Information Seeking Efficiency of Agricultural Scientists in the Digital Environment: A Study on ICAR Research Institutes in Kerala

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Abstract

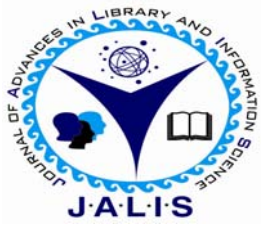
The present study investigate the information seeking efficiency of agricultural scientists working in the research institutes under Indian Council of Agricultural Research (ICAR) in Kerala. A structured questionnaire was distributed to explore the information seeking efficiency of agricultural scientists in the digital environment. Data collected were analyzed using the SPSS 21. The present study revealed that agricultural scientists are using simple search option than advanced search option to retrieve information from the digital sources.

Keywords

Information seeking behavior; Information Sources; e-Resources; Advanced Search Techniques

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1. INTRODUCTION

Indian Council of Agricultural Research (ICAR) is one of the largest national agricultural systems in the world, which encompass 97 institutes which include research institutes, Bureau, Project Directorates and 53 agricultural universities which spread all over India. ICAR is an autonomous organization under the Department of Agricultural Research and Education, Ministry of Agriculture, Government of India. The council is the apex body for coordinating, guiding, and managing research and education in agriculture. The ICAR has played a pioneering role in ushering green revolution and subsequent developments in agriculture in India through its research and technology development. (www.icar.org.in). There are four Agricultural Research Institutes in Kerala. One Hundred and eighteen agricultural scientists are working in the agricultural research institutes in Kerala.Singh and Satija (2008)discovered in their study, the agricultural scientists depends library/ information centre, their personal collection, supervisors and colleagues to meet their information needs.

The present study is intended to investigate the information seeking efficiency of agricultural scientists in the digital environment. This study helps to develop more efficient and effective library and information support system for the agricultural scientists in the ICAR research institutes.

2. REVIEW OF RELATED LITERATURE

Studies on information seeking behavior of the agricultural scientists and other professionals in different parts of India and abroad are reviewed to understand the present situation. Singh, K.P and Satija (2007) revealed in their study in the area of ICAR institutes in Delhi and Punjab Agricultural University, the agricultural scientists depends library/information centre, their personal collection, supervisors and colleagues to meet their information needs. Scientific journals have been ranked first for obtaining information.Bansal (2013) opined that Agricultural scientists depends on for their various information activities. They frequently use e-journals and online databases. Institutional repositories, subject gateways, blogs,wikis etc are less common. ‘Simple’ search option is used than ‘advanced’ search. Majority of the scientists not attended any training programme to use the new information environment. Pradeepa (2015) conducted a study among agriculture graduates, Sri Lanka, and

suggested the tailor made to suit the needs of specific groups rather than offering common training to all. Kumar and Kumbar (2015)suggested organizing seminars, workshops and orientation programmes at regular intervals for faculty and students to keep them in tune with latest technologies. Khan, M.A and Khanam, Z (2014) disclosed that retrieval of too much information was the problem faced by the agricultural scientists while they use web resources. Singh,P and Prasad, H N (2014)opined that majority of the scientists in Indian Agricultural Research Institute aware about the e-resources through the information brochure of library, library notice and training.

3. OBJECTIVES OF THE STUDY

The present study is trying:

1. To know the various dimensions of the agricultural scientists of ICAR institutions in terms of gender, age, designation and their level of education
2. To find out the frequency of use of various information sources by the agricultural scientists of ICAR institutions
3. To evaluate the ability of the agricultural scientists of ICAR institutions to recognize various types of Information sources by its variation in use
4. To find out the frequency of use of advance search techniques by the agricultural scientists while construct the search strategy to meet their information needs.

4. METHODOLOGY

Keeping the above objectives in mind, researcher started this study by searching literature available in the primary and secondary information sources. The study covers agricultural scientists of four institutes under Indian Council of Agricultural Research (ICAR) in Kerala.Central Plantation Crop Research Institute (CPCRI), Kasaragod,Indian Institute of Spices Research (IISR), Kozhikode,National Bureau of Plant Genetic Resources (NBPGR), Thrissur, Central Tuber Crops Research Institute (CTCRI), Trivandrum were selected for the study. The questionnaire method was used to collect the primary data. Five pointLikert scale was used in the questionnaire to record the responses by the scientists.

