

TITLE PAGE

**INFORMATION ACCESSIBILITY AND UTILIZATION AMONG FISH FARMERS
IN GIREI, YOLA NORTH AND YOLA SOUTH LOCAL GOVERNMENT AREAS,
ADAMAWA STATE, NIGERIA**

BY

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APRIL,

2014

DECLARATION

I hereby declare that, this thesis has been written by me and that it is a record of my own research work. It has not been presented before in any previous application for a higher degree. All references cited have been dully acknowledged.

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Date

DEDICATION

This thesis is dedicated to my son, Joshua K. Barguma.

APPROVAL PAGE

This thesis entitled “Information Accessibility and Utilization Among Fish Farmers in Girei, Yola North and Yola South Local Government Areas, Adamawa State, Nigeria” meets the regulations governing the award of Master of Science (M.Sc.) Degree in Agricultural

Extension, Modibbo Adama University of Technology, Yola and is approved for its contribution to knowledge and literary presentation.

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ABSTRACT

The study investigated the information accessibility and utilisation among Fish Farmers in Girei, Yola North and Yola South Local Government Areas, Adamawa State, Nigeria. Fish Farmers have high needs of information but the accessibility and utilisation is low in the face of the constraints they faced. The study described the socio economic characteristics of respondents, determined their information needs, assessed the fish production information available to the respondents, and determined the sources of information available to the respondents. Data for the study were generated through the administration of questionnaires to 48 respondents who were selected by the use of a snowball technique. The data was analysed using descriptive statistics such as mean, percentage and inferential statistics such as Chi – square and Pearson Product Moment Correlation (PPMC) tests which were used to test the hypotheses at 0.05 level of significance. The result revealed that, 37.5% of the respondents were between the age range of 41 – 50 years that is 58% of the respondents were above the mean age which was 45 years. Majority (83.3%) of the respondents were male and 75% were married with 72.9% of them having acquired one form of formal education or another. Civil service was their major (50%) primary occupation and 56.2% of them had household size of 6 – 10 people with 79.1% having less than 10 years of experience in fish farming. Majority (83.3%) of the respondents had high information needs on fish farming. The sources of information available to the respondents on daily basis were friends/fellow farmers (81.3%), family members (56.2%), GSM (52.1%), radio (47.1%) and television (31.2%). The most serious constraints to information utilisation were unstable electricity power supply (100%), conflicting messages (58.3%) and complexity of information (47.9%). PPMC revealed that only educational attainment had significant relationship with the respondents’ information utilization on fish farming. The study recommended that extension agents should provide adequate information on fish farming to fish farmers as their information need in that regard is high.

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ACRONYMS

AADIL	-	Adamawa Agricultural Development and Investment Limited
ADADP	-	Adamawa Agricultural Development Programme
B. Agric. Tech.	-	Bachelor of Agriculture Technology
B. Sc.	-	Bachelor of Science
CBN	-	Central Bank of Nigeria
CD-ROM	-	Compact Disk Read-Only Memory
FAO	-	Food and Agriculture Organization
FDF	-	Federal Department of Fisheries
FISON	-	Fish Society of Nigeria
GDP	-	Gross Domestic Product
GMT	-	Green-which Meridian Time
GSM	-	Global System of Mobile telephone
HND	-	Higher National Diploma
IR	-	Information Retrieval
LGA	-	Local Government Area
NCE	-	National Certificate Examination
NGOs	-	Non Governmental Organizations
NNPC	-	Nigerian National Petroleum Corporation
NPC	-	National Population Commission
PPMC	-	Pearson's Product Moment Correlation
RMRD	-	Raw Materials Research and Development Council
SMEDAN	-	Small and Medium Scale Entrepreneur Development Agency
	of	
		Nigeria
SSCE	-	Senior School Certificate Examination
UNDP	-	United Nations Development Programmes

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

In most developing countries, agriculture is the most important economic activity which provides food, employment, foreign exchange and raw materials for

industries. Agriculture provides livelihood for at least 53% of the economically active population of Africa (Ajala and Ononogbo, 2008; Mohammed *et al.*, 2009).

Among the different aspects of agricultural practices is fish farming, which has gained prominence in Nigeria since the advent of the fourth democratic republic in 1999. Fish provides cheaper source of protein (Moses, 1983), it makes a vital contribution to the food and nutritional security of about 200 million Africans and provides income for over 10 million people, consisting mostly small scale fish farmers and entrepreneurs who are engaged in fish production (World Fish Centre, 2005). According to Raw Materials Research and Development Council (RMRD, 2007), over 10 million people are directly or indirectly engaged in fishery activities in Nigeria. Fish farmers require basic information on fish farming activities. Information on fish production business, pond construction, fish fingerling sources, feed types and sources, fish diseases, prevention and cure, growth and harvesting, fish preservation, processing and marketing are required by fishermen in order to have satisfactory fish production.

Agricultural information is one resource that farmers must acquire to reduce their uncertainty and help them in decision making. In the opinion of Ndaghu (2008), information is one of the major resources needed for agricultural development. Appropriate and timely information help farmers to make more rational decision. Therefore, every farmer whether commercial or subsistence, literate or non-literate need information in order to make decision on their farming activities for agricultural improvement and productivity, hence meeting their set goals.

Information is the increase in knowledge obtained by the recipient by matching proper data elements of a variable of a problem that is an aggregation of processing of data to provide knowledge or intelligence or reduce uncertainty of the user (Burch & Starter, 1991). Information therefore, describes accumulated knowledge derived from all subjects in all forms and from all sources that could help the users reduce their level of uncertainty (Ndaghu, 2008). Food and Agriculture Organisation (FAO, 2001) reported that in many developing countries, wide adoptions of research results by majority of farmers remain quite limited. This therefore calls for a system which allows adequate information flow from researchers to farmers and vice-versa.

In agriculture, the role of information in enhancing agricultural development cannot be over emphasised. Information is vital for increasing food production and

improving marketing and distribution strategies (Oladele, 2006). According to Aina *et al.* (1995), information has a vital role to play in improving and sustaining agricultural production of any nation. Information as a factor of production is necessary to increase productivity. It has been established that poverty in Nigeria has a strong linkage with agricultural stagnation due to decline in productivity as a result of low use of information and improved technologies (FAO, 1999). The right to information becomes as fundamental as the right to food, shelter and employment. Hence, information is seen as a factor of production for which fish farmers may be willing and prepared to pay.

The enhancement of local fish production can be achieved by improving capacity in terms of enhancing access to information which can be achieved through enhanced information seeking behaviour by the use of information communication technologies (Akinbile and Alabi, 2010). Information can be said to be knowledge based on facts which arises as a result of generated data or experience. Aina (1995) defined information as the data for decision making. It is a resource that must be acquired and used in order to make an informed decision. Those who possess appropriate and timely information are likely to make a more rational decision than those without information. According to Yomi and Odefadehan (2006), every individual either literate or non-literate need information in order to take decision. Information is a patterned or formatted data. It only informs if it provides some new patterns relative to the ones already known. That is, if it reduces someone uncertainty beyond his or her existing level of knowledge. Therefore, some patterned data could be information to some people but not to others. This explains the fact that information like any socio-economic variables is not evenly distributed among members of the social-system. Information exists on a continuum from those that have access to those with low or no access. Therefore, when packaging extension information, one need to define the audience for which the reduction of some uncertainty is relevant. Such audience by concept is always at the limit of its own information threshold which is particular to the audience. Hence, the concept of target audience as specific information needs to have specific audience for whom it is addressed.

Accessibility and utilisation of information on fish farming technologies among farmers will always translate into efficiency in fish production which is very crucial in order to increase productivity (Ofuoku, et al, 2008). In the opinion of

Olawoye (1996), useful information could greatly enhance fish farmers' productivity. For fish farmers to maximize productivity and feed the nation, they must be adequately informed, as access to information is essential to increasing agricultural production. This brings to bare the need to address fish farmers' information accessibility and utilisation. Access to and utilisation of useful information is necessary to deal with a given situation (Kaniki, 1989).

1.2 Statement of the Problem

The importance of fish in human nutrition as a major source of protein cannot be over emphasised as it touches the lives of a large percentage of the population of the world. The demand for fish increased especially with its nutritional advantage over meat because it is believed that, red meat contains cholesterol. This calls for improved fish farming technologies and other information needed for improved production level (Ofuok and Itedjere, 2008). Internationally, there is growing concern among the populace about health and healthy living, most adults are encouraged to stay away from oily and fatty food especially red meat that is obtainable in animals. People are now encouraged to feed on fish, fruits and vegetables. There is growing knowledge that fishes could be grown in captivity to complement the ones in the natural lakes, rivers and ocean.

Due to increase in human population and the effect of climate change on natural rivers, streams and lakes causes these water bodies to shrink which results in decrease in fish which could be caught from the wild, thereby diminishing the supply of fish, that such low supply cannot meet the ordinary fish demands of the population. This is besides the increasing awareness of the need to feed on fish as against meat and meat products. This scenario has multiplied the need to access fish and fish products more than ever before in human history. In living up to this challenge the FAO in 1995 in collaboration with most developing countries of the world including Nigeria launched world fish production awareness. Since then many individuals have taken to fish farming, as fish farms are raised by the water body side, in open fields and within the households among other locations where fish farms are sited. Many individuals have taken to fish farming as a business, a hobby or just to provide fish for family needs. Access to sufficient information on fish farming becomes very essential to increase agricultural productivity (Mgbada, 2006). This therefore, necessitates the need for a research to investigate the extent to which fish farmers in Adamawa state

utilize information in relation to its availability and accessibility. It is against this background that this study sought to answer the following research questions:-

1. What were the socio – economic characteristics of the respondents in Girei, Yola North and Yola South Local Government Areas of Adamawa state?
2. What were the production information needs of the respondents in the study area?
3. What were the information accessible to the respondents in the study area?
4. What were the sources of information among respondents in the study area?
5. Which information were utilized by the respondents in the study area?
6. What were the challenges experienced by respondents in accessing and utilization of fish production information.

