

Information-Seeking Behaviour of Crops Research Scientists in Ghana

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Abstract

The study investigated the information-seeking behaviour of crops research scientists in Ghana using the Council for Scientific and Industrial Research, Crops Research Institute (CSIR-CRI), Kumasi, Ghana as the case study. The study was aimed at ascertaining how the crop research scientists seek information in terms of what information sources they use, type, when, where and the purpose for which they use information as well as how they search for information. Wilson's Information Behaviour Model was adopted as the theoretical framework for the study. The researcher employed a questionnaire to collect data from 73 scientists of the Institute, while three (3) Library staff were interviewed on their approach to meeting the information needs of the scientists. The study revealed that the crop research scientists used information centres/libraries for research purposes and prefer to use journals articles (both print/electronic) but preferred electronic format to other types of materials. The study also revealed that scientists used scientific meetings as part of information sources. The study recommended that scientific information centres/libraries should subscribe to current print/electronic journals and also train the crop research scientists in information searching and retrieval skills.

Keywords: Information seeking behaviour, crop research scientists, scientific information, information dissemination, information sources, Ghana.

Introduction

Information is inevitable to almost all jobs and professions. The need to become informed and knowledgeable individuals leads to the process of "identifying information needs". However, this process alone cannot work without knowing the ways individuals articulate, seek, evaluate, select and finally use the required information, which is commonly known as "information-seeking behaviour". According to Devadason and Lingam(1997) the understanding of information needs and information-seeking behaviour of various professional groups is essential as it helps in the planning, implementation and operation of information system and services in the given work settings. Therefore, the working environment and type of task performed by individuals shape their information needs and the ways they acquire, select and use this information. Several studies have shown a relationship between task complexity and information needs. Leckie, Pettigrew and Sylvain(1996) noted that "work roles and tasks largely determine information needs, while a number of factors ultimately affect which sources and types of information are used in a given situation". In the field of science and technology, adequate knowledge of scientists' information needs is vital for libraries to effectively support their research activities. As stressed by Majid, Anwar and Eisenschitz (2000) a library is considered as the nucleus for any research activity and an essential ingredient for a viable research system, providing an account of previous intellectual endeavours which serves as a breeding ground for new concepts and ideas.

The importance of communication in the sciences arises from the fact that the objective knowledge of science is cumulative in nature. Each new bit of knowledge adds to, modifies, refines, or sometimes refutes that which already exists. Scientists are an extraordinary diverse group of professionals. An attribute common to all scientists is their use of information. Viewing the information-seeking behaviour of scientists within a conceptual framework, they must be considered as information processors (Chudamni and Nagarathna 2006). One of the major resources for scientists is information, this is so, because scientists depend on existing relevant, current and accurate literature to identify research problem.

In Ghana, one of the institutes that has a lot of scientists at the core of its activities is the Council for Scientific and Industrial Research-Crops Research Institute (CSIR-CRI). The CSIR-Crops Research Institute (CSIR-CRI) is one of the 13 institutions of the Council for Scientific and Industrial Research of Ghana (CSIR). The Institute was established in 1964, with the ultimate task of developing and disseminating appropriate technologies for high and sustainable food and industrial crop production in Ghana (CSIR-Crops Research Institute, Brochure,2008), Scientists at CSIR-CRI are multi-disciplinary; they include plant breeders, agronomists, socio-economists, biometricians, seed scientists, entomologists, pathologists, biochemists, biotechnologists, virologists among others. They number up to 82.

Over the years, the Institute has done quite well by coming out with various research outputs in food and industrial crops most of which are often adopted by farmers and other users. However, these laudable goals of CSIR-CRI cannot be achieved if there is no current and accurate information for the scientists to use for their research work. Similarly, the success of the Institute in churning out research results rests among other factors on

the ability of the scientists to build on previous research investments, which are usually represented in published literature and datasets.

