

REVIEW OF LITERATURE

2.0 INTRODUCTION

In today's enormous growth in information field, the Library and Information Science (LIS) profession has also been influenced by the various types of challenges including Information and Communication Technology (ICT). All these growth and changes have an active effect on LIS, its association and service. For instance different sweeping changes have been compelling in various directions in LIS profession like from information gatherer to information specialist, custodian to reference based information worker, process oriented to user oriented, quantity to quality, responsive to active, from collection management to information management etc. Information has been developing as an essential issue for stimulating the progress of society just like the human beings basic requirements ranking after air, food, water and shelter. Likewise, the information seeking behaviour is also one of the important issues of today which explains as a set of activities that an individual proceeds to precise information needs, search for information, evaluate and select information and finally use this information to fulfill his or her information needs.

The present chapter provides the wide-ranging review of literature predominantly based on survey centred research on "Insights into Information Seeking and Communicating Behaviour of Agricultural Scientists of ICAR Institutes and Centres of

Northeast India: A Study” which enumerates the usage and perception, efficacy, satisfaction level, feeling and general view etc. regarding information seeking behaviour pattern inside the libraries and outside the libraries. However, some of the studies are also associated with theoretical, methodological aspects of topic on information needs and information seeking behaviour of different types of users e.g. academics, researchers, scientists, students, engineers, lawyers, journalists, artists etc. As per the literature is scattered to varied disciplines with wide collections so it is extremely difficult to review the whole research done so far because many contributions have been made by psychologists, sociologists, scientists and others in addition to LIS professionals in the field of information seeking behaviour. Therefore, a review of simply important studies relating to the present study has been undertaken.

In this twenty-first century, the agricultural world faces different types of new challenges in relation to food, population and environment. Moreover, globalization in agricultural field demands for enhanced competence, better effectiveness and larger share in the trade. Hence, the agriculture sector remains to be the backbone or support of Indian economy. In this part, the reference sources viz. Agriculture, Veterinary and Animal Sciences, Food Science and Technology, Fisheries Sciences, Forestry and Home Science etc. were reviewed and studied specifically by the researcher. It has generally been acknowledged that agricultural research and the information generated from such researches are important stimulant for accelerating agricultural production and development in a country. Information generation is the outcome of investigation, opinion and analysis of difficulties and things. The argument that agricultural research and information enhance agricultural development, consequently the development of the country, is based on the premise that through quality research, a country can generate appropriate technology and information, which if applied can improve productivity with

quality. It is imperative that research and agricultural development demand the provision of better agricultural information to meet the information needs of agricultural community. It can be said that the vitality of research and development in agriculture is not partly but heavily dependent upon information services. This is because in order to conduct quality research and generate useful information for use and for reuse by researchers themselves, agricultural researchers require information to satisfy their information needs. Such information needs often arise in course of research work.

Several studies have been conducted in the past on information need and information seeking behaviour and use of information by various groups of scientists in general and agricultural scientists in particular. These studies made an attempt to identify and predict their information needs and seeking behaviour, but in spite of large number of studies there is dearth of documentary evidence on actual factors that influences information generation and its seeking behaviour of agricultural scientists in general and India is no exception. Furthermore, the problem of lack of studies on information needs and information seeking behaviour in general has been due to the lack of adequately consolidated methodologies for analysis of needs in user studies.

The present review of literature is presented in two major parts. First part is presented as global scenario which included of literature all over the world and second part is presented as national scenario which includes literature of national level. For organizing the course of the present study, the researcher reviewed of various literatures including various kinds of library sources of literature such as monographs, books, encyclopaedias, conference proceedings, dictionaries, directories, handbooks, manuals, yearbooks, bibliographies, glossaries, scientific periodical articles, government reports, research

outputs, bibliographical of doctoral theses submitted and accepted by the various Indian Universities published carefully since 1990 to 2015 etc.

However, it is a fact that there is hardly any study on information seeking and communicating behaviour of agricultural scientists of ICAR institutes and centres of Northeast India. To study the present topic the databases like Vidyanidhi (www.vidyanidhi.org), UGC-INFONET (www.inflibnet.ac.in/infonet/), DELNET (www.delnet.nic.in/resources.htm) and Sodhganga (www.sodhganga.inflibnet.ac.in) were also studied, searched, and browsed carefully. After searching and reviewing different sources and databases the researcher found that there is not any research has ever been carried out on the Information Seeking and Communicating Behaviour of Agricultural Scientists of ICAR Institutes and Centres of Northeast India.

The chief purpose of the study is to examine each and every single meaning and usage of various concepts, methods, procedures, theories, techniques, approaches, types and procedures of societal research specifically in LIS fields. The work at hand contracts with research as to discover out the information use, information need and information seeking behaviour. Hence, the selected area is Agricultural Institutes and Centres of Northeast India on which the development and benefit of the society is entirely reliant on. It is also usually detected that rapid development in information has remarkable impact on different sections of Agriculture. In the area of agriculture, where information is supremacy, the use of information technology is to design, distribute, monitor, manage and spread the learning perceptions as we passing from end to end knowledge revolution in the procedure of information explosion. In agricultural field, the comprehensive areas have been recognized, carefully selected, and studied. In Agricultural Science the major branches dedicates to Agriculture and allied subjects, Veterinary and Animal Sciences,

Food Sciences & Technology, Fisheries Sciences, Forestry, Home Science and the like. Therefore, efforts were made to review the related literature.

Keeping these as an observation, attempts were made to focus the important results of the research on the current topic. The precise views on the above facets were considered as outlying studies for the present work.

2.1 LITERATURE SEARCH IN GLOBAL SCENARIO

Kostagiolas et al. (2015) carried out a survey and examined about information seeking behaviour concentrating to music information seeking by amateur musicians, accompanied with empirical suggestion from a survey on a community performance band. Though several studies in the literature have observed about the information seeking in the context of hedonic purposes (e.g. entertainment oriented), music information can also be used for applied or practical purposes by providing amateur musicians the important tools to increase their ability and become well in their practice. The results specified that musician's struggle of information not only for entertainment but for educational purposes as well as for the acquisition of assured music works. The usage of the internet for information seeking as well as the regular adoption of online social networks has delivered access to new musical resources inside the digital music networks. The survey indicated the new information behaviour results for designers of music information spaces which in chance were generating a new model of the connection between music and society.

Temel & Maru (2014) conducted a study in state of Georgia in USA, though valuing ICT infrastructure and use in agriculture, agricultural policy, research and educational organizations. The main objective of the study was to measure the needs or desires of national agricultural research institutions and their pertinent partners for new,

applicable and effective information and communication systems and links in Georgia. The questionnaire method centred on interviews were used to collect information and evaluate ICT infrastructure and its use in nine organizations which remained part of or one associated to the National Agricultural Research System (NARS). The information was collected from five public sectors, one private sector and one NGO sector. The study detected couple of vital components of policies and capabilities for knowledge transmission. Finally, three major approvals were specified:

i) Partnership of alliances of public organizations, private firms, NGOs etc., who presently work on rural development and enhanced food security;

ii) Abusing the inter dependency and ICT infrastructure in rural zones where traditional infrastructure is deprived, thus manufacture of ICT investment expensive than it would or else be. This could be relieved by broad-based rural development projects, which would have a straight influence on raising ICT competence and sinking the cost of ICT asset; and

iii) Endorsing investment in human resource development; deprived of qualified human resources, no investment in the ICT area would progress and the current activities with international companies for updating the telecommunication infrastructure are probable to miscarry. Hence, there should be skilled workforce to device any ICT hardware on the field.

Elly & Epafra Silayo (2013) conducted a study which aimed to determine about information needs and sources of the rural farmers in Tanzania especially from Iringa rural district. Survey technique including data collection tool was used as the principal technique where 120 rural farmers were interviewed personally. Comprehensive interviews of ten key informants from two villages of Ifunda and Kalenga completed the survey more specifically. The findings of the study showed that 70 per cent of farmers' information

needs was around crop and livestock husbandry, marketing, funding alternatives and value addition. Though, there was a substantial difference between the two districts in information needs for “information on crop and livestock husbandry” along with information on “value addition”. To a great level, farmers used the old means of communication, the traditional and personal by default due to relevancy in the framework and content. The up-to-date means of communication were used to access non-agricultural or other field information. Therefore, the study concluded pointing out that needs of the farmers are not static and they change over time and also there is heterogeneity within farming communities in relation to information needs which necessitates a deliberation by intervention programs.

Ikoja – Odongo (2013) examined that the informal sector is a fast rising economic sector in Uganda for the development and employment of maximum small business entrepreneurs as well as women. The present study shows the insights into the information needs and information seeking strategies of women in the Uganda informal sector. It also explores and represents their business characteristics and sources, the channels they practice to access information and the constraints they face in information seeking. The study also showed different recommendations and actions to be taken to make business information available to women.

Oluwaseyi Quadri (2013) examines the influence of demographic factors on use of online library resources by undergraduate students in two private Nigerian university libraries. The study revealed that there was important relationship among level of study and application of online library resources and age and usage of online library resources and there was not any major relationship in the middle of gender and use of online library resources and also between religion and use of online library resource. The internet and e-

journals were main sources of information used for the university undergraduate students. Students' demographic issues should not be an obstacle to e-resources use and as an end result, students of all eternities or ages and gender should attempt to procure knowledge required to allow them to make active use of online library resources anytime and anyplace. Both young and old students should be stimulated and make aware of the profits accessible in the use of library online resources.

