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INFORMATION NEEDS AND UTILISATION AMONG FISH FARMERS IN NAMIBIA

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ABSTRACT

This study on information needs and utilization among aquaculture farmers in Namibia investigated the knowledge gap that exists between information and aquaculture production by providing research-based evidence on the nature and extent of information needed and utilised by aquaculture farmers in Namibia. The study was driven by the main research question; what are the information needs and utilisation patterns amongaquaculture farmers in Namibia? This mixed methods research employed a concurrent triangulation design, combining qualitative and quantitative research approaches. Data collection methods used for the quantitative research were surveys, and semi-structured interviews, and document analysis for the qualitative. The population comprised of all fish farmers and their managers in Namibia. The key findings of the study revealed that fish farmers lacked the required information to fulfil their information needs. They needed the information for problem solving, performing tasks and decision making. The study also showed that fish farmers needed different types of information which cuts across different disciplines and this information included agricultural information, health information, environmental information, technological information, business and trade information, and government policies and plans. Fish farmers also used information from newspapers, Internet, textbooks, experts, etc. and on various topics such as fish markets and harvests, weather forecast, types of fish species, modern fishing methods, site of shoal, fish feeds, and fishing regulations and government policies. The study highlights the importance of information and knowledge for sustainable livelihoods amongst fish farmers.

KEYWORDS:

Information needs, Information use, Information seeking behaviour, Information and knowledge sharing, Aquaculture farmers, Fish farmers

1. Introduction

The emphasis on aquaculture is quite huge in Namibia and is in-line with the country's national development strategiessince it has a significant role to play in enhancing food security, alleviating poverty and creating employment. Namibia like many other African countries is faced with challenges oflimited government support in establishing a proper information infrastructure on aquaculture. The New Partnership for Africa's Development NEPAD (2016)cited that lack of support on improving the information infrastructure is seen as the underlying factor for the decline of information services among aquaculture farmers. A study by Food and Agriculture Organisationof the United Nations (FAO (2001) also noted that lack of access to timely and accurate information has been identified as one of the constraints to the implementation of the 1995 Food and Agriculture Organisation (FAO) Code of Conduct for Responsible Fisheries.

The problems of accessing relevant and timely information on aquaculture were first tackled and dealt with at the Conference on Aquaculture in the Third Millennium held in February 2000 in Bangkok. In response to challenges faced by member states on aquaculture information, the Conference concluded by adopting a blueprint named the Bangkok Declaration and Strategy for Aquaculture Development. The Declaration identified and advanced a number of issues related to aquaculture information that needed to be addressed. These included poor understanding of the purpose of information and information activities, lack of reliable information, etc.

Namibia’s aquaculture strategic plan (MFMR, 2004), Vision 2030 and National Development Plan (NDPII) state that the aquaculture sector is expected to enhance food security, reduce poverty and increase investment by 2030. However, in all these blue prints no mention is made concerning the role of information in nurturing and developing the aquaculture sector and yet it is a common fact (as pronounced by FAO and the Bangkok Declaration) that the development of the fishing industry in Namibia needs to be supported by a proper and effective information infrastructuresince currently there is no empirical evidence that exist as to what information is needed and or utilized by fish farmers.

Over the last decade Namibia has prioritized the fisheries sector since it contributes 6.6 percent of the Gross Domestic Product (GDP) (Namibia Statistical Agency (NSA), 2021). Despite the achievements being recorded and the priority accorded on the aquaculture sector, there is a lack of literature concerning information needsand utilisation among aquaculture farmers in Namibia. The information provided is exclusively focused on policy makers, researchers, and those who manage policy decisions with little attention paid to the information needs and utilisationof the targeted beneficiaries such as aquaculture farmers.

In aquaculture and fisheries production, serious debate between women and men has been advancedregarding the circumstances, involvement, constraints, barriers, options, and benefits.Thus the information needs, and utilization pattern of man and women also need to be studied. Recognizing this, the Worldfish (2023)commits and contributes to gender equality to ensure that research and development interventions are inclusive, equitable to meet the specific needs of both women and men.To sustain this development, it becomes imperative that information on and for fish farmers be provided and accounted for.

