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Weather Information Needs of Displaced Artisanal Fishermen in Bakassi Pennisula Nigeria

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Abstract

Information on weather forecast is necessary to guide fishermen on their fishing adventure. The purpose of this study was assessed the weather information needs of displaced fishermen in Bakassi Pennisula, Nigeria. This study was conducted in Bakassi which is a peninsula on the Gulf of Guinea that lies between latitudes 4°25' and 5°10'N and longitudes 8°20' and 9°08'E. It has an area of 665 km² (257 sq mi) with displaced Fishermen settling in the area who were the main respondents. It was a descriptive study. One hundred and five (105) displaced fishermen were randomly selected as respondents using snowball sampling

technique and questionnaire were administered to them to elicit information. Descriptive statistics like simple frequencies and percentages were used to analyzed data collected. The findings revealed that male dominated fishing activities using simple rented canoes. Majority of the respondents (90) sought for weather forecast information frequently and almost all the respondents (100) prefer such information be disseminated in local language (Efik). More so, other information needs of respondents include market conditions and daily price fluctuation among others (105). In conclusion, information is a gateway and proper weather forecast to the displaced fishermen can go a long way to prevent incidence of death and injuries on the high sea.

KEYWORDS: Artisanal, Bakassi, displaced fishermen, forecast, information, needs, Weather

Introduction

Millions of people worldwide today depend on fisheries as important source of food and livelihood. However, based on Food and Agriculture Organization (FAO) analysis of assessed commercial fish stocks, the share of fish stocks within biologically sustainable levels has decreased since the 1970s and is only starting to recover now (www.oecd.org, FAO, 2020). Meanwhile, “globalization has provided opportunities for criminal networks to expand the scope and scale of illegal, unreported and unregulated (IUU) fishing operations, sometimes in combination with other crimes such as drug trafficking, forced labour, tax crimes and even financing of terrorist activities” (www.oecd.org Leroy, 2016, Kuemlangan et al., 2016, OECD, 2016). On the other hands, digital tools and other electronic technologies are changing the economies of nations, societies and people’s lives. Information has become a valuable commodity in the global world where nations

that have acquired the necessary ICT infrastructures have been moving rapidly into the post-industrial information-based economy (Idiku et al., 2015). For instance, technology especially has now a deep-rooted effect on the activities surrounding information and communications which are very important for sustainable development.

Fish is an important element in the diet and of course a source of protein from animal which several citizens of Nigeria consumed about 13.3kg annual *per caput* in 2013 alone. It was estimated that 1 027 000 tones of total fisheries was produced in Nigeria in 2015 and out of this, inland waters catches recorded 33%, marine catches was in the proportion of 36%, while 31% came from aquaculture and the whole fishery sector recorded 0.5% of national GDP (www.fao.org). Roughly, 80% of the total domestic production of fish in Nigeria is comes from artisanal fishermen who are small-scale fishers usually from Niger Delta creeks, coastal, inshore like the Bakassi Penninsula, lagoons, lakes and inland rivers where the small migratory bonga (*Ethmalosa fimbriata*) is the main catch (www.fao.org). One of the sources of protein in the human diet is animal protein commonly obtained from meat (Ijatuyiet al., 2017). It has been reported that there is a great shortage of protein from animal source, especially meat as a result of circumstances which are beyond the control of consumers particularly in terms of affordability (Ijatuyi et al., 2017; Adefalu et al. 2013). Again, population increases

has brought significant alterations in the pattern of production and consumption of livestock, hence, creating a pathway for what is known as “food revolution” (Ijatuyi et al., 2017, Zilberman et al. 2011). The implication is that, humans began to seek for other protein sources like the fish and fishery have been maintaining an important position and contributing to the share of Gross Domestic Product in Nigeria (Ijatuyi et al., 2017, Olaoye et al., 2016).