Acheampong & Dzandu (2012) explored about the access to and use of information centres among scientists at Council for Scientific and Industrial Research, Crops Research Institute (CSIR-CRI), Kumasi, Ghana. The study pointed to find out the level of access to and use of information centres among scientists. It clearly revealed from the study that scientists used information centres but at a least percentage, ease of access was limitless. They would however use it more if the centre is adequate resource with proficient personnel, equipment and up-to-date and relevant materials. Scientists use the centre for research purposes and have a preference to use journals to other form of resources. The study also suggested that scientific information centres should subscribe to current electronic journals, acquire new equipment and also train the staff of the information centres to boost high sponsorships of the centres by the scientists and also networking of information centres should be exhilarated as later no library or information centre can merely satisfy the information needs of scientists.

Al-Muomen et al. (2012) observed and report the outcomes of this research conducted to model the information-seeking behaviour of graduate students at Kuwait University and the issues influencing that behaviour. Data were collected through questionnaire and interview method. The findings of the study showed that there were various substantial factors influencing student's information-seeking behaviour were found

to be associated to library awareness, information literacy, organisational and environmental issues, source characteristics, and demographics (specifically gender and nationality). The study recommended an information-seeking model that prolonged two other relevant and significant models of information-seeking behaviour. The extended model shows potential for its intended utility in ascertaining the different factors that influence the information behaviour of graduate students.

Arinola & Adio (2012) investigated the information needs and information seeking behaviour of Agricultural Students in Ladok Akintola University of Technology (LAUTECH), Ogbomoso. The result revealed that most agricultural students in LAUTECH lack basic knowledge on how to use available resources and services in the library especially card catalogue/ Online Public Access Catalogue (OPAC) which are the pointers to location of material in the library. The study equally discovered lack of awareness on the part of the students as well as inadequate basic information retrieval skill on how to use the library independently. A lack or poor internet facility in the library was seen as one of the major constraint in meeting their information needs followed by inadequacy of computers in the library to surf the internet.

Mansour & Alkhurainej (2011) carried out a study and main determination of this research is concerned about the parliament and parliamentarians in the Arabic environment. Both the two researchers of this study tried to examine the information seeking behaviour of Members of the Kuwaiti Parliament (MKPs) in relations to their thoughts, observations, attitudes, incentives, techniques, preferences, methods, tools and difficulties encountered by them towards accessing information. Questionnaire method is used as data collection tool.

Mavodza (2011) conducted a user survey and investigated about information seeking behaviour of Metropolitan College of New York (MCNY) library users. The paper was centred on studying database usage patterns from the time period of January 2007 to December 2010, also a review of literature. The study concludes that database statistics are one and only a part of the story in understanding information behaviour. Presently, database use patterns redirect that their use is only when there is the academic need. This paper proposes that one of the finest ways to motivate students in the MCNY educational background is to use practices that help make the learning actual and expressive to them and that method may enhance database usage statistics also, not as end, but a support in observing database significance and use. Therefore, study recommends that the position that database usage statistics can provide insight into information behaviour and help information collection management decisions, but individually are not enough to give the complete depiction.

Shenton & Hay-Gibson (2011) conducted a survey in which the study pursues to draw on Sice's systems model, itself centred on Senge's "fixes that fail" archetype, and on data from two preceding research projects conducted by one of the authors. The main objective is to create a new model that depicts the information-seeking behaviour of children and young people. The study indicates that one of the new model's most important characteristics is its emphasis on problems and issues that avoid information seeking from continuing smoothly. Information seeking is also revealed to be an iterative procedure, with the individual often reconsidering previous stages, often in response to difficulties. Therefore, the model proves the importance of the information professional's educative role, in terms of both bringing formal information literacy training and providing support at the point of need.

Tandi Lwoga (2011) conducted a study and the purpose of this study is to assess the use of knowledge management (KM) models in managing and assimilating indigenous and exogenous knowledge for better-quality of farming activities in Tanzania, by investigating and management of indigenous knowledge (IK), access and usage of exogenous knowledge, the importance of policies, legal framework, information and communication technologies (ICTs), and culture in KM practices in the communities. The findings of the study revealed that i) western-based KM models should be applied carefully in a developing world setting; ii) both indigenous and exogenous knowledge was assimilated and shared in diverse contexts; iii) IK was shared within a local, small and impulsive network, while exogenous knowledge was shared in an extensive context, where formal sources of knowledge concentrated on disseminating exogenous knowledge more than IK; iv) Policies, legal framework, ICTs and culture determined access to knowledge in the communities. The study as a result developed a KM model that would be appropriate in the social context of developing countries.

Tandi Lwoga et al. (2011) conducted a study on access and use of agricultural knowledge and information in rural areas of Tanzania. The study imposes a need to conduct systematic studies on information needs, map communities, knowledge and information sources, generate awareness of information sources and knowledge values, use participatory methods in design and growth of technologies and use several sources of knowledge and information to bring relevant information to farmers. The findings of the study show that the awareness and information needs and information seeking patterns of farmers are location specific. The major sources of information for farmers predominantly local followed by public extension services. A part from radio and cell phones, advanced technologies and printed materials were used at a low rate despite their existence in the communities.

The findings of the study indicate that i) MKPs were mostly seeking information to make a parliamentary appeal/inquiry, to mark a speech, and to make a judgment; ii) The study showed that the most significant sources of information MKPs were seeking for were actions of sessions, mass media, personal letters and information networks and MKPs preferred printed formats, with a very good use of the internet and computers; iii) It is found that MKPs' confirmation of using the English language, alongside the use of the Arabic language, as the most dominating foreign language used to access information; iv) The study observed that consultants, secretaries and colleagues were the best important assistants of information to MKPs; v) The currency of information, the limited nature of the library's role to provide information, and the practise of technology tools were the most important problems encountered by MKPs when they were seeking information. Lastly, the study investigates and provides appreciated insight into the information behaviour of a very important client group.

Haines et al. (2010) revealed from the study that the basic science researchers used a diversity of information resources reaching from popular internet search engines to highly technical databases. They usually depend on basic keyword searching, with the simplest interface of database and search engine. They were greatly collegial, interrelating chiefly with co-workers in their laboratories and colleagues working at other institutions. They made minute use of traditional library services and as a substitute achieved many traditional library functions internally.

Marouf & Anwar (2010) explored the information-seeking behaviour of the social sciences faculty at Kuwait University. For this study a survey method including questionnaire as a data collection tool used for the study. The major findings of the study were- i) It was found that the respondents greatly depend on books and journals for

teaching and on a larger variation of resources for their research purposes; ii) Their use of informal sources was relatively lesser than formal sources; iii) For meeting their different needs journals and books were considered the most significant sources iv) Amongst the informal sources, conferences, subject experts, and colleagues were given greater importance than librarians and government officials; v) In comparison to raw data, technical reports, manuscripts, journals and books were used more often and their satisfaction level with all the sources was encouraging but greater for journals and books; vi) The level of satisfaction of using informal sources was comparatively higher than formal sources; vii) Their library usage pattern was very low with objections about the superiority of staff, resources, particularly in Arabic, and also found difficulty in retrieving of international resources.

Moran (2010) emphasized panoramic opinion on National Agricultural Library including three U.S. National Libraries i.e. National Agricultural Library, National Library of Medicine and Library of Congress. The objectives were to deliver better dissemination of information, more cohesiveness of obliging efforts and a sharing of resources. Lastly, the author has determined the theoretical article that the upcoming growth of the National Agricultural Library is concerned with close collaboration with the whole agricultural community both on the national and international scene. Communication of agricultural information will apply sophisticated automated programs, as well as traditional means. Hence, this review article offers appropriate guidelines to the present study.

Salaam & Aderibigbe (2010) examined the awareness and utilization of The Essential Electronic Agricultural Library (TEEAL) database resources by the academic staff at the University of Agriculture, Abeokuta, Nigeria. The study indicates that the maximum of the respondents were aware of TEEAL and that they used it when necessary

or essential. The study also ascertains electricity problem and poor internet connectivity as limitations to their utilization of this electronic source.

Sookhtanlo, Mohammadi & Rezvanfar (2009) indicated from the study entitled “Library Information- Seeking Behaviour among Undergraduate Students of Agricultural Extension and Education in Iran” that the awareness of library scientific resources and availability of Library resources items were the furthestmost important and influenced factor in student’s library information seeking behaviour. Students with higher academic level are generally possible to have higher skills through information seeking behaviour. On the contrary, this study indicates that the students were not influenced by this. Gaps in the library facilities in different universities particularly total number of related books to field and the number of computers have straight influence on students library information seeking behaviour. Besides interface probing by asking other students and faculty were the other means students used for seeking information.

Al-Bustan & Etedali (2007) attempted to establish the information seeking behaviour among college students at the colleges of Business Administration and Engineering of Kuwait University. The research tool was in the form of a questionnaire administered to a sample of students from these colleges who are at present engaged in required English-language research- writing courses. The study found that students understand the Internet as a favoured search tool and does not considered knowledge of either English or computers interrupt to their search efforts. Thus, the study concludes, it would be suitable for colleges, and indeed schools, to comprise classes in their courses in the science of seeking information over the Internet.