Scientists are to communicate and share ideas on research activities taking place in other parts of the globe. The scientists cannot undertake effective research without relevant information on current literature on science. The means of attaining this information is through a well packaged source presented to scientists in a format, which would be more useful and easy to work with.

An attribute common to all scientists is their use of information. Viewing the information seeking behaviour of scientists within a conceptual framework, they must be considered as information processors ((Chudamni and Nagarathna 2006), One of the major resources for scientists is information, this is so, because scientists depend on existing relevant, current and accurate literature to identify research problem. Unfortunately, no study on information seeking behaviour of crops research scientists in Ghana has so far been reported in the professional literature. It was, therefore, considered important to conduct this research in order to understand the information seeking behaviour of scientists at CSIR-CRI.

Purpose and Objective of the Study

The purpose of this study was to investigate the information-seeking behaviour of crop research scientists at the Council for Scientific and Industrial Research-Crops Research Institute (CSIR-CRI), Ghana. The study specifically sought to:

- i. ascertain the sources of information used by the crop research scientists
- ii. find the type of information and the purpose for which the crop research scientists seek information
- iii. determine time and place where they most seek and use information
- iv. determine the relationship between the background characteristics and the information seeking behaviour of the crop research scientists

Theoretical Framework

The study was modelled along Wilson's Information Behaviour Model (1999) as a guide to examine and discuss issues of information-seeking behaviour among crop research scientists at CSIR-CRI.

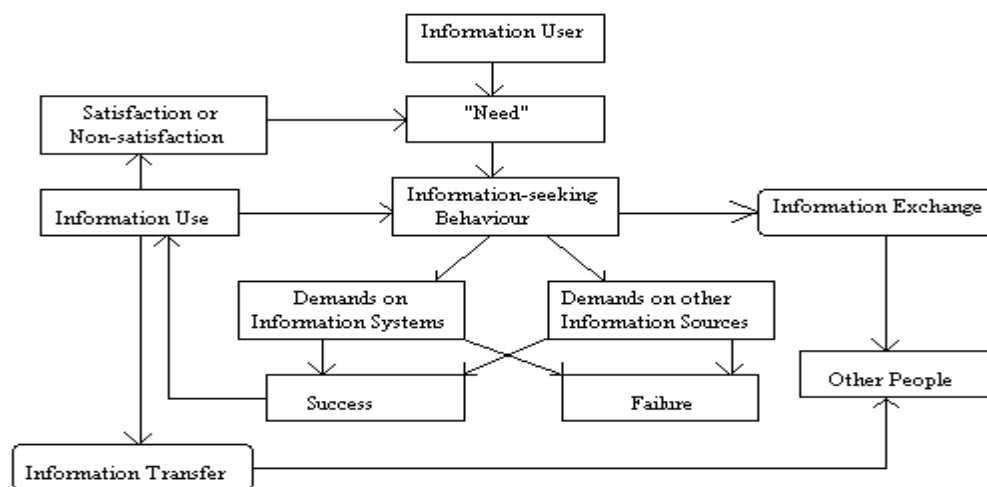


Figure 1: Wilson's information behaviour model (Wilson, 1999)

The model suggests that information-seeking behaviour arises as a consequence of a need perceived by an information user, who, in order to satisfy that need, makes demands upon formal or informal information sources or services, which result in success or failure to find relevant information. If successful, the individual then makes use of the information found and may either fully or partially satisfy the perceived need - or, indeed, fail to satisfy the need and have to reiterate the search process. The model also shows that part of the information-seeking behaviour may involve other people through information exchange and that information perceived as useful may be passed to other people, as well as being used (or instead of being used) by the person himself or herself.

Literature Review

Knowledge about the type of materials preferred by scientists is an important factor in determining and satisfying their information needs apparently, studies on information needs and seeking behavior of scientists can be traced back to the late 1940s (Renekar, 1993). Since then, a large number of studies have been undertaken on

various aspects of information needs and seeking behavior of scientists, medical practitioners, engineers and technologists. Many studies have revealed that several factors such as cost, past success, accuracy, reliability, comprehensiveness, usefulness, currency, response time, accessibility, technical quality, and format contribute to the selection and use of different information sources by scientists (Shanmugan 1999).

