

Library Use Pattern of Malaysian Agricultural Scientists

SHAHEEN MAJID, TAMARA S. EISENSCHITZ, AND MUMTAZ ALI ANWAR

Department of Library and Information Science, International Islamic University, Gombak, Selangor, Malaysia; Department of Information Science, City University, London, UK

The library is considered an integral component of any efficient research system. It plays a vital role in the improvement of scientific and technological research and the acceleration of the innovation process. An understanding of the information needs as well as the ways scientists use their libraries is crucial for efficiently meeting their information needs. This paper explores the methods used by Malaysian agricultural scientists to get information from their libraries, the factors influencing library visits and the occasions for ex-

tensive library use. It was found that most scientists visit libraries personally when they need to search the library OPAC, scan periodicals, or use other sources for identifying new information on their topics. However, they send junior scientists or paraprofessionals to get photocopies of articles, to check out books or to get information from sources already known to them. It was also found that scientists used their library extensively while preparing research proposals and writing reports.

Introduction

Information is a resource of enormous importance for economic, social and scientific development. The economies of most developing countries are agriculture-based and the free-flow of information can play a decisive role in the improvement of this sector. Access to timely and accurate information can help policy and decision makers to make correct decisions. On the contrary, decisions based on inaccurate, irrelevant, inadequate and obsolete information could be disastrous (Wasserman 1991). Similarly, agricultural research plays a crucial role in enhancing agricultural productivity through using innovative and sophisticated techniques for developing high-yielding crop varieties, controlling pests and diseases, and improving animal production and management, etc. As well-equipped laboratories and field facilities are in-

dispensable to carry out agricultural research, well-developed libraries are essential to provide information support to researchers (Perera 1995).

A library is considered the nucleus for any research activity and an essential ingredient for a viable research system. It provides an account of previous intellectual endeavours and functions as a breeding ground for new concepts and ideas. Library resources and facilities can be used as one of the parameters for measuring the capabilities and sophistication of research at an S&T (science and technology) institution (Gooch 1994). Well-stocked and efficient libraries act as eyes or pathfinders for researchers and provide them the inspiration to venture into new areas of research. An ineffective library, on the other hand, may lead to low quality or duplication of research thus resulting in waste of financial, material and human resources (Leckie et al. 1996).

Shaheen Majid, M.Sc., MLIS, is Assistant Professor at the Department of Library and Information Science, International Islamic University Malaysia. Currently he is enrolled with the City University, London for his doctoral studies.

Mailing address: Department of Library and Information Science, Faculty of IRK and Human Sciences, International Islamic University Malaysia, KM 16 Jalan Sg. Pusu, 53100 Gombak, Selangor, Malaysia. Email: shaheen@iiu.edu.my

Tamara S. Eisenschitz, Ph.D. is Lecturer at the Department of Information Science, City University, London, UK. Email: tse@soi.city.ac.uk

Mumtaz Ali Anwar, Ph.D., is Professor at the Department of Library and Information Science, International Islamic University Malaysia. Email: mumtaz@iiu.edu.my

Adequate knowledge of the information needs of scientists and the ways they use their libraries is imperative for effectively supporting their research activity (Zhang 1992). Such an understanding is expected to help develop library collections and services that are more likely to satisfy user information needs (Perera 1995). Similarly, libraries can re-orient their collections, services, and activities to synchronise them with the information-seeking behaviour of scientists. Due consideration should also be given to the fact that the interest, needs, and information-seeking pattern of scientists are dynamic and changing (Recker 1993). Technological advancements are also expected to alter drastically the way that the scientific community identifies, acquires, and utilises information. Consequently, "the models, theories, practices and standards used to organize and provide access to the world's scholarly information is blurring. Librarians will have to adopt new theories and practices for connecting scholars to information" (Oslen 1989, 121).

The success of a library in meeting the information needs of its users plays an important role in the number of future library visits made by them. Mwila (1993) used a questionnaire to study the use of the University of Zambia library by its faculty for teaching and research purposes. Out of the 102 respondents, over 60 percent of the faculty members from the science stream were visiting the library either rarely or only once a month. Major reasons offered for not visiting the library were inadequate and outdated library materials, the unavailability of current journals and disorganised library collections.