The total populations of the agricultural scientists in the four research institutes were one hundred and eighteen. Thirty Five Scientists, Fourteen Senior Scientists, and Sixty nine Principal Scientists are the three categories of respondents in the total population. Sample size was calculated as 91 using Raosoft sample size calculatorwith 95percent confidence level. The software is available at http://www.raosoft.com/samplesize.html. Stratified Random sampling method was used to select the complementary sample size from each strata. Among the 91 questionnairescollected from the scientists, 53 principal scientists, 11 senior scientists and 27scientists from the four research institutes. The data have been analyzed withsimple percentage techniques using the IBM SPSS statistics 21.

Table1: The details of sample selected

Sl. no	Institution	Population	Sample taken
1	Central Plantation Crop Research Institute, Kasaragod	49	42
2	Indian Institute of Spices Research Institute. Kozhikode	32	22
3	National Bureau of Plant Genetic Resources, Thrissur	5	3
4	Central Tuber Crops Research Institute, Trivandrum	32	24
	Total	118	91

5. ANALYSIS

The demographic details of the study population relating to designation, gender, age group and education has been summarized in the Tables below.

Designation

As per the ICAR System, the agricultural scientists are designated as Principal Scientists, Senior Scientists and Scientists. Table 2 shows that the designation wise break upof respondents. Thirty percent Scientists, Twelve percent Senior Scientist and fifty eight percent Principal Scientists were selected as samples in the present study.

Table 2: Designation wise distribution of Agricultural Scientists

Designation	Frequency	Percent	Cumulative Percent
Scientist	27	29.7	29.7
Sr. Scientist	11	12.1	41.8
Pri. Scientist	53	58.2	100.0
Total	91	100.0	

Gender Distribution

The distribution of gender of 91 respondents is shown in Table 3, which shows that among the 91 respondents, 67 percent of the agricultural scientists are male and 33 percent of them are females.

Table 3: Gender wise distribution of Agricultural Scientists

Gender	Frequency	Percent	Cumulative Percent
Male	61	67.0	67.0
Female	30	33.0	100.0
Total	91	100.0	

Age Distribution

Analyzing the distribution of age of ninetyoneagricultural scientists was shown that, Six percent of the scientists are less than 28, Twenty Two percent are in the range 28 -36, Coming in the range of 37 – 44 years are 20 percent, in the range of 45 – 52 years are 36 percent and more than 52 years of age are 16 percent.

Table 4: Age Group distribution of Agricultural Scientists

Age group	Frequency	Percent	Cumulative Percent
Less than 28 yrs	5	5.5	5.5
28-36	20	22.0	27.5
37-44	18	19.8	47.3
45 -52	33	36.3	83.5
Above 52 yrs	15	16.5	100.0
Total	91	100.0	

Education level of the Agricultural Scientists under study

Respondents were asked to indicate their level of educational qualifications. The level of education of agricultural scientists are shown in table 5. It is found that out of 91 respondents, 26percent are Post-graduates, 66 percent Doctoral and Post-Doctoral studies have been completed by the 8 percent of the agricultural scientists.

Table 5: Education wise distribution of Agricultural Scientists

Ed. Qualification	Frequency	Percent	Cumulative Percent
Post graduate	24	26.4	26.4
Doctoral	60	65.9	92.3
Post-doctoral	7	7.7	100.0
Total	91	100.0	

Frequency of use ofInformation Sources.

Apart from the print media information available in many other forms. Use of different type of information sources by the respondents were assessed. Respondents were asked about the frequency of use of various information sources and recorded their responses in the five point likert scale.Frequency of the usage of various types of information sources by the agricultural scientists have been summarized in Table 6.

Table 6: Use of Information sources by Agricultural Scientists

How often do you use the following information sources to find information?	Never=1 n (%)	Rarely=2 n (%)	Sometimes =3 n(%)	Often =4 n (%)	Always =5 n (%)	Total
Internet websites	0	0	3(3.3%)	32 (35.2%)	56 (61.5%)	417
Databases	1(1.1%)	2 2.2%)	14 (15.4%)	52 (57.1%)	22 (24.2%)	365
Consortia for e-resources	1(1.1%)	8 8.8%)	21 (23.1%)	36 (39.6%)	25 (27.5%)	349
Encyclopedia	3(3.3%)	29 31.9%)	32 (35.2%)	23 (25.3%)	4 (4.4%)	269
General Periodicals	1(1.1%)	10 11.0%)	39 (42.9%)	28 (30.8%)	13 (14.3%)	315
Research Journals	0	0	15 (16.5%)	32 (35.2%)	44 (48.4%)	393
Print Books	0	9 (9.9%)	34 (37.4%)	34 (37.4%)	14 (15.4%)	326
Subject Glossaries	2(2.2%)	29 (31.9%)	37 (40.7%)	16 (17.6%)	7 (7.7%)	270
e-publications	0	4 (4.4%)	21 (23.1%)	45 (49.5%)	21 (23.1%)	356