2. Objectives of the study

Aquaculture farmers in Namibia need to be supported by the right information when carrying out their duties in order to improve productivity in their farms. This research study highlights the information needs and utilisation patterns among aquaculture farmers in Namibia.

3. Research methodology

The study used a mixed methods research, combining both qualitative and quantitative research approaches and employed a concurrent triangulation design. The study used a survey to collect quantitative data and semi-structured interviews to collect qualitative data. The population comprised of all fish farmers and their managers in Namibia. The survey respondents were selected using a census while key informants (managers) were selected using the purposive sampling technique. A census was conducted to a total of 60 fish farmers including technicians who were working in the ponds (whose work according to the researcher was seen as equal to that of the fish farmers) were included in the survey.In addition, six key informants who in this case, known as managers were sampled purposefully and interviewed in their respective work stations.

A manual database at the Ministry of Fisheries and Marine Resources (MFMR) was used as a sampling frame. Namibia receives low rainfall and has vast land which is a desert and therefore not every farmer in Namibia is considered a fish farmer. Only practicing aquaculture farmers were included in the sample. The criteria used in selecting these key informants (managers) were based on their positions, which they hold in their institutions and their knowledge of the subject area.

4. Discussion of Findings and Results

The qualitative data from questionnaires was analysed using descriptive frequencies on a statistical package, SPSS while qualitative data from interviews was analysed according to themes using Atlas.ti.

4.1 Social and economic characteristics of aquaculture farmers

The socio economic characteristics of aquaculture farmers investigated in this research study included age groups, gender, highest qualifications and years of experience.Gopi, Narmatha, Sakthivel, Uma and Jothilakshmi (2016) in their study on *Socio-economic characteristics and its relationship with information seeking patterns of dairy farmers in Tamilnadu, India* discovered that the attitude of the farmers change fast with new demands and preferences viz. quality, quantity and cost. In most cases, farmers differ in their individual characteristics, access to and utilisation of information from different sources. Such diversity among farmers could be related to various personal, socio-economical, or institutional factors.

The majority of fish farmers who participated in the survey were between the age group 31-45 years (73%), followed by 46-60 years (10%); 20-30 (15%) and the least was 61-75(2%).The oldest respondents (2%) were aged 61-75, while the youngest (15%) were aged 20-30 years. The figures showed that the majority (98%) of the respondents were below 61 years of age. This age distribution of respondents as studied by Adefalu, Aderinoye-Abdulwahab, Bello, Olorunfemi and Oba (2013)is important when researching the information needs of fish farmers since age categories may give an indication and more leverage in fish farming since the practice requires some strength to work in the ponds. The majority of respondents showed that they were still within their active and more productive years.

The study considered the gender disparity amongst respondents and showed that they were 15 females and 45 males, hence revealed that there were more males involved in fish farming than their female counterparts. The small number of females in the study involved in fish farming could be as a result of the nature of fish farming roles which involved a lot of tasks, requiring more physical and mental coordination. A study on fish farmers' information needs may reveal that the gender of an individual can influence the type and quality of work carried out by the individual (Ofuoku, Emah &Itedjere, 2008). Van der Mheen-Sluijer and Sen (1994) provided an insight on women's role in the utilisation of aquaculture information and concluded that different roles were played between females and males in fish farming. Van der Mheen-Sluijer and Sen (1994) added that females occupied themselves with less physical work whereas males were involved with tasks requiring more physical and mental input.

The educational qualifications amongst respondents were studied and showed the highest qualifications of respondents. The majority of respondents were secondary education (27) tertiary education (26) primary education (3), vocational education (3) and one (1) did not reveal his or her highest educational qualification. These figures however, showed that the majority of the fish farmers had secondary or tertiary education and were predominantly literate. Adefalu et al. (2013) argue that a farmer's level of education is expected to influence his or her innovativeness and ability to make decisions on various aspects of farming. It is important for a study on information needs to look at the level of education of fish farmers since education is highly important for sustainable aquaculture growth and development (FAO, 2012) as well as access and utilisation of information and knowledge. Since the majority of the respondents in the study had some form of education; it therefore implied that the respondents were not likely to have much difficulty in understanding and adopting modern agricultural information technologies and innovation. Farming experience and level of education generally resonate with acquisition of improved skills in agricultural production (Adefalu et al., 2013). In the same breath, education in this case is viewed as an enabler which allows the farmer to increase knowledge in order to use and exploit information and knowledge sources (Ofuoku et al., 2008).