Nkereuwem (1984) noted a very low frequency of library visits by petroleum scientists and engineers in Nigeria. Out of the 324 respondents, 272 (84.0%) reported visiting their library just a few times a year. Only 9 percent of the scientists visited their libraries once or twice a week. Nkereuwem observed that "a library user will visit the library again if his information needs were satisfied during the first time" (Nkereuwem 1984, 120). Her study also showed a positive correlation between the adequacy of library materials and the frequency of library visits. A study undertaken by Yassin (1981) in Malaysia showed that a majority of the agricultural scientists and extension workers preferred to consult other sources to satisfy their information needs and of-

ten the library was the last source for this purpose. Folster (1995, 83) reported that "libraries and librarians are not viewed as a primary, or in some cases, even an important source of information". Al-Shanbari and Meadows (1995) reported that one-third of the scientists and engineers in Saudi universities seldom visited their library. Several other studies had also shown that professionals from different disciplines rarely visit their libraries (Strother 1986; Bunyan 1991; Spath and Buttlar 1996). On the contrary, a study by Kassim (1999) on the use of the library by the law faculty in Malaysia showed that about 59 percent of the respondents were visiting the library at least once a week. Shanmugam (1999) reported a relationship between ease of access to a library and frequency of use. Cabrajec and Dukic's 1991 study showed that Croatian scientists, besides using their institutional library, used other libraries located in the same geographic region.

Many studies have also been conducted to investigate information-seeking behaviour of library users by their subject interest, occupation, and information environment (Ellis 1993, Recker 1994). However, Hart (1993) pointed out that findings of these studies could not be easily summarised. He felt that work setting might have a significant impact upon information-seeking behaviour making it difficult to generalise the conclusions from one study to another. Most of the information-seeking studies have been undertaken in the United States, Great Britain and other developed countries and necessarily reflect the information-seeking environment there. However, conditions in developing countries are considerably different making it relatively difficult to apply data from developed countries befittingly. On the other hand, the limited number of studies on information needs and behaviour in developing countries severely restricts the development of effective library and information services.

Saracevic (1980) noted that, in general, the literature on the subject of science and technology information in developing countries was highly uneven, scattered, elusive, fragmented, and imitative in nature. It is obvious that based on these studies it is relatively difficult to find a clear trend for library use and information-seeking behaviour in developing countries. Therefore, there is a need to systematically study and develop better understanding about library use and

information seeking patterns of scientists in developing countries.

The Malaysian scenario

The agriculture sector is considered one of the major contributors to the Malaysian economy. Although the manufacturing and services sectors have played a remarkable role in transforming Malaysia towards an industrial society, the contribution of the agricultural sector is still very significant (Majid et al. 1998). Commodities such as palm oil, natural rubber, and tropical timber earn precious foreign exchange for the country. Several research organisations in Malaysia are engaged in high quality research to improve agricultural productivity. Libraries in the field of agriculture and allied disciplines, as compared to other S&T disciplines in Malaysia, have the most comprehensive and well-developed collections, services and facilities (Szarina 1992). A thorough understanding of how scientists use these libraries is desirable to further enhance their effectiveness. Searching of *LISA Plus* and other sources showed that no systematic study has been undertaken on this topic in Malaysia. The available literature on the topic is descriptive in nature, basically presenting personal opinions and perceptions.

This study will explore the library use patterns of Malaysian agricultural scientists. Results of this study should help understand the information needs and the ways scientists use the library. Such an understanding may help these libraries to re-structure their resources, services and facilities to synchronise them with the library use patterns of their scientists.

Methodology

The study used a questionnaire-based survey design for data collection. This technique was preferred, as it was less time-consuming and more affordable for a scattered population. Another reason for using a questionnaire was the convenience of contacting the scientists, some of whom often go out-station for field experiments. Follow-up interviews were conducted with some respondents to seek clarifications for certain trends emerging as a result of data analysis.

The study population

Five major Malaysian agricultural institutions – University Putra Malaysia (UPM), Malaysian Agricultural Research and Development Institute (MARDI), Palm Oil Research Institute of Malaysia (PORIM), Rubber Research Institute of Malaysia (RRIM) and Forest Research Institute of Malaysia (FRIM) – participated in the study. These institutions are considered the most reputable and well-established among science and technology institutions in Malaysia. Only agriculture-related departments of UPM were included in the study. PORIM and RRIM are mono-commodity institutions whereas MARDI is a multicommodity, multidisciplinary agricultural institution with a network of sub-stations located in different parts of the country. FRIM is responsible for research and development in forestry and related disciplines.

Agricultural scientists and academicians, with at least a bachelor's degree in science or an equivalent, numbering 1,328 scientists comprised the study population. Various sources such as computerised library membership lists, current institutional telephone directories, and the UPM academic calendar were used for identifying the study population. The personnel departments of some research institutions were also contacted to remove the names of those scientists who were on study leave or recently retired. The proportionate stratified random sampling technique was used to generate a random sample. Each institution participating in the study constituted a stratum. Using a random number table, a sample size of 25 percent was drawn from each stratum.