Suriya, Sangeetha and Nambi, (2004) carried out a research on information seeking behavior of faculty members from Government Arts Colleges in Cuddalore, India. The purpose of their study was to investigate, how faculty members seek information from the library. It was concluded that most of the respondents 61 (38.12 percent) used to visit the library several times a week to meet their information needs. Regarding the type of search made by the respondents, majority of the respondents (57%) made their search by subject. Similarly, Lewin and Stokes, (2004) explored the information-seeking behavior of a group of lecturers, based on one site, delivering a nursing and midwifery curriculum in the School of Health Studies of a higher education (Homerton School of Health Studies in United Kingdom) Findings of this study showed that in order to access information, lecturers were most likely to access the institutional libraries, the Internet, advice from colleagues and their personal collections. Refereed journals were the planked information resources with professional studies and research cited as the most sought after topics. Lecturers mentioned the role of library staff as integral to the information-seeking process.

Meho and Tibbo (2003) refer to Ellis' (1997), research carried out using semi structured interviews for data collection and Glaser and Strauss's grounded theory for data analysis. Ellis' research resulted in a pattern of information-seeking behaviour among scientists that included six generic features namely:

1. *Starting*, which involves initial search for information such as identifying references that could serve as starting points of the research cycle. These references often include sources that have been used before as well as sources that are expected to provide relevant information. Asking colleagues or consulting literature reviews, online catalogues, and indexes and abstracts often initiate starting activities.
2. *Chaining* includes chains of citations or other forms of referential connection between materials or sources identified.
3. *Browsing* involves casually looking for information in areas of potential interest by reviewing table of contents, published journals, abstracts, references etc.
4. *Differentiating* constitutes using known differences (e.g., author and journal hierarchies or nature and quality of information) between sources as a way of filtering the amount of information obtained.
5. *Monitoring* involves keeping abreast of developments in an area by regularly following particular sources (e.g., core journals, newspapers, conferences, magazines, books, and catalogs).
6. *Extracting* includes activities associated with going through a particular source or sources and selectively identifying relevant material from those sources (e.g., sets of journals, series of monographs, collections of indexes, abstracts or bibliographies, and computer databases).

Mueller *et al.* (2009) in their review of information seeking behaviour of scientists and engineers noted five key behaviour patterns of these professionals as follows:

1. Engineers/scientists generally like to help themselves with information. They also use colleagues as a resource, but often they rely on the library as a last resort;
2. Books are critical to this population. They are comfortable with and use electronic resources, but also have a strong preference for accessing what can be considered more traditional library resources such as books;
3. This population often has a cycle for information gathering where the need for information changes drastically depending on the development phase of their projects. Their information needs vary from time to time;
4. Information seeking from this group is generally in response to very specific problems or projects. They often seek answers to immediate problems, and need information quickly; and finally
5. Proximity of services and facilities is important to these professionals. When interviewed, most engineers wanted a physical library or reading room in their specific location. They used services readily available.

Other scholars such as Zawawi and Shaheen, (2001) explored the information needs and seeking behaviour of biomedical scientists at the Institute for Medical Research (IMR), Malaysia, the oldest and leading medical research centre in that country. Their findings indicated that biomedical scientists use a variety of information sources to satisfy their information needs. Biomedical scientists who were solely involved in research work considered journal articles as the most preferred information source. On the other hand, researchers and lecturers considered books as the most preferred information source in meeting their information needs. Both categories of scientists also considered interaction with colleagues as an important source for satisfying their information needs. The study also revealed that in spite of having access to modern and up-to-date digital information sources, most respondents still preferred using printed materials. Nonetheless, CD-ROM was the most utilized IT-based source. For the Internet-based information sources and applications, e-mail was