That the majority (39) of the respondents had 1-10 years of experience in fish farming followed by (21) fish farmers who had 11-20 years of experience. The study revealed that the majority of fish farmers had some reasonable years of fish farming experience which might have facilitated their acquisition of some good skills and knowledge in fish farming production. This result is in conformity with the findings of Gopi et al. (2016), who observed that literacy and experience are important factors to all farmers for purposes of good farming methods and increasing agricultural productivity. In this study, although fish farmers appeared to have enough experience in fish farming, they still needed to be provided with information so as to increase their productivity (Adewumi, 2003).

4.2 Information and knowledge needs of aquaculture farmers

According to Rather and Ganaie (2018) an information need is the perception of a lack of information that provokes one to develop a need for it. It is often believed that an information need may exist when there is a gap between the state of the present knowledge possessed by somebody and that which they need to deal with to solve some problems or handle a present situation. The respondents were asked if they felt uncertain when they lacked information and 100% mentioned that they felt uncertain when they lacked information. It is this information gap or lacuna that arises as a result of feelings, thoughts and actions, which prompts the fish farmers to require information as noted by Kuhlthau (2001). It was also mentioned in an interview by ZA2 that the frequency with which farmers looked for information varied from daily to occasionally and this was mainly influenced by a number

of factors such as the level of education, problems encountered in their work, and eagerness to learn in order to acquire new skills

In this study, aquaculture farmers revealed that they lacked information and required information to fulfil their information needs and this need symbolises the gap between information and the action they ought to take to correct a situation.

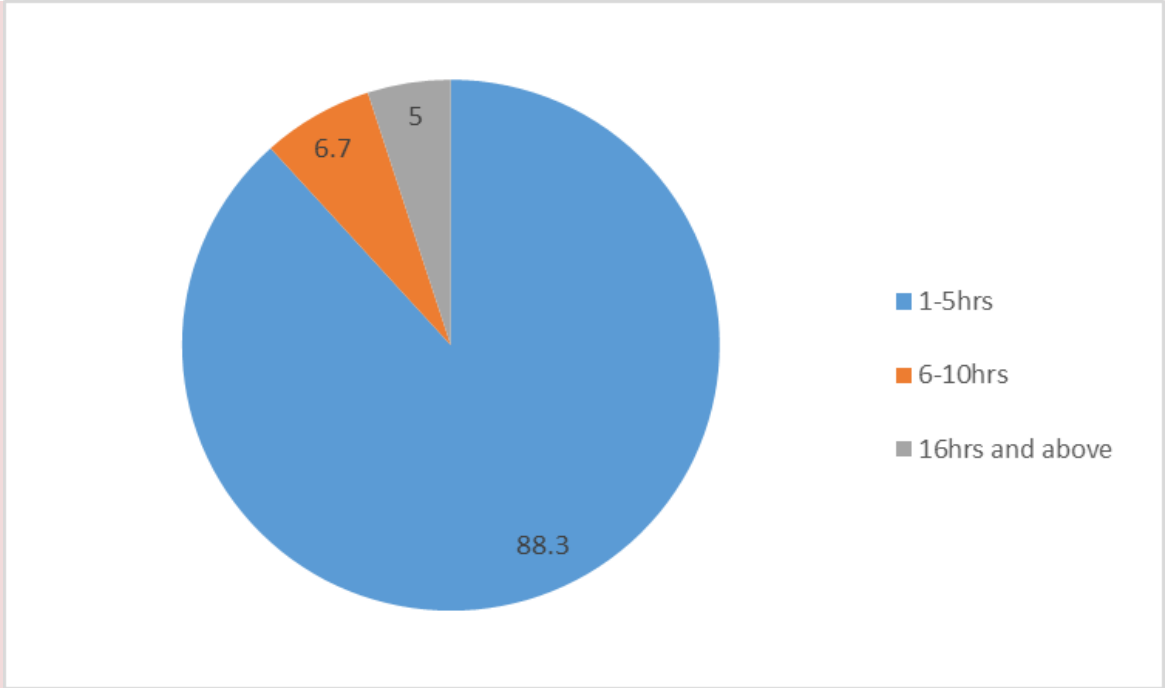

Figure 1: Time spent on gathering information

The frequency of time spent by respondents looking for information suggested that aquaculture farmers needed information on timely basis to accomplish their work or tasks. Holeh, Ochiewo, Tsuma and Mirera (2020) posit that farmers require information on regular basis related to the following: most appropriate technology options, changing farming systems, collective action with other farmers, consumer and market demands, etc.