The Instrument

Several studies on related topics were consulted and their instruments were critically examined (Hart 1993; Mwila 1993; Kim 1990; Nkereuwem 1984; Zammarano 1979). Materials from these instruments and the personal knowledge of the authors were used to develop a questionnaire for the study. Section 1 of the questionnaire deals with personal information about respondents such as job title, age group, gender, and the highest academic qualification. Section 2 elicited data on methods used by the respondents for getting information from the library, location of the li-

Table 1: Study Population, Questionnaire Distribution and Response Rate

Institution	Total Population	Number of Questionnaires Distributed	Number of Questionnaires Returned	Response Rate (%)
University Putra Malaysia	368	92	61	66.3
Malaysian Agricultural Research and Development Institute	472	118	88	74.6
Palm Oil Research Institute of Malaysia	132	33	24	72.7
Rubber Research Institute of Malaysia	192	48	33	68.8
Forest Research Institute of Malaysia	164	41	30	73.2
Total	1,328	332	236	71.1

brary, frequency of library visits, and occasions when the library was used extensively. The questionnaire was pre-tested on eight UPM academicians and five MARDI scientists, not included in the randomly drawn sample, to ensure the reliability and effectiveness of the instrument.

Data for the study was collected during 1996–97. A total of 332 questionnaires were distributed and 236 filled-in questionnaires were received back. The overall response rate for the survey was 71.1 percent, which is considered satisfactory for this type of survey. An institution-wise breakdown of respondents is given in Table 1.

Two questionnaires, one each from UPM and MARDI, were not usable and thus excluded from the data analysis. Therefore, the data for 234 (70.5%) respondents will be presented in the analysis.

Follow-up interviews were conducted with those respondents who consented to the interview request made at the end of the questionnaire. The purpose of these interviews was to seek clarification for certain trends emerging as a result of data analysis. Another objective was to seek opinions of the respondents on other pertinent aspects not fully covered in the questionnaire. Altogether interviews with 60 respondents were conducted.

Results and discussion

Respondents

Sixty respondents consisting of eight professors, 20 associate professors, and 32 lecturers came from UPM. One respondent from UPM did not provide information on his/her job title. Of the remaining 174 individuals affiliated with four agricultural research institutions, the distribution

was: 13 (5.6%) heads of division; five (2.1%) principal research officers; 22 (9.4%) senior research officers; and 134 (57.3%) research officers.

Twenty-four (10.3%) respondents were 30 years' old or less while 58 (24.8%) were in the age group of 31 to 40 years. The largest group of respondents (59.8%) belonged to the age group of 41 to 50 years. Only 12 (5.1%) individuals were in the age group of 51 years or above. One hundred sixty-six (70.9%) respondents were male and 68 (29.1%) were female.

Of the 233 respondents who provided information on their academic qualifications, 103 (44.2%) were holding a Ph.D. degree; 98 (42.1%) had a M.Sc. or M.Phil. and 32 (13.7%) held a B.Sc. degree. Altogether 86.3 percent of the respondents possessed a post-graduate qualification. One hundred and seventy (73.3%) respondents acquired their highest academic qualification from overseas and the remaining 62 (26.7%) from the local academic institutions. Two respondents did not provide information about the place of getting their highest academic qualification.

Majority of the respondents has had substantial work experience. Over 67 percent of them had more than 10 years' work experience as compared to 13.4 percent who had a working experience of five years or less.

Methods used for getting information from the library

Respondents were asked to indicate how they get the needed information from the library. The purpose was to find out whether respondents prefer visiting the library personally or using other options for getting the needed information. It was found that all participants visited the library, though with varied frequencies. Of the 234 respondents, 78 (33.3%) visited their library

'always', 92 (39.3%) 'frequently' and 64 (27.4%) 'occasionally' (see Table 2).

One hundred and seventy-eight (76.1%) participants responded to the method 'sending junior professional' to the library to get the needed information for them. Of these respondents, 4 (2.2%) sent junior professionals 'always', 17 (9.6%) 'frequently' and 66 (37.1%) 'occasionally'. The remaining 91 (51.1%) of these respondents reported that they never send the junior professionals to get information for them. A similar pattern was observed for the method 'sending paraprofessionals'. Of the 179 respondents, 86 (48.0%) reported that they never used this method. Of the remaining 93 participants who used this method, 4 (2.2%) used it 'always', 28 (15.7%) 'frequently', 61 (34.1%) 'occasionally'.

