Information needs and information seeking behaviour of rural dwellers in Sarawak, Malaysia

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ABSTRACT
This research aims to investigate the information needs and information seeking behaviour of the rural dwellers in Sarawak focusing on identifying their information needs; examining their use of information sources; assessing their perception of quality and accessibility of the information sources; and determining the barriers to information seeking. An interviewer-administered questionnaire survey is adopted for data collection, from the rural dwellers, covering broadly the northern, central, and southern regions of Sarawak. This study covers a broader range of information needs (12 types) and use of information sources (20 sources) of the rural dwellers in Sarawak. Using a quota sampling technique based on geographical region, data are collected from 130 respondents in each region, a total of 390 respondents. This paper reports the research findings using descriptive statistical analysis. The rural dwellers have the highest needs in the area of religion, health and medical, as well as entertainment, leisure, and sports. They have the lowest needs for information about social welfare, politics, and general/state election. The popularity of digital sources such as the Internet, social media, and mobile applications have become the main source of information seeking of the rural dwellers, with the traditional sources such as television, radio, and newspapers are still being widely used. When the perception of information source quality and accessibility is high, the frequency of using the source for information seeking is also high. Poor infrastructure and limited financial ability are cited as the main barriers to information seeking among the rural dwellers.

Keywords: Information needs: Information quality; Accessibility of information sources; Barriers to information seeking; Rural dwellers.

INTRODUCTION

In this 21st century, possessing the right information at the right time is utmost important in everyone's life. Different individuals have different information needs in their daily life, be it for work or non-work purposes. With the advancement of information and communication technologies (ICT), various digital enabled information products and services have emerged and are replacing the traditional information sources to meet individuals' information needs. Nevertheless, not everyone is fortunate to have access to ICT to fulfil their information needs. Generally, urban folks have less issues in accessing the digital information sources as the digital infrastructure is

commonly better developed. However, it is not the case for their rural counterparts where the digital infrastructure is less developed and their access to digital information sources is often affected by socio-economic condition. The inability to gaining the required information in a timely fashion may further accelerate the inequality of economic, socio-cultural, and psychological development between people in urban and rural areas. This study, therefore, attempts to investigate the information seeking behaviours of rural dwellers, drawing on the context of least developed areas in Sarawak, Malaysia.

Sarawak is the largest state in Malaysia covering an area of 124,450 km^2. As of 2019, the total population of Sarawak is estimated to be 2.8 million (Department of Statistics Malaysia 2020b). World Bank (2018) documented that Sarawak has the highest proportion of rural population (approximately 48%) while the nation's rural population is 24 percent. With the huge geographical spread, Sarawak has the most widely dispersed rural communities in Malaysia. A large proportion of Sarawak rural household is earning below RM2,000, the highest among all the states in Malaysia (Household Income Survey 2014). Consequently, Sarawak commands the highest poverty rate of 0.9 percent (Household Income Survey 2014). In terms of digital spread, Sarawak's broadband penetration rate per 100 inhabitants is 107 as compared to 121 for the whole of Malaysia (Malaysia Communications and Multimedia Commission 2018). Rural broadband penetration rate to household stands at 29.9 percent. Malaysia Communications and Multimedia Commission (2018) also documented Sarawak as the fifth lowest cellular penetration rate per 100 inhabitants of 108.2 percent among all states as compared to the nation's average of 130.2 percent. These statistics indicate that rural dwellers may have difficulty in gaining access to the required information in a timely fashion. In addition, Alias (2018) reported that Sarawak has the fourth highest Gini coefficient (stands at 0.386 in 2016), a measure for income inequality, in the country. Income inequality brings about various socio-economic issues in the rural regions and could also diminish the opportunities for the rural dwellers to actively participate in socio-economic development and integration.

To reduce income inequality, various public policies and strategies have been implemented to improve rural development such as in education provision, telecommunication access, electricity and pipe water supply, and infrastructure development. Specifically, as of 2015 in Sarawak, under the Universal Service Provision (USP) program, Internet access through Internet Centre (formerly 1Malaysia Internet Centre) has been provided in more than 92 villages. A total of 142,054 smart devices with Internet package have been activated, and 36 village libraries and nine city/district libraries have been established. All these rural development projects have commonly emphasised the importance of information access among the rural dwellers. Indeed, access to the right information by rural communities can help them to acquire the necessary skills, knowledge, and confidence to fully participate in community affairs, which naturally helps rural dwellers to be included in socio-economic development and integration.

In the literature, from a number of studies on identifying information needs and information seeking pattern of rural communities in both developed and developing countries (e.g. Abu Bakar 2011; Anwar and Supaat 1998; Du and Haines 2017; Patrick and Ferdinand 2016; Zhang and Yu 2009), it is concluded that the information needs of rural dwellers from most countries are largely on the same parameter. The common information needs of the rural dwellers are related to the daily life or everyday life.