In the Figure1 above, Eighty eight point three percent (88.3%) of the respondents mentioned that they spent 1-5 hours gathering information per week, while 6.7% spent 6-10 hours per week of their time gathering information and 5% spent 16 hours per week and above looking for information.

In Table 1, below, the majority of respondents (96.5%) revealed that they needed information for problem solving, 98% needed information for performing tasks and the same figure (98%) needed information for decision making. This need of information is inherent in an individual as suggested by Wilson's model (1999) that sees an information need as a behaviour, which arises as a consequence of a need perceived by an information user. This observation by Wilson interfaces with the definition by Nicholas and Herman (2009) who concludes that an information need is the need for information that individuals ought to have in order for them to perform their job effectively. The findings of the study revealed that fish farmers had information needs and these needs can be described as needs for information which may exist when there is a gap between the state of the present knowledge possessed by the individual farmer and that which each farmer needs to solve some problems or handle a difficult situation at his or her farm.

Table 1: Categories of information needed by aquaculture farmers

Category of information Needed	Yes	No
Emergency Problem solving	96.5	3.5
Performing tasks on aquaculture	98.3	1.7
Decision making related work	98.1	1.9

The type of information needed by fish farmers varied from agricultural, health, environmental, technological to business and trade information. In Table 2, respondents rated their need for each category of information on a 4 point Likert Scale using very often, often, sometimes and rarely (Tables 4.3-4.5). The highest scores showed that 26.7% very often needed agricultural information and 36.7% often needed agricultural information, 10% very often needed health information and 43.3% often needed health information, 21.7% very often needed environmental information and 55% often needed environmental information, 21.7% very often needed technological information and 36.7% often needed technological information, while 26.7% sometimes needed technological information, business and trade information was sometimes needed by 33.3% while 42.4% often needed government policies and plans. These high figures signify that Namibia's fish farmers in one way or the other need information just like other farmers, who require diverse information to support their farm enterprises (Ofuoku et al., 2008). Ofuoku et al. (2008) further argue that information is needed not only on best practices and technologies for crop production, which the traditional public-sector extension system provided during the Green Revolution, but also information about postharvest aspects including processing, marketing, storage, and handling.

Table 2: Types of information needed by Fish Farmers

Types of information needed	Rarely	Sometimes	Often	Very Often
Agricultural information	6.7	30	36.7	26.7
Health information	11.7	35.0	43.3	10.0
Environmental information related to aquaculture	5.0	18.3	55.0	21.7
Technological information on aquaculture	21.7	26.7	36.7	21.7
Fish business and trade information	20.0	33.3	26.7	20.0
Information on government policies	20.3	32.2	42.4	5.1

During the interviews all key informants agreed that fish farmers had specific information needs, and the information needs included the following information: weather forecasts, fish breeding, fish types and species, water quality, fish markets, aquaculture farming methods, current affairs and political situation, policy and legislative issues as well as other information on general agriculture and the environment. The key informants also explained that fish farmers used the above mentioned information for emergency problem solving, performing tasks, decision-making and keeping abreast with current trends in fish farming.In Table 3, respondents revealed that fish farmers had specific

needs of information which included, 36.7% sometimes needed information on fish markets, 31.7% often needed market information, 45% often needed information on weather conditions, 31.7% sometimes needed information on post-harvest and storage, 46.7% very often needed information on fish breeding, 33.3% rarely needed information on credit facilities, 45% often needed information on diseases and pest management, 33.3% often needed information on fish markets, stock, pricing etc., and 45% very often needed information on soil and water management. The implication of the respondents' high demand for information on weather forecast, fish breeding, fish types and species, water quality and fish markets revealed that farmers were not sufficiently knowledgeable in these areas. This could make farmers susceptible to poor fish farming practices, which might hinder their level of profit increases in fish farming production. The study is in tandem with Adefalu et al. (2013) who studied the information needs of fish farmers in Kwara State, Nigeria and found that the farmers' information needs include fish marketing, fish processing and fish preservation as they ranked these needs 1st, 2nd, and 3rd respectively, while the respondents moderately needed training on water quality management, brood stock selection and record keeping which were ranked 4th, 5th, and 6th respectively.

