Research Report

Information Seeking Behaviour of Agriculture Scientists working in the Select ICAR Institutions in Delhi, and the Punjab Agricultural University, Ludhiana: A Study

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0 INTRODUCTION

The journey of formal agricultural education and research after independence began with only 17 agricultural colleges, three veterinary colleges and one agricultural engineering college in 1950. The National Agricultural Education System (NAES) under the control of Indian Council of Agricultural Research (ICAR), New Delhi is biggest network of agricultural education and research in the world. It comprises of state agricultural universities (SAUs) and their constituent colleges and institutions supported by the central government. These institutions impart education and research in all fields of agriculture sciences and their allied areas. Today, there are:

39 State Agricultural Universities (SAUs) including one Central Agriculture University (Tezpur, Imphal);

05 Deemed-to-be-Universities (DU);

35 National Research Institutes (NRI);

46 Central Research Institutes (CRI);

05 National Bureaus (NB);

11 Project Directorates (PO); and

90 All India Coordinate Research Projects (AICRP)

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All these institutions are funded and functioning under the control of Indian Council of Agricultural Research (ICAR), New Delhi. In addition, the Institute of Agriculture Education (IAE) of Banaras Hindu University (BHU), Aligarh Muslim University (AMU), about 50 agricultural colleges affiliated to 16 general universities and seven Indian Institute of Technology (IIT) of the country are also imparting education and research in agricultural sciences.

The information seeking behaviour (ISB) essentially refers to the strategies and actions undertaken to locate discrete knowledge elements. It is concerned with the interactive utilization of the three basic resources namely people, information and system. Information seeking is a human process that requires' adaptive and reflective control over the afferent and efferent actions of the information seeker. Information seeking behaviour (ISB) resulted from the recognition of some gap in information perceived by the user, who as a consequence makes demand upon formal systems such as libraries/information centers, or some other systems in order to satisfy the perceived information need to fill the gap.

1 STATEMENT OF THE PROBLEM

The term Information Seeking Behaviour (ISB) varies from discipline to discipline and researcher to researcher. Keeping in view the changing information needs of users in each case the sources of information and the libraries, where information is acquired, stored, organized, preserved, and disseminated to the researcher, have undergone changes dramatically in their forms and contents: It is also established that under all circumstances, user's satisfaction remains the top priority for any library and information system. The best way to satisfy the users is to understand their needs properly, which helps to serve them Jadequately, efficiently and effectively. The last two decades have made radical impact on library and information centres particularly due to the emergence of information communication technology and its use by the libraries and also the declining capacity of acquisition due to the drastic cuts on financial allocations. On the one sipe, the use of information communication technology and communication networks such as the Internet, Intranets, WWW, Web directories, Portals, blogs, etc. facilitate to seamless access to number of research papers, reports, conference proceedings, monographs, technical bulletins, etc., while on the other side the budgetary constraints restrict the accessibility to the scientific information which in turn-hampers very badly the research outpLit oylhe research scientists.

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Agriculture scientists are also facing these problems. The limited accessibility to the information due to the paucity of funds compells us to develop need based collection, which will be possible only when users needs and information seeking behaviour is known properly. Several studies have been conducted in the past in order to access the information gathering habits of scholars and scientists in different fields of knowledge, but still so much study has been conducted specially to know the Information Seeking Behavior of agriculture scientists in India. Similarly, most of the studies conducted in the past have made an attempt to know the use of libraries and its materials which speaks very little about the nature of enquiry, procedures, and strategies of seeking required information, Therefore, a study on 'Information Seeking Behaviour of Agriculture Scientists working in select ICAR Institutions in Delhi, and Punjab Agricultural University, Ludhiana' is justified and has been undertaken.