Everyday life information seeking is defined as the type of information seeking that "people employ to orient themselves in daily life or to solve problems not directly connected with the performance of occupational tasks" (Savolainen 1995, p. 267). Nevertheless, work and non-work information seeking are not exclusive of one another, but rather are often complementary (Case 2006, p. 130). This research differs from prior studies by focusing on both work and non-work information needs of rural dwellers.

Although numerous studies have been conducted, the literature on information needs and information seeking behaviour of rural dwellers in Malaysia is limited. The first published article about the topic was conducted by Anwar and Supaat (1998) in three villages in Selangor. After over a decade, Abu Bakar (2011) examined the information needs and sources used by women rural dwellers in Gombak district, Selangor, while Mohd-Nor, Chapun and Wah (2013) focused their study on health information needs and use of online information sources of the rural community in Serian, Sarawak. These studies, detailed in literature review, involved relatively small sample size (108, 51, and 193 respectively) using convenience sample from a single village or few villages which limit the generalisability of the findings to the population of rural dwellers in Malaysia. On the other hand, other empirical studies in Malaysia focused either on a specific group of individuals (e.g., agricultural scientists by Majid, Anwar and Eisenschitz (2000) and formal caregivers at child welfare institutions by Durahman, Yanti Idaya and Noorhidawati (2019)), or on a single type of information need (e.g., drug-related information by Ting et al. (2017) and sexual and reproductive health information by Panting et al. (2018)). These studies focused on a specific subject, and thus, provide little relevance to this research.

From the practical perspective, the Sarawak government is committed to improving and providing more rural infrastructure, to enhance connectivity and facilities to upgrade the quality of life in rural areas (Sarawak Multimedia Authority 2017). It is imperative that a study which investigates the information needs and information seeking behaviour of rural dwellers is conducted. The empirical findings from this study will enable for more pragmatic, advocacy strategies and actions to be devised. More importantly, the implication of this research is to promote the inclusion of rural dwellers in the socio-economic development of Sarawak. In sum, the literature review reveals that the call to collect empirical data to understand the information needs, use of information sources, and barriers to information seeking in the rural context is in need. Generally, this research aims to investigate the information needs and information seeking behaviour of the rural dwellers in Sarawak. The specific research objectives are to:

(a) identify the information needs of the rural dwellers;
(b) examine the information sources that the rural dwellers use to seek information;
(c) assess the rural dwellers' perception of information quality and accessibility of the information sources; and
(d) determine the barriers to information seeking among the rural dwellers.

LITERATURE REVIEW

Theoretical Foundation

Savolainen (1995) developed a non-work information seeking model based on the context of way of life and mastery of life, and called it Everyday Life Information Seeking (ELIS) model. Unlike work-related information seeking, way of life is concerned about order of things and the relationship between work and leisure time, while mastery of life relates

to keeping things in order. The model is focused on problem solving behaviour and the expectancy toward solvability of the problem. Four typologies were created using two dimensions of the seeking of orienting and practical information, which are optimistic-cognitive, pessimistic-cognitive, defensive-affective, and pessimistic-affective mastery of life. Optimistic-cognitive mastery of life is characterised by the positive belief that problems can be solved by optimal solutions using systematic and detailed analysis, which requires information seeking from different sources. Pessimistic-cognitive mastery of life has less faith in the solvability of problems, even though the systematic approach to problem solving exists. Defensive-affective is grounded on positive views concerning the solvability of problems, but affection dominates reasoning in problem solving and information seeking process. The last typology, pessimistic-affective mastery of life has doubts about the ability of solving problems and thus takes an avoidance approach to problem solving. The Savolainen's model provides a theoretical perspective on how rural dwellers with different typologies of mastery of life seek information in their everyday life. The model has been tested in the context of grocery shopping (Wimberley and McClean 2012), leisure and travel (Savolainen 2015), and job opportunities (Savolainen 2018). The current study reports only the information seeking behaviour of the rural dwellers in terms of their information needs in daily life, and the typologies of information seekers (Savolainen 1995) will be published elsewhere.

Information Needs and Information Seeking

The existing literature offers no universally accepted definition about information needs and information seeking behaviour. Different scholars focused on different perspectives of the concepts. Generally, the research community agree that information needs are a basic aspect of human need which change constantly with new and sensory inputs. However, the needs for information are motivated by different purposes, for instance, seeking answers (Taylor 1968), reducing uncertainty (Belkin 1978), and making sense (Dervin 1992).