One hundred and eighty-two participants responded to the option 'calling the library' for acquiring the needed information. Of these respondents, 1 (0.5%) reported using this method 'always', 17 (9.4%) 'frequently', and 113 (62.1%) 'occasionally'. Fifty-one (28.0%) respondents reported that they had never used this method. A split response was received for the method 'writing to the library'. Of the 164 respondents, 83 (50.6%) mentioned that they use this method for getting the needed information.

In response to an open-ended option for this question, only three UPM academicians reported that they 'occasionally' used their graduate students for getting information from the library. However, it is interesting to note that of the 16 interviewees from UPM, 12 (75.0%) mentioned that they occasionally used their students for getting information from the library.

Table 3 presents the ranking of different information-seeking methods based on their mean scores. It was observed that the preferred method for obtaining information was visiting libraries in person (mean score=2.06). This was followed by other options such as 'sending paraprofessionals' (mean score=1.40) and 'junior professionals' (mean score=1.29). The least preferred method was 'writing to the library' with a mean score of 1.11.

During interviews it was found that a majority of the respondents personally visit the library when they need to search the library OPAC, scan periodicals, and use other sources for identifying new information on their topics. However, they

Table 2: Methods Used for Getting Information from the Library

Method	Visit Frequency			
	Always	Frequently	Occasionally	Never
Going to Library Themselves (N=234)	78 (33.3%)	92 (39.3%)	64 (27.4%)	-
Sending Junior Professionals (N=178)	4 (2.2%)	17 (9.6%)	66 (37.1%)	91 (51.1%)
Sending Paraprofessionals (N=179)	4 (2.2%)	28 (15.7%)	61 (34.1%)	86 (48.0%)
Calling the Library (N=182)	1 (0.5%)	17 (9.4%)	113 (62.1%)	51 (28.0%)
Writing to the Library (N=164)	-	9 (5.5%)	74 (45.1%)	81 (49.4%)

Table 3: Ranking of Information Seeking Methods

Scale: 1. Occasionally 2. Frequently 3. Always

Ranking	Method	N	Mean	Standard Deviation
1.	Going to Library Themselves	234	2.06	.78
3.	Sending Paraprofessionals	93	1.40	.61
4.	Sending Junior Professionals	87	1.29	.55
2.	Calling the Librarian	131	1.15	.37
5.	Writing to the Librarian	83	1.11	.31

used other methods for getting photocopies of articles, checking out books or getting information from other sources already known to them. It would be interesting to study the effect that remote searching of OPACs, contents of periodicals, and bibliographic databases may have on personal library visits.

Information collection methods and institutional affiliation of respondents

An institution-wise breakdown of respondents using different methods for getting information from the library is presented in Table 4. All participants visited the library in person. Well over one-half of the participants from different institutions, except for RRIM and MARDI (out stations), sent their junior professionals to get needed information from the library. About one-quarter of

Table 4: Methods Used for Getting Information from the Library by Institution

Method	UPM	MARDI (Head Office)	MARDI (Out Stations)	PORIM	RRIM	FRIM	χ^2
Going to Library Themselves	60 (100%) (N=60)	49 (100%) (N=49)	38 (100%) (N=38)	24 (100%) (N=24)	33 (100%) (N=33)	30 (100%) (N=30)	Not applicable
Sending Junior Professionals	25 (58.1%) (N=43)	20 (51.3%) (N=39)	7 (24.1%) (N=29)	12 (57.1%) (N=21)	9 (42.9%) (N=21)	14 (56.0%) (N=25)	$\chi^2=10.056$ $df=5$ $p>.05$
Sending Para- Professionals	32 (68.1%) (N=47)	21 (52.5%) (N=40)	3 (10.3%) (N=29)	13 (68.4%) (N=19)	10 (50.0%) (N=20)	14 (58.3%) (N=24)	$\chi^2=31.139$ $df=10$ $p<.01$
Calling the Library	33 (76.7%) (N=43)	24 (61.5) (N=39)	15 (53.6%) (N=28)	16 (76.2%) (N=21)	18 (81.8%) (N=22)	24 (82.8%) (N=29)	$\chi^2=8.559$ $df=5$ $p>.05$
Writing to the Library	14 (37.8%) (N=37)	14 (36.8%) (N=38)	23 (76.7%) (N=30)	11 (68.8%) (N=16)	10 (50.0%) (N=20)	11 (47.8%) (N=23)	$\chi^2=52.625$ $df=5$ $p<.01$

the respondents from MARDI (out stations) assigned this work to the junior professionals. The same trend was observed for the option 'sending paraprofessionals'. About 50 to 68 percent of the respondents from all institutions, except MARDI (out stations), used this method. It is quite natural that individuals from out stations are less likely to send junior professionals to get needed information from the main library (MARDI head office) because this would have financial and administrative implications. During interviews it was learned that respondents or their colleagues from out-stations, while visiting their head office for attending meeting or for undertaking other jobs, often also visit the library to get needed information.