the most popular while other applications were used infrequently

Scientists and technologists are major users of libraries and information centres. A study to assess the library usage pattern of scientists considered the influence of their background variables namely, age, gender, qualifications and status. The study sample population consisted of 246 scientists and technologists from two major scientific and technical research institutes in Bangladesh. One-way analysis of variance (ANOVA) statistical test was used to test the hypotheses and the results of the analysis showed that the socio-economic background variables influence the use of libraries and information centres by scientists. In addition, scientists and technologists do not depend solely on the resources of their parent institutional libraries and information centres, but they use other libraries. It implies that in this age of knowledge and information explosion, no library can be self-reliance. The library should resort to resource sharing and the solution lies in networking. A library or information centre should serve as an access point to resources that are available worldwide (Rahman and Binwal, 2000)

A study to investigate the adequacy of pharmaceutical scientists' information environment in feeding their occupational activities was conducted by Opeke, Osunkunle, and Okwilagwe, (2002). Data was collected through observation and questionnaire administration to all the twenty-seven scientists in two large pharmaceutical companies in Lagos, Nigeria. The study revealed that pharmaceutical scientists carried out their work activities under less than optimal information conditions and with outdated information. Although scientists were found to rely a lot on oral sources (colleagues and so on) for information, documented sources were identified as being more reliable. They recommended to the pharmaceutical companies to improve the information resources available for the use of their scientists through the provision of functional and effective information centres and through the provision of basic skills in information handling.

A study conducted on the impact of Internet use on agricultural research outputs in Nigerian universities of agriculture revealed that about half (54 per cent) of the agricultural researchers at the university use the yahoo search engine and that they spend an average of an hour per day browsing the Internet. The study also revealed that respondents use the Internet to find research materials such as journals and conference proceedings, followed by sending and receiving of electronic mails (e-mail) Oduwole, (2004).

Methodology

The case study method was used to carry out the research enquiry. Questionnaire made up of both close-ended and open-ended questions and interview schedule were the main instruments used for collecting data for the study. The questionnaire was divided into four (4) parts: the first section was background information of respondents, section B was the extent of access to and use of information centres by respondents, section C was the information seeking behaviour of the respondent and section D was on the nature and range of information services provided by CSIR-CRI Library. The population for the study was 85 which consisted of 82 scientists and three library staff of CSIR-CRI respectively which were at post as at July 2011. Even though the study was meant to cover the entire population of 85, only 76 scientists were covered which represent 89% of the total population. The sampling technique used for the study was purposive sampling. According to Kumekpor, (2002) in purposive sampling, the units of the sample are selected not by a random procedure, but they are intentionally picked for the study because of their characteristics or because they satisfy certain qualities.

Direct administration of questionnaire was used for some of the respondents; this method was employed to administer the questionnaire. The staff at the Information Centre of CSIR-CRI were met at the Centre during working hours and the interview was conducted by the principal investigator. In all 82 copies of the questionnaire were given out to the scientists. However, 73 were completed and returned representing a response rate of 89%. In addition, all three (3) staff of the Information Centre were interviewed representing 100%. The questionnaire was formatted in such a way that the responses were easily coded by assigning numbers to all responses. The data collected was analysed using Statistical Package for Social Sciences (SPSS version 16). This helped to generate percentage and frequency distribution.

Results and Discussion

The results and the major findings of the study are presented in this section. These have been done under the themes namely sources of information, type of information and purpose of use, information seeking behaviour of the scientists.

Sources of Information

The study revealed that 83.6% of the scientists used other libraries like CSIR-Forestry Research Institute of Ghana (CSIR-FORIG), and Kwame Nkrumah University of Science and Technology (KNUST) which about one (1) kilometre and five (5) kilometres respectively away from where CSIR-CRI is situated. This therefore implies that scientists at CSIR-CRI do not depend solely on the resources available at the Information Centre/Library. The study confirmed an earlier study conducted by Rahman and Binwal, (2000)¹⁶ that scientists and

technologists do not depend solely on the resources of their parent institutional libraries and information centres. It implies that in this age of knowledge and information explosion, no library can be self-reliance. Libraries should resort to resource sharing and the solution lies in networking. A library or information centre should serve as an access point to resources that are available worldwide.