1.3 Objectives of the Study

The general objective of the study is to determine the information accessibility and utilization among fish farmers in Girei, Yola North and Yola South Local Government areas, Adamawa state.

The specific objectives of the study were to:

1. describe the socio – economic characteristics of respondents in Girei, Yola North and Yola South Local Government areas, Adamawa state,
2. determine the information needs of the respondents in Girei, Yola North and Yola South Local Government areas, Adamawa state,
3. assess fish production information accessible to the respondents in the study area,
4. determine the sources of information among the respondents in the study area,
5. assess information that are utilised among the respondents in the study area, and
6. identify the challenges experienced by the respondents in accessing and utilization of information in the study area.

1.4 Research Hypotheses

Ho₁: There is no significant relationship between the socio-economic characteristics of the respondents and utilisation of fish production information.

1.5 Significance of the Study

For fish farmers to continue to practice fish production effectively, they must be adequately informed, as access and utilisation of information is essential to increasing fish production.

This study would be useful to fish farmers in the study area especially the incoming ones; it will help the farmers to know how to utilise fish farming information optimally in relation to its availability and accessibility.

The study will also provide useful information to policy makers, both Government and non-government agencies such as Agricultural Development Programmes (ADPs), United Nation Development Programme (UNDP), Adamawa Agricultural Development and Investment Limited (AADIL), Food and Agriculture Organisation (FAO), Federal Department of Fisheries (FDF), Fish Society of Nigeria (FISON) and SMEDAN (Small and Medium Scale Entrepreneur Development Agency of Nigeria). The study will equally provide useful information to researchers who will like to carry out similar or related research in the study area or other fish farming areas.

CHAPTER TWO

LITERATURE REVIEW

2.1 Agricultural Information

Agricultural information is defined as all published and unpublished knowledge in all aspects of agriculture (Aina, 1990). This simple definition shows that the scope of agricultural information is very broad and wide, encompassing some documented and undocumented facts relating to agriculture. In the opinion of Aina (1995), agriculture is interdisciplinary in nature and generally has universal application. He categorized agricultural information as follows:

Technical or scientific information: These are information that arises from research and development works. Such information may emanate from the various agricultural institutions including universities with the aim of increasing agricultural production by providing high yielding seedlings, control of pests and diseases among others.

Social/Cultural information: This encompasses information relating to farmers' interaction with other individuals in the environment, information on agricultural practices, local culture and background information on farming communities.

Commercial information: This includes information on credits and cooperatives, national prices for export commodities which are important to farmers either on subsistence farming or who are involved in export crops in order to maximize their profit. Also information on how and where a farmer can sell his or her products at profitable prices is in this category.

Legal information: These are information that involve all legislations that affect agriculture such as land tenure, production, distributions and sales among other issues. In an increasingly globalized and information-driven world, information has become a necessity and valuable commodity to individuals, organizations and societies in their existence. For individuals, it has become a tool for proper integration through interactive interpersonal networking and a means of maintaining a healthy balance in such interactions for the purposes of personal and group development. Many scholarly views exist on the value and usefulness of information as a tool for individual and societal development (Aboyade, 1985; Ndavi, 1990; Kibirige, 1996; and Uhegbu, 1997). Aboyade (1985) particularly provides a refreshing and exciting perspective to the burning issue of information provision for mass mobilization from

the rural grassroots upwards, and stresses that its implementation will address problems linked with present efforts in Nigeria and developing countries towards economic reconstruction, which now shifts emphasis from urban to rural development. Iwe (2003) concurs with this view by stating that rural development experts, planners and information scientists have identified information as an important input in rural development programmes. She avers further that development schemes or efforts in Nigeria failed in the past because of a lack of information at the planning and execution stages and posits the necessity to identify the areas of need of the rural community and to provide the information needed. The information environment of the rural area is distinct from that of the urban environment due to obvious differences.

The rural areas are mostly inhabited by people with low economic potentials, illiterates, semi-literates, school drop-outs etc. who have limited or no access to social amenities including agencies for information dissemination. The factor of illiteracy or low level of illiteracy acts as a great inhibitor to information access and assimilation in rural communities in Nigeria. When thinking of information that can help solve a problem in a development context, we inevitably see such information as being a resource with which to solve a particular problem. Because information plays such an important role in almost every human activity, its value in the development process has been a topic of extensive debate. According to Camble (1994), and Sturges and Neill (1990), lack of adequate and relevant information has impacted negatively on any development process. Although academics and researchers are aware of the value of information in development, there is some concern that information is still not perceived as being as important as other resources. Neelameghan (1980), Camara (1990) and (Sturges and Neill, 1990) posit that planners, developers and governments do not yet acknowledge the role of information as a basic resource, or are unaware of its potential value. It seems that people are not always aware of what information entails (Manzvanzvike, 1993). It seems also that the extent to which information users in developing communities are able to handle information (i.e. the extent to which they use information) will determine the usefulness of information as a development resource. Ozowa (1995) is of the opinion that a general lack of awareness among rural people can be attributed to their high level of illiteracy. However, the nature (and particularly its attributes) has not yet been challenged as a possible reason why information is not viewed in the same light as other development process. Information

is power, but in the other hand, information by itself is worthless and cannot solve problems as information has power only when used and applied effectively (Boon, 1992). This apparent contradiction lays the strength of this article as it strives to discuss the attributes of information and how these attributes comply with development requirements for rural communities.

Development Information: Conceptual Analysis Among the ingredients needed to drive developmental process in rural communities is the supply of needed information as a tool of empowerment to take meaningful decisions. Development information relates specifically to the information packaging and dissemination efforts targeted specially at rural communities, with aim of improving their conditions of life when utilized. Uhegbu (2004) and Imhabekhai and Olumukoro (2007) are of the view that well informed and information-conscious citizens is a road-map to sustainable development, be it economic, social, environmental, educational, or even technological. Development information aims at changing people's negative values, educating them on better ways of achieving set goals, imparting new ideas or knowledge, and generally empowering the target audience to take better decisions that will improve their current state of affairs. Researches by Aboyade (1989) and Uhegbu (1997) reveal that rural Nigeria is experiencing and increased flow of information. However, the packaging and mode of dissemination, it is alleged do not address the development needs of the rural populace as adequately as needed. To drive the process of rural development in Nigeria, information packaging and dissemination must be done to meet the specific demands of development information provisioning. Information comes in many different forms, and is expressed in many different ways.

Information can take on any value in the context of an individual situation. This proves that, as a resource, information is different from most other resources. The very fact that information is characterized as a dynamic force, constantly altering and extending a store of knowledge corresponds with situations in development in which information is offered to non-literate people to alter their understanding of certain practices, which in turn can help them solve problems (such as improving standard of living (Rogers, 1992). Information almost always forms part of technology (Röling, 1990). Without its information component, technology has little value as a resource for potential users who are not familiar with its workings or its background. With regard to developing non-literate societies, one should bear in mind that it is not necessarily new technology that brings about these achievements. All new technology

applied for the first time is viewed as new to non-literate people, or that particular situation, and could have similar effects. From a development point of view, there is more emphasis, first, on improving people's lives socially, and only secondly on economic improvement in development, new technology is often introduced with the help of education, training and visual demonstration. The training will help people in rural communities to increase perceptions, enhance competences and enhance self-esteem. A frequent complaint is that information often derives its role a resource (Boon, 1992), yet, when looking at the effect of information on development situations, there seems to be an underlying awareness of information as the hidden component of technology on, say, agriculture on the basis of such areas as increased farm income, improved health, reduced risk, better standard of living and overall economic growth. The above seem to emphasize the impact of the dynamic force of information, where the extension or altering of people's stores of knowledge positively affects their social well-being. Although, information is an intangible entity, it has the ability to bring about change for the better, which is the ultimate goal of development information.

2.2 Fish Farmers' Information needs

Globally, consumer demand for fish continues to climb, especially in affluent, developed nations which imported 33 million tonnes of fish worth over US\$61 billion yearly. And some 77 per cent of fish consumed globally as food is supplied by developing countries (FAO, 2007) However, levels of captures of fish in the wild have remained roughly stable since the mid-1980s, hovering around 90-93 million tonnes annually. Similarly in Nigeria, Fish demand is put at about 1.5 million metric tons per annum and Similarly in Nigeria, fish demand is put at about 1.5 million metric tons per annum, and the total domestic fish production can only supply 511,700 metric tons, leaving a shortfall of 680,000 metric tons of fish annually. To meet the local demand, government imports fish worth of ₦50 billion yearly (Nwankwo, 2005). Nzeka (2003) asserted that for Nigerians, fish is an affordable source of protein and the most popular imported species include croaker, herring, mackerel and catfish. Mackerel fills 65percent of the domestic market and is preferred by most Nigerians.

Information seeking is a human process that requires adaptive and reflective control over the afferent and efferent actions of the information seeker. The study on

information seeking behaviour includes: the strategies people adopt for making discoveries, their expectations, attitudes, and anxieties, promotion of relationships as they live and work with other information users. Information seekers should begin with finding out the obstacles which deter progress, thereby creating an information gap / vacuum. An important aspect of sense making is a process in which people struggle to understand a problem that drives them to seek meaning; for in many situations and many circumstances they are content to take no such action. Therefore the need arises to find out if the tapioca growers are able to obtain the information they need as they go about searching for relevant and pertinent information. It is also important to find out what methods and sources of information they usually utilize while trying to meet their objectives (Balasubramani and Murugan, 2011).

