INFORMATION NEEDS AND SEEKING BEHAVIOUR OF TANZANIA FORESTRY RESEARCHERS IN THE ELECTRONIC ENVIRONMENT

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Abstract

This study examined information needs and seeking behaviour of Tanzanian forestry researchers in the growing global electronic environment. A questionnaire based survey was conducted in three forestry research institutions. The findings indicated a wide range of information needs among forestry researchers in the studied institutions. Findings also revealed that researchers depend mostly on printed sources but evidence also suggests that they use electronic information resources such as CD-Rom databases and Internet services in varying levels. Researchers depend mainly on their institutional libraries, other forestry research institutional libraries as well as those of international and governmental organizations to meet their information needs. The paper recommends that there is a need to improve forestry research institutional libraries and that they should be networked in order to facilitate resource sharing.

Introduction

It is evident that all researchers are producers as well as consumers of information. Forestry researchers are no exception to this. In regard to this view, Kapange (2000) stresses that although information is the major output of the research process in the form of recorded research results, it is also a necessary input in the research process. Availability of information to researchers at the right time ensures less duplication, resources are not wasted and researchers are able to keep track of new developments in a given field. It also enables researchers to have access to local and international knowledge, research topics, internationally acceptable standards, methodologies and quality solutions and helps to minimize mistakes done elsewhere.

The need for research information leads researchers to seek information from a variety of information sources. The type of information needed determines the type of information sources to be consulted and the information-seeking

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behaviour of researchers (Wilson, 1997). According to Chen and Hernon (1979), information-seeking behaviour can be defined as:

> Patterns or paths pursued by an individual or individuals in an attempt to resolve an information need.

Information needs and information seeking behaviour of users are closely related and are dependent on a number of factors including the field of research (Wilson, 1997). They also depend on point in time (the historical dimension), place (the geographic dimension), technology, economic situation and social system (Haywood, 1993).

Rapid technological advances in Information and Communication Technologies (ICT) revolutionized the manner in which information is created, converted, stored, processed, disseminated and retrieved to electronic formats. This has resulted into the proliferation of electronic information resources, such as CD-ROMs, e-journals and other Internet resources. These new electronic resources provide many advantages over traditional print-based sources such as easier and faster access to current information, sharing of the same resources among many users at the same time and easy storage of reference materials (Majid and Abazova, 1998).

Since the electronic environment is rapidly expanding globally, the need to determine the information needs and seeking behaviour of users is a priority issue. Although much of the information needs and seeking behaviour of users are well known with regard to non-electronic resources, those resulting from the unique features of electronic information resources need to be studied. This study therefore, examined the information needs and seeking behaviour of forestry researchers in Tanzania in the growing global electronic environment. Specifically this study aimed at obtaining a better understanding of:

- Information needs of forestry researchers in Tanzania ;
- Electronic information resources frequently consulted by forestry researchers and determine the reasons for their low or wide use; and to
- Find out if access to electronic information resources affects information seeking behaviour of forestry researchers and to what extent.

It was expected that knowing the information needs and information-seeking behaviour of forestry researchers in the electronic environment would form a basis for libraries and other information providers to effectively provide information to forestry researchers. The study will also contribute to the existing literature in information needs and information-seeking behaviour patterns.

Methodology

This study was conducted in three institutions involved in forestry research in Tanzania namely:

- Tanzania Forestry Research Institute (TAFORI) – (both at headquarters in Morogoro and zonal centre in Lushoto).
- Faculty of Forestry and Nature Conservation (FF&NC) of the Sokoine University of Agriculture (SUA) - Morogoro.
- National Tree Seed Programme (NTSP) - Morogoro.

The selection of these institutions was based on the fact that these are the major institutions with a substantial number of researchers involved in forestry research in the country. They also have access to electronic equipment and facilities and are most closely located to centers that provide relatively easy access to electronic sources both within Morogoro and in Dar es Salaam. The study was conducted for three months from August to November 2002.

All forestry researchers with at least a Bachelor's degree or equivalent qualifications participated in this study. Fifty three (53) researchers were given a questionnaire each to fill, in and three officers were interviewed in-depth. A total of 45 questionnaires out of 53 distributed were returned. The overall response rate for the survey therefore was 86.7%. Furthermore, the availability and status of ICT facilities and the activities performed by researchers in searching literature were observed during the distribution of questionnaire. The purpose of in-depth interview and observations was not only to supplement the data collected by questionnaire but also to offset the disadvantages associated with a questionnaire as a research instrument. Data collected by self-administered questionnaires were analyzed quantitatively using Statistical Package for Social Sciences (SPSS version 10.0 for Windows) to derive frequencies, percentages and tables. Analysis of data from interview questions and observations was done using content analysis.