It was observed that from 76 to nearly 83 percent of the respondents from UPM, PORIM, RRIM and FRIM called the library to get needed information. On the contrary, 61.5 percent of the respondents from MARDI (head office) and 53.5 percent from MARDI (out stations) used this method. One possible reason for a fewer number of respondents from MARDI (out stations) using this option might be due to the high cost of long-distance calls. An opposite pattern was observed for the method 'writing to the library' to get the required information. The highest number of respondents using this method was from MARDI (out stations). It might be due to the fact that making written requests for the needed materials was the most economical method for the re-

spondents working in MARDI out stations. It was also observed that fewer UPM respondents (37.8%) wrote to their library as compared to respondents from research institutions (54.3%). However, the Chi-square test showed significant differences among respondents from different institutions for only two methods, sending paraprofessionals and writing to the library.

We can conclude that a majority of the participants preferred to visit the library personally, though frequency of library visits varied for different agricultural institutions. We also observed that the UPM respondents were the least frequent visitors of the library. They preferred sending junior professionals, paraprofessionals, laboratory technicians and postgraduate students to get information for them. This finding is supported by the fact that, on the average, UPM participants spent 9.3 percent of their office time on reading and literature searching as compared to 16 percent by respondents from agricultural research institutions (Majid 1999). Other methods of obtaining information from the library were relatively less popular among the respondents. A similar study by Kissam (1999) on the use of library by the law faculty at the International Islamic University Malaysia showed that besides personally visiting the library, respondents also used other methods for getting the needed information. Of the 66 respondents, 36 (54.6%) called the library and 13 (28.8%) sent students for this purpose.

Table 5: Location of the Library

N=233

Library Location	UPM	MARDI (Head Office)	MARDI (Out Station)	PORIM	RRIM	FRIM
Convenient	55 (91.7%)	44 (89.8%)	18 (48.6%)	24 (100%)	22 (66.7%)	30 (100%)
Inconvenient	5 (8.3%)	5 (10.2%)	19 (51.4%)	-	11 (33.3%)	-

Chi-square = 52.625, *df* = 5, *p* < .001

Table 6: Frequency of Library Visits and Institutional Affiliation

N=233

Visit Frequency	UPM (N=60)	MARDI (Head Office) (N=49)	MARDI (Out Stations) (N=37)	PORIM (N=24)	RRIM (N=33)	FRIM (N=30)	Total
Twice a Week or Less	25 (41.7%)	21 (42.9%)	8 (21.6%)	16 (66.7%)	12 (36.4%)	20 (66.7%)	102 (43.8%)
Once or Twice a Month	22 (36.7%)	22 (44.9%)	7 (18.9%)	5 (20.8%)	13 (39.4%)	10 (33.3%)	79 (33.9%)
Several Times a Year or Less	13 (21.6%)	6 (12.2%)	22 (59.5%)	3 (12.5%)	8 (24.2%)	-	52 (22.3%)

Chi-square = 22.405, *df* = 8, *p* < .01

Library location

Respondents were asked if location of the library was convenient for them for visiting and using library collections and facilities. All the respondents from PORIM and FRIM felt that the location of their library was convenient (Table 5). A majority of the respondents from UPM and MARDI (head office) shared this opinion. One-third of the participants from RRIM considered the location of their library inconvenient. Over one-half of the out station respondents from MARDI quite naturally considered the location of the main library inconvenient. The Chi-square test showed significant differences among respondents from different institutions for their perception about the convenient location of their library.

Frequency of library visits

Table 6 presents information on library visits by participant. They were asked how frequently they visit their library. One hundred and two (43.8%) respondents reported that they visited their library 'at least once or twice a week'. Another 33.9 percent of the respondents mentioned that, on the average, they visited their library 'once or twice a month'. Altogether 77.7 percent

of the respondents visited the library 'at least once a month'. It was better than the University of Zambia, where 60 percent of the respondents from science faculty visited the library either rarely or only once a month (Mwila 1993). Similarly, about 84 percent of the petroleum scientists and engineers in Nigeria visited their library only a few times in a year (Nkereuwem 1984).