A current ban on imported poultry has made fish even more popular. In order to meet growing demand, the Nigerian aquaculture industry is growing Tilapia and catfish as the primary species produced at domestic fish farms, but it will be quite some time before production can match consumer demand Akinbile (2003) reported that extension services were rendered to the fish farmers on pond construction, stocking, pond management, fish breeding, credit, fish harvesting, feed formulation, group formation and marketing outlets. Information has been identified as one of the resources required for the improvement of agricultural production (Aina, 1995). It is said to be a resource that must be acquired and used in order to make an informed decision. Those who possess appropriate and timely information will make a more rational decision than those without (Adesope *et al.*, 2007). The expansion of the pond fishery sector is hampered by low levels of knowledge of fish farmers on inputs and pond management (Sarka *et al.*, 2006).

Information seeking is a human process that requires adaptive and reflective control over the afferent and efferent actions of the information seeker. In the study of information seeking behaviour, the discovery of people strategies, expectations, attitudes, and anxieties promotes the relationships as they live and work with other information users. Information seekers should begin with finding out what is stopping progress, creating an information gap/vacuum. An important aspect of sense making as a process in the struggle of people to understand a problem that drives them to seek meaning for in many situations and many circumstances they are content to take no such action. According to Gary (1997), he defined information seeking as a process in which humans engage to purposefully change their state of knowledge. The process is

inherently interactive as information seekers direct attention on adapt to stimuli, reflect on progress, and evaluate the efficacy of knowledge base of the information seeker. Information seeking is thus a cybernetic process in which knowledge state is changed through inputs, purposive outputs, and feedback Kuhlthau (1993), and Chatman (1996) are concerned with the ways the worlds information seeking” term has been used by the people in their research work. Such researchers present conceptions of process, learning and social relations that reflect the focus and interest of their research work.

Kuhlthau (1991, 1993) focused on information search process, which emphasizes feelings, thoughts, and understanding of a situation that they need to resolve task, problem, or topic. This particular action led to the action of people as they seek the meaning of useful research in providing a frame work for improving information search (Kuhlthau, 1994). In understanding the pattern of people information behaviours, the variety, uncertainty and complexity of the information needed by the seekers must be known (Bates, 1986). Chatman (1996) stated that, there are barriers and constraints that faced by people during the cause of seeking information on their research work. Information seeking is distinguished from information retrieval (IR) in that information retrieval does not involve persistence, continuous or regular human attention, i.e. retrieval may aim to yield an intermediate value that is applied and then forgotten. Information retrieval may be automated and embedded in the larger information-seeking process. There is a progress during an information-seeking process, this is a product of information seeker attributes, informational environment attributes, and the communication channel over which information flows.

2.3 Access to Agricultural Information by Fish Farmers

Among the varieties of agricultural practices is fish farming which is predominant in the coastal states of Nigeria. Currently, there is an observed increase in the population of fish farms and farmers. Fishing is no longer restricted to the wild alone; fish farms can be found around towns and villages even behind people’s homes. To sustain this development, it becomes imperative that information on and for them be provided. This is because information is the driving and sustaining force behind any development strategy.

In agriculture, the role of information in enhancing agricultural development cannot be over emphasized. Information is vital for increasing production and

improving marketing and distribution strategies (Oladele, 2006). Information also opens windows of sharing experiences, best practices, sources of financial aids and new markets. As posited by Aina *et al.* (1995), information has a vital role to play in improving and sustaining agricultural production of any nation.

For fish farmers, they would need information on fish farming technologies, construction and management, breeds and spawning, processing, storage and marketing (Ofuoku *et al.*, 2008) and financing. Access to information is very essential for increased productivity by fish farmers. In Nigeria agricultural information is available through National Agricultural Extension and Research Liaison Services (NAERLS) and its information services (Ekoja, 2003). They are available 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. Many previous studies agree that the problem of farmers is access to agricultural information; and that even with the advent of information technologies which have succeeded in eliminating bottlenecks in information dissemination; constraints to access to information is still a real experience. (Oladele, 2006).

2.4 Information Utilization of Fish Farmers

Information is an indispensable factor in the practice of farming and it is the basis of extension service delivery. It is defined by Adereti *et al.* (2006) as data that have been put into a meaningful and useful context which is communicated to recipient who uses it to make decisions. Kantumaya (1992) opined that information can also be described as power which an individual in every society should have easy access to.

Agricultural information as suggested by Agbamu (2006) is defined as all published or unpublished knowledge in all aspects of agriculture. He classified agricultural information into four categories namely, technical, commercial, socio – cultural and legal information. Fish farming information can be considered as all published or unpublished knowledge in all aspect of culture fish production.

The quality of information rests solidly on three pillars which are accuracy, timeliness and relevance. Adereti. *et al.* (2006) stated accuracy implies that information is free from bias; timeliness means that recipients can get information when they need it, while relevance implies whether the piece of information specifically answers the users' question of what, why ,when , who and how? An individual consciously or unconsciously engages in information search in order to

find appropriate information which can fill the information gap thereby regaining physiological and psychological balance.

Access to adequate information is very essential to increase agricultural productivity Mgbada (2006). The information on fish farming or fish farming technologies needed for farmers cover pond construction and management, breeds and spawning, fish processing's storage, marketing etc.

The importance of fish in human nutrition as a major source of protein cannot be over emphasised as it touches the lives of a large percentage of the population of the world. As population increases, the demand for fish and fish products increases, especially with its nutritional advantage over meat. This calls for improved fish farming technologies and other information needed for improved production level. However, in spite of research and extension services efforts, Adereti *et al.* (2006) stated that there are improved packages on agricultural production; they are not being adequately used by farmers. All these information on fish farming techniques, when acquired and effectively utilised by the fish farmers will help to increase culture fish production and translate into income, improved farmers' standard of living, improvement in rural and by extension, the nation's economy.

Accessibility and utilisation have been described as opportunities or means of reaching, using or approaching something (Practer, 1980) cited by Olowu and Banmeke (2005). Fish farmers' access to productive resources like information is very crucial in order to increase productivity. In the opinion of Olawoye (1996), useful information could greatly enhance farmers' productivity. This is because agricultural information is very crucial to the productivity of the women farmers. For farmers to continue to do what they used to do effectively and feed the nation, they must be adequately informed, as access to information is essential to increasing agricultural production. This brings to bare the need to address farmers' access to and utilisation of agricultural information. Access to useful information is necessary to deal with a given situation (Kaniki, 1989).

2.5 Sources of Information

In the context of classification of agricultural information by Aina (1995), agricultural information may be accessed and utilized from different areas and such information may come from more than one source.

According to Yomi and Odefadehan (2006), an information source could be an enterprise, an individual, a publication, credit and financial agencies or other similar institutions. Magnire (1994) cited by Yomi and Odafadehan (2006) asserts that information sources, attract two connotations namely: The store or the location in which information is kept, in this regard, a source of information may be personal or impersonal, public or private, passive or interactive, stored locally or remotely to which delayed or access may be available and access may be difficult or easy to arrange, and in the sense of writing such as books or words. Information could also be obtained from books, electronic and printed, media/materials, conference proceedings, dissertations, internet, and training or through interpersonal interaction.

2.6 Socio – economic Characteristics of fish farmers.

Age plays a significant role in one's life experience and ability in adapting to changes as well as working capacity. According to Akinbile and Ndaghu (2003) most farmers are between the ages of 20-50 years. However Deressa *et al.* (2001) stated that, age of the respondents represents experience in farming, the older the farmer, the more experienced he/she is in farming and the more he/she is exposed to challenges of past and present farming experience over longer horizons of his or her life span. In the opinion of Ofuoku *et al.* (2008), male dominance of this source of livelihood implies the laborious nature of fish farming operations right from pond construction to management, which their female counterparts cannot easily undertake and cope with.

Married individuals are more concerned with the provision of household needs of their families than the singles or divorced individuals who may tend to consider their personal well-being alone. This is in respect with the findings of Ndaghu *et al.* (2012) that most of the farmers in Adamawa state are married. Similarly, Ofuoku (2011) found that married farmers had responsibilities that must be reflected on their farming activities.

In the opinion of Ofuoku *et al.* (2008) fish farming requires a lot of technical and scientific knowledge to be successfully under taken. The information on the innovations of fish farming is somehow complex and these need some high level of education to comprehend. Also, this makes it easy for them to read instructions and labels on fish feeds, drugs and other information that are pertinent to the successful execution of fish production venture.

2.7 The Obstacles and the Solutions of Information to fish farming development in Nigeria.

In order to understand how information seeking behaviour of the rural people can impact on their acceptance of new information it is necessary to consider how fish farmers respond to these information attributes identified as less needed for development purposes (Eaton and Bawden, 1991). Intangibility of information: Because information is not a tangible resource for development as is technology, or as agricultural products, fish farmers often do not realize that they may lack information in certain aspects, which otherwise could help them solve their problem, and to progress. Ignorance of information as an aid could be ascribed to the fact that rural people are more inclined to make sense of real-life objects they are familiar with or of abstract things they can compare to physical objects they are familiar with –for example, comparing a circle to the moon, or a square to a house, etc. This perhaps explains why they find it so difficult to perceive and accept information above new concepts provided by way of a discussion on a particular topic without any visual demonstrations or comparison to something they can identify with. So to address the problem of intangibility, it is important that the source of information makes use of communication mechanisms such as comparisons, metaphors or visual demonstration the fish farmer can relate to.

Information interdependent on technology: In this knowledge era, where information almost always forms part of technology (whether as a product or as a process), it is evident that information on that product or process will not be well received by rural people when provided in isolation. Consequently, these people will be unable to add the information to existing knowledge. This could be ascribed to fish farmer's inclination to relate any new information to real-life objects or situations. To counteract this negative impact, development efforts should not only use technology-based information transfer, but also explain, by way of demonstration, how to apply simple development-oriented technology, and the gains associated with it. Information is culture-dependent: There is also the problem of cultural dependence. If it is accepted that information is socially conditioned and shaped by social environment from which it is originated (Shields and Servaes, 1989), it should be remembered that if that information is transferred to a rural community with a different social background and environment, chances are that the information will not be understood

in the way it was intended to. This is because background knowledge is not transferred along with the information.