Results and discussion

Background information of respondents

In order to determine information needs and seeking behaviour of respondents, it was thought necessary to study their backgrounds. This was important because, as pointed out earlier, the information needs and information-seeking behaviour of individuals are influenced by, among other things, their background characteristics. Their age distribution, education levels and work experience are summarized in Table 1.

Table 1: Background information of respondents

Age (years)		Education		Work experience (years)	
Category	%	Level	%	Category	%
Below 35	34.1	PhD	27.3	20 and above	18.2
36 – 49	56.8	2nd degree	50.0	10 - 20	31.8
50 and above	9.1	1st degree	13.6	Less than 10	50
		Others	9.1		

Table 1 indicates that the "middle age" group, 36 – 49 years, constituted more than half of respondents (56.8%). More than three quarters (77.3%) of respondents were well educated, with postgraduate qualification and half of respondents (50%) had a good working experience of more than 10 years. Thus, age, educational level and working experience suggest that the respondents were used to the traditional methods of seeking information using manual bibliographical tools (catalogues and indexes) and print sources of information (books and journals). Therefore, the use of electronic sources and tools would indicate a major shift in information seeking behaviour.

Information needs of forestry researchers
Determination of information needs is quite difficult and is not directly observable (Mchombu, 1992). In this study open-ended questions were used to determine information needs of respondents by asking them to state their major fields of research in forestry. This is because, as stated above, information needs of users depend on their field of specialization and they vary from one discipline to another. Secondly, respondents were directly asked to state the kinds of information they require for research in their fields.

The identified information needs of respondents were categorized as shown in Table 2. It was found that there was a wide and uneven distribution of researchers by their fields of research, with agroforestry (22.2%) and forest ecology and soils (22.2%) topping the list while forest resource assessment (4.4%) and botany (2.2%) were at the bottom of the list. The findings show that forestry researchers had a wide range of information needs. The spread also shows that some researchers had very specific fields of interest such as tree improvement and tree seeds while others had more than one field of research.

Table 2: Information needs of forestry researchers

Information needs	Frequency	%
Agroforestry	10	22.2
Forest ecology and forest soils	10	22.2
Forest management	8	17.8
Forest economics and other socio-economic issues	7	15.6
Tree improvement	5	11.1
Wood utilization and non-timber forest products	5	11.1
Timber harvesting, transportation and ergonomics	5	11.1
Tree seeds	4	8.9
Biodiversity	3	6.7
Forest resource assessment	2	4.4
Botany	1	2.2

Information seeking behaviour of forestry researchers

In order to establish the information seeking behaviour of respondents in the electronic environment, a number of aspects were assessed. First, respondents were asked to state the availability, access and use of various electronic information resources. Secondly, the information practices performed by researchers in searching for literature were studied and finally the major forestry information providers in Tanzania were identified i.e. where they go in search of information.

Electronic information resources

Electronic information resources are all sources of information that can be accessed through a computer. These resources include but are not limited to, online public access catalogues (OPACs), compact discs (CD-ROMs) and various Internet services (ELDIS, 1996). In this study only a few electronic information resources were studied. These were CD-ROMs, Internet services and e-journals.

CD-ROM Databases

All surveyed institutions had a number of CD-ROMs, their accessories and specific retrieval software. When asked if they used CD-ROMs, and over seventy percent (71.1%) of the respondents said they used CD-ROM databases in their research activities. The high percentage indicates that CD-ROMs have become popular among Tanzanian forestry researchers. In order to identify the CD-ROM databases that were used by most Tanzanian forestry researchers, respondents were first provided with a list of forestry

and forestry related CD-ROMs to indicate which ones they have used. The CD-ROMs were selected purposefully after making a survey to some forestry research institutions to identify CD-ROM databases available. The results are presented in Table 3.