Flaxbart (2007) executed the study on information seeking behaviour of faculty members in the Department of Chemistry and Biochemistry at the University of Texas at

Austin. The study mainly focussed on information seeking behaviour, favoured resources, and opinions about the transition from print to an electronic information environment. The study showed that most of the faculty members have eagerly comprised the improved access to chemical information made possible by the stable addition of electronic journals and networked database systems which results to significant time-saving and suitability as well as access to more journals than ever and also the usage of physical library and its printed collections by faculty is deteriorating. While, it is clear that they have a strong self-dependence in their information –seeking skills and showed superiority in their choice of tools.

Shen (2007) in his study entitled “Information seeking in academic research: A study of the sociology faculty at the university of Wisconsin Madison” observes how social scientists reach at the utilization of information in the course of their research. The study mainly draw results about the information resources and channels to address information review, the strategies for information seeking, and the difficulties met in information seeking for academic research in today’s environment.

Steinerova & Susol (2007) conducted a study of library users in Slovakia as portion of a larger research project on the usage of information. They used a large -scale questionnaire survey conducted in 2002 in sixteen academic and research libraries with 793 subjects, particularly students and educators. The results of the study indicated that men prefer individual information seeking and women apply collaborative information use. By arranging user types it was found out that women tended to clear a realistic way of information use and men confirmed analytic information processing. Women stated that they have less experience in the use of electronic resources and publication.

George et. al (2006) conducted a study on information seeking behaviour, different types of method of investigation and scholarly activities of graduate students of Carnegie Mellon University, Pittsburg, USA. The study revealed that graduate students frequently initiate with a conference or meeting with professors who shows direction, recommend and provide the basic resources. While, graduate students' research activities were mainly contour by other students, and university library personnel provide supervision in finding of different types of resources. Amongst the students Internet plays a main part, even though students still remain to stick with the print resources. It also found that students facing difficulties like convenience and lack of sophistication in finding and using resources and also course related requirements.

Jorosi (2006) investigated about the information needs and information seeking behaviour of SME managers in Botswana. The findings of the study specify that SME managers consider customer and competition in creation to be the most significant types of information to their firms. They assign a significant expanse of time to active information-seeking and on usual spend around five hours per week seeking information, spend time seeking customer and competition information, they use both personal and impersonal sources, their information source selection is largely determined by availability and ease of use and they use information for creating important decisions and carrying out their routine actions.

Kari (2006) in the study explored one question: what does internet searching has to do with personal development? Personal development means that individuals increase their own abilities, skills, knowledge or other abilities by working on them. The paper informed on a qualitative case study, in which a single participant was interrogated and her Web searches observed. Information search strategies appeared to form a spectrum of

development superiority. Four major types of relationship were revealed: a) the internet in the perspective of development; b) development in the context of the Internet; c) development affecting Internet use; and d) Internet use affecting development. It also found that there were some informational phenomena, which showed regression and the reverse of development.

Oduwole & Sowole (2006) surveyed the utilization and impact of the Essential Electronic Agricultural Database (TEEAL) at Nigeria University of Agricultural Library, Abeokuta, Nigeria. The results of the study reveal that postgraduate and final year undergraduates are the main users of the TEEAL database. The study also exposed that however maximum users are computer literate; they still seek the assistance of library staff for the database searching. The major restrictions to the use of the TEEAL database consist of the high cost of printing of carefully chosen papers and the limited number of computers.

Asemi (2005) reported that most of the respondents search for scientific information through Internet because their university library offers access to various databases and online journals. Internet was also used by the respondents for downloading software or text, chatting, discussion, e-mail services, and for finding related references. The study observed that related to other search engines the Google and Yahoo search engines were more widely used. The study similarly revealed that most of Internet users always find useful information on the net and respondents also assumed that quality information is accessible on the Internet and it is also found that most of the respondents used print, online and offline for of information for updating their subject knowledge.

Callinan (2005) studied a comparative analysis Information-seeking behaviour of undergraduate first year biology and final year biochemistry students of University College

Dublin, to understand what differences be present in between first year biology and final year biochemistry students so that actions can be taken to address those needs. The study highlights the positive features of seeking information from the student's perception as well as the barriers they met when seeking course related information. The findings show that there are variances in the extent to which sources of information are used by students in different years of their studies. A part from web sites and web-based lecture notes, lack of awareness is the primary reason why undergraduate biology students did not use the electronic databases. The students suggested that bibliographic instruction should encounter the specific information needs of first year biology and final year biochemistry students as well as greater link between faculty and librarians in the area of collection development and information literacy.

Kalusopa (2005) discussed in the study about the challenges of utilizing information communication technologies (ICTs) for the small scale farmers in Zambia. The key objective of survey was to evaluate the use of information communication technology (ICTs) as a tool that would offer active communication and information services to mediators that help small scale farmers in the agricultural sector in Zambia. To create and highlight their information needs a survey of information needs of small scale farmers in two particular areas was carried out. Finally, the study determined that agricultural improvement events were centred on the application of information. Though, for information to be in effect, it has to be methodically collected, structured and repackaged to supply the consumer as and when desired.

Oduwole (2004) conducted an outstanding research study on "Impact of Internet use on Agricultural Research Outputs in Nigerian Universities of Agriculture". Research study was conducted to observe the application of internet services or facilities and its

influence on the research outputs of agricultural scientist at the University of Agriculture, Abeokuta, Nigeria for the period of academic session of the year 2001- 2002. The study was determined with definite interpretations. These interpretations are a) the 54 % of the agricultural researchers at the university use the “yahoo” search engine and they spend an average one hour per day surfing the Internet; b) Respondents use the internet to discover research material such as journals and conference proceedings, monitored by distribution and receiving of “electronic mails” and; c) The use of the internet for academic research by Agricultural scientist has upgraded their research output. Lastly, the author also suggested the training of scientists in information searching and retrieval services.

Savolainen & Kari (2004) executed the study entitled “Conceptions of the internet in everyday life Information Seeking” undertook interviews of people in Finland in 2001-2002. The findings of the study identified two major kinds of Internet conceptions. First, in metaphorical conceptions, the Internet was mainly conceived in terms of space or place, for example, a library or a bazaar. Second, ideas based on real use experiences of the Internet considerably drew on quality judgements of the network services. Further they described that, since a growing number of information sources and channels will increase importance as a formation by which sources will be accepted or rejected. This appears to be a specific characteristic of networked information environment.

Spink (2004) found that humans involve in multitasking information behaviours, often in libraries, as they seek and search for information on more than one information task. Multitasking information behaviours may contain library search and use behaviours, or database or Web search sessions on numerous information tasks. However, few human information behaviour models of seeking, searching or use, or library use models, include concerns of multitasking information behaviour. The findings of the study include

taxonomy of information behaviours, a consecutive flowchart of the information seekers complex and iterative processes, including multitasking information behaviour.

Tunde & Ashcroft (2004) summarized the results of a study aimed at evaluating the information skills of UK and international students pursuing an undergraduate course in business studies. The study shows that no important difference between the information skills of UK and international students was found. Only about one quarter of students implemented well on the test while three quarters had inadequate information skills. The common students have more positive attitude than home students. One of the main sources of negative attitudes cited was the incapability to find information without help.

Dulle et al. (2002) made a study on application of Information Technology for research in Tanzania: feedback from Agricultural Researchers. The study proposed to estimate agricultural researcher's access to information technology services and level of usage of such facilities. By questionnaire method from 13 Research Centres all over Tanzania selected randomly and data collected consequently. The researcher concluded that alongside with a low level of IT Development in the country, the accessible IT services or facilities were been fully developed to simplify agricultural researcher's access to information and also some methods to endorse IT infrastructure and its use for developments of research efficiency were suggested.

Whitmire (2002) identified that a number of information-seeking activities affected by disciplinary differences like use of online catalogues, indexes and library books frequently. It is also revealed that cultural backgrounds also influenced some parts like students' usage of the library catalogue and seeking help from librarians.

Anderson et al. (2001) examined in the study in what way US Aerospace Scientists and Engineers select information carriers. The study examined how the

respondents select written carriers, the decision to use or not to use a written carrier was found to be mainly a function of the perceived importance of the carriers, information to a person's work. The observed quality and accessibility of written carriers were not found to be significant. Hence, the study highlighted the need for firms to hire knowledgeable employees to afford them with inclusiveness training programmes, and to improve formal and informal communication networks.

Haruna & Mabawonku (2001) conducted a survey on information needs and seeking behaviour of Lawyers in Lagos, Nigeria. Results revealed that many lawyers observed the need to know the most recent decision of superior courts as their supreme professional information need and other also expressed needs include meaningful recent legislation, obtaining information on local and international seminars and conferences and on acquisition and use of legal "Know-How". The library has been identified as the most heavily accessed information source for job-allied information.

