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Lawrencia D. Acheampong

CSIR-Crops Research Institute, Ghana, lawdonkor@gmail.com

Michael D. Dzandu

University of Ghana, mdzandu@ug.edu.gh

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Lawrencia D. Acheampong
CSIR-Crops Research Institute
Kumasi, Ghana
Email: lawdonkor@ymail.com

Michael D. Dzandu
Dept. of Information Studies
University of Ghana
Legon, Ghana
Email: mdzandu@ug.edu.gh

Abstract

The study investigated 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 aimed at ascertaining the level of access to and use of information centres among scientists. The research design for the study was a study case. Questionnaire and interview schedule were used to collect data from 73 scientists and 3 library staff respectively. The study revealed that scientists used information centres but at a minimal rate, accessibility was unlimited. They would however use it more if the centre is well resourced with competent personnel, equipment and current and relevant materials. In addition, scientists use the centre for research purposes and prefer to use journals to other type of materials. The study recommended that scientific information centres should subscribe to current electronic journals, procure modern equipment and also train the staff of the information centres to encourage high patronages of the centres by the scientists. In addition, networking of information centres should be encouraged since no library or information centre can solely cater for the information needs of scientists.

Keywords

Access, use, information centre, CRI-CSIR, scientists, scientific information, dissemination, Ghana

Introduction

In this era of information overload, explosion and globalisation, information centres have become the link or medium through which professionals, scientists, researchers and students have access to the relevant information available. The development of information technology has brought about the creation of information at a higher rate. The dramatic acceleration in the development and use of information and communication technology (ICT) during the last few years has set in motion, a worldwide process of transition from the “industrial to the information society” (Alemna, 2000).

Information centres are essential for the free flow of information and are also used to maintain, increase and spread knowledge. They play a vital role in the dissemination and use of scientific and technological information for economic and social development. The traditional role of information centres is collection, organization and dissemination of information. Information is provided in various formats (written, visual and audiovisual) to make them easily retrievable for use. Nevertheless, presently information centres remain the key source of information because they generate, collect, organize, interpret, store, retrieve, disseminate, transform and use information, with particular emphasis on the applications of modern technologies in these areas (Griffith, 1980).

For decades, the scientific industry has played an increasingly important role in the national development. They develop the economy through research by providing information in the areas that have already been researched into and new areas that can be researched. In this sense, the production, management and dissemination of scientific data and information become very critical within scientific research (Oddoye, 1979).

Michael Faraday, the famous chemist, once stated that the three necessary stages of useful research are to begin it, end it, and to publish it. 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 (Faraday, 1991). In most developing countries like Ghana, libraries do not enjoy the recognition as pertain in the developed countries. The idea that, special libraries are the pivot around which scientific research work revolves does not apply because the vital role information centres play is not fully appreciated. In Ghana, the demand for current scientific information grows more acute, because the scientist needs information to research and thereafter the need to disseminate the results obtained to the appropriate users of such information. The growth in literature, which has led to information overload, superhighway, or information flooding, has made it difficult for people to keep abreast with the current information in their various fields. Unless one is information literate, it will be difficult to get hold of relevant information at the right time. 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 an information processor (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.

The onset of the Internet has brought about information overload. There is therefore the need to have people and structures in place that can sift the information (on the Internet) into manageable units for use. To this, the need for information centre for the scientists becomes very important. In their busy schedule of organising data, the information officer in his/her professional way, organises the relevant information for the scientists. In Ghana, one of the institutes that have a lot of scientists at the core of its activities is the 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-CRI Brochure, 2008).

Being an agricultural research institute, CSIR-CRI undertakes research on both food and cash crops as well as on new and emerging technologies in crop production, management and post-harvest practices. The Institute has a broad research mandate covering all food and industrial crops. These include maize,

rice, cowpea, soybean and groundnut. Others are cassava, yam, cocoyam, sweet potato, vegetables and fruit crops, plantain and bananas.

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 and disseminate their findings to the end-users. To achieve this, the role of the information centre becomes very crucial; an information centre which is well resourced and equipped to collect, manage and disseminate information to the scientists and other end-users to enhance the agricultural research and development agenda of the CSIR-CRI and the country as a whole. Similarly, the success of the Institute in churning out research results rest among other factors on the ability of the scientists to build on previous research investments, which are usually represented in published literature and datasets. CSIR-CRI information centre has performed this role over the many years of its existence until recently where there appears to be serious shortfalls in the content and management of the information centre.