Wilson (1999) defined information behaviour as the totality of human behaviour in relation to sources and channels of information, including both active and passive information seeking, and information use. Information seeking behaviour is described as a reaction to the recognition of an information need (Case 2006). Consistent with varying purposes of information needs, information seeking in this study involves the process of acquiring information to satisfy some goals such as learning, problem solving, and sense-making.

The study of information needs and barriers to information seeking of rural dwellers constitute a dominant aspect of information science literature in developing countries. There exist a plethora of studies, for instance, in Africa, Uta (1993) in Malawi; Momodu (2002) in Nigeria; and Mooko (2005) in Botswana; and in Asia, for instance, Chakrabarti (2001) in India, Naveed and Suhaib (2019) in Pakistan, and Anwar and Supaat (1998) in Malaysia. This research topic remains relevant in recent years where a number of articles are published in the third issue of 2019 in *Information Development*, a journal dedicated to the developments in the provision, management and use of information worldwide, with an emphasis on the information needs and problems facing the developing countries.

In general, the literature on information needs of rural dwellers falls into two broad streams. The first stream of research is focused on non-work information which covers a wider scope of topics such as health and medical information, educational and training

information, political information, religious information, among others (e.g., Uta 1993; Momodu 2002; Mooko 2005). The second stream of research is concerned with work-related information including survival of everyday life or income-generation information. These studies focus on the information needs and information seeking behaviour of rural dwellers in specific occupations such as fishermen in Nigeria (Njoku 2004), Uganda (Ikoja-Odongo and Ocholla 2003) and Bangladesh (Shuva 2017); cottage producers in India (Musib 1991), and farmers in Tanzania (Benard, Dulle and Hieromin 2018), Zambia (Kalusopa 2005), Malawi (Phiri, Chipeta and Chawinga 2019), Indonesia (Purnomo 2019) and the Philippines (Superio 2019). The major information needs by these groups of rural dwellers are related to income-generation information such as crop production, agricultural technology, financing, market, prices, and maintenance of their agricultural produce or livestock.

Information Sources

Information sources are defined as repositories that provide information and knowledge to users (Agarwal, Xu and Poo 2011). The literature on information seeking behaviour has widely examined the frequency and preferences of using different information sources to meet information needs. The information source categories may include traditional and non-traditional, print and online, and personal and impersonal (Agarwal, Xu and Poo 2011). Other scholars conceptualised information sources as either human or non-human (Woudstra, van den Hooff and Schouten 2016), or relational and non-relational (Zimmer, Henry and Butler 2007). In the literature on information sources use, impersonal sources such as TV and radio, and newspapers (e.g., Momodu 2002; Uta 1993), and personal sources such as relatives, friends, neighbours, and community leaders (e.g., Chakrabarti 2001; Folitse et al. 2018; Mooko 2005; Msoffe and Ngulube 2016) are the widely used information sources among the rural dwellers. Emerging information sources such as the Internet and social media are also used by rural dwellers as reported by Du and Haines (2017) and Folitse et al. (2018). However, some studies reported that the use of digital sources among the rural dwellers is either none (Okwu and Lorkaa 2011) or low (Mahindarathne and Min 2019; Mwantimwa 2020).

Perception of Quality and Accessibility of Information Sources

Past studies have identified two dominant factors affecting seekers' choice of information sources – quality and accessibility (Msoffe and Ngulube 2017; O'Reilly 1982; Phiri, Chipeta and Chawinga 2019; Zimmer, Henry and Butler 2007). Quality of a source can be viewed from either the information received or the channels providing the information (O'Reilly 1982). A source is preferred when it offers quality information (Zimmer, Henry and Butler 2007). High quality implies reliability, relevance, timeliness, comprehensiveness, specific, accuracy and trustworthy of source (Kim and Sin 2011; O'Reilly 1982; Woudstra, van den Hooff and Schouten 2016). The perceived source quality was found to be positively related to the use of the source (O'Reilly 1982; Zimmer Henry and Butler 2007). In this study, source quality is defined as the usefulness, relevance, and reliability of the information content the source carries based on Xu, Tan and Yang (2006) and Zimmer Henry and Butler (2007). On the other hand, accessibility is the extent to which an individual perceives that source is easily available for use (Zimmer Henry and Butler 2007) or physically proximate (Xu, Tan and Yang 2006). Prior empirical studies (Kim and Sin, 2011; O'Reilly, 1982; Zimmer Henry and Butler 2007) argued that information seekers tend to minimise the access effort or cost, and use the most convenient and cheapest sources, thus, more accessible information sources are used more frequently.

The relative importance of source quality versus source accessibility in the selection of information sources remains debatable (Woudstra, van den Hooff and Schouten 2016). Researchers suggest that information seekers' source choices are highly context dependent (Agarwal, Xu and Poo 2011; Allen, Cain and Meyer 2020), varied according to individual characteristics and information needs (Chen and Lu 2020), and seeker-source relationship (Xu, Tan and Yang 2006). Hence, this study will shed light on Sarawak rural dwellers' perception of information source quality and accessibility, and their use of information sources, which is largely absent in the literature.