To mitigate the negative impact of culture-dependence of information those involved in rural development need to provide additional information about related aspects in order to put the background into perspective for the prospective rural audience. Additional effort can also be made by providing information about related issues, such as reasons for using fertilizers and applying weed control, in agricultural information transfer, for example. Information is dependent on medium: Information captured in a written or digital format is not accessible to people used to the oral tradition, since they never learned to read or access this type of format to find a solution to their problems. This problem can be solved by transferring the required information by word-of mouth and face-to-face demonstration of important concepts. In this way, those engaged in rural development can easily avoid the pitfall of inappropriate media by not assuming that rural people will accept information on a particular topic when offered in a picture or even audio-visual format, such as a television programme. The information packaged in images or audio-visual format will not have the intended effect unless potential users have enough background knowledge of the topic. Suppliers of development information therefore, should consider the use of media that they know the rural people are familiar with. Information becomes more useful when packaged for a specific situation –more so in the case where users in a rural community lack specific information and background knowledge on a particular problem. In such a case, chunks of information put together in a new package will be more useful and readily accepted than when transferred in its original package(s).

2.8 Conceptual framework

Conceptual framework in Figure 2.1 attempts to define the orientation underlying this study. It articulates the nature of the relationship between the dependent and independent variables of the research. The independent variables were the socio-economic characteristics, information accessibility, information sources and challenges experienced, while the dependent variable is the information utilized. The intervening variables of the study are government policies, culture and NGO activities. The framework is predictive and interactive.

The Conceptual framework is built on the assertion that, socio-economic characteristics can directly influence information utilization, an educated fish farmer

for instance may be more conversant with fish farming techniques that will increase his production capacity compared to non-literate farmer. Farming experience has a direct link to information utilization, the more the farmer practices fish farming over time the more information is utilised. Likewise primary occupation has a link with information utilization where a farmer whose primary occupation is fish farming, utilizes information than a farmer whose secondary occupation is fish farming.

In the same vein, socio-economic characteristics also have a direct relationship with constraints experienced by the fish farmers, a farmer with high educational level experiences less constraints because he can make use of almost all the information sources available. Similarly, an experienced fish farmer encounters fewer constraints due to his versatility in fish farming. So also a farmer whose primary occupation is fish farming faces low constraints because he concentrates all his time and efforts into fish farming.

Information sources are directly related to information utilization, for example radio is highly utilized by fish farmers because of its availability and affordability. In the same manner, information sources are directly linked to information access, a fish farmer accesses more information from his fellow farmers due their experiences in fish farming. Accessibility of fish farming information may ginger fish farmers to utilize information about fish farming more appropriately. A fish farmer with more sources of information encounters less constraints because of the available options. The information access has a link with information utilization in the sense that more access to information on fish farming by farmers will lead to higher utilization of information and vice versa.

Conversely, there is an indirect link between the intervening variables and information utilisation of the respondents on fish farming. These intervening variables includes government policies, non-governmental organizations, local values customs culture and other sources. For instance government policies could constitute low or high constraints and this in turn affects the utilization of information.

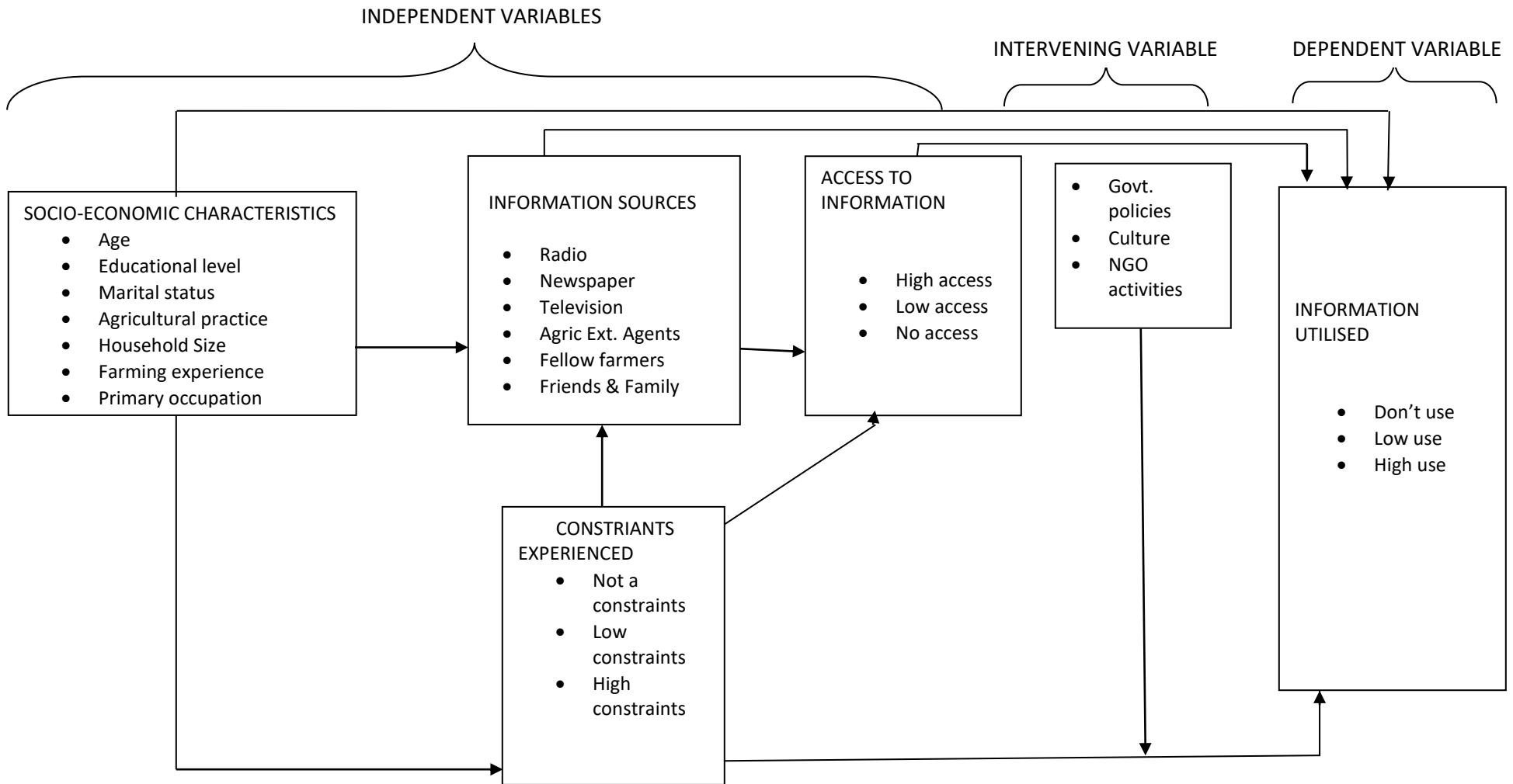


Figure 2.1: Conceptual framework for fish farmers' Information Accessibility and Utilisation.

CHAPTER THREE

METHODOLOGY

3.1 The Study Area

The study was conducted in three Local Government Areas of Adamawa State namely: Girei, Yola North and Yola South. The study area lies between Latitude 7° and 11° North of the Equator and between Longitude 11° and 14°E of the GMT (Adebayo, 1999). The wet season commences in April and ends in late October, while the dry season starts in November and ends in April. The mean annual rainfall of the area is about 1000mm (Adebayo, 1999). The study area falls within the Northern Guinea Savannah Zone with land mass of 2,310.05km² and a population of 522,849 (NPC, 2006). The area is bounded by Fufore, Song and Demsa Local Government areas to the south and east, to the north and to west respectively, (see Fig.3.1)

The major occupations of the people are crop farming, animal rearing and fishing. The major tribes in the study area are Fulani, Bata, Hausa, Yungur, Higgi, Margi, Mboi, Kanuri, Laka and Verre. There are a lot of fishing activities in the study area as one of the two major rivers that is, river Benue links through the study area with two major dams (Njuwa and Gerio) attached to it are located within the study area.