2 OBJECTIVES OF THE STUDY

The specific objectives of the present study were:

1. To identify the purpose of seeking information, nature and types of information required by agriculture scientists;

2. To ascertain as to how far the existing information services provided by the libraries attached to the Indian Council of Agricultural Research Hqrs., (ICAR), Indian Agricultural Research Institute (IARI), Indian Agricultural Statistical Research Institute (IASRI), National Bureau of Plant Genetic Resource (NBPGR), National Centre for Agricultural Policy and Research (NCAP), and Punjab Agricultural University, (PAU) Ludhiana, meet their information needs;

3. To examine the information seeking strategies of the agriculture scientists;

4. To find the effectiveness of existing information systems and services in the field of agriculture sciences and the extent to which they meet the information requirement of agriculture scientists;

5. To identify, the information sources and types of publications used by the agriculture scientists with particular reference to secondary and tertiary sources;

6. To identify the gaps in the existing pattern of communication of information;

7. To identify the problems faced by the agriculture scientists while gathering information and to provide appropriate suggestions to overcome them; and

8. To provide a list of core journals in different areas of agriculture sciences and technology.

3 SCOPE OF THE STUDY

The main thrust and purpose of the study is to examine the information seeking behaviour of agriculture scientists working in the agricultural academic and research institutions functioning under the control of Indian Council of Agricultural Research (ICAR). The population primarily consists of scientists and teachers (i.e., Principal Scientists, Senior Scientists, Scientists, Professors, Associate Professors, and Assistant Professors) working in the Indian Council of Agricultural Research (ICAR) Hqrs., Indian Agricultural Research Institute (lARI), Indian Agricultural Statistical Research Institute (IASRI), National Bureau of Plant Genetic Resource (NBPGR), National Center for Agricultural Policy and Research (NCAP) of Delhi and Punjab Agricultural University (PAU), Ludhiana, Punjab. The study covers all the fields of agricultural sciences i.e., Agronomy, Horticulture, Plant Breeding, Genetics, Entomology, Agriculture Extension, Microbiology, Food Science, Food Technology, Plant Pathology, Soil Science, Agriculture Engineering, Rural Sociology, and Agriculture Economics.

4 METHODOLOGY AND DATA COLLECTION

The survey method i.e., questionnaire and personal interviews method,was used to collect the relevant data. It was decided to focus on the agriculture scientists of the ICAR institutions of Delhi and Punjab of all categories of scientists. It was found from the preliminary survey that nearly 1400 agricultural scientists were working in selected institutions of the study. The target was to cover at least 50 percent of total population. Therefore, 700 questionnaires were distributed among the agricultural scientists of these selected institutions. The number of respondents who returned the duly filled questionnaires was 375 (53.6%). The number of responses turned out to be fairly representative of the population of agriculture scientists of the ICAR institutions of Delhi.

For the study, the agriculture scientists were grouped into four categories as per the ICAR. i.e.,

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(*i*)   Crop Improvement discipline

(*ii*)   Resource Management discipline

(*iii*) Crop Protection discipline

(*iv*)   Basic and Applied Science discipline

5 ORGANISATION OF THE STUDY

The study has been divided into following chapters:

Chapter   1: Introduction: Statement of the problem, need, Scope, objectives, research design and methodology, definition of terms, organisation of the study.

Chapter   2: Agriculture in India: An overview

Chapter   3: Agriculture Education and Research in India: Past- present and future

Chapter   4: Review of related literature

Chapter   5: Users' characteristics

Chapter   6: Information seeking strategies

Chapter   7: Type of information sources used by the agriculture scientists

Chapter   8: Profile of selected libraries and Information centres

Chapter   9: Use of Libraries and Information centres

Chapter 10: Summary, findings, recommendations and areas for further research.

Data collected through questionnaires were analyzed using latest version of MSExcel for tabulation, charts, pie-diagrams and other statistical analysis. The summary, findings and recommendations are the outcome of the analysis of information seeking behaviour of agriculture scientists, focusing mainly on the following broad areas, namely, users characteristics, strategies of information seeking, use of rources of information sources, and use of libraries and information centres. The main findings of the research are:

Users Characteristics

The agriculture scientists have been grouped into four basic categories of specialization, i.e., (1) Crop improvement, (2) Resources management, (3) Crop protection, and (4) Basic and applied sciences.