Meho & Hass (2001) surveyed on information seeking behaviour of members of the social science faculty in the number of countries studying the Kurds. The results of the study showed that besides using traditional methods, they use the World Wide Web and electronic mail and that their information – seeking behaviour is influenced by elements similar to those influencing other social science faculties. It also found that accessing the materials is a chief information seeking activity that should be added to David Ellis' behavioural model, and that the faculty observed employ a somewhat more elaborate 'differentiating' information- seeking activity than the one described before. Lastly, some elements of interdisciplinary of

Kurdish studies as a field of research have been discovered and still further research is required to verify them.

Parker (2001) described the early stages of a research project exploring student learning as information behaviour in the course of literature based assessment tasks in higher education. The study explained that although information and learning are closely linked, their relationship has been enclosed by a narrow explanation of 'information' in Higher Education literature and measured beyond the scope of Information Science. It also showed the interactions between seeking and using of information is essential to a meaningful search of student learning. The diverse processes involved in Literature Based Assessment Tasks are dynamic to students' success, because they are used widely for assessment in many faculties. The study directed to clear understanding of how information tasks and subjects learning are related within the context of a specific discipline.

Ward (2001) reported the results of a questionnaire survey of 21 Principal Engineers at Ricardo Consulting Engineers, a leading power train consultancy, devoted to the design, testing and research engines and transmissions conducted in 1996-1997. The study explored the degree to which these engineers use informal information sources, such as colleagues and formal sources, their own and departments' collections notes and other literature and Ricardo's Information Services Department (ISD), in particular its large text base of engineering references, POWERLINK. The findings specified that respondents used to visit the library more than once a week; two of them claimed to be very regular visitors; eight others claimed to use it about once a week; three said that their visits followed no set patterns. The most preferred reason for using the library was to consult the

database but an objective test of retrieval techniques, which seems to conflict with the general attitude of the engineers.

Zawani & Masjid (2001) discovered in the study about the information needs and seeking behaviour of biomedical scientists at the Institute for Medical Research (IMR), Malaysia, and it is the oldest and important medical research centre in the country. The findings point out that biomedical scientists use different types of information sources to fulfil their information needs. Scientists who remained solely involved in research work considered journal articles as the utmost desired information basis. On the other hand, researcher-cum-lecturers measured books as the mostly chosen information source in gathering their information requirements. Both groups of scientists also considered collaboration with colleagues as a major source for satisfying their information needs. The study besides exposed that in spite of having access to recent and up-to-date digital information sources, most respondents still favoured of using printed or on paper resources. However, CD-ROM was the most used IT based source and in place of the Internet-based information sources and applications, e-mail was the most common whereas other applications were used rarely.

Fescemyer (2000) made the study entitled “Information – Seeking Behaviour of Undergraduate Geography Students” found that students used a wide variety of sources in print and electronic formats to collect information for the test. The study also shows that the fall semester students cited print sources more as compared to electronic sources and lecture notes. Whereas, the spring semester students cited print sources as compared to electronic resources and lecture notes.

Masjid & Kassim (2000) surveyed the information seeking behaviour of Law faculty members of International Islamic University Malaysia. The study revealed that

respondents used several sources for obtaining the required information. For teaching and research purposes, law reports and statutes books were categorized as the most important source. They preferred first to their personal collection before resorting to other information providing sources and agencies. The Online Public Access Catalogue (OPAC) and CD-ROM were the most often used IT-based sources and services. E-mail was the most common among the Internet-based services and applications. On the total, respondents perceived IIUM library collections, services and facilities as sufficient to come across their information wants efficiently.

Wales (2000) conducted a survey of UK veterinary practitioners to identify the key issues in veterinary information use and information seeking behaviour. The findings of the study shown that the greater proportion of respondents used the Internet for veterinary information than used a veterinary library. However, the conventional journals, textbooks and conferences were the main information sources used. Some variations in information source used by practice size and type and information were identified. Further, the study also found that the majority of library users and non-users wanted enhanced library access via. internet, especially to full text journals.

Kooganurmth & Jange (1999) conducted a study which discovered more than 70% of the users used internet for higher studies and only 39% used it for dicussions with peer groups. The most used services of internet were email, the Web, discussion forums, FTP and Telnet.

Ocholla (1999) discussed the information- seeking behaviour of academics in relation to the productivity of academics in South Afrin Universities, with particular reference to the University of Zululand, through a survey of academics. It was recognized that the nature of the discipline and the rank of the academics, which normally corresponds

with the academic qualification, experience, exposure and research productivity level, largely determine the information seeking behaviour. The study also found that academics mainly need information for career development and occupational and professional needs.

Shanmugam (1999) investigated the information seeking behaviour of trainee teachers from two teachers training colleges within the state of Johor, Malaysia. The finding of the study revealed that the majority of trainees' information are focused around their course work and there is low awareness of information needs that are not related to teaching. More than half of the trainees moderately expressed positive feeling for seeking information. Trainees largely preferred informal and interpersonal sources of information. Renowned print sources such as journals, encyclopaedias and indexes recorded as low frequency of use. The trainees favoured Malay language than English. Even though the students' teachers rated public libraries as excellent; they frequented college libraries most despite rating it as third best. Accessibility was considered as the most important external attribute of information. Currency and relevancy of information were given high priority amongst the internal attributes. Accessibility to sources and using the OPAC were cited as major problems when locating information. It also revealed that computers were largely used for typing rather than for seeking and processing information.

Wilson (1999) presented a framework of models of information seeking and other aspects of information behaviour, presenting the relationship between communication and information behaviour as overall with information seeking and information searching in information retrieval systems. It is recommended that these models address concerns at various levels of information behaviour and that they can be associated by imagining a 'nesting' of models. It is also suggested that, in both information seeking research and

information searching behaviour, alternate models address comparable issues in related ways that the models are balancing rather than contradictory. Lastly, a substitute, problem-solving model is presented, which, it is proposed, offers a basis for linking the models in appropriate research strategies.

Fidzani (1998) reported the results of a questionnaire survey to determine the information seeking behaviour and use of information resources by graduate students at Botswana University. The main purpose of the survey was to determine their information wants and their awareness of library services accessible to them. The findings of the study showed that guidance in the use of library resources and services is necessary and that periodicals and textbooks are the most prevalent sources of information for course work and research and those students need to be taught how to use the library. The study also recommends that a further questionnaire survey be conducted on student's ability to use information resources and administered during registration to all master students.

Yang (1998) explained a review of studies related to the information needs and communication behaviour of scientists which aims to discover the aspects that effect their needs and methods of problem solving. The study shows that particular work environments affect needs and the information seeking and basic requirements are inclusive, exact and accessible. Whereas, the suitability of information access has a direct influence on the efficiency of scientist's research but a lack of confidence in put on the solutions to information problems which are employed by librarians bounds scientists to the extra traditional ways of finding information in libraries. An awareness of this should lead librarians to develop collections and user services for the advantage of scientists and consequently win their trust.

Aderibigbe & Emmanuel (1997) conducted a survey on usage of library information technology resources by graduate students of university of Agriculture in Abeokuta, Nigeria. Centred on six research questions have interpreted into the objectives of the study and tried to provide answers to these questions. Overall 32 departments in the eight colleges of the institutions were covered from the University of Agriculture, Abeokuta in Ogun state of Nigeria. A total of 918 population of students group were carefully chosen randomly for the study. The study was limited on the use and responsiveness of IT resources in the library, regularity and practicality of IT resources. In conclusion, the study determined that the most of the respondents are somewhat aware of the accessibility of the IT resources in the university library and also comprehend the abilities of all and that they consider the resources valuable to their academic activities.

Hammond & Mitchell (1997) conducted a survey on the information seeking behaviour of practitioners in accounting, architecture, psychology and recreation/tourism. The aim was to expand information skills instruction programmes for students and less than half of the survey respondents had discipline-specific library instruction. It also revealed that the practitioners recognised the need for information but the less use of electronic resources. Data supported the requirement of information skills for those entering the professions. Instruction should be information centred rather than library centred. On-going education for professional's information finding is desired.

Abifarin (1994) examined the Information seeking behaviour of agricultural students in selected Nigerian Universities. Information was sought through the use of questionnaire distributed to students in five universities offering agriculture courses including the University of Agriculture. The analysis of the study showed that the students make less use of library than expected as some of the respondents use to attend formal

lectures; they first turn to their lectures for further information rather than to library. Thus, the study corroborates the general finding that the library shelves are disorganised because users have a little idea about the systematic library usage. The author also records that the library orientation, strongly focussed on information gathering, be established where they are non-existent.

2.2 LITERATURE SEARCH IN NATIONAL SCENARIO

2.2.1 Studies in Northeast India

Bhattacharjee (2014) executed a study with a view to know the status of e-resource and Internet use pattern of Social Science community of Tripura University, Tripura which comprises of research scholars and staff members. From the study it is observed that the majority of library users visit library on daily basis. The study also shows that information seeking and gathering could be a challenging task to the library users as most of the libraries are not aware of using electronic-resources. Many users are suggested subscribing more online journals and e-resources of various publishers. A rapid change in literature searching behaviour and use of Internet for online access of e-resources have become the vital part of various information needs and lack of training among library users is one of the vital factors in the usage of Internet, e-resources and e-journals in Tripura University, Tripura.