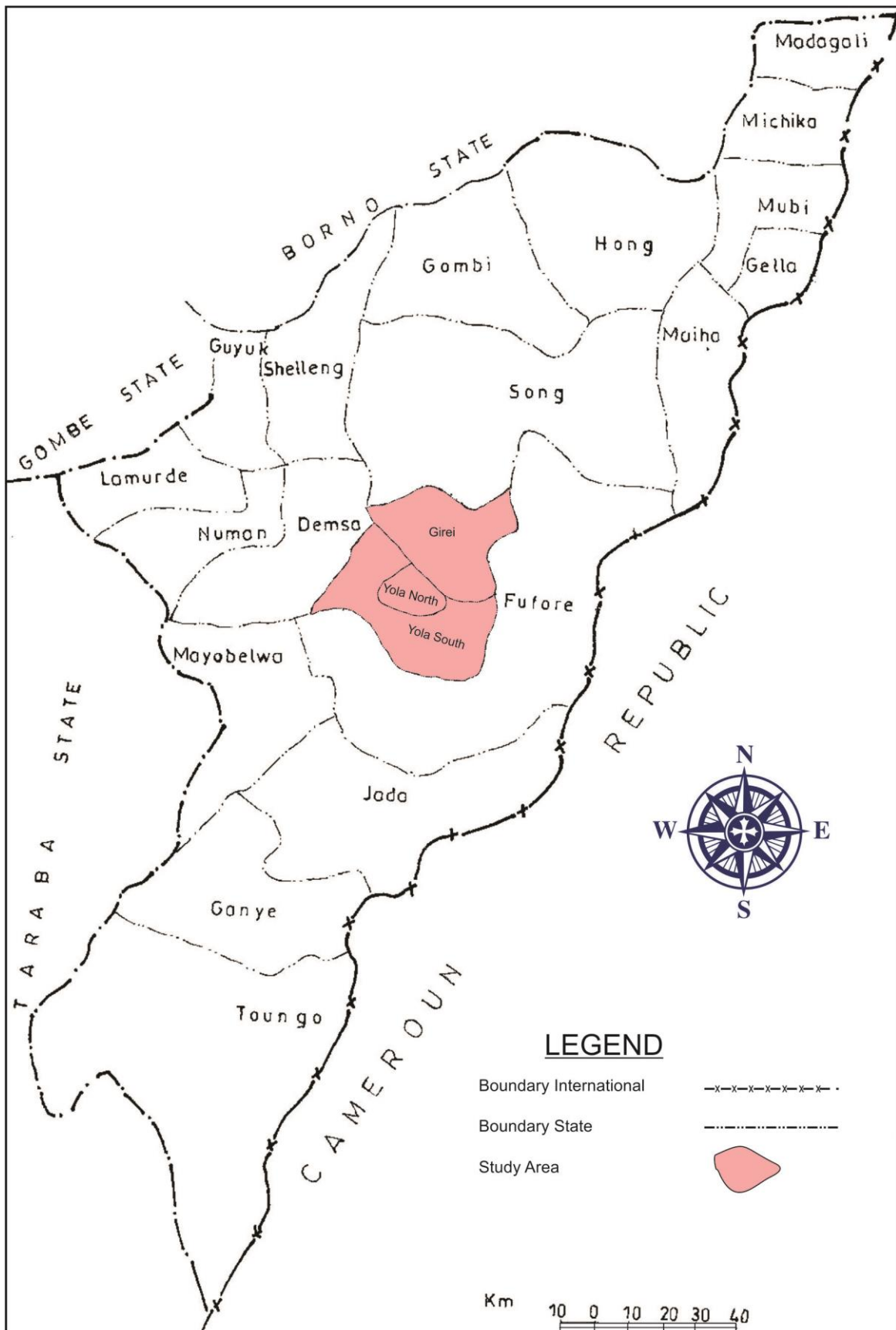


Figure 3.1: Adamawa State showing the Study Area

3.2 Sources of Data.

The source of data for the study was generated from primary and secondary sources. Primary data was generated by the use of structured questionnaire administered to the sampled respondents in the study area; enumerators were also trained to collect data from the respondents, while the secondary data was obtained from text books, Journals Newspapers, and bulletins

3.3 Sampling Technique and Sample Size.

Multi – stage sampling was applied in the study. Three Local government areas (Girei, Yola North and Yola south) were purposively selected; this selection was done because of the preponderance of fish farmers around the area compared to other parts of the state. Snowball technique was used where the respondents from the purposively selected L.G.As were used to identify other respondents because of the difficulty in identifying fish farms and fish farmers. The questionnaire was administered to 60 fish farmers but only 48 questionnaires were completed and returned properly which formed the basis for the analysis in this study.

3.4 Methods of Data Analysis

Both descriptive and inferential statistics were used to analyse the data collected. Objectives 1 to 6 were analysed using descriptive statistics such as percentages, frequency counts and mean. Inferential statistics were used to test the Hypotheses. This was done by the use of Chi – Square and Pearson Product Moment Correlation (PPMC).

Chi square is given as:

$$\chi^2 = \frac{\sum(O-E)^2}{E}$$

Where:

O = Observed frequency

E = Expected frequency.

\sum = Summation

Pearson Product Moment Correlation (PPMC) formula is given as:

$$r = \frac{N \sum xy - (\sum x)(\sum y)}{\sqrt{N \sum x^2 - (\sum x)^2} \sqrt{N \sum y^2 - (\sum y)^2}}$$

Where: x = Dependent variable

y = Independent variable

\sum = Summation

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Socio-economic characteristics of the respondents

4.1.1 Age distribution of the respondents

The age distribution of the respondents as presented in the Table 4.1 revealed that 37.5% of the respondents were between 41 – 50 years of age, 31.3% of them were between 31 – 40 years and 20.8% of them had an age range of 51 – 60 years while 6.3% of the respondents were over 60 years of age, only 4.1% of them were between the ages of 20 – 30 years. This implies that 58% were above the mean age of the respondents which was 45 years while 42% were below the mean age. Farmers that were above the mean age were older farmers who are matured people and are capable to handle risks, uncertainties and hazards associated with fish farming. This corroborates the findings of Akinbile and Ndaghu (2003) that most of the farmers are between the ages of 20-50 years.

Therefore age plays a significant role in one's life experience and ability in adapting to changes as well as working capacity. However Deressa *et al.* (2001) stated that, age of the respondents represents experience in farming, the older the farmer, the more experienced he/she is in farming and the more he/she is exposed to challenges of past and present farming experience over longer horizons of his or her life span.

4.1.2 Sex distribution of the respondents

Table 4.1 also revealed that majority (83.3%) of the respondents were male, while 16.7% were female. This indicates that men dominate fish farming than women in the study area. This finding is in tandem with Ofuoku *et al.* (2008) who reported that the male dominance of this source of livelihood implies the laborious nature of fish farming operations right from pond construction to management, which their female counterparts cannot easily undertake and cope with.

4.1.3 Respondents' Marital Status

Table 4.1 further more describes the marital status of the respondents. It indicates that majority (75.0%) of the respondents were married, 14.6% were single, 8.3% of them were widowed, while only a few (2.1%) of them were divorced. This implies that, majority of the respondents are married because of the value attached to being married in the study area. Also, married individuals are more concerned with the provision of household needs of their families than the singles or divorced individuals who may tend to consider their personal well-being alone. This is in line with the

findings of Ndaghu *et al.* (2012) that most of the farmers in Adamawa state are married. Similarly, Ofuoku (2011) found that married farmers had responsibilities that must be reflected on their farming activities.

4.1.4 Respondents' Household Size

Table 4.1 shows that 56.2% of the respondents had household size of 6 – 10 persons, 29.2% of them had between 1 – 5 persons, while 14.6% had household size of 11 and more persons. This indicates that, majority (60.6%) of the respondents had household size greater than the size of seven persons. This means that, majority (60.6%) of the respondents had household size greater than the mean household size of seven persons. Only 39.4% of the respondents had household size below the mean. This implies that farmers in the study area had large household sizes. Household size represents the labour input of the farm; large household size is part of the labour force into fish farming activities as a means of increasing the output of fishery production.

4.1.5 Respondents' Primary Occupation

Table 4.1 revealed that majority (50%) of the respondents were civil servants by primary occupation, 35.4% of them were farmers, 10.4% were traders and 4.2% were artisans. This shows that fish farming in the study area were in the hands of civil servants who were engaged in their areas of primary assignment and likewise traders and artisan who practise fish farming on part – time basis.

4.1.6 Educational Attainment of the Respondents

Table 4.1 points out that 33.3% of the respondents had NCE/Diploma, 22.9% of them had B.Sc/HND, 16.7% had M.sc, 14.6% had senior secondary school education, 8.3% had no formal education and 4.2% had primary education only. This implies that 72.9% of the respondents had one form of tertiary education or another, only 8.3% were not formally educated. This implies that, fish farming is dominated by the educated class. This is so because in the opinion of Ofuoku *et al.* (2008) fish farming requires a lot of technical and scientific knowledge to be successfully undertaken. The information on the innovations of fish farming is somehow complex and these need some high level of education to comprehend. Also, this makes it easy for them to read instructions and labels on fish feeds, drugs and other information that are pertinent to the successful execution of fish production venture.

4.1.7 Fish Farming Experience

Table 4.1 reveals that 45.8% of the respondents had been in fish farming for less than 5 years; 33.3% of them were in the venture for 5-10 years; 16.7% for 11-15 years; 2.1% for 16-20 years, and 2.1% of them are over 20 years. The mean years of farming experience is seven years. While 79.1% of the respondents practised fish farming for less than 10 years, 20.9% of them had more than 10 years farming experience. This connotes that fish farming diffused very slowly among the farmers in Girei, Yola North and Yola South Local Government areas of Adamawa state. The situation is attributed to the presence of many water sources such as rivers and streams and natural ponds that mainly supplied fish for the people of the area.

Table 4.1. Socio-economic characteristics of the respondents

Variable	Frequency	Percentage
Age (Years)		
20 – 30	2	4.1
31 – 40	15	31.3
41 – 50	18	37.5
51 – 60	10	20.8
60 and Above	3	6.3
Total	48	100
Mean = 45 Years		
Sex		
Male	40	83.3
Female	8	16.7
Total	48	100
Marital Status		
Single	7	14.6
Married	36	75.0
Widowed	4	8.3
Divorced	1	2.1
Total	48	100
Household size		
1 – 5	14	29.2
6 – 10	27	56.2
11 and above	7	14.6
Total	48	100
Mean = 7 People		
Occupation		
Farming	17	35.4
Trading	5	10.4
Civil Servant	24	50.0
Artisans	2	4.2
Total	48	100
Educational Attainment		
No formal Education	4	8.3
First School Leaving Certificate	2	4.2
Senior Secondary School Certificate	7	14.6
Diploma/NCE	16	33.3
B.Sc./HND	11	22.9
M.Sc.	8	16.7
Total	48	100
Farming Experience		
< 5 Years	22	45.8
6 – 10 Years	16	33.3
11 – 15 Years	8	16.7
16 – 20 Years	1	2.1
>20 Years	1	2.1
Total	48	100

Source: Field survey, 2012

4.2 Respondents' Information Needs

The result in Table 4.2 revealed that respondents need information in almost all the areas presented to them. However, the respondents had high need for information in the areas of suitable land (72.9%), hired labour (66.6%), good water quality (64.6%), waste drainage (62.5%), fish feeding (60.4%), fish preservation and processing (60.4%), fish harvesting (56.3%), feed storage (56.3%) and credit facilities (56.3%). It is a pressing need among fish farmers. It is also in line with Ofuoku, *et al.* (2008) who posited that fish farmers need information on fish farming technologies, construction and management, breeds and spawning, processing, storage and marketing. The reason has been the urge to improve and increase yield as asserted by Margaret *et al.* (2010). Many of the fish farmers need information about marketing of their agricultural produce for better profits (Luoga, 2010). The mean information needs was 14.25.