Barriers to Information Seeking

Barriers to information can be defined as any "obstacles hindering, delaying or preventing access to information, that is, information seeking, searching and use" (Świgoń 2011, p. 475). The barriers to information seeking can be categorised into internal or external. Internal barriers inherit from individual information seekers are either affectively or cognitively. Affective barriers are negative emotion while seeking information such as fear or worry, while cognitive barriers refers to low awareness of various information sources and lacking search skills. On the other hand, external barriers stem outside an individual information seeker, which may include spatial, temporal, and social cultural (Savolainen 2016). In the literature on barriers to information seeking among rural dwellers, internal cognitive barriers such as illiteracy, language barrier, ignorance, and awareness are commonly reported (Abu Bakar 2011; Chakrabarti 2001; Momodu 2002; Uta 1993; Naveed and Suhaid 2019). External barriers such as poor Internet access (Naeem, Bhatti and Ahmad 2020) and lack of financial ability (Mwantimwa 2020; Phiri, Chipeta and Chawinga 2019) are also reported.

Prior Empirical Research in Malaysia

Few prior studies conducted in Malaysia focused on rural dwellers in specific locations. Anwar and Supaat (1998) identify the information needs and information sources use of 108 individuals of three villages in Selangor state with no library service. The findings show that the village dwellers have an extensive range of information needs, with religious information, family bonding, current affairs, health information and education information being the most needed; and they rely very much on TV/radio, friends/neighbours, printed materials, relatives from the city, and school libraries to seek information.

Abu Bakar (2011) identifies the information needs, information sources use, and barriers to information access of 51 rural women in Gombak district, Selangor state. The findings show that the information needs of the rural women concentrate on family-related information, with finance information, child education, religious information, information about foods and health being the most needed; and they perceive mass media such as newspapers, magazines, TV and radio as more valuable sources of information. The Internet is perceived as the least valuable among all the sources and the majority of the respondents are unsure about seeking financial information on the Internet. On the contrary, another study reported that Internet source was most frequently used by rural youth populations in Selangor to seek information on education and career while government and field experts were the least used information sources among these rural youth (Shaifuddin, Ahmad and Mokhtar 2011).

Mohd-Nor, Chapun and Wah (2013) investigate the use of ICT and formal sources in seeking health information among 193 rural dwellers in Serian district, Sarawak state. The findings reveal that TV and radio are the most preferred sources used to seek health

information among the rural dwellers. A majority of them do not actively use the Internet to seek health information, even though they have access to the Internet at home or workplace. The rural dwellers also concur that the Internet provides useful health-related information in which they need to enhance ICT skills in order to search health information online effectively. In terms of barriers to information seeking, awareness and ICT training, and digital accessibility are cited as the most important barriers to seeking health information.

In general, even though the studies described are based on different research contexts, they arrived at fairly similar research findings. Nearly all studies found that the rural dwellers have an extensive range of information needs, but the needs are centred on survival or income-generation information and some social information related to health and religion. Rural dwellers also rely very much on traditional media and interpersonal networks in meeting their information needs.

METHOD

Sample and Sampling Procedures

It is worth to note that no universally accepted definition of "rural" exists in the literature. In Malaysia, only the definition of "urban" is available on the website of Department of Statistics Malaysia (2020a). The definition of urban is based on number of inhabitants (i.e., 10,000 or more) and involvement in non-agricultural activities (i.e., at least 60% of population above 15 years old). World Bank (2020) has recently endorsed a revised definition of cities, towns and rural areas based on number of inhabitants and density to facilitate comparison between countries that have significant differences in defining urban and rural areas. Rural dwellers in this study are thus defined as those who do not belong to urban areas – i.e., people living in an area with less than 10,000 inhabitants or an area with more than 10,000 inhabitants with at least 40 percent of population above 15 years old are involved in agricultural activities.

The population of the study consists of the rural dwellers in Sarawak which is approximately 1.34 million. Since the sampling frame is not accessible, non-probability sampling procedure is used in this study. Among the many types of non-probability sampling techniques, quota sampling is chosen as it can better represent the population of Sarawak in three geographical regions and be used for sub-group analyses. Using the quota sampling procedures, nine rural villages are selected based on personal contact of the researchers, covering broadly the northern, central, and southern regions of Sarawak. The selection criteria are expected to achieve a higher representativeness of the rural dwellers in Sarawak. In terms of sample size, according to Krejcie and Morgan (1970), a sample size of 384 is sufficient for a population of more than a million. A hundred and thirty responses are equally collected from the three regions of Sarawak, generating 390 respondents. A research assistant is recruited for each region and responsible to collect the required number of respondents conveniently from the selected villages. The research assistants have been trained to elicit responses from potential respondents at community hall and market of the village based on the survey protocol approved by the Human Research Ethics Committee of the researchers' affiliated institution.