Table 3: The use of CD-ROMs

CD-ROM database	Frequency	%
TREE-CD	30	66.7
UNASYLVA	18	40
CAB ABSTRACTS	9	20
TEEL	5	11.1
PAPYRUS	5	11.1
TROPAG & RURAL	5	11.1
AGROFORESTEE	4	8.9
HUMANITY DEVELOPMENT LIBRARY (HDL)	3	6.7

The findings show that forestry researchers mainly use TREE-CD (66.7%), UNASYLVA (40%) followed by CAB ABSTRACTS (20%). Only a few respondents were using the rest of the CD-ROM databases in an almost equal proportion. The frequently mentioned reasons for the trend of using the CD-ROM databases include the availability of databases, coverage and user-friendliness. These reasons appear valid to some extent. For example, on the question of availability, it was observed that the TREE-CD and UNASYLVA were available in all surveyed institutions. In addition, UNASYLVA has recently become available on the Internet, covering full text articles. Therefore, it is expected that researchers who were used to search the UNASYLVA CD-ROM would easily make the transition to the Internet version as an alternative. The user interfaces were Windows-based, which made the CD-ROMs easier to use. On the other hand the reasons did not fully explain the usage pattern because the researcher observed that some useful CD-ROMs such as WORLD ENVIRONMENTAL LIBRARY and FAO DOCUMENTATION available in these institutions with similar properties were hardly exploited.

Internet

Findings revealed that most forestry researchers (91.1%) use Internet for literature searches. These findings are in agreement with those of Busagala (2001) who found that 92.2% of research staff and postgraduate students from University of Dar es Salaam and Sokoine University of Agriculture use Internet for literature search. Some institutions like TAFORI Headquarters

and Lushoto Zonal Centre had no Internet connection during this study, but researchers used Internet Cafes and other institutions to search for information. This poses a serious constraint to the full use of Internet by researchers.

Respondents were provided with a list of some Internet services to indicate the services they use in connection with their research activities. The results summarized in Figure 1 show that e-mail was the most heavily used service (77.8%). Other Internet services used by researchers include browsing the Internet (64.4%), looking for forestry related websites (62.2%), accessing databases (31.1%) and subscription to lists (24.4%). Very few (6.7%) respondents seem to have accessed digital libraries. The findings indicate that the Internet has become a popular facility among forestry research community, although some of the services are not fully used.

Figure 1: The use of Internet services
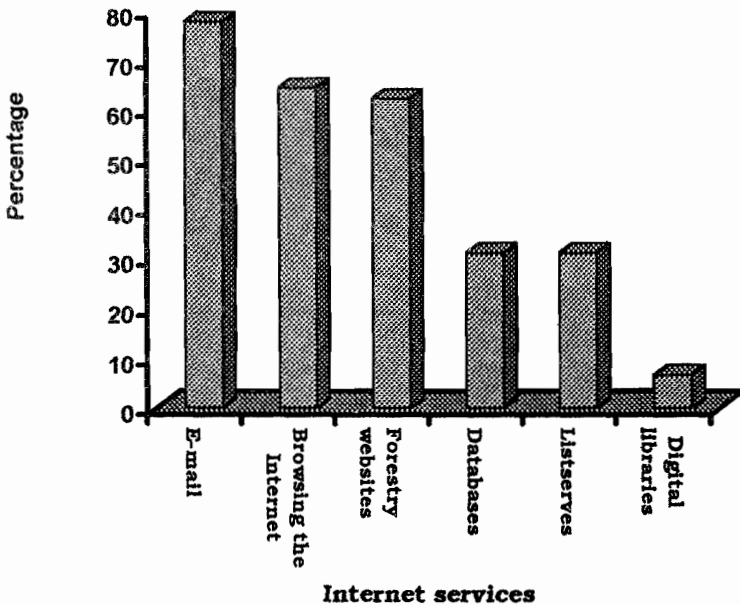
Electronic Journals (e-journals)

Electronic journals are electronic versions of print journals or, in some cases, journals available in electronic format only. Electronic journals are available on CD-ROMs or, in most cases, via the web. According to MacEldowney (1995), electronic journals come in many forms. Some are traditional paper

journals simply made available electronically; others are sample selections or just tables of contents of the paper journal, while others have no equivalent paper copies.

Although electronic journals form a part of Internet resources, in this study they were studied separately because of their significance to researchers. When asked if they use e-journals to meet their information needs, 71.1% of forestry researchers indicated that they do not use e-journals. Even the few researchers (28.9%) who claimed to use electronic journals failed to list these journals when requested to do so in an open-ended question. The findings imply that although some electronic information resources have become an indispensable service to forestry researchers, there are still important resources like e-journals, which are neither known nor exploited to their full potential.

Advantages of electronic information resources

Respondents were asked to indicate the ways in which electronic information resources have improved their research work. The aim of this question was to find out if researchers really know the potential benefits of electronic information resources. Table 4 indicates that 82.2% of respondents viewed access to current-up-to-date information as a benefit of using electronic information resources. Other benefits include faster access to information (60%), access to a wider range of information (60%) and easier access to information (48.9%). To probe more on the advantages of electronic information resources, researchers were asked if they feel the standard of their work would suffer without electronic information resources. A high proportion (88.9%) of respondents agreed that it would. The results imply that most researchers know and appreciate the potential benefits of electronic information resources and therefore if well equipped with the necessary skills, they would fully exploit these resources.