Table 4.2. Fish Farmers' Information Needs

Information needs	High		Low	
	F	%	F	%
A. Production				
Pond Construction	24	50.0	9	18.7
Fish Fingerling types/ sources	15	31.3	17	35.4
Feed types and sources	18	37.5	11	22.9
Fish disease prevention	22	45.8	12	25.0
Fish disease treatment	21	43.8	12	25.0
Fish growth	16	33.3	8	16.7
Fish harvesting	27	56.3	10	20.8
Fish preservation and processing	29	60.4	14	29.2
B. Inputs				
Suitable Land	35	72.9	7	14.5
Good Water Quality	31	64.6	9	18.7
Credit Facilities	27	56.3	14	29.1
Hired Labour	32	66.6	3	6.3
C. Management				
Pond environment management	20	41.7	21	43.7
Fish feeding	29	60.4	10	20.8
Equipment repair	23	47.9	12	25.0
Feed Storage	27	56.3	13	27.1
Waste Drainage	30	62.5	9	18.8
D. Marketing				
Fish processing	22	45.8	18	37.5
Fish storage	26	54.2	17	35.4
Fish marketing	22	45.8	18	37.5
$\bar{X} = 14.25$				

Source: Field Survey 2012

The information needs of the respondents were classified into low and high depending on the number of respondents that fall above and below the mean. The respondents' that 58.31% of the respondents were above the mean while 41.7% of them were below the mean. This indicates that, there is information need among the respondents. They need such information to improve their productivity and maximize profit.

Table 4.3. Categorization of respondents' information needs

Information needs	Frequency	Percentage
High	28	58.3
Low	20	41.7
Total	48	100

Source: Field survey 2012

4.3 Respondents' Access to Information

Table 4.4 revealed that most (62.5%) of the respondents had low access to information on temperature, feed type and source (58.3%), production management (58.3%), disease control (50.0%) and pond management (47.9%). Other areas where they had low access to information were sources for improved fingerling (47.9%), community development project (47.9%), current market prices (47.9%), fish harvesting (45.8%) and environmental protection (41.6%). This study shows that fish farmers have low or no access to fish farming information. This could probably be due to high cost of information and fear of accessing the information by the community as asserted by Williamson (1998). This also corroborates the findings of Peter (2012) that, various factors are known to hinder information accessibility.

Table 4.4. Respondents' Access to information

Access to Information	High Access		Low Access		No Access	
	F	%	F	%	F	%
A. Technical Information						
Disease control	15	31.2	24	50.0	9	18.8
Temperature	12	25.0	30	62.5	6	12.5
Feed Types and Sources	16	33.3	28	58.3	4	8.3
Pond Management	17	35.4	23	47.9	8	16.7
Improved Fingerlings	15	31.3	23	47.9	10	20.8
Fish production/Management	13	27.1	28	58.3	7	14.6
Harvesting	20	41.7	22	45.8	6	12.5
B. Economic Information						
Current Market Prices	15	31.3	23	47.9	10	20.8
Market Location	14	29.2	19	39.5	15	31.3
Agric. Insurance	12	25.0	15	31.3	21	43.7
Budgeting Methods	14	29.2	14	29.2	20	41.7
C. Legal Information						
Land Dispute Settlement	14	29.2	14	29.2	20	41.6
Government regulation	11	22.9	17	35.4	20	41.7
Environmental Protection	14	29.2	20	41.6	14	29.2
D. Social Information						
Sources of assistance/grants	12	25.0	15	31.3	21	43.7
Self-help project	17	35.4	11	22.9	20	41.7
Community development project	4	8.3	23	47.9	21	43.8
$\bar{X} = 17.06$						

Source: Field survey, 2012

Access to information of the respondents were classified into either low or high depending on the number of respondents that fall above and below the mean access to information, respectively as shown in Table 4.5 It revealed that 41.7% of the respondents were above the mean while 58.3% of the respondents were below the mean. This implies that fish farmers in the study area got low or no access to fish farming information. This calls for improved accessibility to fish farming technologies and other information needed for improved productivity among the fish farmers.

Table 4.5. Categorization of respondents' access to information

Access to Information	Frequency	Percentage
Low	28	58.3
High	20	41.7
Total	48	100

Source: Filed Survey, 2012

4.4 Respondents' Sources of Information

Table 4.6 shows that, most (81.3%) of the respondents sourced information from friends/fellow farmers,(56.2%) family members, (52.1%) GSM, radio (47.9%) and television (31.2%) of them from daily basis. Also 41.7% of the respondents accessed information monthly from farmers' association and 22.9% of them accessed information on weekly basis from the newspapers. In the same vein 33.3% of them received information once in several months from workshop/seminars. Majority (45.8%) of the respondents never accessed information from internet, agricultural extension agents (39.6%) and agricultural extension bulletin (41.7%).

4.4.1 Extension Agents

Table 4.6 shows that most (39.6%) of the respondents did not get information from extension agents, only 27.1% of them got information from extension agents once in several months, 20.8% got information on monthly basis while 10.4% and 2.1% sourced information from extension agents weekly, and fortnightly, respectively. This implies that the respondents did not access information from extension agents as expected. They got most of the information needed on daily basis from other sources. Though such other sources may not be technically competent in the provision of information to the fish farmers, they are just the ones available to them and these may pose serious challenge because fish production is a highly technical venture. This limited contact with agricultural extension agents asserts the findings of Arokoyo *et al.* (2003) and Olowu *et al.* (2005) who revealed that, farmers in Northern Nigeria have limited contact with agricultural extension agents.

4.4.2 Farmer association.

Table 4.6 reveals that 41.7% of the respondents obtained information from farmers associations on monthly basis, while 20.8% of them got information once in several months, 10.4% each got information from farmers' association weekly and fortnightly. This implies that fish farmers' associations in the study area are performing in terms of providing relevant information on fish farming to its members. This finding corroborates Ofuoku *et al.* (2008) who reported that, those who joined in fish farmers' associations did so because of easy access to extension services, market and credit facilities.

4.4.3 Family Members.

Table 4.6 shows that more than half (56.2%) of the respondents obtained information daily from family members while 12.5% and 2.1% of them obtained information once in several months and on weekly basis, respectively. Also, 6.3% each got information from family members on monthly and fortnightly basis. The implication of this result is that, farmers may not get adequate technical information from family members on fish farming, most of the information they get are on indigenous practices. This result corroborates Achia (2002), who found that farmers' access to agricultural information is based mainly on their everyday interactions with the communities of which they are a part and the groups of individuals with whom they regularly come into contact.

4.4.4 Fellow Farmers/Friends.

Table 4.6 reveals that majority (81.3%) of the respondents sourced information from fellow farmers on daily basis. While 33.3% of them accessed it once in several months, only a few (20.8%) of the respondents did not access information on fish farming from fellow farmers. Also 22.9% of the respondents sourced information from friends/fellow farmers fortnightly while 25.0% and 16.4% sourced monthly and weekly respectively. Fellow farmers/Friends are becoming the major sources of information among most farmers in developing countries as most of the respondents sourced information obtained from their fellow farmers/Friends daily. The result is exactly with the findings of Anthult (1994) who found that, there is rise in farmers' preference for

other farmers as the first hand source of information on agricultural production. This may be due to the apparent perceived ineffectiveness in the public extension service in developing countries.

4.4.5 The Internet

Table 4.6 shows that, most (45.8%) of the respondents did not use internet as source of information at all, 20.8% of them used once in several months while 2.1%, 4.2%, 10.4% and 16.7% used internet daily, weekly, fortnightly and monthly, respectively. The use of internet among the respondents is very low, this may be as a result of inadequate knowledge of computer and that accessing information on the internet may be difficult more especially with low and poor information communication technology (ICT) infrastructure that is characteristic of rural parts of Africa. However, some respondent were able to get information from the internet using their mobile phones. Norman and Ntokotha, (1990) reported that, the major constraints in relation to agricultural information were lack of adequate equipment such as computers, photocopiers, up – to – date books, as well as inadequate budgetary allowances and the lack of scientific journals.

4.4.6 Radio as source of information

Table 4.6 also revealed that, most (47.9%) of the respondents used radio on daily basis as a source of information on fish farming, 18.7% of them used radio once in several months, 6.3% each used radio on monthly and fortnightly basis while 10.4% used radio weekly. This implies that, the establishment of several radio stations in the state helped the respondents to utilize fish farming information whenever they are aired. This asserts Adekunle (1986) and Nwachukwu (2003) who separately reported that, radio is the cheapest and quickest means of passing information to farmers and effective medium of disseminating agricultural information in Nigeria.

4.4.7 Television as a source of information

Table 4.6 revealed that, 31.2% of the respondents used television daily, 16.7% of them view television weekly, while 14.6% each view television monthly and once in several months. According to Hussain (1997), television as source of information was the most effective tools in communication for the support of development in Africa. The implication of this is that, television broadcast transfers information to literate and non - literate farmers alike even in interior areas, within a short time.

4.4.8 Extension bulletin/Posters

Table 4.6 indicates that 41.7% of the respondents did not source information on fish farming from extension bulletins/posters, only 20.8% of them used posters weekly, 6.3% used fortnightly, while 22.9% and 8.3% used once in several months and monthly respectively. Most of the respondents were not able to access information on fish farming in extension bulletin/posters.