Bhattacharjee, Sinha & Bhattacharjee (2014) conducted a survey to understand the status of information seeking behaviour of college library users of Cachar district, Assam. The study explored that the majority of them visit library on daily basis for updating themselves. It is also found that besides visiting their college library they also used to visit other academic library. Information seeking and gathering is a challenging

task for all the five college library users of this district as the library collections are very limited ,text books and reference books are very old collection and most of such materials does not able to meet with the users expectations. The study concluded that with rapid development in information technology and internet needs it is essential to develop and improve the infrastructure of college library and also to conduct special trainings on usage of internet, e-resources, e-journals etc. in college libraries.

Sarma & Sarma (2014) undertook a study to define the information seeking behaviour and use of information resources by the students of Life science Department of Rajiv Gandhi University. The study made a determination to decide the sources used for accessing e-resources in precise. The study cleared that most of the students were in the habit of using library and they were highly satisfy with the newspaper collection and e-resource collection. Students preferred print collection and also used e-resources, e-journals and online databases were frequently browsed by the students for their academic and research activities. Lastly, the study concluded that as students agreed their lack of IT knowledge and skills for better utilization of e-resources and to overcome from this the library must organize awareness programmes and seminars to teach the students on seeking information from e-resources and to make the most of the use of library resources and services.

Sinha (2004) described the usefulness and advantage of Internet in day-to-day life, impact of Internet on the library and information services etc. and explains the aims and objectives of the survey on the usage of Internet in Barak Valley. The study shows that the users communities of different strata, use of Internet from personal connectivity or from Internet café or office, or academic institutions, types of connectivity for Internet account subscription, place and time for Internet search, time slot for Internet connectivity, use of

Internet tools and services, mostly used search engines for Internet access, use of browsers for Internet search, rate of Internet access from Internet café etc. Moreover above aspects, the main part of the study described the role of Internet in library and information services, problems of getting Internet connectivity, and some suggestions for making people aware for the use of Internet and popularise the use of Internet among the users communities by arranging short term training programme by Computer Institutions, Regional Engineering College (REC), Assam University and other private Institutions.

Debroy (2013) conducted a survey on information needs and information seeking behaviour of Assam University library users. Survey method including questionnaires was administered to the users for collecting relevant data. The study shown that the information seeking behaviour of the users under study which is influenced to some extent on the accessibility of information sources and the constrictions faced by them in seeking information. The findings of the study showed that textbooks and periodicals are the supreme sources of information for the users. Finally, the study specifies that the guidance and training is compulsory for the use of library resources and services. Library automation was found to be the need of the time by most of the faculty members and research scholar to overcome different types of problems faced by them while accessing information.

Saikia & Gohain (2013) investigated about the utilization of library resources, understanding the satisfaction level of users from library resources and services and information seeking behaviours of the students and research scholars of Tezpur University. Questionnaires were distributed among students and research scholars of Tezpur University to collect relevant data. The findings of the study shows that i) approximately half of the total respondents visit library frequently and their chief purpose is borrowing books from the library, followed by reading of print journals from different field and

having access to online periodicals, reference sources and also to read newspaper/magazine; ii) the study also shown that printed books are still occupying the major place in library to encounter students' information wants; iii) it is also discovered that students and research scholars are greatly satisfied with the collection of online journals and use these online journals both for academic and research purpose; iv) ICT application in library services is also providing outlooks to users to access and use both library online resources and services efficiently. Finally, the study concluded that library is playing vital role to come across multidimensional demands of students, and research scholar for information and knowledge and it is also felt that user supervision is necessary to help library users to meet their information needs and make users aware of the available library resources and services.

Mishra (2011) made an attempt to know the information use pattern of scientists of NEIST, Jorhat. The main objectives of the study are: (i) To determine the use pattern of scientists; (ii) To determine the nature and type of information required by the scientists; (v) To determine their current information needs and habit of library use. The study revealed that, the KRC, NEIST is adequately equipped to provide incentive and value added services to the scientists and others with the present collection development. Due to unavailability of a departmental library, the scientists and other users primarily depend upon the resources of KRC to promote their learning, research, and development. The library, however, is equipped with e-resources which have become the primary sources of information for the users of the library under study. The scientists prefer to use the information available through electronic form rather than traditional way. Therefore, subject gateways and portals are required to be provided with to the scientists for better use of information. Further, most of the scientists and research scholars prefer to use current periodicals to keep them update in the knowledge of their interested field. The study

suggests that KRC needs to be fully automated for providing value added information and services to the scientists which has become essential in present day context as the library has become a work house for the different R&D programmes in the science and technology institutes, and also due to the increasing demand for processing of data and retrieval of information in the easiest and quickest possible time.

Devi & Singh (2009) executed a survey to understand the attitude of Internet users, taking into account the use of Internet by research scholars of Manipur University library, India. The major objectives were to identify Internet is not a substitute for the library and to find out the use of internet resources by research scholars for their research work. The paper verified that research scholars were not fully satisfied with the Internet facilities provided by Manipur University library. The findings of the study also revealed useful facts about the use of Internet by research scholars. Lastly, on the basis of findings, some suggestions have been made to improve the use of Internet among the Research Scholars.

Singh, Singh & Devi (2009) executed a survey on “Users Skills and Awareness on Knowledge Retrieval Methods Adopted in Manipur Libraries: A Study”. The findings of the present study lead us to a number of clues on knowledge retrieval methods and tools being adopted by some leading libraries of Manipur. The prevailing system of knowledge retrieval in the libraries of Manipur is not up to the desired level. At the same time, most of the users in the context of Manipur are hardly aware of traditional as well as new methods adopted by the libraries. Students enrolled in the colleges and universities know very little or nothing about basic library use and information search skills, computer related and other information skills in general and this problem emanates from unavailable or inadequate school and public library facilities in this state. Lastly, the study recommended the necessity to initiate information literacy programme to make users fully satisfy in accessing their choice of information among the available sources.

Singh, Devi & Raychaudhury (2009) described in the study on the use of electronic information focussing on the Internet services by users of Manipur University Library. The study also examines the utilization, purpose, difficulties and satisfaction levels of users about Internet based e-resource services provided by the library. The study found that low speed internet access, erratic power supply and lack of required full text journals are problem with regard to the use of Internet based e-resources.

Verma et al. (2008) examined the use of electronic resources in the library of Sikkim Manipal Institute of Technology Library. The study highlighted the usage of e-resources by faculty members of Computer Science Department in SMIT Library. The findings of the study revealed that the main purpose of seeking information, formal and informal sources used by faculty in searching the relevant information is studied in the paper. It also shown the frequency of their visit to the library and tools used for searching the information and also the role of library professionals in helping faculty for finding information is also touched upon.

Prodhani & Gautam (1997) implemented which deals with numerous services rendered by ten university libraries of North East India. These universities include Arunachal University (ARU), Itanagar, Assam Agricultural University, Jorhat, Assam University, Silchar, Central Agricultural University, Imphal, Manipur University, Imphal, Tezpur University, Tezpur and Tripura University, Agartala. The study indicates that these university libraries provide several services based on traditional methods. For improved user satisfaction using a computer and e-mail facilities under the INFLIBNET Project should assist them to automate services.

2.2.2 Studies in Other Parts of India

“Handbook of Agriculture” published by the Indian Council of Agricultural Research (ICAR), which is a blue print of agriculture area, consists of continuing research actions at the national level and certain ideas on the outline of future agriculture. The subjects deal with soil and water, land utilization, field and forge crops have been reorganized with the most recent development, in addition to this several new topics such as environment, agro biodiversity, resource conservation technologies, integrated pest management, seed production and technologies, energy in agriculture, informatics, biotechnology, intellectual property right, agricultural marketing and trading and original technical knowledge have also been addressed. The handbook is beneficial to students, researchers, planner, farmers etc. However, the handbook delivers a separate chapter on “Informatics in Agriculture” which is a way for implementing present section of research. The handbook is a basic source of library literature for every researcher in the field of agriculture and agriculture allied subjects. Hence, this is deliberated as a relevant review for the study.

Kumar & Shukla (2013) indicated about the comparative study on information seeking and use pattern in electronic environment of both science and arts research scholars of Banaras Hindu University. The study simply revealed that both the groups of researchers have some similarities and some dissimilarity in information seeking. Even in this technological and electronic era research scholars from science discipline use electronic resources for meeting their needs while research scholars from art discipline mostly depended on print form of publications for their information needs.

Kumari, Kumari & Devi (2013) attempted to recognize about Information Needs and Information Seeking Behaviour of Teachers of NIT, Kurukshetra. The study revealed that maximum of the teachers used to visit the library to issue books, referred periodicals,

journals and reference material for different purposes but their frequency of visit hugely differs while maximum of them never used audio-visual material as a basis of information. It also clears that teachers are least fretful with Government papers, dissertation/thesis and proceeding of conferences as the basis of information. Maximum teachers are conscious about the back volume of the journals. It is also found in the study that most of the teachers were satisfied with the library collections. Maximum users preferred to use circulation service, reference service, computerized service and photo coping facility etc. available in the library.

Pareek & Rana (2013) explored about the information seeking behaviour and library usage pattern by research scholars at the Banasthali University. The general purpose of the study was to select what their information desires and also determine their awareness of library services accessible to them. The findings point out that assistance in the use of library resources and facilities is compulsory to support researchers to come across some of their information necessities.