Total 375 responses were received from the respondents as to category-1 (112), category-2 (96), category-3 (82) and category-4 (85). It was found that more responses were from the agriculture scientists of category-1 Crop Improvement and category-2 Resource management disciplines.

Maximum number of the respondents, i.e., 152 (40.53%) falls in the age group of 30 years. The second largest group i.e., 82 (21.88%) belong to 31-35 age group, followed by 66 in age group 36-40 years and 62 in the age group of 41-50 respectively. Only 13 (3.46%) respondents are in the age 51-60 and none is found above 61 years of age.

Respondents were overwhelmingly males (89%). The female respondents constitute only 11 %.

The majority respondents belong to age group of 21-30 years. This confirms that both male and female agriculture scientists are young. Gender ddes not seem to play any distinct role in determining the information seeking behaviour of agriculture scientists. The basic pattern of information seeking was found the same for both the genders.

Respondents were asked to indicate their level of education. It is found that all 100% agriculture scientists have master's degree in their respective field.

It is found that 89.28% respondents is 'category-1, 94.74% is category - II, category-III ; 3nd 84.11 % ih category-IV have their PhD degrees in their respective disciplines.

It was found that maximum number (42.4%) of respondents have the designation/status of Scientists / Assistant Professors followed by 36.53% and 21.06% in the designation of Senior Scientists / Associate Professors and Principal Scientists / Professors.

In regards to the purpose of current research for the respondents it was found that the maximum number of respondents i.e., 20.8% by all categories rated first rank, research project as a purpose of current research. Followed by teaching18.13% rank-second, writing a book 13.86% rank-third, Writing an article for journal 11.46% rank-fourth, writing a research report 10.66% rank-fifth, and writing paper for seminar and conference proceedings 10.40% rank-sixth respectively. Further, it was also found that the other purposes such as research guidance, writing for newspapers and TV interviews are marked by least number of respondents.

6. STRATEGIES OF INFORMATION SEEKING

In the process of seeking information, it is found that agriculture scientists have expressed greater dependence in meeting their information requirement on their institutional library and information centre. A Library and Information Centre is the most preferred source for 72.05% of the respondents. It was found that all categories of agriculture scientists used their library and information centre heavily, and there is no significant difference in the use of this source by different categories of agriculture scientists. This is the highest degree of contribution of this information source towards the work of agriculture scientists and speaks of the enormous degree of still dependence of the agriculture scientists on libraries and information centres.

Analysis of the responses indicate that there is a marked preference for review articles in periodicals. Review articles were ranked as first priority by 51.34% of the respondents and it occupies second position in the ranked order. Agriculture scientists in crop improvement discipline consult more review articles than Category-2. Scientists in crop improvement discipline seek current information and assistance, which is contained in review articles in periodicals. Field of speciality is one such characteristic, which influences the information seeking by agriculture scientists.

Discussions with colleagues within the organization were the third preferred source of information. Out of 332 respondents of this source, 39.46% accorded it first priority, whereas 38.55% and 21.89% respondents gave it second and third priority respectively. Agriculture scientists of categories-3 and 4 use this channel of communication more than the agriculture scientists of categories- 2 and 1.

So far with regards to the priority in the use of indexing and abstracting journals is concerned, about 42.42% of the respondents gave it first priority. All categories of agriculture scientists use indexing and abstracting journals and this source ranked fourth in order of priority. The use of indexing journals by different categories of agriculture scientists were examined to find out if there is any significant differences in using the indexing and abstracting journals by different categories of agriculture scientists. It was found that agriculture scientists belonging to categories of 2 and 1 preferred more the use of indexing journals than the agriculture scientists of other categories.

The study also indicates that the agriculture scientists approach librarianlreference staff of their library. In this matter 25.1 % gave first priority to this channel followed by 29.41 % and 45.49% for second and third priority respectively.

Agriculture scientists make use of a variety of information sources while seeking information for different purposes. (i.e., obtaining specific information, keeping upto-date and acquiring background information.).