Table 3: Specific types of information needed by aquaculture farmers

Specific Type of information Needed	Rarely	Sometimes	Often	Very Often
Fish market information	10.0	36.7	31.7	21.7
Weather conditions	3.3	15.0	45.0	36.7
Post-harvest and storage	10.0	43.7	31.7	15.0
Fish breeding	6.7	15	31.7	46.7
Credit facilities	33.3	21.7	28.3	16.7
Market trends, prices and stock	23.3	30.0	33.3	13.3
Fish diseases and pest management	1.7	18.3	45	35
Soil and water management	5	13.3	36.7	45

4.3 Information accessed and utilised by aquaculture farmers

The study revealed that aquaculture farmers accessed information from the following places (see Table 4): 30% answered they rarely accessed and used information at home, 40% of respondents often used information centres to access information, 41.7% answered they sometimes used Non-governmental organisations (NGOs) and Community Based Organisations (CBOs) as places of accessing information, and 61.7% rarely used libraries to access information, while 28.3% sometimes used libraries to access information to satisfy their information needs. These figures confirm that respondents were active users of information and they accessed information from a plethora of places. Swanson and Rajalahti (2010) agree that aquaculture farmers access and used information related to aquaculture production activity from different sources through extension methods such as mass media, extension service (advisory service, orientation about seasonal activities information, training, field days, demonstration, visits), and on-farm research. Agricultural information is also made accessible in the many agricultural research institutes and school of agriculture in the Universities (Adomi et al., 2003) as well as the federal and state Ministries of Agriculture.

Table 4: Sources/ Channelsof information accessed and used by fish farmers

Sources/ Channels of accessing information	Rarely	Sometimes	Often	Very Often
Newspapers	28.3	40	16.7	15
Radio	18.3	33.3	23.3	25.0
Television	30.0	26.7	33.3	10.0
Training seminars	18.3	25.0	35.0	21.7
Professional colleagues	6.7	10.0	41.7	41.7
Posters	36.7	26.7	21.7	15.0
Textbooks	21.7	38.3	26.7	13.3
Internet	41.7	15.0	11.7	31.7

The study also revealed the three most important media of accessing information, which were namely, professional colleagues, seminars and training, and radios. The responses were provided in a Likert Scale in which respondents mentioned as indicated in Table 4.5 that 41.7% very often used colleagues to access information, similarly 41.7% often used colleagues to get information. The study also recorded 10% and 6.7% representing sometimes and rarely used professional colleagues to access information respectively.Table 5.5.4 shows that 35% of respondents often accessed information through training and seminars; followed by 25% sometimes accessed information through training and 21.7% very often accessed information through training. The figure of 18.3% is for those who rarely accessed information through training. The use of the radio in Table 5.5.2 is represented by 33.3% sometimes used the radio to access information, followed by 25% very often used and 23.3% often used the radio to access information. The least figure of 18.3% indicates those who rarely used the radio to access information. Radio as a media for accessing information was sometimes popular amongst fish farmers as shown in the figures above. The other media used as shown by the study included are television, newspapers, posters, text books and libraries. The findings of this study were somehow similar to discoveries by Alfred and Fagbenro (2006.) who revealed that radio and television were the most used technologies by the fish farmers in Nigeria. The slight difference between the two studies might be that the use of television is not very popular in the Namibian context because of connectivity problems since most of the fish farms are located in villages and remote areas. The few who could use television have access to alternative sources of electricity such as solar power or generators. It is instructive to note that a study by Ugboma (2010) also points out to radio and television as media platforms where farmers access information. In the Namibian context, respondents also pointed out to programmes broadcasted on radio where farmers are educated about fish production. These programmes still run today, however key informant KA1 noted that these programmes covered a wide range of agricultural issues and thereby not having regular slots on fish farming programmes on television and radio. Key informants even claimed a lack of electricity as a prohibiting factor to watch or listen to these programmes on television and radio.