The profile of the respondents is dominated by individuals of the Dayak (one of the native groups in Borneo) ethnic group (40%), aged between 18 to 29 years old (33%),

secondary school leavers (50%), and working in the retail and services sector (40%). Table 1 details the demographic information of the respondents.

Table 1: Sample Characteristics (n=390)

Demographic Information	Frequency	Percentage
Region		
Northern Sarawak	130	34
Central Sarawak	130	33
Southern Sarawak	130	33
Ethnic Group		
Dayak	157	40
Malay	89	23
Orang Ulu	70	18
Chinese	39	10
Melanau	35	9
Gender		
Male	162	42
Female	228	58
Age		
18 to 29 years old	127	33
30 to 39 years old	102	26
40 to 49 years old	101	26
50 years old and above	60	15
Highest Educational Level		
No Formal Education	6	2
Primary School	39	10
Secondary School (Form 3)	41	11
Secondary School (Form 5)	111	27
Secondary School (Form 6)	45	12
Certificate / Diploma	83	21
Bachelor's Degree	41	11
Postgraduate Degree	11	3
Missing	13	3
Occupation		
Retail and Services	156	40
Teacher	58	15
Agriculture	42	11
Homemaker	33	8
Manufacturing	28	7
Entrepreneur	24	6
Student	19	5
Public Sector	11	3
Driver	8	2
Unemployed	7	2
Retiree	4	1

Accessibility to information channels such as mass media and information services is crucial for the rural dwellers to seek for information. As shown in Table 2, more than 80 percent of the respondents have access to television, radio, and mobile data. However, less than two-thirds of them have the access to broadband Internet services (62%), and less than half of them have access to satellite television (49%). Library or information centre is rated as the least accessible information services by the rural dwellers (47%). Table 2 presents the respondents' accessibility to different types of information channels.

Table 2: Accessibility to Information Channels (n=390)

Mass Media	Frequency (Percentage)
Mobile Data	325 (83%)
Television	315 (81%)
Radio	310 (80%)
Broadband Internet	240 (62%)
Satellite Television	189 (49%)
Library / Information Centre	183 (47%)

Note:
Accessibility to information channels is measured by "Yes" or "No". The frequency denotes "Yes"

Data Collection Method

An interviewer-administered survey is used to gather responses of the rural dwellers concerning their information needs, use of information sources, perceived quality and accessibility of information sources, and barriers to information seeking. The interviewer-administered questionnaire allows research assistants to build a good rapport with the respondents and to explain the content of the survey or answer any queries should the respondents have any doubts. Questionnaire survey is probably the most appropriate method to collecting original data for direct observation and to describe a large population. In addition, questionnaire survey is an economical and efficient way of collecting primary data across different villages throughout Sarawak.

The survey instrument is developed based on ELIS model and other prior related studies. The survey instrument contains questions concerning the major variables under investigation and relevant demographic information. The survey form is prepared in three languages – English, Malay, and Chinese to cater for the respective respondent ethnicity. The aspects covered in the survey instrument are described as follows:

Information Needs. Information needs comprise both work and non-work related information. Work-related information includes information for income generation such as information about agricultural production, agricultural technological, market, product prices information, financing/credit, agricultural maintenance, agricultural policies and regulations, trading/business and job opportunities information. Non-work related information includes education and training information, health and medical information, religious information, entertainment, leisure, and sports information, social welfare information, rural development information, community information, consumer information, and information about politics and general/state election. The types of information needs are adopted from Anwar and Supaat (1998) and Chakrabarti (2001). Respondents identify their information needs based on a six-point scale labelled as: 1 – 'never'; 2 – 'less than once a year'; 3 – 'few times a year'; 4 – 'at least once a month'; 5 – 'at least once a week'; and 6 – 'at least once a day'.

***Information Sources*.** Both personal and impersonal sources are included. Personal sources cover family members, relatives, friends, neighbours/fellow villagers, community leaders, school teachers, medical practitioners, religious leaders, government officials and social workers/ NGOs. Impersonal sources consist of both print and online sources such TV, radio, the Internet, social media, mobile applications, library/information centre, newspapers, magazines, books, and other printed materials such as brochures/leaflets/posters/banners/ buntings. The categories of information

sources are adopted from Momodu (2002) and Mooko (2005). Respondents use the list of 20 information sources to indicate the frequency of using these sources in information seeking based on a six-point scale, similar to that of information needs.