4.4.9 Newspapers as source of information

Table 4.6 shows that, only 18.8% of the respondents used newspapers as source of information on daily basis, 27.0% of them never used newspaper as source of information, 20.8% used it once in several months, while 22.9%, 6.3% and 22.9% used newspapers weekly, fortnightly and monthly, respectively. This implies that fish farmers have very low use of newspapers as a source of information. This low use may be due to the cost of the newspapers. According to Ozawa (1995) the quantity and quality of publication of newspaper in Nigeria still pose a problem as relevant source of information because newspapers cannot be accessed in a timely manner by the farmers in Nigeria.

4.4.10 Global System of Mobile telephone (GSM)

Table 4.6 reveals that, most (52.1%) of the respondents used mobile phone as a source of information to fish farmer on daily basis, 20.8% of them never used mobile phone to access fish farming information, 8.3% used it weekly, 10.4% used it once in several months, 6.3% each got information from mobile phone fortnightly and monthly. This implies that mobile phones as a source of information make it easier for fish farmers to communicate and it is also less expensive to seek information on fish farming using GSM – phone.

Table 4.6. Respondents' Sources of information

Sources of Information	Daily		Weekly		Fortnightly		Monthly		Once in several Months		Never	
	F	%	F	%	F	%	F	%	F	%	F	%
Extension agents	-	-	5	10.4	1	2.1	10	20.8	13	27.1	19	39.6
Farmers' Associations	4	8.3	5	10.4	5	10.4	20	41.7	10	20.8	4	8.3
Family Members	27	56.2	1	2.1	3	6.3	3	6.3	6	12.5	8	16.6
Fellow Farmers/												
Friends	39	81.3	8	16.4	11	22.9	12	25.0	16	33.3	10	20.8
Internet	1	2.1	2	4.2	5	10.4	8	16.7	10	20.8	22	45.8
Radio	23	47.9	5	10.4	3	6.3	3	6.3	9	18.7	5	10.4
Television broadcast	15	31.2	8	16.7	5	10.4	7	14.6	7	14.6	6	12.5
Bulletin/Posters	-	-	10	20.8	3	6.3	4	8.3	11	22.9	20	41.7
Newspapers	9	18.8	11	22.9	2	4.2	3	6.3	10	20.8	13	27.0
Mobile phone GSM	25	52.1	4	8.3	2	4.2	2	4.2	5	10.4	10	20.8
Workshop/Seminar	-	-	8	16.7	2	4.2	8	16.7	16	33.3	14	29.1
\bar{X}	35.31											

Source: Field survey 2012

4.5 Respondents' Information Utilisation

Table 4.7 revealed that most of the respondents had low utilisation of information on pond management (54.2%), feed types and sources (52.1%), disease control (47.9%), fish production/management (47.9%), government regulation (47.9%) sources of assistance/grant (47.9%), community development project (47.9%), land dispute settlement (43.7%) and market location (41.7%). Also the respondents had high information utilisation on current market prices (45.8%) and self-help project (43.7%) while they don't utilise information on agricultural insurance (45.8%). The rate at which fish farmers utilize fish farming information is low in nearly all the areas presented to them. Dada (2004) confirmed that fish farming potentials of the country have not undergone the degree of development it is expected as only less than one per cent of the potential is utilised. Accessibility of fish farming information as an important resource which leads to maximum utilisation but most people especially the fish farmers are marginalized and have access to 10% of agricultural extension

programme (World Bank, 1998). It is obvious that fish farmers information utilisation was low because, economic, legal and social information on fish production become useful if it is relevant, timely and appropriate. The choice through which fish farming information is transmitted must be perceived as appropriate and affordable by the fish farmers (Ochieng, 1999).

Table 4.7. Respondents' Information Utilisation

Information Utilisation	High use		Low use		Don't use	
	F	%	F	%	F	%
A. Technical Information						
Disease control	18	37.5	23	47.9	7	14.6
Feed types and sources	21	43.8	25	52.1	2	4.1
Pond management	18	37.5	26	54.2	4	8.3
Improved fingerlings	18	37.5	22	45.8	8	16.7
Fish production/management	18	37.5	23	47.9	7	14.6
Harvesting	20	41.7	22	45.8	6	12.5
B. Economic Information						
Current market prices	22	45.8	18	37.5	8	16.7
Market location	11	22.9	20	41.7	17	35.4
Agricultural Insurance	9	18.8	17	35.4	22	45.8
Budgeting methods	15	31.3	17	35.4	16	33.3
C. Legal Information						
Land dispute settlement	7	14.6	21	43.7	20	41.7
Government regulation	9	18.8	23	47.9	16	33.3
Environmental protection	12	25.0	18	37.5	18	37.5
D. Social Information						
Sources of assistance/grants	10	20.8	23	47.9	15	31.3
Self-Help project	21	43.7	14	29.2	13	27.1
Community development project	3	6.3	23	47.9	22	45.8
$\bar{X} = 16.64$						

Source: Field Survey, 2012

The utilisation of information by the respondents were classified into low and high depending on the number of respondents that fall above and below the mean utilisation of information as shown in table 4.8 it revealed that 44.0% of the respondents were above the mean while 56.0% of the respondents were below the mean. This implies that fish farmers in the study area utilized fish farming information at a low level. This calls for enhanced utilisation of fish farming technologies and other information needed for improved production level.

Table 4.8. Categorisation of fish farmers' utilisation of information

Information Utilisation	Frequency	Percentage
Low	27	56.0
High	21	44.0
Total	48	100

Source: Field Survey 2012

4.6 Respondents' Constraints to use of Information

In accessing and use of fish farming information, respondents were faced with several challenges. Table 4.9 shows that majority of the respondents believed unstable electricity power supply (100%), high cost of materials for fish farming (91.6%), conflicting messages (58.3%) and complexity of information (47.9%) to be the most serious constraints in the use of fish farming information. This finding corroborates the work of Kalusopa (2005) and Dutta (2009) that most of the sources of information were expensive, lack of electrification, batteries were expensive, the timing of the programmes is sometimes not helpful, the messages are of poor quality, and use of wrong language.

The respondents indicated low constraints in the use of the following; lack of simple reading material (60.4%), lack of seminar, workshop, training programme (58.3%), lack of agricultural demonstration (56.3%), extension agents come at odd time and not regular (52.1%), channels of information are not affordable (47.9%) and farmers association not well organised (41.7%) However, in spite of research and extension services efforts, there are improved packages on fish production which are not being adequately used by farmers. Adereti *et al.* (2006) assert that this is either because there is no information on these improved production packages or there is no adequate training on them.

The respondents indicated that fish farmers are busy with other activities (70.8%), lack of library and information centre (64.6%) and information not practicable in agricultural activities (43.8%) are not a constraint to utilisation of fish farming information. This implies that the information and communication infrastructure are considered as indispensable conditions for wide spread of socio-economic development in this age of globalization and information age. This corroborates the finding of Ellen (2003) who found that farmers are constrained by poor information infrastructure and poor communication facilities. Communication is ineffective because most of the time, farmers find it difficult to comprehend information, extension contact is poor because the ratio of extension agents to farmers is far from adequate.

Table 4.9. Respondents' Constraints to use of Information

Constraints to Information Use	High constraint		Low constraint		Not a constraint	
	F	%	F	%	F	%
Conflicting messages	28	58.3	16	33.3	4	8.3
Channels not affordable	18	37.5	23	47.9	7	14.6
Messages difficult to understand	16	33.3	18	37.5	14	29.2
Information not practicable in						
Agricultural activities	9	18.7	18	37.5	21	43.8
Messages not timely	15	31.3	18	37.5	15	31.2
Extension agents come at odd time	15	31.3	25	52.1	8	16.6
Extension agents are not regular	15	31.3	25	52.1	8	16.6
Fish farmers are busy with other activities	5	10.4	9	18.8	34	70.8
Messages not relevant to fish farmers	12	25.0	25	52.1	11	22.9
Information is too complex	23	47.9	21	43.8	4	8.3
Lack of Library and Information Centre	7	14.6	10	20.8	31	64.6
Farmer's Association not well organized	17	35.4	20	41.7	11	22.9
Unreliable nature of electricity	48	100	-	-	-	-
Lack of simple reading material	9	18.8	29	60.4	10	20.8
Lack of farm demonstration	14	29.2	27	56.3	7	14.5
Lack of seminars, workshop, training programme	15	31.3	28	58.3	5	10.4
High cost of materials on Fish Farming	44	91.6	3	6.3	1	2.1

$\bar{X} = 19.47$

Source: Field Survey 2012

4.7 Test of Hypotheses

4.7.1 Hypothesis one

H₀₁: There is no significant relationship between selected socio economic characteristics of fish farmers and information utilisation.

Findings: The hypotheses of the study were tested at 0.05 levels of significance. There is a significant relationship between educational attainment ($r = 0.316$ $p < 0.05$) and their information utilisation. (Table 4.10).

The result is in consonance with the conceptual framework of the study which assumes that, socio-economic characteristics have a direct link with information

utilisation. Conversely, the PPMC test revealed that there is no significant relationship on household size ($r = -0.0130$ $p < 0.05$) and fish farming experience ($r = -0.038$ $p < 0.05$). This implies that fish farmers do not subscribe to the use of family labour and their information utilisation behaviour is not in accordance with their old age which says “experience is the best teacher”.

Table 4.10. Correlation and Chi – square result for the relationship between some socio – economic characteristics of the respondents and information utilization.

Variables	DF	Test Statistics	P. Value	Decision
Educational Attainment	5	$r = 0.316^*$	0.040	S
Household Size	2	$r = - 0.130$	0.378	NS
Fish Farming Experience	4	$r = 0.038$	0.797	NS
Marital status	3	$\chi^2 = 0.915$	0.216	NS
Primary Occupation	3	$\chi^2 = 0.116$	0.216	NS

Source: Field Survey 2012

CHAPTER FIVE

SUMMARY, CONCLUSION, RECOMMENDATIONS AND CONTRIBUTIONS TO KNOWLEDGE.