Institutional repositories	1 (1.1%)	10 (11.0%)	31 (34.1%)	30 (33.0%)	19 (20.9%)	329
Mass Media (newspapers, TV,)	1(1.1%)	23 (25.3%)	30 (33.0%)	21 (23.1%)	16 (17.6%)	301
Government documents (i.e. official gazette)	6(6.6%)	39 (42.9%)	27 (29.7%)	15 (16.5%)	4 (4.4%)	245
University/college archives	12(13.2%)	34 (37.4%)	27 (29.7%)	14 (15.4%)	4 (4.4%)	237
Blogs, Wikis	12 (13.2%)	34 (37.4%)	20 (22.0%)	18 (19.8%)	7(7.7%)	247
Social networking sites	12 (13.2%)	38 (41.8%)	23 (25.3%)	9 (9.9%)	9 (9.9 %)	238

The study reveals that major information sources used by the agricultural scientists are Internet websites, Research Journals, Databases, Consortia for e-resources, e-publications and least used sources are Blogs and Wikis, Social Networking sites, University/ college archives, Government documents. Graphical representation of frequency of the use of various information sources by the agricultural scientists. Table 6 shows that 61.5 percent of respondents always use Internet as information source and 35.2 percent use internet often, followed by research journals as the major information source by 48.4 percent of the agricultural scientists use always and 35.2 percent use often. Database use by 57.1percent of agricultural scientists often and 22 percent always. Consortium for e-Resources in Agriculture (CeRA) is a consortium functioning under Indian Council for Agricultural Research. More than three thousand six hundred journals related to agriculture discipline are available through this consortium. 39.6 percent of the agricultural scientists use this consortium often, followed by 27.5 percent use CeRA always.

Recognizing different types of information sources

There are different types of Information sources used by the scientists for different purposes. The respondents were asked to rank their activities which require information .The major activities of the scientists are undertaking research and projects, discourse classes to the farmers and other stakeholders, writing research papers, books, popular articles for the layman and giving advice to the farmers and clear their doubts. These activities are highly demand the latest information in the discipline of agriculture. Information sources are divided into primary, secondary and tertiary by the nature of the information it contains. The major information sources related to the discipline of agriculture available in the library were enlisted and requested to recognize the source with respect to its content. The responses by agriculture scientists under study have been shown in Table 7.

Table 7: Different types of information sources

Recognize Primary, Secondary and tertiary information sources.	Correct	Wrongly identified
CAB abstracts	41(45.05%)	50 (54.95%)
DOAJ	48 (52.75%)	43 (47.25%)
Krishiprabha (digital thesis database)	16(17.58%)	75 (82.42%)
Bibliography of Bibliographies	40 (43.96%)	51 (56.04%)
Online Journals through CeRA (Consortium for e-Resources in Agriculture)	79 (86.81%)	12 (13.19%)
Books	47 (51.65%)	44 (48.35%)

CAB Abstracts is one of the major abstracting database in the field of agriculture published by the Centre for Agriculture and Biosciences International (CABI, UK), 55 percent of the scientists has not identified this as secondary source. Directory of Open Access (DOAJ) wrongly identified by the 47.25 percentof the respondents,Krishiprabha e-theses database was not identified by 82.42 percent of the agriculture scientists, Bibliography of Bibliographies by 51 percent, CeRA – Consortium for e-Resources was not identified by 13.19 percent and books by 48.35 percentof the respondents.