Perceived Information Source Quality* and *Accessibility. Perceived information source quality consists of four items, namely relevance, usefulness, reliability, and trust. While, perceived accessibility consists of four items – readily availability, easiness to obtain from the sources and nearby location, and easiness to understand. The items for perceived source quality are adopted from Hardy (1982), Marton and Choo (2002), and O'Reilly (1982), and the items for perceived source accessibility are adopted from Anderson et al. (2001), Curley, Connelly and Rich (1990), Marton and Choo (2002), and O'Reilly (1982). Respondents use the list 20 information sources to indicate their perception of quality and accessibility of each sources in information seeking based on a five-point scale, ranging from 1 – 'low' to 5 – 'high'.

***Barriers to Information Seeking*.** Barriers to information seeking include poor infrastructure, poor literacy, language barrier, limited financial ability, poor digital access, lack of interest/ignorance. These six items are adopted from Chakrabarti (2001) and Momodu (2002). Respondents use the list of six barriers to indicate their agreement of each barrier to information seeking based on a five-point scale, ranging from 1 'strongly disagree' to 5 – 'strongly agree'.

Demographic Information and Accessibility to Information Channels. Demographic information includes five questions – ethnic group, age, gender, highest educational level, occupation. An additional question on their accessibility to six types of information channels (Radio, TV, Satellite TV, broadband Internet, mobile data, and library/information centre) which is measured by 'Yes' or 'No' response.

Data collected from the questionnaire survey are descriptively analysed using the data analysis packages in R. Specifically, this study employs *dplyr* package for data manipulation using frequency and percentage, and the *pastecs* package for descriptive statistics using mean and standard deviation. As this study collects data from a single source, common method bias may exist. As such, this study conducts Harman's one-factor test to assess the potential common method bias in the study. The test shows the variance explained by a single factor is 29%, well below the threshold of 50% which indicate that common method bias may not pose a serious threat to the findings.

RESULTS AND DISCUSSION

Information Needs of the Rural Dwellers

As shown in Table 3, the rural dwellers have the highest needs for religious information (M = 3.75; SD = 1.38) followed by health and medication information (M = 3.72; SD = 1.23), and entertainment, leisure, and sports information (M = 3.71; SD = 1.28). The lowest needs are for information about general or state election (M = 2.85; SD = 1.32) and politics (M = 3.05; SD = 1.29). The results are different from most of the prior studies where work-related information such as income generation tops the list of rural dwellers' information needs. It could be due to the reason that about a third of the respondents either have a stable job (e.g., teachers) or are not currently working (e.g., homemakers, students, or retirees). Nevertheless, information about work such as income generation (M = 3.57: SD = 1.24) and job opportunities (M = 3.55; SD = 1.31) are

not far behind, as they are ranked fourth and sixth respectively. The rural dwellers in Sarawak have the highest information needs for religion as belief in faith is an important part of the everyday life of Malaysians which consist of a multi-ethnic and multi-religious society with a strong religious heritage (Butler, Khoo-Lattimore and Mura 2014). Needs for information about health and medication remain high among the rural dwellers and are consistent with the findings by Anwar and Supaat (1998) and Abu Bakar (2011) on Malaysian rural dwellers. On the other hand, the lowest information needs for politics and elections can be explained by low level of political activism among the younger people of below 40 years old (Hed and Grasso 2020), who constitute almost 60 percent of the respondents in this study. This finding also corroborates the study by Du and Haines (2017) where politics is ranked the second lowest among the everyday information needs of the Australian indigenous people. Generally, this study provides empirical evidence of the rural dwellers' information needs that are suggested by ELIS model.

Table 3: Information Needs of the Rural Dwellers in Sarawak

Information Need	M	SD	Rank
1. Information for income generation	3.57	1.24	4
2. Information for job opportunities	3.49	1.40	6
3. Education and training information	3.55	1.31	5
4. Health and medical information	3.72	1.23	2
5. Religious information	3.75	1.38	1
6. Entertainment, leisure, and sports information	3.71	1.28	3
7. Rural development information	3.27	1.21	9
8. Social welfare information	3.25	1.19	10
9. Community information	3.34	1.21	7
10. Consumer information	3.30	1.23	8
11. Information about politics	3.05	1.29	11
12. Information about general / state election	2.85	1.32	12

Note: Information needs are measured on a six-point scale labelled as: 1 – 'never'; 2 – 'less than once a year'; 3 – 'few times a year'; 4 – 'at least once a month'; 5 – 'at least once a week'; and 6 – 'at least once a day'.