The current information resources of CSIR-CRI Information Centre include scientific journals, conference proceedings, articles, staff publications, staff theses, newspapers, books, and CD-ROMs containing scientific information from collaborating institutions both local and international. In spite of all these resources access and use of the information centres among the scientists at CSIR-CRI is low.

According to Lartey and Sam (2004) most information centres in scientific institutions lack information and a communication technology (ICT) facility, and even when these facilities are available, the network and Internet connectivity are not reliable. There are a number of factors that account for the lack of adequate resources in scientific information centres in Ghana including CSIR-CRI. Among these factors are inadequate funding and apathy of government officials, lack of coordination, low interest in library services and patronage, and unwillingness on the part of some institutes to employ qualified information professionals in the scope of activities of research institutions.

The effect of this problem is lack of information flow between scientists and their counterparts in and outside the country as is the case at CSIR-CRI. Researchers are to communicate and share ideas in order not to duplicate research already done. The scientists cannot undertake effective research without information on current literature on science. Where would they find this information if the information is not well packaged and presented to them in a format, which would be more useful and easy to work with?

Purpose of the Study

The purpose of this study was to investigate the level of access to and use of information centres among scientists at the CSIR-Crops Research Institute.

Objectives of the Study

The specific objectives of the study are to:

- ascertain the level of access to the and use of the CSIR-CRI Information Centre
- The frequency of use of the Information Centre by the scientist
- determine the relationship between the background characteristics of the scientist and access to and use of the Information Centre
- ascertain the factors affecting the use of the Information Centre by the scientists
- make recommendations for information access to and use of information centre by scientist for national development

Literature Review

The Nature and Role of Information Centres

Like special libraries, information centres are created primarily to provide much specialised services to support the parent organization. The complexity of inquires at the traditional information centres is more challenging than in special libraries. The staff is often called upon to be deeply involved in the interpretation of information, which usually meant that a higher educational background is required of staff members than is needed in the average special library. Some specific examples of information centres are libraries, corporate information centres, database information centres, network technology centres, and technical information services among others. The type of information services provided by information centres vary in nature. This includes information consultation, searching, selective dissemination of information (SDI), translation of foreign materials, learning and reading services, providing trade literature, user education and subject information research (Mount, 1995).

Rahman and Binwal (2000) see information centres as essential institutions for the communication of scientific and technological ideas. According to them, information centres identify, collect, organise, store, retrieve, disseminate specialised information and make it available to the right person at the right time and in the right form. They act as an intermediary and a communication institution concerned with the communication of information amongst scientists and technologists (Rahman and Binwal, 2000). An information centre must provide management with solid proof of the contribution it makes towards helping the sponsored organization to reach its goals. Another measure of information centre is the number of hours it serves its clients by providing information rapidly. According to Kramar (1971) "the major advantage of an information centre is that it can find answers for the inquirer more rapidly than he/she could him/herself" (Mount, 1995).

A study conducted in 15 urban and rural capitals in Rochester, New York in 1991 concluded that 80% of 208 participating doctors stated that they handle some aspect of their patient's care differently as a result of information provided by their hospital library (Marshall, 1992). Again, 96.5% of the physicians indicated that information provided by their hospital librarians contributed to their research leading to better-informed clinical decisions. In addition, 85% physicians also reported that information provided by their librarians save them time and 93% added that the information provided them with new ideas resulting in improved patient care.

In a study on "Information needs of staff of the CSIR-Water Research Institute, Jiagge (1999) reported that that majority (78%) of the scientists responded that they use the library everyday and anytime the need arises. This proves that the scientists have strong perception of information as the basis of their work and aware of the significant role libraries play in research activities.

Characteristics of Scientists and their Information needs

Knowledge about the information needs and seeking behaviour of scientists could play a vital role in meeting their information needs effectively. Libraries can use this knowledge for re-orienting their collections and facilities to attune them to the needs of the scientific community. In a study was conducted on the information needs and seeking behaviour of Malaysian agricultural scientist by Anwar and Eisenschitz (1983), it was found that a large number of the participants felt that they had not been keeping in touch with scientific literature due to deficient library collections and services. They recommended that science and technology libraries should periodically survey the information needs of their users, assess their collections and facilities, and strengthen their promotional activities. 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 consists 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 too. It implies that in this age of knowledge and information explosion, no library can be self-sustaining. It 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).