Based on the rate of demand for fish farming which is a major sub-sector of agriculture in Nigeria, there is need for an urgent knowledge and information sharing to fishermen (Ejiogu-Okereke *et al.*, 2016). In order to enhance local fish production in the country, there is need to improve access and utilization of information communication technologies (ICTs) (Akinbile & Alabi, 2010). This is because inadequate agricultural information has been identified as the greatest obstacle to farmers because agriculture is becoming information-oriented. Agricultural production and productivity are heavily depended on accurate and appropriate information. Information guide management decisions in farms and as such, farmers are engaged in seeking for information to meet their objectives by filling such information gap in their farm practices (www.aesonnigeria.org, Madhavan, 2017). Agricultural information includes both unpublished and published knowledge in agriculture and is made up of ideas, innovations and technological activities (Madhavan, 2017). Agriculture information is required to

in order to develop development the agricultural sector and improve the standard of living of farmers and fishermen (Salau et al, 2013). This is because poverty in Nigeria and Cross River State to be specific is a rural phenomenon (Idiku et al., 2014). All farmers require information and communication systems (Natsa 2013). However, in all human endeavors, information is necessary especially as a factor of production for a better communication to enhance productivity (Idiku *et al.*, 2015). For example the introduction of mobile phones in agricultural sector has brought about drastic changes which have helped farmers to be able to access information with ease (Idiku *et al.*, 2015). In addition, the easy access to mobile phones and low prices has made the technology an important tool for socioeconomic opportunities among Fisherfolks. Fisheries have indeed contributed to the socioeconomic development of Nigeria and thus, information can help fisherfolks a lot, as new information are released across the sector, from commercialization and capture or culture to processing as well as resource assessment. Others include special applications like sonar for locating fish, mobile phones for information exchange, emergencies and trading, Global Positioning Systems (GPS) used for navigation and location finding, radio programming with fishing communities and Web-based information and networking resources (www.itu.int, FAO, 2016). Although a minor section of fisherfolk still hold on to the traditional practices of fishing because majority of them cannot afford and

utilize the applications which are often chargeable and require a lot of internet data thereby placing a huge burden on the farmer/fishermen (Baumuller 2012, World bank 2012; FAO, 2016).

Fishermen need a wide range of information on modern fishing gears (Otolu, 2015). Research has shown that rural dwellers who are agrarian (fish farming and animal rearing) retrieve their required information from various sources. As a matter of fact, fishermen source for information from various sources such as from neighbors, colleagues, friends, and relatives and usually in most cases from word of mouth (Otolu, 2015). Fishermen face several challenges and problems in the course of their fishing activities and seeking information for their livelihoods. Some of the problems include “transportation both personal (for fishing) and commercial for movement from fishing camps to big towns and villages” (Otolu 2015). Others include lack of portable drinking water, lack of electricity, unavailability of modern fishing gears, pollution by oil with adverse effects on fishes and sources of water for drinking and lip service from government; lack of credit facilities as well as poor storage and preservation facilities (www.iec.ac.uk) . But several research reports have focused on the general information needs of the Fisherfolks and not on the weather forecast which the fishermen require for their safety and livelihoods on and around the high sea. For instance, majority of the fishing communities and displaced Fisherfolks in Bakassi Peninsula are not

receiving weather forecast information as there is poor capacity on the part of agricultural extension agents within the area to disseminate such information. This has endangered their lives and livelihoods resulting in several deaths and injuries at sea which would have been averted if weather forecast information and other relevant information were readily available to the displaced Fisherfolks, hence, the urgent need for information that this study intends to fill the knowledge gap by assessing the Weather Information Needs of Displaced Fisherfolks in Bakassi Peninsula Nigeria. The specific objectives include describing the socioeconomic characteristics of respondents, identifying the type of fishing vessel used and the ownership status, identifying the weather forecast information required by the respondents and identifying other information needs of respondents.