Use of appropriate techniques to construct search strategy

The present study shows that most of the respondents are using information sources in the digital environment very frequently. But, use of advanced search option such as truncation, the Boolean

operators and proximity operators to construct search strategy were found very less

Table – 8: Use of appropriate techniques to construct search strategy

How frequently do you use the following things to construct search strategies?	Never =1 n (%)	Rarely =2 n (%)	Sometimes=3 n (%)	Often =4 n (%)	Always=5 n (%)	Total
Truncation	49 (53.85%)	12 (13.19%)	19(20.88%)	7 (7.69%)	4 (4.40%)	178
Boolean Operator: AND	31 (34.07%)	5 (5.49%)	18 (19.78%)	27 (29.67%)	10 (10.99%)	253
Boolean operator: OR	32 (35.16%)	12 (13.19%)	14 (15.38%)	25 (27.47%)	8 (8.79%)	238
Boolean Operator : NOT	38 (41.76%)	12 (13.19%)	19 (19.78%)	16 (17.58%)	6 (6.59%)	213
ProximityOperators	47 (51.65%)	18 (19.78%)	17 (18.68%)	6 (6.59%)	3 (3.30%)	174
Thesaurus	27 (29.67%)	16 (17.58%)	28 (19.78%)	12 (13.19%)	8 (8.79%)	231
Multiple – Field Searching (such as by date/ type)	17 (18.68%)	15 (16.48%)	32 (35.16%)	19 (20.88%)	8(8.79%)	259

6. DISCUSSION

The demographic characteristics of the respondents reveals that 50 percent of the respondents are above the age of forty five, 67 percent of them are male and highly qualified. 75percent of the respondents have doctoral degree. K.P.Singh (2015) observed that various academic and research purposes such as teaching, writing books, articles, research report and research guidance are the major activities of scientists in India. The present study identified the major activities of the scientists are research and undertaking projects, writing research papers, books, and popular articles in the periodicals,talks and discussions with the farmers and other stakeholders. Kaur, R (2015) found that the print source have not loosened its stronghold over the user's choice and highlighted the dominance of digital resources in the information world.The present study (Figure 1) reveals that major information sources used by the agricultural scientiststo meet their information requirements were Internet websites, Research Journals, Databases, Consortia for e-resources, e-publications.The least used sources were Blogs and Wikis, Social Networking sites, University/ college archives, and Government documents.K. Singh and Gill (2011) found that research scholars are making use of social networking sites for their research affairs.Facebook has been emerged as the most popular social networking site by all category of research scholars.

The present study has shown that the scientists were aware of the core information sources available in digital form particular to their field, even though more than sixty percent of the respondents always depend upon internet to meet their information needs. Table 7exposedabove sixty percent of the agricultural scientists wrongly identified the information sources such as CAB abstracts, Krishiprabha, DOAJ, CeRA etc. Among the agricultural scientists only less than 20 percent are able to use advanced search technique such as use of Boolean operators, truncation etc. Basics of this methods can be acquired through short term or one day training. Similar study conducted in Jammu University,Lalotra, seema and Sharma, Bindu (2012) found that most of the research scholars use only basic research option for information retrieval. Other tools like Boolean operators and Truncation of search items is used least, as the research scholars are unaware about this. More than 80 percent of the respondents use basic search to retrieve information from the databases which may not give the exact information they require. Basic search options always provide surplus information, more than what they can manage. This prevents the user to meet the actual requisite which leads to reluctance in using such credible sources.The survey on "e-information search pattern by the faculty of autonomous engineering institutions in Karnataka", Kumar and Kumbar (2012) reveals that majority of the faculty retrieve irrelevant information while searching e-resources. He suggests users should be trained in using advanced search options to avoid retrieval of irrelevant information.

The present study discloses that more number of respondents are using thesaurus than other techniques like Boolean operators, truncation and proximity operators, which are purely generated for the purpose to retrieve information in the digital environment. Vocabulary control was used in the print media also; hence they were familiar with thesaurus earlier. May be their experience in using the thesaurus in the non-digital environment persist in their search method.

Familiarization of new techniques for information retrieval is the need of the hour. While introducing a new resource in the library collection, provision for compulsory training along with hands-on-experience to use the product, may change the situation.

7. CONCLUSION

The present study was conducted on information seeking efficiency of agricultural scientists working in four research institutions under ICAR in Kerala. Daily activities of the agricultural scientists of ICAR institution is highly diversified and multifaceted hence requires adequate time management to perform in all related fields. Scientific literature is available in different forms and formats with very huge volume data. A specialized skill is necessary to retrieve the required information available in digital environment. This study exposes that majority of the scientists were aware of the sources and they retrieve the information using the basic search than advanced search option. The usage of advanced search techniques like, truncation, Boolean and Proximity operators were very less. This study reveals that 17percent of the agricultural scientists in the age group of more than 52 years, find it difficult to adopt new technologies. Informal training has to be provided for the senior agricultural scientists, by fostering them to make use of e-resources. The remaining scientists those who have basic knowledge may be provided with short term training/workshops for advanced level search techniques which help them to use the sources more effectively.

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