Table 4: The Benefits Electronic Information Resources

Benefit	Frequency	Percentage
Current up-to-date information	37	82.2
Easier access to information	22	48.9
Faster access to information	27	60.0
Access to a wider range of information	27	60.0

Information Seeking Practices

Respondents were provided with a list of information seeking practices and asked to rank them according to the frequency of occurrence. The aim of this question was to gain some light on what activities are performed most by forestry researchers in order to meet their information needs. The results

presented in Table 5 show that consulting printed books and journals (88.9%), using the Internet (60%) and CD-ROM databases (40%) were ranked as frequently pursued information practices, while consulting professional colleagues (60%), attending seminars and workshops (60%) and accessing e-journals (48.9%) were viewed as occasionally (sometimes) pursued activities. Therefore, it can be seen that although majority of researchers still exhibit a strong reliance on printed sources and other practices, there is a major shift to using electronic information sources.

Table 5: Information Seeking Practices

Practices	Frequently		Sometimes		Rarely		Never	
	frequency	%	frequency	%	frequency	%	Frequency	%
Printed books and Journals	40	88.9	5	11.1	0	0	0	0
CD-ROMs	18	40	17	37.8	8	17.8	2	4.4
Internet	27	60	13	28.9	1	2.2	4	8.9
Colleagues	14	31.1	27	60	4	8.9	0	0
Workshop and Seminars	5	11.1	27	60	13	28.9	0	0
E-journals	4	8.9	22	48.9	10	22.2	9	20

Major information providers

Respondents were asked how they seek information to meet their needs. This question required respondents to indicate who were their main information providers. The results in Table 6 show that all (100%) respondents considered their institution libraries as the most important information providers. An explanation to this might be the question of proximity and the fact that institution libraries have more specialized information. For example if a researcher from NTSP needs information on seed biology, it is certain that he/ she would first consult the NTSP library before going to other libraries. Libraries of other forestry institutions ranked second highest (37.8%) for researchers outside these institutions. International organizations like ICRAF, FAO and UNDP (31.1%) and government organizations like NEMC and Forest and Beekeeping Division (FBD) (22.2%) were also

mentioned as useful information providers. The findings suggest a great interaction among forestry researchers from various institutions in Tanzania as far as information seeking is concerned.

Table 6: Information Providers

Information source	Frequency	%
Own institution library	45	100
Other forestry research institution libraries	17	37.8
International organizations	14	31.1
Government organization	10	22.2

Conclusions

This study examined information needs and information seeking behaviour of Tanzanian forestry researchers in the growing global electronic environment. The study findings indicated that there is a wide range of information needs among forestry researchers in the studied institutions. The needs were mainly determined by the researchers' fields of specialization. A good number of forestry researchers use various types of electronic information resources. However, the use was uneven since only a few Internet resources like e-mail and CD-ROMs like TREE-CD and UNASYLVA were heavily used while other available CD-ROM databases and online resources like e-journals were not used to their full potential.

It was also found that although use of printed sources still predominate, evidence suggests that researchers were moving towards the use of electronic resources, even to the extent of using non-institutional sources such as Internet cafes. Electronic information resources are rapidly supplementing and even replacing printed sources. Therefore, one can conclude that there has been some behaviour change among forestry researchers in the way they seek information.

Findings also revealed that researchers depend mainly on their institutional libraries and some international and governmental organizations to meet their information needs. This indicates a great interaction among the researchers from these institutions. Other important sources of information were consulting professional colleagues personally and attending professional workshops and seminars, implying that when print and electronic sources did not satisfy the information needs, researchers used interpersonal communications.

Based on the study findings it was recommended that, since Tanzanian forestry researchers depend largely on their institutions' libraries for their information needs, these libraries should be improved in terms of collection development (both electronic and print), electronic communication facilities, skilled personnel, awareness raising and training of users. Parent institutions

need to allocate adequate funds to meet basic requirements of these libraries. All forestry research institution libraries should endeavour to access and share their resources through establishing a network using modern ICT. TAFORI library should coordinate the establishment and management of such a network. The national network then should be linked to Local Area Network (LAN) in each of the major forestry institutions. This will enable researchers to access information from their offices because all forestry research institution libraries, as observed, are dependent on one another as far as information provision is concerned.

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