Materials and Methods

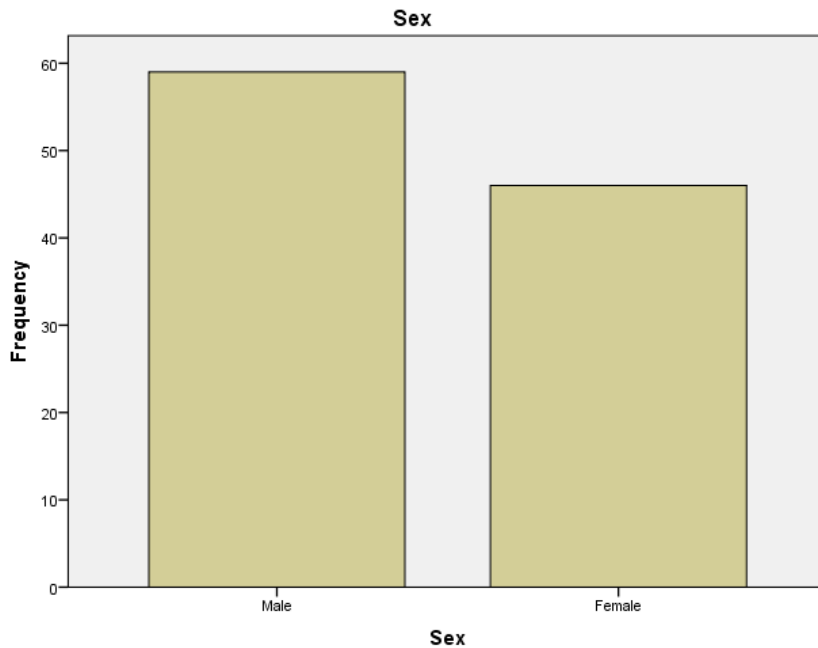
This study was conducted in Bakassi which is one of the eighteen (18) Local Government Areas in Cross River State Nigeria. Bakassi is a peninsula on the Gulf of Guinea lying between the Cross River estuary, near the city of Calabar in the West of the Bight of Biafra, and the Rio del Ray estuary on the East

(www.wikiyy.com). The peninsula lies between latitudes 4°25' and 5°10'N and longitudes 8°20' and 9°08'E and consists of a number of low-lying, largely mangrove covered islands covering an area of around 665 km² (257 sq mi) (www.en.wikipedia.org). “The population of Bakassi is the subject of some dispute, but is generally put at between 150,000 and 300,000 people. Bakassi is situated at the extreme eastern end of the Gulf of Guinea, where the warm east-flowing Guinea Current (called Aya Efiat in Efik) meets the cold north-flowing Benguela Current (called Aya Ubenekang in Efik)” (www.en.wikipedia.org). These two ocean currents interact, creating huge foamy breakers which constantly advance towards the shore, and building submarine shoals rich in fish, shrimps, and a wide variety of other marine life forms making the Bakassi area a very fertile fishing ground, comparable only to Newfoundland in North America and Scandinavia in Western Europe. Most of the population makes their living through fishing (www.en.wikipedia.org).

The study utilized a descriptive research design and the population comprises all Fisherfolks in Bakassi Local Government Area. A snowball sampling technique to select one hundred and twenty (120) displaced fishermen as respondents. Snow ball sampling technique was used because it was not easy to track the fishermen at home as they are always in the high sea, thus, any fisherman that come in contact was administered a questionnaire to elicit information. The primary data so

obtained from the respondents were analyzed using descriptive statistics such as simple frequencies and percentages with the help of SPSS.