In addition, the interview with the library staff at CSIR-Crops Research Institute's Information Centre indicated that some of the requests made by scientists to the library were sometimes referred to these libraries if the answers to the requests are not readily available at Information Centre. The interview also revealed that scientists usually seek information in electronic format, especially journal articles.

However, the study conducted by Adedigba, (1995) and Bettiol, (1990) revealed that most Nigerian agricultural specialists and researchers used their institutions' special libraries only and that they mainly used special textbooks to meet their information needs. Also, the Brazilian agricultural biotechnologists often used special libraries of their institutions, Bettiol, (1990). The researcher therefore agrees with Rahman and Binwal, (2000) that no library can be self-reliance because scientists do not depend on solely on their parent organization to satisfy their information needs.

Majority of the respondents, (64.4%) indicated that although they acquire the needed information through both informal and formal channels; however, given the choice, they prefer the formal to the informal. Attending scientific conferences and meetings were very beneficial. Respondents observed that not only do they gain knowledge from listening to presentations and discussions but also help develop social contacts and relationships among scientists. In addition scientific meetings provide the major platform for the acquisition of informal information through discussions with colleagues encountered at such gatherings.

Preference for Current and Electronic Information

The study revealed that the majority of the scientists (78%) do not use the Internet at the CSIR-CRI Information Centre because it was not reliable but use Internet facilities elsewhere such as their offices because the computers in their offices were connected to the Internet. Others used their self acquired Internet modem in search of electronic journals. It was also observed that scientists used the Internet in search of information. Seventy-six (76%) of the respondents indicated that they use Internet as the first point of information search. This indicates a high preference for current and electronic information rather than printed documents as reported by Oduwole, (2004) in his study *Impact of Internet Use on Agricultural Research Outputs in Nigerian Universities of Agriculture*.

Also majority of the scientists at CSIR-CRI (92%) indicated the use of Internet in search of scientific information for research mostly online databases such as Sciencedirect, AGORA among others. These scientists also use the Internet to send and receive e-mail from their collaborators and colleagues both within and out of the Institute.

Use of Information Centres/Libraries

The study revealed that the majority of the scientists (77%) had unlimited access to information centres/libraries such as CSIR-CRI Information Centre, CSIR-FORIG and KNUST but used them occasionally, In addition, most of the scientists used other information centres apart from the Information Centre at CSIR-CRI.

Conclusion

The study revealed that apart from the primary literature that scientists gather from the field, scientists at the CSIR-CRI used other materials representing the five groups of scientific information as indicated by Søndergaard, Andersen and Hjørland, (2005). These are primary literature, secondary literature/bibliographical literature, tertiary literature/review literature, incidental information and popularizations. The scientists preferred to use current and electronic information. Among them are electronic journals, edited and unedited conference/seminar/workshop papers, technical and annual reports for research and communication purposes. Additionally, scientists at CSIR-CRI accessed and used the CSIR-CRI Information Centre and other information centres/libraries in and around Kumasi. Others also access electronic journals from their own computers in the offices since most of the computers at the Institute are connected to the Internet even though it is not always reliable.

Recommendation

Since scientists are interested in having immediate answers to their questions, rather than getting lengthy reports, having the right information at the right time will give scientists the competitive edge they need to help them in their research work. The information centres and special libraries at research institutions should be more proactive in providing value added services such as online searching, current awareness services, selective dissemination of information (SDI) services and user education. They should also subscribe to current print/electronic journals. In addition, Information specialists with specific subject areas have to be employed and equipped with the right skills to tap databases around the world to extract, analyze and present relevant

information to the scientists and other clientele. Scientists should also be trained in information searching and retrieval skills.

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