4.4 Challenges of accessing and utilising information and knowledge by aquaculture farmers

The respondents revealed problems, which they encountered when accessing information. These problems included lack of skills to use media tools; illiteracy to use information, lack of transport

facilities, and lack of extension support from extension workers, lack of connection to rural electrification and lack of awareness of government responsibility as far as aquaculture farming is concerned.

Table 5: Problems encountered by fish farmers when accessing andutilising information

Challenges encountered when accessing information	Rarely	Sometimes	Often	Very Often
Inability to use ICTs	44.1	20.3	10.2	25.4
Illiteracy	91.5	8.5	0	0
Inadequate transport facilities	20	40	15	23.3
Inadequate extension workers	49.2	16.9	27.1	6.8
Lack of rural electrification	62.7	8.5	11.9	16.9
Ignorance of government responsibility	66.7	11.7	11.7	8.3

The respondents were asked whether inability to use ICT media tools is a challenge when accessing information. As indicated in Table 5, the majority (44.1%) of the respondents responded that they rarely encountered challenges of using ICT. In Table 5the results show that most fish farmers were rarely illiterate to access aquaculture information and this figure is represented by 91.5% and only 8.5% answered sometimes were illiterate to access aquaculture information. It can therefore be implied that the majority of respondents were information literate and knew how to access aquaculture information. In contrast, a study by Oladele (2006) noted that a wealth of information is not readily accessible because of many impeding variables among fish farmers which are; insufficient agricultural extension officers, lack of use of media, language barrier and the unreliable nature of electricity in Nigeria.

Table 5also reveals the rate with which respondents got supported by extension workers. The majority (49.2%) rarely lacked support from extension workers and the findings of this study contrast with findings of a Nigerian study by Ugboma (2010) which found that fish farmers saw agricultural extension officers occasionally. Fish farmers in Nigeria indicated that where information from agricultural extension officers was available, the information was found to be not current as the information received did not answer to their agitations and therefore could not solve some of their problems. Ugboma's (2010) study further reveals that farmers often fell prey to extension workers who sought bribes in order to make them visit their farms.

The majority (67.8%) were rarely ignorant of the government's responsibilities and the results showed that the majority of respondents were not ignorant of government responsibility in relation to their work as fish farmers. The Nigerian study by Ugboma (2010) showed that some fish farmers were ignorant of their government's responsibility and hence ended up losing a lot of money to pay or bribe extension workers to visit their farms and these results contrast sharply with the current study where the majority of farmers were aware of the government responsibility and information support systems rendered to aquaculture farmers.

Fish farmers noted that they encountered problems with accessing information and these problems included lack of skills to use media tools, information illiteracy, lack of transport facilities, lack of extension support from extension workers, lack of connection to rural electrification and lack of awareness on government responsibility as far as aquaculture farming is concerned. The findings revealed that the majority (62.7%) of fish farmers rarely lacked electrification in their homes followed by 16.9% that mostly lacked electrification. The remainder 11.9%, often lacked electrification and 8.5% sometimes lacked rural electrification in their homes. The analysis shows that the majority of fish farmers did not lack rural electrification and also could not see it as a challenge to use information. In contrast, a study carried out in Nigeria which cited unreliable nature of electricity in Nigeria (Ugboma, 2010) as a big challenge and impacted on the farmers' usage of information. This difference could be as a result that Namibian farmers have adapted to use alternative energy such as diesel and solar power as mentioned by one of the key informants (KW2).

Ugboma (2010) also noted that most fish farmers faced challenges of insufficient agricultural extension officers. These findings of the study in Nigeria by Ugboma differ from the results of this study, which confirmed that the majority of respondents (49.2%) rarely lacked support from extension workers, followed by 27.1% often lacked support from extension officers. 16.9% sometimes lacked support and 6.8% very often lacked support from extension officers. The study showed that the majority of respondents rarely faced inadequate support from extension workers and this could be the reason why all key informants mentioned that they supported their fish farmers with information and their doors were wide open to accommodate them in case they had any queries.