Prakasan (2013) surveyed the information needs and use of health care suppliers all over the world. The study emphasised on different types of professionals in the medical field such as medical faculty members, general consultants, nursing specialists, family physicians, clinicians, etc. The progress of research and developmental (R&D) activities in the medical and health-care, lead to many alterations in the entire field of Medicine. The health-care professionals require up-to-date information to work for the society in a better way. The findings of the studies are planned into the main headings like information needs and information use.

Sahu & Singh (2013) conducted a survey and examined about the different features of information needs and information seeking behaviour of

astronomy/astrophysics academics, comprising of different variables such as academic, rank-wise positions, age wise individualities and also different types of methods for keeping up to date. For gathering data stratified random sampling survey including questionnaire and interview method were used. The finding of the study showed the differences and also emphasized the value of information needs and information seeking behaviour of astronomy/astrophysics. The study determined that astronomy/astrophysics academics mainly used the Astrophysics Data System followed by e-archives for their education and research purposes. Astronomy/astrophysics academics worked under a very unique setting with generalized needs. It also highlighted the need to continue retrieving of specialized needs to discover new solutions.

Kannappanavar & Swamy (2012) made a significant study on user education program in agricultural science university libraries in India with special reference to South India. The study found that the Agricultural university libraries under the study are in the preliminary stage of progress. Modern technologies in the libraries are currently being made use of to fulfill the information need of the users. Whereas, the staffs occupied in these libraries needs training and revelation to new technologies available at nationwide and worldwide levels.

Sharma & Gupta (2012) made a survey on information seeking behaviour of faculty members of Sher-e-Kashmir University of Agricultural Science and Technology, Jammu, India in the Internet era. The study emphasized the development of information and communication technologies and the completeness of degree of use of the same. The data was collected by using a questionnaire technique from 83 faculty member in the field of agriculture and veterinary sciences. Centered on three research questions, six objectives were expressed to develop the conclusion. The study was improved to help to plan an

outline of efficiently exploit the usage of online information resources effectively. The distribution of respondent according to faculty, gender, status, age and experience was evaluated using T - test grouping for co-relations of library analysis. Finally, study was determined with numerous suggestions. All the faculty members have accessibility of computers with internet connections in their departments. The e-mail was the most frequently used service of internet at home. Internet was used nearly on daily basis of most of them. Faculty member's use internet mainly for having up-to-date information of the subject related to their field and then for their individual research purpose.

Singh (2012) investigated the various problems related to the study such as information usage, level of satisfaction, and their different types of difficulties met by agricultural scientists while search for information, which support to the agricultural libraries and librarians in restructure their library collections with more logically. The result showed that the chief bases of information for agricultural scientists recognized in this study in order of use like databases, journals; books, research reports etc., and conversation with colleagues and experts, and appearing lectures, conferences, seminars, etc. were also found to some extent beneficial sources of information by the agricultural scientist.

Gopinath & Nair (2011) estimated the efficiency of Kerala Agricultural University Library and Information Systems (KAULIS) in gathering the rising demands for Information Services. The Agricultural Libraries play a vital role in safeguarding the real flow of information and data to researchers and agriculturists. The objectives of the study were to distinguish the efficiency of library collection and services as well as fulfilment about the user education program, and to know the understanding of the user's satisfaction concerning library equipment and physical facilities. Using survey method,

data were collected with the questionnaire, interview maintained with observation. The major conclusions were: i) Information needs and prospects of library users is always changing information scenario. Library should reorient its collection, services and facilities to retain step with this development. A change to a user oriented method is fairly evident from the new library assessment studies and ii) User's feedback is careful as more dependable factor while determining usefulness and efficiency of any library. The factors that affect the insights of library effectiveness are carefully interdependent with user's satisfaction. The concentration on or placing too much stress on a particular type of collection service or facilities may not lead to advance the library efficiency.

Sheela & Shivaram (2011) explored from the study and stated that 'Information Seeking' is the process or activity of attempting to obtain information in both human and technologies contexts. Information seeking is related to, but yet different from information retrieval (IR). The survey showed that much library and information science research is focused on the information seeking practices of practitioners in various fields of professional work. The library systems and information services have changed due to the availability of e-resources and these e-resources affected the internal library use and can be accessed through the internet.

Shibu & Baby (2011) described that information is a vital source for success, and those who possess right information at right time will only succeed. Information communication technology (ICT) has influenced the way in which users approach for information. This paper tried to investigate the information seeking behaviour of the academics of University of Kerala in the changed library scenario. The study revealed that academics had welcomed the automation in library and a shift towards electronic information seeking is visible which implied that ICT has an impact on the ISB of the academics and library system of the university was

well used during different stages of research, and they also used the library for academic purpose.

In order to progress in agriculture, there is a necessity to have well-ordered and well-designed unified information provision system, maintained by efficient national cooperation programs. Hence, there is an essential to reshape the information provision system for agricultural progress. Outcome from this study is a distinctive example of the base for the alteration of the prevailing information system if it has to be reinforced and to be of importance so that it can deliver information that is timely, pertinent, perfect, and trustworthy and in preferred operational forms.

Kannappanvar & Swamy (2010) estimated user perception of LIS in Agricultural Sciences Universities in South India. The hypotheses were formulated and tested that there were important relationship amongst the opinions of the post graduate students, research scholars, and faculty members in the direction of the purpose of using the library. For this, the survey method was accepted. The study was centred on theoretical as well as experimental data. The study determined that the information needs to be progressive and rational and to make rapid and correct choices to recover rural life. The nature of information services provided by the agricultural university libraries differ from one to another, owed to the variety of attention of the user community. Modern technologies in the libraries are currently being used to gratify the information need of users. The people functioning in these libraries need training and contact to new technologies. There is a need to grow the culture of interlibrary loan services and electronic transmission of documents. Database of theses, journal articles, and library catalogues must be made obtainable to users.

Kumar & Sharma (2010) estimated the use of Electronic Resources at Punjab Agricultural University Library. The objectives of the study were: a) to discover the most used e-resources b) to classify the use, approval and influence of e- resources in teaching, research and educational activities c) to identify the satisfaction resultant by users while using e-resources. d) To distinguish the difficulties faced by users in accessing electronic information e) To determine the training requirements of users in accessing e-resources f) to recommend the ways and means for development in actual use of e-resources. While attaining the objectives, a representative sample of 5% size out of a population of 1300 was studied by using questionnaire method data were collected. 68 questionnaires received out of 80 respondents which come out to be 85% response rate. The study determined that e-resources have altered the information seeking and distribution patterns. The e-resources are proficient of providing most current, related and genuine information. These are extensively accepted by all the group of users for one determination or another like teaching, publishing, research and information.

Kumar (2010) made an analytical study on information-seeking behaviour among agricultural scientists in Sardar Vallabhbhai Patel University of Agriculture and Technology, India. The results reveal that the scientists of agricultural science in this study are uniform in their preference for journals, internet resources and services as the most important sources of information in their teaching and research purposes. Information must be current and easily accessible. ICTs can thus enhance this process. ICT can convey about fresh or innovative information resources and exposed new communication opportunities for the rural farming communities.

Sheeja (2010) observed the information-seeking behaviour of science and social science research scholars, together with service efficiency, satisfaction level on different

type of sources and different methods adopted by the scholars for keeping up to date. Data were collected through random sampling technique with 200 sample size of PhD students of science and social science departments of four universities in Kerala, India. The finding of the study shows that the similarities exist in between social science and science PhD students with respect to information-seeking behaviour. There is a vital difference amongst the science and social science scholars on the awareness of the adequacy of print journals and database collection which are very significant to the research purposes. There are no significant dissimilarities between science and social science scholars on the perception of the adequacy of e-journals, the utmost used source for keeping up to date. The study corroborated that scholars of both the fields are dissatisfied with the efficiency of the library in keeping them up to date with most recent progresses or advances in different fields.

Vasappa & Shivalingaiah (2010) explained that information is an essence of research. University libraries played an important role in providing information to the researchers. The researchers seek for information in different patterns. In the present study authors had made an attempt to know the information seeking patterns of researchers of various disciplines in the university libraries in Karnataka states. The questionnaire made was adopted to collect data. The study identified the preferences of the researchers over channels of information, various modes of literature search, purpose of visit, type of information gathered, frequency of library visit time spent in the library. The chi-square test was applied to find out the significant relationships on the opinion of the researchers among the disciplines. The result showed that there is significant difference among the research scholars of various disciplines in the preferences of various channels of information, modes of

literature search, purpose of visit to the library , time spent in the library and modes of communication.

Biradar, Kumar & Mahesh (2009) conducted a case study to know the level of usage of agricultural information sources and ICT tools, and services in Agricultural Science College at Shimoga. The definite objectives of the study were to look at and ascertain the information sources, purpose and frequencies and to measure the utility of agriculture sciences periodicals and services provided by university libraries. The study showed that the frequency of use of library literature sources is very low, the lack of awareness while use of these resources and e-consortia approach. The essential of establishing e-consortia models among the agriculture libraries in India and also information literacy programs were emphasized.

