55.	Central Institute on Post-harvest Engineering and Technology (CIPET), Ludhiana	CIPHET Library	1989	4107 books, 970 annual reports, 1004 journals	Current contents service, Library consultation, Reference services and sale of publications	Digitization and automation is under process.
56.	Central Marine Fisheries Research Institute (CMFRI), Kochi	CMFRI Library	1947	60,000 books and periodicals and over 400 scientific journals, 80 foreign and over 50 Indian journals subscribed in addition to 235 journals accessible in the electronic form through Internet	Monthly abstracting and title page service, Computerized search facility and electronic check in and checkout are also available	Digitization and automation is on-going
57.	Central Plantation Crops Research Institute (CPCRI), Kasargod	CPCRI Library	1916	21459 books, 25125 back volumes, 138 journals and 12763 other publications	Accessibility to online databases and journals	Using Dspace for their in-house publications.
58.	Central Potato Research Institute (CIPRI), Shimla	CPRI Library	1971	4032 books, 5576 bound journals, 1266 reprints, 1270 annual reports	Photocopy and database accessibility of agriculture	Digitization and automation is under process.

					resources	
59.	Central Soil and Water Conservation Research & Training Institute (CSWCRTI), Dehradun	CSWCRTI library	1974	8896 books, 6673 bound volumes of journals, 22 Indian and 25 foreign (print and online) journals, 170 bulletin reports, 410 maps/charts and other references and reprints.	Photocopying, Thermal binding, Access to CD-ROM databases	Automated with Libman software
60.	Central Soil Salinity Research Institute (CSSRI), Karnal	CSSRI Library	1969	14668 books, 7967 bound journals, Subscribing 94 journals, 152 theses and CD-ROM databases.	Internet surfing, literature searching, inter-library loan	Fully computerized and automated library through Libsys
61.	Central Tobacco Research Institute (CTRI), Rajahmundry	CTRI Library	1947	13554 books, 12132 bound volumes, 70 periodicals and 3045 reports.	CAS, SDI, Reference and Referral service, reprographic, binding, and user training programmes	Automation is under process.
62.	Central Tuber Crops Research Institute (CTCRI), Trivandrum	CTCRI Library	1963	17400 volumes, subscribing of 42 journals, 3500 reprints (hard copy) and 2000 e-reprints	Reference, circulation of books, photocopying, bibliographic services, Digital library services. CD Databases Search	Databases are maintained by WINISIS and Greenstone digital library software
63.	ICAR Research Complex for Eastern Region including Centre of Makhana (RECR), Patna	RCER Library	2001	10,256 books and 67 journals	Photocopy and database accessibility of agriculture resources	Automation is under process.

64.	Indian Agricultural Statistical Research Institute (IASRI), New Delhi	Library Information System	1949	26677 books, 9135 bound journals, 9573 reports, 726 CD-ROM, 967 theses and dissertations and 6 databases	Internet surfing, literature searching, access to resources	Fully barcoded and computerized library
65.	Indian Grassland and Fodder Research Institute (IGFRI), Jhansi	IGFRI Library	1962	9535 books, 4968 bound journals, subscribing 109 journals, 1750 reports,	CAS, consultation and reprography services	Digitization and automation is under process.
66.	Indian Institute of Horticultural Research (IIHR), Bangalore	IIHR Library	1968	10,279 books, 14,169 back volumes of Journals, 95 theses and dissertations, 1031 reports, 214 proceedings and 1361 bulletins	Bibliographic searching, TOC service, Lending, reprography	Fully automated, barcoded and digitized library.
67.	Indian Institute of Spices Research (IISR), Calicut	IISR Library	1975	4311 books, 3451 bound volumes, subscribing 120 journals, 2305 reprints, 906 technical reports, 127 theses, 153 project reports.	Bibliographic, consulting and access to electronic resources	Automated library using Libsys
68.	National Academy of Agricultural Research & Management (NAARM), Hyderabad	NAARM Library	1976	26000 books, 200 journals	Internet surfing, literature searching, access to resources	Digitization and automation is under process.
ICAR National Research Centres						
69.	National Centre for Agril. Economics & Policy Research (NCAP), New Delhi	NCAP Library	1991	2821 reference books, 64 CD ROM's, 1890 database publications, 127 reports, 50 SAARC publications, subscription to 42 journals	Reference, Literature searching, Internet services	Computerized library
70.	National Centre for Integrated Pest	NCIPM	1988	2106 books, 30 journals	Reference, bibliographic	Library is using computer software

	Management (NCIPM), New Delhi	Library			searching, access to CD- ROM and e- resources	developed by the centre ARIS cell.
71.	National Research Centre for Banana (NRCB), Trichi	NRCB Library	1993	865 books, 3600 journals and 75 technical reports	Documentation, bibliographic and information services	Automation is on pipeline.
72.	National Research Centre for Pomegranate (NRCP), Solapur	NRCP Library	2005	1558 books, 17 journals	Consultancy and bibliographic services	Initiatives for computerization is being undertaken
73.	National Research Centre on Camel (NRCC), Bikaner	NRCC Library	1984	7539 books, 33 journals	CD-ROM database search database, Camel research index and internet facility	Automated through Libsys
74.	National Research Centre on Equines (NRCE), Hisar	NRCE Library	1985	850 books and several journals	Access to databases, Bibliographic searching and access to electronic resources	Computerization is being done.
75.	National Research Centre on Meat (NRCM), Hyderabad	NRCM Library	2004	1000 books	Bibliographic and information services	Automation is on pipeline.