The study showed that the majority (44.1%) of the respondents responded that they rarely faced challenges of using ICT media tools followed by 25.5% who very often faced challenges to use ICT media tools. Of the respondents, 20.3% and 10.2% sometimes faced challenges to use ICT media tools and often faced challenges to use ICT media tools respectively. These figures showed that aquaculture farmers in Namibia moderately encounter problems to use media tools when accessing information and these findings could be equated to the studies by Ugboma (2010), Haruna, Obaroh, Yahaya, and Muhd (2015),Aina, Kaniki and Ojiambo (1995) and Mchombu (2006), which acknowledge that farmers encountered problems of using media tools such as ICT gadgets, and Internet. The reason could be that with the current study, fish farmers in Namibia were well supported by the government and most of which were well resourced financially had the means to equip themselves with ICT skills, unlike other studies byMchombu (2006) and Chisenga (2015), which showed that farmers lacked ICT skills due to rapid technological changes that were affecting them and making them fail to keep pace with this technological advancement (Chisenga, 2015).

The current study showed that respondents moderately faced challenges of transport facilities since many of these farmers had their means of transportation as noted by one key informant (ZA2). Ugboma (2010) also cited lack of transport facilities as a challenge faced by fish farmers in Nigeria.

Table 6: Barriers to information access and use

Barriers to information access	Yes	No
Required information not available	56.7	43.3
Incomplete information	43.3	56.7
Information sources far apart from each other	53.3	46.7

Not having enough time to look for information	15	85
Information on the subject is too vast	38.3	61.7
Outdated information on aquaculture	35	65

In Table 6, respondents cited the following as barriers to information access and use: 56.7% stated that the information that they needed for their work was not available; 43.3% faced challenges of being provided or finding incomplete information sources; 15% did not have enough time to look for information, 53.3% found that information sources were far apart from each other; 38.3% agreed that there was vast information on aquaculture and this posed as a challenge to use the information and 35% mentioned that information on aquaculture, which they came across was outdated.

The dispersing of information from each other was cited by key informant (KE2) as a problem which makes it difficult for information to be accessed and utilised. It was further mentioned by the interviewee that information on aquaculture was fragmented in different ministries: that is, Ministry of Agriculture, Water and Forestry (MAWF), Ministry of Environment and Tourism (MET), Ministry of Fisheries and Marine Resources (MFMR), Ministry of Lands and Resettlement, etc., and this lack of coordination amongst ministries in the provision of information resulted in knowledge gaps amongst fish farmers.

5. Conclusion and Recommendations

This research study showed that fish farmers need information when carrying out their duties and it was evident in the study that their needs matched the type of information which they accessed and utilised. They gathered and assembled information for different reasons such as problem solving problem solving, constructing new knowledge, performing tasks, decision making and share information with other fish farmers and to influence others. The study also showed that the majority of farmers used ICTs to access information and they used internet to access information from blogs, WhatsAppas well as the radio and television.

The study identified low usage of libraries and barriers to effective use of information such as; low levels of ICT skills, low levels of information literacy skills, low levels of understanding the subject matter and aquaculture farming practices, information sources scattered in different ministries, agencies or offices and information overload as a result of not being able to access information from the Internet. The research therefore recommends the following:

i) The Ministry of Fisheries and Marine Resources should collaborate with the Ministry of Education and Culture through the directorate of Namibia Library and Archives Services (NLAS) to provide training to farmers on information literacy; which covers areas such as retrieval of aquaculture information from online databases and the Internet, evaluating information sources and applying information to solve their daily information needs.

ii) The Ministry of Fisheries and Marine Resources should further develop their existing Portal to become a one stop shop for information access so as to enhance easy access and retrieval of information from the databases held by partner organisations and related ministries on aquaculture production.

iii) The government should accelerate the rural electrification project in Namibia as this will be the only way to accelerate the adoption and use of ICTs especially among rural farmers. This will pave way to accelerated exchange of information among farmers and extension workers as well as effective application of ICT tools. It has been observed by Ajit (2003) that linear information flows are being replaced by pluralistic information flows where new actors are emerging to form community information spaces.

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