Rokade (2009) provided moderately a useful book to the users of all faculties, agricultural library and information science and to state and central competitive examination entitled “Agricultural education and libraries in India”. The whole book is divided into three major parts: a) Agriculture education in India; b) Agricultural University libraries in India and; c) Agricultural information system. The author has stressed on the importance of information services which are bases to the development of agriculture, agricultural education, research, extension education and agribusiness. The services are delivered by the agricultural libraries for the longer development of the users and country. Though, the agricultural university libraries are providing the needs of users.

Singh (2009) attempted a survey of graduate student’s knowledge on use of numerous library and learning resources and their retrieval skills, approach as to how they up-to-date themselves of the latest development in their subjects of G.B. Pant university of Agriculture and Technology, Pantnagar. Survey was prepared before the beginning of one

credit course on user education and information literacy. Data were collected with the help of questionnaire method. The study discovered that there were distinguished gaps and digital division amongst students and recommended that teaching of credit bearing information literacy courses should be made necessary to enhance graduate students knowledge and information retrieval skills.

Ahmad & Fatima (2008) examined the information seeking behaviour of the students at Ajmal Khan Tibbiya College, Aligarh Muslim University. The study directs that the assistance in the use of library resources and services is essential to help students to encounter their information requirements. It also clears from the study that text and journals are the most popular sources of information for the students course work.

Chatterjee & Gupta (2008) carried out a study on usage of Internet by the Agricultural Researchers in Bidhan Chandra Krishi Vishwavidyalaya. The main point of this case study was information seeking behavior, Internet use and Search engines used by the user community. The necessity of the study was to discover the development of use of internet by the researchers in BCKV and their regularity of use of internet. The various types of difficulties faced by researchers for evaluating required information, different information seeking association associated with web resources. The objectives of the study were: to distinguish the researcher's awareness, frequency, details, and method of action while using internet. The study determined that the nation to increase of agricultural production with appropriate connections of communication of research findings to the targeted user to maximize their output. Scientists and Scholars were accomplished of generating knowledge and conveying the research output. Use of internet will be measured for proper planning and policy creation of agricultural libraries while interpreting effective

and well-organized services. It is important to implement technologies which provide chances to reshape knowledge centre.

In direction to accomplish those above objectives, questionnaire and interview method of research were implemented. The major conclusions were: i) Library professionals should be used to with the concerned subject, current progresses of research and development activities in the field of agricultural services; ii) Users should be skilled or trained in seeking agriculture sciences information and familiarized with new phases of information. Most of the users recommended that library should be computerized and local area network (LAN), software, hardware and networking technique should be recognized at an early by the library.

Kumar & Hussain (2008) conducted user survey on identification of qualitative services delivered by Sardar Vallabh Bhai Patel University of Agriculture and Technology. The objectives of the study were: i) to ascertain the category of users and their nature of use of information at the Sardar Vallabh Bhai Patel University of Agriculture and Technology, Meerut Central Library; ii) to classify the levels of use of the numerous services delivered; iii) to estimate the availability, usefulness and retrieval of information by users; iv) to know the problem associated with such services and; v) Right to use the strengths and weakness of the present library, mention a mechanism to improve information dissemination to researchers.

Pattanaik & Parida (2008) conducted a survey on information needs and seeking pattern of users of Orissa University of Agriculture and Technology, Bhubaneswar. The objectives of the study were: i) to ascertain the purpose of seeking information nature, pattern of information, information needs and resources used by the agricultural university libraries; ii) to measure the degree of their awareness and to observe the limitations of the

current library facilities and services; iii) to study the methodology accepted by them for discovering information sources and types of publications and time expended for various activities; iv) to discover the utility of collection and assess the user behaviours patterns as well as to reduce the cost involved in obtaining, using by them. The study shown that the faculty members are interested for seeking information by multiple reasons, though the amount of motivation varies from motive to motive in terms comparative importance of these motives, lecture preparation made the maximum contribution followed by the professional requirement, career development etc. The usage of formal sources of information, journals are optimally used followed by books, hand books, conference literature etc., whereas face to face discussions inhabit the major position succeeded by personal experience, seminar, or conference in terms of relative degree of usage, as far as informal sources are concerned.

Rokade & Rajyalaxmi (2008) conducted a study on Integrated Information Systems in Agricultural University Libraries in Maharashtra in the context of digitization. Four universities were carefully chosen for the study namely, i) Mahatma Phule Krishi Vidyapeeth, Rahuri; ii) Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola; iii) Marathwada Krishi Vidyapeeth, Parbhani and; iv) Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli.

The study determined that nowadays the labour and responsibility of the librarians have greater than before; every library has to update their operation to the new-fangled challenges. The situation has altered where libraries cannot keep on isolated. They can keep in touch with other libraries and therefore the development of integrated information systems in agricultural university libraries and other libraries will be beneficial in services to their users.

Singh & Satija (2007) carried out a research study on information seeking behaviour of agricultural scientist with particular reference to their information seeking strategies. The ICAR institutions of Delhi and Punjab Agricultural University, Ludhiana were chosen for the study. The precise objectives were: to find out and study the different sources of information, strategies and the utility of information resources used by the agricultural scientists. The study determined that the working culture of the individual demanding information, the importance to be found on getting it, the facilities, the accessible for seeking it, the knowledge about these facilities or services, the decision of their value, and the prospect of getting what is required are the issues that may affect information seeking behaviour. ICT is usually measured as the high word of today's IT word. It has transformed the society into information society and our way of life. ICT's coming together with computer and communication technology creates processing, storage and its retrieval very quicker, prompt and effective.

Nath (2006) had made an effort to describe a survey of the usage of information resources by the research scholars as the users of Punjab Agriculture University Library, Ludhiana. By using a questionnaire method author has recognized the impression of research scholars towards the awareness of library services, sufficiency of library resources and their observations on library services. Finally, the study observed the satisfaction level of users about Internet, CD-ROM databases, online databases, e-resources and services provided by the library.

Perumalsamy (2006) defined the role of Agricultural University Library with an opinion to developing a Network of Agricultural Universities Libraries. The key objectives were: i) to encourage and sharing of resources amongst the Agricultural University Libraries in India by emerging a network of Libraries by gathering, sharing &

disseminating information; ii) to offer and create guidance to the member libraries and organize efforts for suitable collection development and referral centre while using E-mail; iii) to synchronize the national and international networks for exchange of information and documents and carried out publication for sharing information.

Lastly, the author determined the study with the following recommendation:

- i. The library authorities should express their necessities for computerization of their libraries. ICAR should concentrate financial support to each such library service, who has not got familiarized to computer facilities or services with National Agricultural Library and Information Network is essential.
- ii. The National Agricultural Library is a necessity for our nation and should be well-known at the earliest possible time. The IARI library must be familiar as the National Agricultural Library.

Sharma (2006) had delivered the comprehensive account of “Information Generation and its use by Agricultural Scientists: A Critical Study”. The study wisely observed about the agricultural information, its nature, generation and usage by agricultural scientists. It also indicates the different important factors like position, age, sex, educational qualifications, professional training working environment, experiences and area of interest and research and the membership of professional bodies to which they are involved. The whole book is organized in five chapters exactly the summary and conclusions are very much associated to the present work in hand.

Rokade & Rajyalaxmi (2006) surveyed the evolution of electronic information services which explain and improve the understanding by the professionals by using survey method with the objectives to discover the various kinds of electronic information services

and user information needs, electronic information services and INFLIBNET services provided by the agricultural university libraries in Maharashtra with special reference to university library of Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. The data were acquired and presented in tabular formats while representing the current status of infrastructure, human and financial resources, database in CD ROM form, information services, status of the use of information services, and users need. Finally, the study concluded that electronic information services are chosen by the users to other kinds of services. But INFLIBNET, DELNET, ARISNET services are not obtainable in three agricultural university libraries in Maharashtra except the MKV library, Parbhani. Thus, the study recommended that the INFLIBNET should also contain the Indian Council of Agricultural Research under its coverage and attempts to provide electronic information services to all the agricultural university library users in India in association with ICAR similarly.

Alha (2005) conducted a study on “Automation of the Central Institute of Agricultural Engineering (CIAE), Library an account of practical experience”. The study makes an effort to describe the activities of the CIAE library as an efficient information centre using information technology. All the resources accessible in the library namely: books, technical reports, conference proceedings, bound volumes, standards; annual reports, etc. have been computerized using library automation software. The study determined that the automation has brought about in added proficiency and usefulness of library services.

Kannappanavar & Kumar (2005) estimated the training programs relating to library and information science professionals and their efficiency in selected Agricultural Science Libraries in India. Agricultural libraries have been moderately computerized and

information stored in digital format. Study shown that workshops organized were usually designed to deliver practical training on IT applications, but they are not estimating the training needs of library professionals.

Long & Shrikhande (2005) conducted a study under the title “Improving information –seeking behaviour among business majors”. They found that existing generation of college students has used the Internet to access information since the early 1990s. No valuation of information use, quality, variety, and consistency of information generally occurs at both the students and faculty level. It is found that the set of teaching methods executed results in significant improvement in information-seeking behaviour, particularly among undergraduate business majors.