It is found that for specific information, journals have been reported as a first priority source by 78.4% of respondents. This is followed by twelve more sources, all of which are made use of by more than 50% of the respondents and rank 2-13 in the rank order these include conversation with colleagues and experts (74.4%), books, monographs, etc. (69.6%), references found while reading literature (68%), research reports (87.2%), abstracting journals (88.4%), indexing journals (83.2%), attending lectures, conferences, seminars, etc. (59.2%), yearbooks/ annual reviews/advances in ... etc. (56%), workshop, seminar and conference proceedings (54.4%), preprints / reprints directly from authors (53.6%), bibliographies/library catalogues (52%), library acquisition lists (50.4%). The least used source for obtaining specific information is dissertations/theses. The reasons for the low usage of these sources can be non-availability, lack of direct access and lack of proper dissemination of these in the libraries of the institutions concerned.

For keeping up-to-date, journals have been reported to be the most used source by 83.2% of the respondents, so it occupies the first rank. In addition, there are seven more sources, namely, attending lectures, conferences, seminars etc. (77.6%), books, monographs, etc. (72.8%), yearbooks / annual reviews / advances in, etc. (71.2%), abstracting journals (62.4%), workshop, seminar and conference proceedings (81.8%), conversation with colleagues and experts (60:8%), research reports (59.2%), which are referred to by more than (50%) of the respondents while looking for current information and rank second to seventh position in the rank order.

For background information, Qpoks, monographs, etc. have been identified to be the most used source by 80.8% respondents and hold the position of first rank. Scientific journals are next in the order of rank (50.4%) followed by conversation with colleagues and experts (47.2%), yearbooks / annual reviews / advances in, etc. (46.4%), research reports (42.4%), references found while reading literature (40.8%). Rest of the sources was

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used by less than 40% of the respondents for background information.

7 USE OF SOURCES OF INFORMATION

Agriculture scientists make use of a variety of information sources while seeking agriculture information, with each source contributing to their information requirement in varying degrees.

Regarding the use of information sources it is found that 'databases' as source of information is the first priority (frequently) for 70.01 % agricultural scientists respondents followed by 60.31 % often and 43.81% sometimes. 50.54% of the respondents used journals frequently followed by 31.89% often and 15.67% sometimes. All the respondents reported that they used journals in their current research and teaching in different measures.

Books, monographs, etc. are frequently used by 59.56% of the respondents. Further, 24.86% and 15.57% used this source often and sometimes. Surprisingly, it has been observed that agriculture scientists engaged in teaching of Category 3 and 4 use more books, and monographs than agriculture scientists engaged in research. The reasons for the extensive use of these print materials were their availability and close proximity to the place of work, their accessibility that is their ability to provide information quickly as per syllabi, and their reliability.

Attending lectures, conferences, seminars etc. ranked fifth as a source of information. 26.87% used it frequently. Agriculture scientists used this source more than agriculture teacher, which is indeed surprising. The reason for the high use of this channel by agriculture scientists can be that during their training and research they have to attend number of lectures and participate in the departmental seminars, journals clubs, etc. for the presentation of their projects.

Indexing and abstracting journals are the ninth information source in the order of ranking. These sources are used less frequently. About 7% of respondents indicated that they never used indexing and abstracting services. The reasons for the less use of these sources are their lack of availability, and accessibility, and problems in the use of these sources.

It is also found that among the indexing and abstracting sources of agricultural sciences, *AgriIndex* is used by majority of the respondents and indicate that 29.73% used this source frequently followed by 28.65% and 34.32% consulting this source often and sometimes, respectively. The use of *AgriIndex* ranks first. Thus, it is the most used source of information.

Agriculture scientists of category 1 and 2 make use of this source more than agriculture scientists of category 3 and 4. This is due to the nature of their specialization, as they require more up-to-date and specific information for teaching, training and research.