Relationship between frequency of library visits and institutional affiliation of respondents

Respondents from various agricultural institutions demonstrated a different pattern of library visits. Two-thirds of the respondents from FRIM and PORIM visited the library 'at least once a week'. Nearly 42 percent of the respondents from UPM and MARDI (head office) exhibited a similar frequency of library visits. On the contrary, only 21.6 percent of the participants from MARDI (out stations) visited the central library 'once or twice a week'. One possible reason for fewer library visits by these individuals may be the long distance of some MARDI out stations from the central library.

The Chi-square test was administered to find out if significant differences existed among partici-

Table 7: Frequency of Library Visits and Location of Library
N=233

Visit Frequency	Location	
	Convenient (N=193)	Inconvenient (N=40)
Twice a Week or Less	93 (48.2%)	9 (22.5%)
Once or Twice a Month	69 (35.8%)	10 (25.0%)
Several Times a Year or Less	31 (16.0%)	21 (52.5%)

Chi-square = 25.835, *df* = 2, *p* < .001

Table 8: Frequency of Library Visits and Age Groups of Respondents
N=233

Visit Frequency	Age Groups			
	30 years or Below (N=24)	31-40 Years (N=58)	41-50 Years (N=139)	51 Years or Above (N=12)
Twice a Week or Less	17 (70.8%)	28 (48.3%)	51 (36.7%)	6 (50.0%)
Once or Twice a Month	7 (29.2%)	20 (34.5%)	50 (36.0%)	2 (16.7%)
Several Times a Year or Less	-	10 (17.2%)	38 (27.3%)	4 (33.3%)

Chi-square = 15.622, *df* = 6, *p* < .05

pants from different institutions for their library visits. High significant differences were found among respondents from various agricultural institutions for their frequency of library visits.

Relationship between frequency of library visits and location of library

Table 7 shows the relationship between the frequency of library visits and the location of libraries. Ninety-three (48.2%) respondents who perceived location to be 'convenient' reported that they visited the library at least once a week. On the contrary, only 22.5 percent of the respondents who considered the library's location 'inconvenient' indicated that they visited the library at least once a week. A majority of the respondents in this category (inconvenient) visited the library infrequently. The Chi-square test showed very high significant differences between both categories of respondents for their frequency of library visits. This is in line with the findings of a study by Shanmugam (1999) that showed a re-

Table 9: Occasions of Extensive Library Use
(Multiple Response)
N=232

Occasion (Ranked)	Number	Percentage
While writing research reports	205	88.4
While preparing research proposals	203	87.5
While conducting actual research	159	68.5
While submitting future research plans	139	59.9
While going to attend conferences	100	43.1
While preparing for lectures	76	32.8
During off-season of the research crop	46	19.8
While scrutinizing research proposal from other researchers	42	18.1
While preparing for interviews	14	6.0
Other occasions	12	5.2

lationship between ease of access and use of a library. It can be concluded that those patrons who consider location of the library convenient are likely to visit the library more frequently.

Relationship between frequency of library visits and age of respondents

Relationship between frequency of library visits and age of the respondents is presented in Table 8. Over 70 percent of the respondents in the age group '30 years or below' visited their library once or twice a week. Nearly one-half of the respondents in the age groups '31-40 years' and '51 years or above' visited the library at least once a week. On the whole, the frequency of library visits generally decreased with increase in age of the respondent. The Chi-square test showed significant differences among respondents from different age groups for their frequency of library visits. It may be concluded that younger scientists visit their library more frequently as compared to their senior colleagues. It seems that the managerial and supervisory roles of older scientists affect their library visits.

Occasions of extensive library use

It was assumed that there might be certain occasions when respondents would be using the library more extensively. In order to verify this assumption, a list of possible occasions was provided in the questionnaire with an open-ended option. Respondents were asked to choose any number of options according to their situation. The analysis of responses, presented in Table 9,

Table 10: Occasions of Extensive Library Use and Institutional Affiliation
(Multiple Response)
N=232