Sharma & Pant (2004) executed a study on “Information seeking patterns of DRDO Scientists.” The objectives of the study were: (i) To ascertain the various channels through which information was accessed by DRDO Scientists; (ii) To identify the utilization of different library services; (iii) To observe the different factors which hinder information seeking behaviour of DRDO Scientists and when do they refer to library staff to choose the required information etc. (iv) To evaluate the relationship between library and scientists. The major findings of the study were (a) Most of the scientists belong to 40-49 age group; 100% scientists are using library for referring journals articles; (b) Success rate of getting information from the library is 85%; (c) 40.9% scientists get help of library instructions and 45.45% felt the need for library instructions; (d) Current information sources are record common among the scientists 72.72% attending conference, seminars etc. and; (e) 95.45% Scientists are using modern medium of communication and DRDO Scientists are using databases mostly MEDLINE, OVID, PUMBED etc.

Kanauji & Satyanarayana (2003) conducted a study of Science & Technology community of Lucknow city to evaluate the level of awareness and demand of web based learning environment among Science & Technology information seekers. The major findings of the study revealed that 49.2% users browsed the Web for more than 2 to 4 hours and 14% for more than 5 hours a day. The study also showed that 36.6% users consulted e-journals frequently on the Internet, 40.4% used Internet for referring technical reports, 24.8% to find online databases and 10.4% for telnet service.

Kebede (2002) mainly focused in the study about the information needs of users that are changing as a result of changes in the accessibility of information content in electronic form. It highlighted the trend and nature of the physical form in which information content is presently being made available for users' access and use in electronic information environments. The study also attempted to determine why the usual information needs of users are coming into being and how they are shaped in electronic information environments. Finally, it suggests concerning how to go about recognizing and meeting the usual needs in electronic information.

Padmamma, Vijaykumar & Vasudevan (2002) conducted a survey on information seeking behaviour of 84 Vishwesvaraih Iron & Steel Limited (VISL) scientists, Bhadravathi, Karnataka, which exposes that, roughly one-third of the scientists visit the information centre to satisfy the information needs of research activity, about 31% scientists discoursed that education of the dependents is one of the factors which delays their information seeking behaviour.

Shokeen & Kushik (2002) executed a study to know about information seeking behaviour of social scientists working in the universities located in Haryana. The study reported that majority of the social scientists used to visit the library on daily basis. The

first favoured method of searching the required information by the social scientists followed by searching through indexing and abstracting periodicals and citations in articles correspondingly. The social scientists frequently used current journals followed by books.

Mahapatra & Panda (2001) explained the theory of information seeking behaviour at some length. The study showed an insight into its many aspects such as concept, associated psychological attributes, behavioural options and economical influence, impact of dissonance theory, as well as different methods and categories of information seeking and also reflected different models of information seeking behaviour and their implications, along with research finding in this field.

Mahapatra & Panda (2001) conducted a study on information seeking behaviour of working journalist in Orissa. The study provides an idea of various behavioural approaches of working journalists in seeking and searching information. It also describes the pattern of their searching and locating information sources and services, method of communication and strategy employed in seeking needed information, their importance on information sources, and constraints met by them in locating information.

Kannappanvar & Vijay Kumar (2001) studied the use of IT in University of Agricultural Science Libraries of Karnataka, specifically University of Agricultural Sciences Library, Dharwad and University of Agricultural Sciences Library, Bangalore. The collection, computer services, hardware and software facilities, library services, databases, IT applications were evaluated. The survey determined that however the program was meant for helping the information needs of academicians, the output have not reached the academic community due to non-access of the INFLIBNET programs separately from this there are many network facilities accessible at national and international levels, which are not retrieved by the libraries. This is mostly due to the

absence of adequate training and financial support. To overwhelm this, the librarians should approach the university authorities and train the library personnel on IT application. The university librarians should also approach the funding agencies like INFLIBNET and ICAR for their library automation and provide IT-based information services to their clients or users.

Tripathi & Prasad (2001) conducted a study on information seeking behaviour of scientists in Physical and social sciences. The study highlights various sources and methods followed by the scientists to find required information and also discuss various types of information and bibliographical sources used by the scientists in the study.

Garg (2000) implemented a study on information seeking patterns of users of Engineering Institutions in Rajasthan. The study identified the relative importance of the users, their various aspects of information seeking such as motives of seeking information, use of formal, informal and electronic information sources, different sources for generation of ideas, interpersonal sharing of information and information sources instantly turned to, for the needed information.

Chakrabarti & Basu (1999) explained that information need of any community is obligatory upon its economic conditions and its responses to these conditions. Socio-economic features include various needs of the community media, stratification in the community leadership, roles of different groups e.g. women, men etc., information on political conditions, relationship with the community, the electoral procedure and the government needs for infra-structural resources such as roads, electricity, markets, schools, health facilities.

Kuruppu (1999) conducted a study to understand the information needs and behaviour of workers in an organization which is the base for designing and developing

information systems and services to sufficiently satisfy their needs. The study also discussed information needs, information seeking behaviour, and methods used in studying them, especially in research organizations, and the significance of such studies. It also considered that the use of the findings of such studies in making decisions connects to the design of information systems and services, as well as the influence of emerging information technology on information users and their information seeking behaviour.

Kanungo (1997) investigated the methods of seeking information by women researchers in the disciplines of history and political science in the University of Delhi (DU) and Jawaharlal Nehru University (JNU). The study tried to make a comparative analysis of the methods accepted by these researchers in finding, accessing and obtaining information. Being practical in nature, the study has been directed in the form of a 'user survey' using questionnaire and interview methods.

Reddy & Karsidappa (1997) executed a survey on information seeking behaviour of medical scientists on the use of formal and informal channels of communication, which indicated that journals are preferred for formal source on information for arranging course or teaching materials whereas, books are used more for providing discussion and offering therapeutic/ diagnostic services. The time expended in borrowing / reading literature for various purposes has also been studied.

Kolozs (1992) reported a questionnaire survey of the teachers of a large vocational secondary school about their information needs. The findings showed that teachers have the highest need for information related to the subject they are teaching, and the second greatest need for teaching information. They also fulfil their special literature first of all in the school library, which is, though, capable to meet just 1/2 of their request.

Tejomurthy (1992) analysed the information requirements and information services to the engineers in Dewas. An attempt prepared to know the interests of respondents about fresh and new developments in their field of work. Different features such as users' needs and services, awareness about knowledge, sources of information required etc. were taken into consideration.

Korah & Devarajan (1991) reported the results of a study of the information needs and use patterns of scientists using literature of rubber technology at the Rubber Research Institute of India. The study examined use patterns of different types of materials, the adequacy of the library collection and services, information strategies and other facets. Findings of the study directed that there is a need to increase the library services in areas such as the acquisition of foreign language periodicals, filling in of gaps in titles, organising user training programmes and the restructure of collections of dissertations.

French (1990) carried out a study on the user needs and library services in agricultural sciences and advised roles of librarians and information professionals while providing their information needs. The study observed the users of information in terms of response of their seeking habits, their information requirements and their response to library services. The term "user" is employed to mean an agriculturist i.e. a scientist, a farmer, an extension agent, or any individual involved in agriculture or its product. Every information professional in the agricultural sciences should be apprehensive with the user who is liable for the request of information to the practice of agriculture or science. This review centres into three sections. These sections are: a) comprehensive interconnection; b) independence and; c) intercom which are between user and information professionals. First, the outline of users of agricultural information, about them, their habits of library usage, and the issues and challenges elaborated. The second review pacts with the trends in

agriculture and information distribution. This review of research is limited to Ph. D students, postgraduate, research scholars, faculty members, extension specialists, agricultural staff and other research scholars in the field of agriculture and related subjects.

Deshmukh (1987) emphasized that research and communications are very carefully interrelated. The Information and Communication needs in agricultural research have been allocated with the edited book of the author. The book offers to the Information Systems for the Agricultural Sciences and Technology. This was the main Summer Institute of its kind in the history of Agricultural Universities in India. The chief objectives of the Summer Institute were to transfer the latest information technology techniques and bring up to date the professional skill of librarians and information scientists working in the Agricultural University Libraries and ICAR Institute Libraries in the country. Eminent scientists have contributed in this book on different topics related to agricultural research.

2.3 CONCLUSION

The above review of literature centered on the studies carried out by the researchers in different parts of the world and different parts of India in many aspects has shown us many indications about the users of different categories. The studies are interrelated with the use, access, use pattern, information seeking behaviour, study of the existing system, behaviour model, etc. Use of different methods and techniques in the study is also comprehended in such studies. Researchers have taken into account different categories of users in the activities. Scientists are found to be one of important group of users on whom many studies have been conducted to analyze their information seeking behaviour in different information environment. Studies of the scientists concerning their behaviour in the present information environment can be considered as an emerging area of study in the

field of Library and Information Science. The study also concluded that now a days the work and responsibility of the librarians have increased; every library has to update their operation to the newer challenges. The circumstances have been changed where libraries cannot remain isolated or out of the way. They can keep in touch with other libraries and therefore the development of integrated information systems in agricultural institutes and centre libraries will be useful in services to their users. Hence, this comprehensive review of literature is relevant and useful to the researcher for planning and right direction to carry out the present research study. The next immediate chapter of this is the chapter on methodology adopted while conducting survey of the present study (**Chapter 3**).