With regards to the use of journals, it is found that library of the institution was the main source of access for journals by majority of the respondents. i.e., 84.6% followed by the National Agricultural Library, IARI, New Delhi i.e., 6%. Respondents were also asked whether they have subscribed to the agriculture journals personally, it was found that the indian published journals in the field of agricultural sciences are subscribed by majority of the agriculture scientists. Whereas only 3.2% respondents were found to subscribed of foreign journals personally. The response rate is very low, this is due the subscription rate of the foreign journals are more than the Indian journals.

Keeping abreast with current developments in one's own field of specialization is essential for the agriculture scientists. Therefore, an in-depth analysis of this aspect of information behaviour was made of the use of the library and information centers. The agriculture scientists were asked to indicate how they are 'able to keep yourself up-to-date with the latest trends and development'. The majority of the respondents i.e., 66.4% revealed that library and information centres as a main source for keeping them up-to-date, whereas 12.53% feel very well and 21.06% feel not well.

8 USE OF LIBRARIES AND INFORMATION CENTRES

It is estimated that there are over two hundred agricultural libraries and information centres in India, which provide agriculture information support to the institutions to which they are attached. These are mostly at state agricultural universities (SAUs), Central Research Institutes (CRI), National Research Centres (NRC), National Bureaus (NB), Project Directorates (PO) and All India Coordinate Research Projects (AICRP).

The respondents were asked to indicate whether or not they were aware of different library services being provided by the libraries and information centres. It has been found that agriculture scientists are aware of certain types of services such as Inter-library loan service (92.53%), photocopying service (89.07%), database search service (78.67%), CD-ROM search service (78.67%) and reference service (89.33%), and indexing and

abstracting service (50.40%). On the other hand other majority of agriculture scientists are not aware of translation service (81.07%), SOl (79.47%), microfilming / slide making (60.27%), CD-ROM service (59.73%) and CD-Net service (49.87%).

Library services like indexing and abstracting, CAS, loan of books, loan of periodicals, photocopying service and reference and referral service are being used frequently. However, library services like translation service, SDI, Microfilming, CD-ROM and CD-Net services are being used less frequently.

Use of the library services ranked in the order are: Photocopying Service (Rank 1), Loan of Books (Rank 2), Loan of Periodicals (Rank 3), Reference and Referral Service (Rank 4) and Database Services (Rank 5), Indexing and Abstracting Service (Rank 6), Inter-Library Loan Service (Rank 7), Microfilming (Rank 8), SOl (Rank 8), CD- Rom Service (Rank 10), CD-Net Service (Rank 11), CAS (Rank 12) and Online Search (Rank 13) respectively.

For improving the library services respondents were asked to give their suggestions/opinions, which might improve the library services to meet their information requirements effectively. A few important suggestions / recommendations that were received from the agricultural scientists for improving the existing LIS services are given below:

Suggestion from Agriculture Scientists

With regards to physical facilities, library and information centres should be airconditioned, properly illuminated and ventilated to make libraries worth sitting and free from dust. There should be separate reading rooms for staff and students, cubicles for research scholars, and for reading personal books. Reading room should be adjoining the stack area, and have one attendant to take out the books and journals from the stack room.

Keeping in view the number of users in a particular subject a balanced acquisition policy should be adopted. Subject specialists should be consulted for purchase the documents in libraries. Libraries should have up-to-date collection of journals and other documents. Arrival of important journals should be efficient and not delayed by more than six months after publication. Incomplete volumes of journals are another problem faced by users. Efforts should be made to complete the volumes by way of exchange of duplicate issues or photocopying of the missing issues.

Libraries should be linked to online vendors / gateways in order to access the global agricultural databases services such as *AGRIS International, CAB Abstracts, AGRICOLA, CARIS, INIS International*, etc. and have the facility to provide full text contents of documents over Institute's Intranets. Reprographic services should be improved. Published information about current research should be made available. Reference and referral services in the libraries and information centres should be provided to find reading material on its own place. In case of specialized services such as, content lists of current journals and other reading materials received in the library should be regularly circulated to the users. Inter-library loan, computerized CAS and SOl services are needed to be strengthened.