In a study by Adedigba (1985) it was 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. Bettiol (1990) also found that the Brazilian agricultural biotechnologists often used special libraries of their institutions but in Iran, Dizaji's survey (1995) showed that half of the experts and researchers of the Ministry of Agriculture either did not use the library, or spent one to two hours a week using library books.

Access to and use of Information Centres Among Scientists

Using cross-sectional survey, Agyemang and Badu (2008) undertook a research on the use of library and information services by nuclear scientists in Ghana. The study was aimed at making suggestions that would help to improve nuclear information service delivery in the country. The study used 100 nuclear scientists drawn from some research institutions, universities and government ministries in the country. The results indicated that the majority of them were young, male, well educated, affiliated to research institutions and currently engaged in the agricultural sector of the economy. The nuclear scientists use libraries mainly to fulfil their research, publication and teaching needs. Some of the nuclear scientists were found to use their organisational libraries, but the frequency of use of the libraries and other local information services were found to be low. The awareness of all library services by the scientists was not universal. The study suggested the need for a deliberate campaign by information workers in the nuclear sector to encourage the use of their resources and services (Agyemang and Badu, 2008).

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 through 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.

Rasouli (2001) reported that the Iranian agricultural specialists' aim in searching information sources was to conduct research and to be up-to-date. More than fifty percent of respondents did not have access to computers, special databases and computer networks in the libraries they referred to. Akrami (2001) indicated that books, standards and technical catalogues were used more than other materials by the engineers at food industry factories in Mash'had metropolitan area. However, they were deprived of an active Information Center.

Methodology

The case study method was used to carry out the research enquiry. According to Marshall (1992) case study is known to have certain attractive advantages over other methods; because it provides the opportunity to give a thorough and detailed examination and analysis of the research. 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 (Fraenkel and Wallen, 1993). The population for the study was the scientists and the staff at the information staff of CSIR-CRI. The total number of scientists as at December 2008 was 82. All the 82 scientists were used for the study in addition to 3 staff at the information centre at CSIR-CRI. The population size for the study was 85. Even though the study was

meant to cover the entire population of 85, only 73 scientists and 3 staff of the Information Centre were covered bringing the total sample size to 76, 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.

Results and Discussion

Access to and Use of the Information Centre

The study revealed that (65%) of the scientists had unlimited access to the CSIR-CRI Information Centre and used it occasionally, In addition, most of the scientists used other information centres apart from the CSIR-CRI Information Centre of which scientists get unlimited access to and use of the other information centres. This is shown in tables 1 and 2.

Table 1: Level of Accessibility by Scientists

Level of Accessibility	Yes	No	Total
Limited	7 (13.7%)	3 (13.6%)	10 (13.7%)
Unlimited	34(66.7%)	14 (63.6%)	48 (65.8%)
Partially	5 (9.8%)	5 (22.7%)	10(13.7%)
Access only at certain times	5 (9.8%)	0 (.0%)	5 (6.8%)
Total	51 (100%)	22 (100%)	73 (100%)

Table 1 indicates that the scientists had unlimited access 34 (66.7%) to the information centre. The scientists also visited the centre occasionally 56 (76.7%) while 10 scientists visited the centre at least once every week. It is therefore obvious that the scientists visited the centre when they needed information but not as a regular practice.

Table 2: Frequency of use of the Centre by Scientists

No. of visits	Frequency	Percentage
Everyday	3	4.1
Once a week	10	13.7
Twice a week	3	4.1
More than twice a week	1	1.4
Occasionally	56	76.7
Total	73	100

Further analysis revealed that use of the information centre was not dependent on area of specialization of the scientists ($X^2 = 18.8$, $df = 11$, $p=0.063$); the length of service of the scientists at the institute ($X^2 = 29.01$, $df = 24$, $p=0.22$) and the division or department in which the scientist worked ($X^2 = 12.40$, $df = 10$, $p=0.259$). Also there was no significant relation between use of the information centre and the educational qualification of the scientist ($X^2 = 5.32$, $df = 2$, $p=0.070$); the rank of the scientist ($X^2 = 9.06$, $df = 4$, $p=0.059$), as well as age ($X^2 = 34.92$, $df = 24$, $p=0.070$), even though it more older scientist than younger ones used the information centre. The data for the study however, revealed a significant relation between gender and use of the information centre (Table 3).