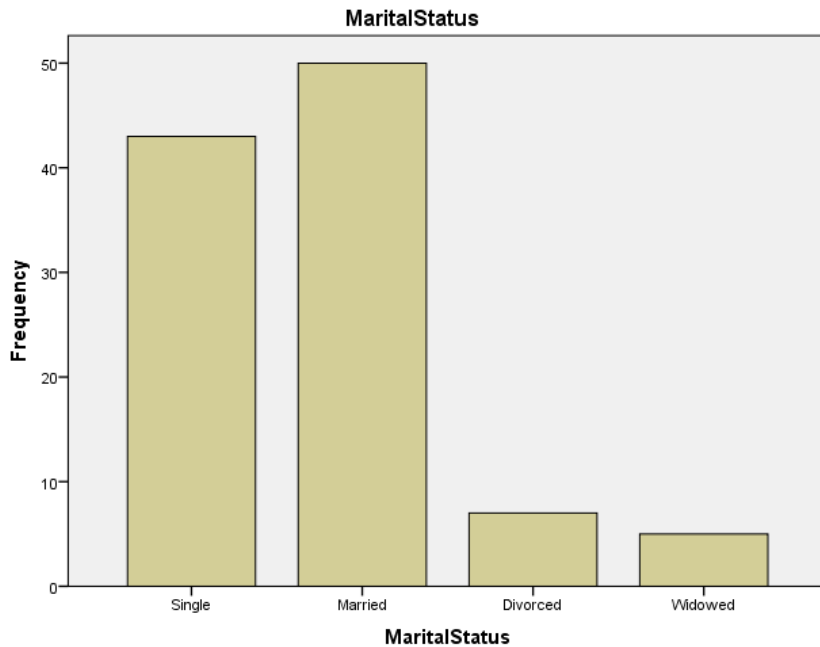
Results and Discussions



Source: Field survey 2019

Fig.1 Distribution of Respondents by Sex

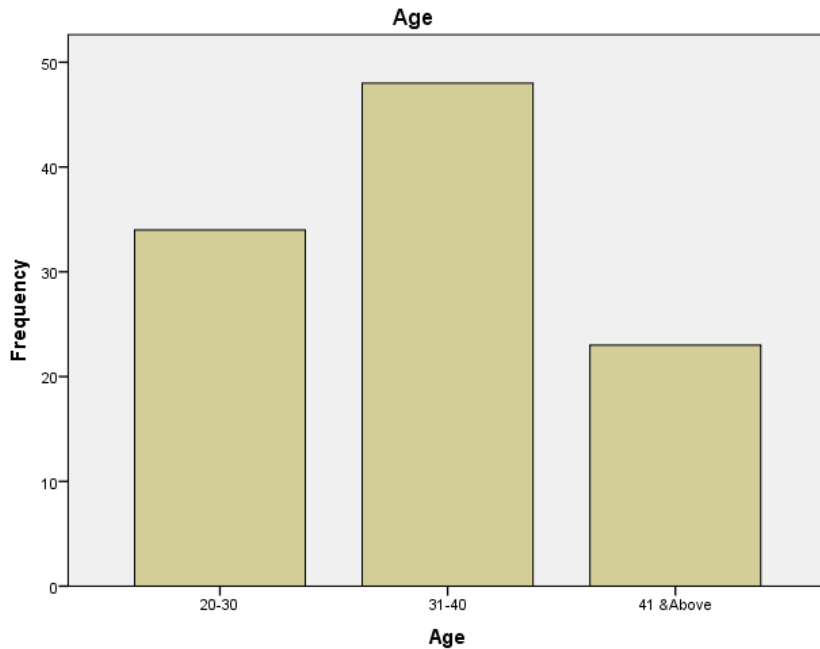
The result of Fig.1 shows that male 56.2% participated in fishing activities than female with 43.8%. The domination by male in participation in fishing activities may be due to their access to information and productive resources than the female counterparts who are usually at a disadvantage. Moreover, there are inherent dangers in Bakassi high sea as a result of the activities of the Niger Delta militants, sea pirates and Cameroonian jandams who are constant threats to fishermen who have either been killed or robbed of their fish and fishing vessels