Occasion	Number of Respondents				
	UPM (N=60)	MARDI (N=85)	PORIM (N=24)	RRIM (N=33)	FRIM (N=30)
While writing research reports	52 (86.7%)	76 (89.4%)	24 (100.0%)	27 (81.8%)	26 (86.7%)
While preparing research proposals	46 (76.7%)	78 (91.8%)	23 (95.8%)	27 (81.8%)	29 (96.7%)
While conducting actual research	40 (66.7%)	52 (61.2%)	16 (66.7%)	23 (69.7%)	24 (80.0%)
While submitting future research plans	28 (46.7%)	56 (65.9%)	13 (54.2%)	17 (51.5%)	25 (83.3%)
While going to attend conferences	23 (38.3%)	47 (55.3%)	6 (25.0%)	10 (30.3%)	14 (46.7%)
While preparing for lectures	4 (78.3%)	13 (20.0%)	2 (8.3%)	6 (18.2%)	4 (13.3%)
During off-season of the research crop	9 (15.0%)	25 (29.4%)	3 (12.5%)	4 (12.1%)	5 (16.7%)
While scrutinizing research proposals from other researchers	7 (11.7%)	16 (18.8%)	2 (8.3%)	8 (24.2%)	9 (30.0%)
While preparing for job interviews	2 (3.3%)	3 (3.5%)	-	3 (9.1%)	6 (20.0%)
Other occasions	3 (5.0%)	4 (4.7%)	2 (8.3%)	1 (3.0%)	2 (6.9%)

revealed that there were two occasions when agricultural libraries were used extensively. Two hundred and five (88.4%) participants consulted the library more frequently ‘while writing research reports’. Two hundred and three (87.5%) participants used their library extensively ‘while preparing research proposals’. Two other occasions when libraries were used extensively were ‘while conducting actual research’ and ‘while submitting future research plans’.

Twelve participants, in response to an open-ended option for this question, mentioned other occasions when they used their library more frequently. Two such occasions were while preparing for a new academic course and while working on a new research project. Some participants reported that they used libraries more extensively while undertaking feasibility studies and providing consulting services.

Occasions of extensive library use and institutional affiliation of the respondents

Table 10 provides a breakdown of the occasions of extensive library use by the institutional affiliation of the respondents. It was observed that, irrespective of their affiliation, all respondents

used their library heavily while developing their research proposals and writing research reports. Although the use of libraries while conducting actual research was quite heavy but it was substantially lower than aforementioned two occasions. A possible explanation for it could be that during actual research most respondents might be busy in conducting field research or over-occupied in research laboratories. Other occasions did not show heavy use of library collections and facilities.

As the population of the study comprised two distinct categories of individuals, academicians and working scientists, the Chi-square test was administered for each category to find out if there was any difference between them. For this purpose, respondents from four agricultural research institutions – MARDI, PORIM, RRIM and FRIM – were grouped together. A high level of significant differences was found between both categories of users for three occasions: while preparing research proposals (Chi-square=8.68, *df*=1, *p*<.005), while preparing lectures (Chi-square=76.31, *df*=1, *p*<.001), and while submitting future research plans (Chi-square=5.91, *df*=1, *p*<.05).

We conclude that a majority of the participants are likely to use their library more extensively

during two important stages of research, proposal development and report writing. Comparatively fewer respondents visit libraries during actual execution of their research projects. A majority of UPM respondents also used the library extensively while preparing their lectures in addition to research-related activities.

Conclusions and suggestions

The role of libraries in scientific research need not be over-emphasised. Dr. Abdul Qadeer Khan (1998), the renowned Pakistani scientist, once said:

I will say without exaggeration that if the Quran from Islam and the Bible from Christianity is taken away, nothing is left. Similarly libraries are indispensable for national development and scientific advancement. Their existence is as critical as revealed books for any religion.

However, in order to come up to the expectations of scientists, librarians need to thoroughly understand their needs and the ways they consult their library. The results of this study revealed that respondents visited their library for searching OPAC and scanning periodicals whereas they sent paraprofessionals and junior scientists for getting photocopies of articles and checking out books or other materials already known to them. A majority of the respondents who considered location of their library convenient reported visiting it more frequently.

Respondents used their library more extensively while developing research proposals and writing research reports. In order to support research activities of the scientists effectively, librarians need to become an integral part of the research system. They must convince management to allow library representation on the institutional research committee(s) considering new projects or reviewing the progress of ongoing research. Such an interaction would help library professionals to get first-hand information on institutional priorities and on future directions for research. Librarians can also take this opportunity to promote library services and facilities as well as draw the attention of the management to problems encountered by them. Frequent interactions with researchers would also make the library more visible and its role in scientific research would be better understood and acknowledged.