Table 3: Use of the CSIR information centre by gender

Response	Female	Male	Total
Yes	13 (25.5%)	38 (74.5%)	51 (100.0%)
No	1 (4.5%)	21(95.5%)	22(100.0%)
Total	14 (19.2%)	59 (80.8%)	73 (100.0%)

$X^2 = 4.35$, $df = 1$, $p=0.037$

The study confirms the study conducted by Rahman and Binwal, (2000) that scientists and technologists do not depend solely on the resources of their parent institutional libraries and information centres, but they use other libraries too. It implies that in this age of knowledge and information explosion, no library can be self-sustaining. It 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.

However, the study conducted by Adedigba (1985) 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. The researcher therefore agrees with Rahman and Binwal, (2000) that no library can be self-sustaining because scientists do not depend on solely on their parent organization.

Use of the Information Centre by Scientists

The data for the study showed that 31 (42.5%) indicated that they do not find the needed information at the Centre while 21 (28.8%) also stated the facilities at the Centre were not adequate for their use. The Internet connectivity was also a challenge to the 10 (13.7%) of the scientist. In the researcher's view, this is so because the materials at the Centre are not adequate and the Internet where current information can be found is not reliable. It is therefore obvious that users cannot get the information needed.

Table 4: Challenges Scientists Face in Using Information Centre

Challenges	Frequency	Percentage (%)
Not Applicable	9	12.3
Do not find the needed information at the Centre	31	42.5
Inadequate facilities at the Centre	21	28.8
Unreliable internet connectivity	10	13.7
Unreliable electricity	2	2.7
Total	73	100

The study revealed that majority of the scientists (78%) do not use the Internet at the Information Centre but use Internet facility elsewhere such as their offices because the computers in their offices are connected to the Internet. Apart from the above reason, it was also observed that the Internet connectivity at the Centre was not reliable. In addition, the Centre had only two computers, which would not allow more users to use it effectively even if the Internet connectivity were reliable. As reported by Lartey and Sam (2004) most information centres in scientific institutions lack information and a communication technology (ICT) facility, and even when these facilities are available, the network and Internet connectivity, are not reliable.

Conclusion

The study has revealed that even though the scientists had unlimited access to the use the CSIR-CRI information centre and others in and around Kumasi, their level of use was very minimal. Also the scientists preferred to access electronic journals from their own computers in their offices since the poor state of Information Centre such as lack of *resources* (current and relevant materials) and equipment and the somewhat incompetence of the library staff were challenges which discouraged them from using the Information Centre and rather use the computers at their offices to access most of the information they need for their research. There were indications that they would use it more if the centre is well resourced with competent personnel, equipment and current and relevant materials. It was also evident that the scientist themselves were part of the problem of lack of current materials at the information since although some of the scientists were aware of the policy of depositing their publication at the Information Centre, the number of the scientists who deposited their publications at the Centre was not encouraging.

Recommendations

Based on the findings of the study, the following recommendations are made.

Training of Information Centre Staff

Secondly, the technology of information management is expanding at a much faster rate than local resources can absorb. One of the main means to combat this is to staff the information centre with qualified personnel for professional implementation and maintenance of information production and exchange. Attention must be paid in the training of information professionals either in short or long term to enhance the skills of the staff at the information centre.

Formation or Strengthen of Consortium

Thirdly, networking is an important tool in promoting free flow and exchange of information. Scientists need to collaborate with other scientists in and outside the country to share ideas and avoid unnecessary duplication of research. Furthermore, since, no library or information centre can meet the information needs of the scientists, it is ideal for scientific research institutions to form a consortium to share resources like expertise, databases and union catalogues. Even though this is being practised at some institutions, it must be strengthened to enhance research programmes in the country.

Expansion and Up-Date of the Centre's Collection

Concerning the inadequacy of the Centre's collection, the Centre needs to expand and update current collection by subscribing to electronic resources like AGORA, OARE among others. In addition, since the publications of the scientists at the Institute form part of the Centre's collection, measures should be put in place to encourage and ensure that scientists deposit their publication at the Centre.

Improvement of Services of Information Centres

Finally, needless to say, 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. 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 of the Centre.

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