5.1 Summary

The study investigated the information accessibility and utilisation among fish farmers in Girei, Yola North and Yola South Local Government Areas of Adamawa State and specifically, described the socio-economic characteristics of the respondents, determined the information needs, assessed the fish production information available to the respondents, assessed the information that are utilized by the respondents, identified the sources of information among them and ascertained the constraints they experience in accessing and use of information. The hypotheses of the study which were stated in the null form were tested. The PPMC test of correlation revealed that there is a significant relationship between educational attainment ($r = 0.316^*$, $p < 0.05$) and information utilization

Primary data were used for the study; this was sourced using structured questionnaire which was administered to the respondents. The data were analysed using descriptive statistics and inferential statistics (Chi-square and PPMC) which was used to test the hypotheses at 0.05 level of significant.

The study reveals that, majority (37.5%) of the respondents were within the age of 41 – 50 years, 56.2% of the respondents had household size of 6 – 10 persons and 83.3% of them were male. Majority (50.0%) of the respondents were civil servants and 72.9% of them had one form of tertiary education or another and only 8.3% had no formal education. Most (79.1%) of the respondents had less than 10 years of farming experience and only 20.9% of them have practiced fish farming for more than 10 years.

Result of the information needs shows that 58.3% of the respondents had high information needs while 41.7% were below the mean which indicates a low information need among the respondents.

Result of access to information revealed that the respondents had low access to fish farming information in most (58.3%) of the respondent indicated low access to fishery production information and 41.7% of the respondents indicated high access to fish farming information.

The result on sources of information used by respondents revealed that friends/fellow farmers (81.3%), Family members (56.2%), GSM (52.1%) as well as radio (47.9%) and Television (31.2%) were the most predominant sources of

information available to farmers on daily basis. 41.7% of the respondents sourced information from farmers association monthly, 22.9% got information from the newspapers on weekly basis and 33.3% sourced information from workshop/seminar once in several months.

The result of information utilization also revealed that, the rate at which the respondents utilize fish farming information was low in almost all the areas presented to them. Information was inadequate on pond management (54.2%), feed types and source (52.1%), Disease control (47.9%), improved fingerlings (45.8%) and fish harvesting (45.8%) as well as information on market location (41.7%).

The result of the respondents' constraints in the utilization of fish production information shows that: unstable electricity power supply (100%), high cost of materials on fish farming (91.6%), conflicting messages (58.3%) and complex information (47.9%) were the most serious constraints to the use of fish farming information. The hypotheses of the study were tested at 0.05 levels of significance. The result of the PPMC test revealed a significant relationship between educational attainment ($r = 0.316$ $p < 0.05$) and utilisation of fish production information.

5.2 Conclusion

Considering the result of the study, it is concluded that, the majority (83.3%) of the respondents were male and 75% were married with 72.9% of them having acquired one form of tertiary education or another. Their primary occupation was civil service (50%) and 56.2% had household size of 6 – 10 people with 79.1% having less than 10 years of experience on fish farming. The respondents had high information needs on fish farming but accessibility and utilisation of the information on fish farming was far from adequate. Most of the respondents differ in their access to and utilisation of fish farming information from various sources at different time intervals. Information obtained on frequent basis was few and the diversity could be related to personal, social, economic or institutional factors. The reasons behind diversity and farmers' current level of access and utilisation of agricultural information would be subscribed to the gaps in information technology and inadequate number of Agricultural Extension officers, who create awareness on fish farming information utilisation. This was capable of enhancing the production and productivity of agriculture. This was not the case as revealed by the results from this study.

Furthermore, respondents in the study area were not always using institutionalized sources of information such as extension service, internet, and extension bulletin/poster among other sources. Most of the farmers obtained first-hand information from family members/friends, radio and mobile phone (GSM). Such sources may be devoid of the expected accuracy and the technical efficiency that may come with the information had it come from the agricultural extension agents or research organisations.

5.3 Recommendations

Based on the findings of this study, the following recommendations were made:

- ❖ Government, extension agents and other assisting agencies should intensify their efforts and provide better means of spreading fish farming information needs to fish farmers as this will aid in improving fish farming and hence increase fish production.
- ❖ Information that is mostly needed by fish farmers should be identified and provided to them at the right time as this will increase their accessibility to information and its utilisation thereof.

- ❖ Concerted efforts should be made in ensuring that extension messages are properly channelled to fish farmers through various sources of information such as family members, radio, television broadcast and mobile phones. A combination of these information sources would assist agricultural extension workers to effectively reach out to the fish farmers.
- ❖ Fish farmers' reasons for the non-utilization of certain categories of information should be sought from them. This would subsequently guide development planners and agricultural extension agencies in designing information dissemination pattern that will be adopted in reaching the target audience.
- ❖ Extension planners and executors should continually advocate the presence of basic social amenities such as electricity, water supply etc. in fish farming area while trying to constantly determine fish farmers access to and utilisation of fish farming information from time to time.

5.5 Contributions to Knowledge

The study has made the following contribution to knowledge:

- Fish farming in the study area is male dominated.
- Fish farming is a relatively new venture in the study area with most respondents having less than ten years of experience.
- Though, respondents had high information needs, they had low information access and utilization.
- Friends and fellow farmers were the major source of fish production information among the respondents.
- Unstable electric power supply was respondents' major constraints.

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APPENDIX 1

Department of Agricultural Economics and
Extension,
Modibbo Adama University of Technology,
P.M.B 2076, Yola,
Adamawa State.
Date_:.....

Dear Respondent,

I am a postgraduate student of the above named institution undertaking a research on INFORMATION ACCESSIBILITY AND UTILIZATION AMONG FISH FARMERS IN GIREI, YOLA NORTH, AND YOLA SOUTH LOCAL GOVERNMENT AREAS, ADAMAWA STATE.

You are please requested to fill in the attached questionnaire appropriately. The information provided by you will be treated confidentially and be used for research purposes only. Thank you for your anticipated cooperation.

Thank you.

Yours faithfully,

Barguma Kitanyi

A. SOCIO-ECONOMIC CHARACTERISTICS OF FISH FARMERS

INTRODUCTION: Please tick [] or fill appropriately in the spaces provided

- i. Age.....
- ii. Sex: (a) Male [] (b) Female []
- iii. Marital status: (a) Single [] (b) Married [] (c) Widowed []
(d) Divorced []
- iv. Educational attainment: (a) No formal education [] (b) First school leaving certificate [] (c) Senior secondary school certificate [] (d) Diploma/NCE [] (e) B.sc/HND [] (f) M. Sc. [] (g) Others (please specify)
- v. Household size.....
- vi. Primary occupation: (a) Farming [] (b) Trading [] (c) Civil servant [] (d) Artisan [] (e) Others (please specify)
- vii. Fish farming experience.....

A. THE INFORMATION NEEDS OF FISH FARMERS:

	Information Needs	High	Low
A	Production		
	Pond construction		
	Fish Fingerlings types/sources		
	Feed types and sources		
	Fish disease Prevention		
	Fish disease treatment		
	Fish growth		
	Fish harvesting		
	Fish preservation and processing		
B	Inputs		
	Suitable Land		
	Good Water Quality		
	Credit Facilities		
	Hired Labour		
C	Management		
	Pond environment management		

	Fish feeding		
	Equipment repair		
	Feed storage		
	Waste Drainage		
D	Marketing		
	Fish processing		
	Fish storage		
	Fish Marketing		

C. ACCESS TO INFORMATION BY THE FISH FARMERS:

	Types of information	High Access	Low Access	No Access
A	Technical information			
	Disease control			
	Temperature			
	Feeds types and sources			
	Pond management			
	Improved fingerlings			
	Fish Production/Management			
	Harvesting			
B	Economic information			
	Current market prices			
	Market location			
	Agric. Insurance			
	Budgeting methods			
C	Legal Information			
	Land dispute settlement			
	Government regulation			
	Environmental Protection			
D	Social Information			
	Sources of Assistance/Grants			
	Self Help Project			
	Community Development Project			

D. SOURCES OF INFORMATION AVAILABLE TO RESPONDENTS ON FISH FARMING:

S/N	Sources	Daily	Weekly	Forth Nightly	Monthly	Once in Several months	Never
1.	Extension agents						
2.	Farmers association						
3	Family members						
4	Fellow Farmers/friends						
5.	Internet						
6.	Radio						
7.	Television						
8.	Bulletins/posters						
9.	Newspapers						
10.	Mobile phone (GSM)						
11.	Workshop/seminar						

E. FISH FARMERS' UTILISATION OF FISH FARMING INFORMATION:

	Types of information Used	High use	Low use	Don't use
A	Technical information			
	Disease control			
	Feeds types and sources			
	Pond management			
	Improved fingerlings			
	Fish Production/Management			
	Harvesting			
B	Economic information			
	Current market prices			
	Market location			
	Agric insurance			
	Budgeting methods			

C	Legal Information			
	Land dispute settlement			
	Government regulation			
	Environmental Protection			
D	Social Information			
	Sources of Assistance/Grants			
	Self Help Project			
	Community Development Project			

F. CONSTRAINTS EXPERIENCED BY THE FISH FARMERS IN SEEKING AND UTILISATION OF FISH FARMING INFORMATION:

Constraints	High constraint	Low constraint	Not a constraint
Conflicting messages			
Channels not affordable			
Messages difficult to understand			
Information not practicable in agric. activities			
Messages not timely			
Extension agents come at odd time			
Extension agents are not regular			
Fish farmers are busy with other activities			
Messages not relevant to fish farming			
Information is too complex			
Lack of library and information Centre			
Farmers' Association not well organised			
Unstable electricity power supply			
Lack of simple reading materials			
Lack of farm demonstrations			
Lack of seminars, workshops & training progs.			
High cost of materials on fish farming			