References

- Al-Shanbari, H. and A. J. Meadows. 1995. Problems of communication and information-handling among scientists and engineers in Saudi universities. *Journal of Information Science* 21(6): 473-78.
- Bunyan, L.E. and E. M. Lutz. 1991. Marketing the hospital library to nurses. *Bulletin of the Medical Library Association* 79(2): 223-25.
- Cabrajec, L. and Z. Dukic. 1991. Communication practices of Croatian scientists. *International Library Review* 23(3): 237-53.
- Ellis, D., D. Cox, and K. Hall. 1993. A comparison of the information seeking patterns of researchers in the physical and social sciences. *Journal of Documentation* 49 (4): 356-69.
- Folster, MB. 1995. Information seeking patterns: social sciences. *Reference Librarian*, 49/50: 83-93.
- Gooch, P. 1994. Information flows in agricultural research in Vietnam: status and prospects. *IAALD Quarterly Bulletin* 39(4): 312-18.
- Hart, R. L. 1993. The information-gathering behaviour of the faculty of a four-year state college. Doctoral dissertation, The University of North Carolina at Chapel Hill.
- Khan, Abdul Qadeer. 1998. Role of library in scientific research and development. *Pakistani Librarian*, No. 4: 1-7.
- Kim, M. J. 1990. Planning for dissemination of scientific and technical information in information centers in the Republic of Korea: a suggested model. Ph.D. dissertation, Texas Woman's University.
- Kassim, G. M. 1999. Information seeking behaviour of IIUM law faculty members. Masters thesis, International Islamic University Malaysia.
- Leckie, G. L., K. E. Pettigrew, and C. Sylvain. 1996. Modeling the information seeking of professionals: a general model derived from research on engineers, health care professionals, and lawyers. *Library Quarterly* 66(2): 161-93.
- Majid, S., M. A. Anwar, and T. S. Eisenschitz. 1998. Adequacy of collections in Malaysian agricultural libraries. *Malaysian Journal of Library & Information Science* 3(2): 35-47.
- Majid, S. 1999. Effectiveness of Malaysian agricultural libraries. Ph.D. thesis submitted to City University, London.
- Mwila, A. B. 1993. The use of the University of Zambia library by the social science, humanities, and science faculties. Ph.D. dissertation, University of Michigan.
- Nkereuwem, E. E. 1984. An analysis of information use by scientists and engineers in the petroleum industry in Nigeria. Ph.D. dissertation, University of Michigan.

- Oslon, J. K. 1989. Strategic issues in information: with special reference to developing countries. *IAALD Quarterly Bulletin* 34(3): 119-25.
- Perera, M. J. C. 1995. Development of scientific information services in Sri Lanka: A perspective with special reference to agriculture. *IAALD Quarterly Bulletin* 40(4): 109-13.
- Reneker, M. H. 1993. A qualitative study of information seeking among members of an academic community: Methodological issues and problems. *Library Quarterly* 63(4): 487-507.
- Saracevic, T. 1980. Perception of the needs for scientific and technical information in less developed countries. *Journal of Documentation* 36(3): 214-67.
- Shanmugam, A. 1999. Information seeking behaviour of trainee teachers in selected teacher training colleges in Malaysia. *Malaysian Journal of Library & Information Science*, 4(1): 1-26.
- Spath, M. and L. Buttlar. 1996. Information and research needs of acute-care clinical nurses. *Bulletin of Medical Library Association* 84 (10): 112-16.
- Strother, E., D. Lancaster, and J. Gardiner. 1986. Information needs of practising dentists. *Bulletin of Medical Library Association* 74 (3): 227-30.
- Syed Salim Agha. 1983. Response to the information needs of the agricultural sector in Malaysia. Paper presented at the 6th Congress of Southeast Asian Countries, Singapore, 30 May-3 June 1983.
- Szarina, Abdullah. 1992. Science and technology information systems in Malaysia. *Asian Libraries* 2 (3): 38-49.
- Wasserman, P. 1991. Information transfer in science and technology: An overview. *Asian Libraries* 1(2): 27-38.
- Yassin, S. M. 1981. Information needs of the Malaysian agricultural community: A study conducted by Universiti Pertanian Malaysian and UNESCO, unpublished report. (cited by Syed Salim Agha, 1983).
- Zammarano, K. T. 1979. A study of the information needs of FAO agricultural staff. Master's thesis: City University, Department of Information science.
- Zhang, X. 1992. Information-seeking patterns and behaviors of selected undergraduate students in a Chinese university. Ph.D. dissertation: Columbia University.

Note

- * A copy of the complete questionnaire is available from Shaheen Majid: Email: shaheen@iiu.edu.my.