Information Sources Used

In terms of information sources used, the rural dwellers highly depend on the emerging information channels such as the Internet (*M* = 4.57; *SD* = 1.31), social media (*M* = 4.53; *SD* = 1.28), and mobile applications (*M* = 4.41; *SD* = 1.36) due to the advancement of ICT where people are now increasingly dependent on digital platforms. This finding concurs with the studies by Du and Haines (2017) and Folitse et al. (2018) where digital sources are ranked the most frequently used sources by rural communities in Australia and Ghana respectively. Nevertheless, the traditional information sources such as television (*M* = 4.52; *SD* = 1.32), radio (*M* = 4.43; S*D* = 1.36), and newspapers (*M* = 4.08; *SD* = 1.33) are still highly used for information seeking. Personal information sources such as family members (*M* = 4.02; *SD* = 1.25), friends (*M* = 3.98; *SD* = 1.25), and relatives (*M* = 3.97; *SD* = 1.18) are also frequently used by the rural dwellers in information seeking. The findings partially corroborate the studies by Folitse et al. (2018) and Msoffe and Ngulube (2016) where information sources from family and friends top their list. On the other hand, personal information sources from social workers/NGOs (*M* = 2.84; *SD* = 1.22), government officials (*M* = 2.99; *SD* = 1.21), and medical practitioners (*M* = 3.06; *SD* = 1.35), are least frequently sought by the rural dwellers. Surprisingly, the respondents rated religious leaders (*M* = 3.10; *SD* = 1.37) the next least frequently used source of information in the list although information about religion is rated the highest needs by

the rural dwellers. This finding may imply that religion information may not be acquired through religious leaders. Table 4 details the findings.

Table 4: Frequency of Use, Perception of Quality and Accessibility of Information Sources

Information Source	Frequency of Use		Quality		Accessibility	
	M	SD	M	SD	M	SD
1. Newspapers	4.08	1.33	3.68	1.06	3.68	1.06
2. Magazines	3.35	1.31	3.18	1.14	3.16	1.11
3. Books	3.39	1.32	3.22	1.14	3.18	1.07
4. Other printed materials	3.50	1.21	3.24	1.03	3.24	1.00
5. Television	4.52	1.32	3.92	0.99	3.94	1.06
6. Radio	4.43	1.36	3.89	1.02	3.90	1.08
7. Internet	4.57	1.31	3.92	1.01	3.86	1.08
8. Social media	4.53	1.28	3.85	1.02	3.81	1.06
9. Mobile applications	4.41	1.36	3.74	1.02	3.72	1.04
10. Library / Information centre	3.13	1.31	3.04	1.12	2.92	1.10
11. Family members	4.02	1.25	3.48	0.93	3.48	1.02
12. Relatives	3.97	1.18	3.40	0.91	3.44	1.02
13. Friends	3.98	1.25	3.43	0.97	3.42	1.04
14. Neighbours / Fellow villagers	3.52	1.25	3.23	1.00	3.23	1.10
15. Community leaders	3.27	1.32	3.11	1.08	3.00	1.10
16. School teachers	3.30	1.36	3.08	1.10	3.01	1.12
17. Medical practitioners	3.06	1.35	2.98	1.18	2.85	1.18
18. Religious leaders	3.10	1.37	2.96	1.14	2.89	1.16
19. Government officials	2.99	1.21	2.90	1.02	2.89	1.09
20. Social workers / NGOs	2.84	1.22	2.84	1.00	2.80	1.09

Note: Frequency is measured on a six-point scale labelled as: 1 – 'never'; 2 – 'less than once a year'; 3 – 'few times a year'; 4 – 'at least once a month'; 5 – 'at least once a week'; and 6 – 'at least once a day'. Perception of quality and accessibility of each source is measured on a five-point scale, ranging from 1 – 'low' to 5 – 'high'.

Perception of Quality and Accessibility of Resources

The information sources which were perceived to be of higher quality and more accessible were used more frequently than those of lower quality and less accessible. This finding holds across most information source types with some exception. For example, even though the Internet is the most frequently used information source (*M* = 4.57; *SD* = 1.31), perceived quality (*M* = 3.92; *SD* = 0.99) and accessibility (*M* = 3.94; *SD* = 1.06) of television is rated slightly higher. This finding supports previous work in the role of resource quality and accessibility on information sources selection (O'Reilly 1982; Woudstra, van den Hooff and Schouten 2016; Zimmer, Henry and Butler 2007). Further, the findings suggested lower preference on human information sources than non-human information sources, in which human information sources are perceived to be relatively lower in quality and accessibility. This finding is contrary to a number of recent studies in the African continent and other developing countries where rural communities preferred interpersonal sources that are easily accessed and more credible, as opposed to impersonal sources such as the Internet and television (Folitse et al. 2018; Msoffe and Ngulube 2017; Phiri, Chipeta and Chawinga 2019).