REFERENCES

- Ani, Okon E. (2005). Evolution of virtual libraries in Nigeria: myth or reality? *Journal of Information Science*, 31 (1), 67-70.
- Bansal, Jivesh (2011). Status of the Libraries of Indian Council of Agricultural Research (ICAR) institutions in Haryana: a survey. *International Journal of Information Dissemination and Technology*, 1(4), 211-215.
- Cagliarni, Adam & Rush, Anthony (2011). Economic development and agriculture in India. *Bulletin of Reserve bank of Australia*, 6, 15-22.
- Chandrasekharan, H., Patel, Sarita, Pandey, P.S., Mishra, A.K., Jain, A.K., Goyal, Shikha, Pandey, Amit, Khemchandani, Usha & Kasrija, Rajkumari. (2012) CeRA- the e-journal consortium for national agricultural research system. *Current Science*, 102(6), 847-851.
- Chisenga, Justin (2000). Global Information and Libraries in Sub-Saharan Africa. *Library Management*, 21 (4), 178-187.
- Government of India (2013) State of Indian agriculture 2012-2013. Retrieved on 20/03/13 from: [http://164.100.47.132/paperlaidfiles/AGRICULTURE/State%20of%20Indian%20Agriculture%202012-13%20\(English\)%20with%20cover.pdf](http://164.100.47.132/paperlaidfiles/AGRICULTURE/State%20of%20Indian%20Agriculture%202012-13%20(English)%20with%20cover.pdf)
- Hori, Mistsuyoshi, Kawashima, Eiji & Yamazaki, Tomihiro (2010). Application of cloud computing to agriculture and prospects in other fields. *FUJITSU Science Technology Journal*. 46(4), 446-454.
- Harper, Judy (2004). Developing a New Branch Agriculture Library at the University of Manitoba, *Science & Technology Libraries*. 24(3-4), 251-257.
- Kannappanavar, B. U. & Kumbargoudar, P.K. (2010). Manpower planning in agricultural science university libraries in India. *Journal of Media and Communication studies*. 2(3), 62-66.
- Kannappanavar, BU. & Swamy, H.M.C. (2012). User education in agricultural science university libraries in India with special reference to South India. *Library Philosophy and Practise*. 1(4). Retrieved on 28/03/13 from: <http://unllib.unl.edu/LPP/kannappanavar-swamy2.htm>
- Fescemyer, Kathy (2005). Using the Internet to Find Information on Agriculture's Hot Topics, *Journal of Library Administration*, 44(1-2), 373-394.
- Lalotra, Seema & Gupta, Sangita (2010). Information needs and expectations in digital era: a study of select agricultural institutes in Northern India. *TRIM*. 6(2), 113-124.
- Malhan, I.V. and Rao, Shivarama (2007). Agricultural knowledge transfer in India: a study of prevailing communication channels. *Library Philosophy and Practice*. Retrieved on 23/03/13 from: <http://www.unllib.unl.edu/LPP/malhan-rao.htm>
- Mangstl, A. (2006). Importance of Agricultural Information in the global context. Paper presented at the 2006 USAIN conference, "Delivering Information for the New Life Sciences," Oct. 8-11, Ithaca, New York. Retrieved on 25/03/13 from:

<http://usain.mannlib.cornell.edu/index.html>

- Mellinger, Margaret and Starmer, Mary Ellen (2003). Preservation in an agriculture library: Balancing best practices with practical conditions. *Journal of Agriculture and Food information*. 4(3), 51-59.
- Oduwole, Adebambo Adewale & Okorie, Chichi Nanacy (2010) Access to agricultural information and millennium development goals. *Library Hi Tech News*. (1), 10-12.
- Raman, Nair R., & Francis, A. T. (1996). Information Needs of Agricultural Scientists in India: Problems and Prospects. In Proceedings of 17th National Seminar of IASLIC, pp. 121-126,
- Rokade, S.M. & Rajyalakshmi, D. (2006) Evaluation of electronic information services in agricultural university libraries in Maharashtra: a study. In Proceedings of 4th International Convention CALIBER – 2006.
- Shilpa, S.U., Uplaonkar, S.S. & Mahadevagouda, Rajshekhar (2013). Agriculture libraries in the knowledge web: library networks and consortia. *E-library science research journal*. 1(3), 1-6.
- Teeter, Robert (2011). *Library Resources*. In *Encyclopedia of Water Science*. (2nd Ed.). New York: Taylor and Francis. 719-721.
- Womboh, B. S. H.(1999). Education and training for subject specialization in agriculture university libraries in Nigeria. *Library Review*. 48(7), 320-327.