When compared to previous studies conducted in Malaysia (e.g., Abu Bakar 2011; Mohd-Nor, Chapun and Wah 2013), the rural dwellers in this study begin to use more digital platforms such as the Internet and social media than seeking information from their family and friends, moving away from interpersonal or human information sources to non-human information sources. Correspondingly, government officials, social workers/NGOs, and medical practitioners are less frequent used sources and perceived to be of lower quality and less accessible sources. This finding concurs the work of

Shaifuddin, Ahmad and Mokhtar (2011) where rural youth used least of government and field expert, and preferred Internet source. In short, the study implied evidence of improving quality and accessibility of digital information sources in rural areas. Refer Table 4 for more details.

Barriers to Information Seeking

Poor infrastructure (*M* = 3.46; *SD* = 1.26), limited financial ability (*M* = 3.43; *SD* = 1.17), and poor digital access (*M* = 3.40; *SD* = 1.23) are cited as the main barriers to information seeking by the rural dwellers, followed by poor literacy (*M* = 3.36; *SD* = 1.20), lack of interest in information seeking (*M* = 3.33; *SD* = 1.20), and language barriers (*M* = 3.24; *SD* = 1.11). Notwithstanding the differences in means between the barriers, the differences are not obvious. As this study is conducted in Sarawak, the largest state with the most dispersed population in Malaysia, the infrastructure has been the main barrier to information seeking among the rural dwellers, a finding that concurs with Msoffe and Ngulube (2016) and Mwantimwa (2020). For financial barriers, the findings are consistent with that of Phiri, Chipeta and Chawinga (2019) and Mwantimwa (2020). In terms of other barriers, the findings corroborate Nair et al. (2010) who found that high cost of computer, low computer literacy and lack of relevance and interest are the main reasons for digital divide in rural communities.

Table 5**:** Barriers to Information Seeking

Barriers	M	SD	Rank
1. Poor infrastructure	3.46	1.26	1
2. Poor literacy	3.36	1.20	4
3. Language barrier	3.24	1.11	6
4. Limited financial ability	3.43	1.17	2
5. Poor digital access	3.40	1.23	3
6. Lack of interest / Ignorance	3.33	1.20	5

Note:
Barriers are measured on a five-point scale, ranging from 1 – 'strongly disagree' to 5 – 'strongly agree'.

CONCLUSION

The results of this research, covering the identified information needs of the rural dwellers, the sources that they use to seek the information, and barriers to information seeking, provide important implications for public policy makers and for practice. Public policy makers such as those in the State Planning Unit under the Chief Minister's Department of Sarawak and Malaysia Digital Economy Corporation could use the relevant information to develop appropriate measures for improving rural information provision, to evaluate the effectiveness of existing rural development strategies and policies, and to identify areas for further improvement, in connection with the common use of mainstream media such as television and radio, and the emerging sources of the Internet, social media, and mobile applications. In particular, to promote the use of personal sources of government officials, NGOs, medical practitioners which are placed at the bottom of the information sources in terms of frequency of information seeking and the perception of quality and accessibility.

For practice, based on use frequency of information sources, libraries and information centres should reposition themselves as important information service providers in order to remain relevance in the digital era today. Mobile services providers should continue to identify and develop useful and easy-to-use mobile applications for the needs of rural dwellers. Government officials, social enterprises and NGOs should establish a stronger presence in the rural regions by having more regular communication, community services activities to reach out and engage with the rural dwellers for socio-economic development and integration. On the other hand, based on the barriers to information seeking, telecommunication companies should provide quality and affordable network services to rural regions to ensure the Internet connections are not affected by the geographical barriers.

The research is descriptive in nature, without suggesting any causal relationships between the antecedents and provision of information services. Moreover, the research provides general understanding of the rural dwellers' information needs, the use of information sources and their perceived quality and accessibility of the information sources, and the barriers to information seeking. Future studies are recommended to focus on a particular types of information needs (e.g., work-related), use of information sources (e.g., digital sources), and target group of people (e.g., rural entrepreneurs) to obtain a deeper understanding on specific information seeking behaviour. The typologies of information seekers recommended by Savolainen (1995) can be tested in relation to specific information needs and use of information sources, especially among youth in the digital era today. This study also acknowledges that human behaviour could not be adequately understood using a survey instrument. As such, future researchers may consider using other research design and data collection method such as ethnography and participant observation to explore information seeking behaviours of rural dwellers.

It is hoped that having the understanding of information needs, the use of information sources, perceived quality and accessibility of information sources, and barriers to information seeking, quality provision of information services to rural dwellers will be enabled to bring about economic and social development of rural regions and ultimately achieve a high-income and advanced state of Sarawak in 2030. This research work may also provide a reference for similar studies for other states in Malaysia, other Southeast Asian countries, and beyond.

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