Source: Field survey 2019

Fig.2 Distribution of Respondents by Marital Status

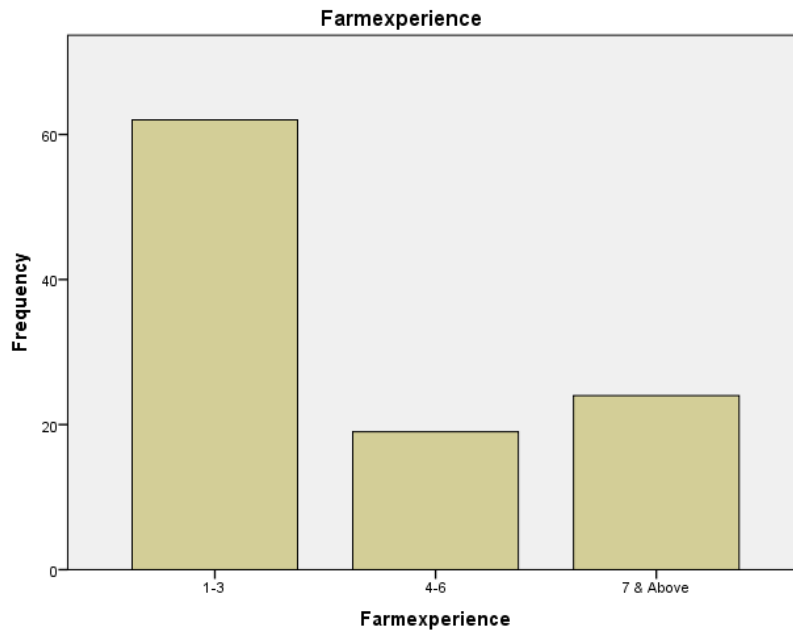
According to the result in Fig.2, they were more married fishermen with 47.6% than single fishermen with 41.0%. On the other hands, those divorced recorded 6.7% and widowed fishermen 4.8%. This result implies that majority of the fishermen are responsible people who are ready to carter for their households as marriage confer some bit of responsibility on the part of married couple.



Source: Field survey 2019

Fig.3 Distribution of Respondents by Age

In terms of age, Fig. 3 shows that age category 31-40years recorded the highest score of 45.7% followed by 20-30years with 32.4% while 41 years and above had 21.9%. The ages of fishermen are significant when considering participation in innovation, hence, the fact that fishermen in their prime age recorded 45.7% implies that they are still young and active and are likely to venture into or adopt innovations faster and better as risk takers.



Source: Field survey 2019

Fig. 4 Distribution of Respondents by Farming experience

The result of the farming experience of Fishermen is presented in Fig. 4. It shows that 59.0% of the respondents had 1-3years of fishing experience, 22.9% had 7years and above while only 18.1% had fishing experience of 4-6years.It is widely stated that experience is the best teacher, therefore the upcoming fishermen with 1-3 years experience will be more eager to learn about new and modern information needs than the older ones who might be interested only in the traditional information dissemination methods.

Table1. Distribution of Respondents by Educational Level

| Educational Level | Frequenc y | Percentage |
|--------------------------|-----------------------|-------------------|
| No formal education | 49 | 46.7 |
| Primary education | 23 | 21.9 |
| Sec Education | 20 | 19.0 |
| Tertiary education | 13 | 12.4 |
| Total | 105 | 100.0 |

Source: Field survey 2019

Table 1 indicates that fishermen with no formal education were 46.7%, those that attained Primary school level were 21.9%, and Secondary school level was 19.0% while Tertiary education level with 12.4%. The various differences in educational attainment means that fishermen information needs and use will be different. Well educated fishermen will be more receptive to seeking new information and change especially from extension agents and internet than those with no formal education and conservative.

Table2. Distribution of Respondents by Income Level

| Annual Income Level (Thousand Naira) | Frequency | Percentage |
|---|------------------|-------------------|
| 50,000-100,000 | 85 | 81.0% |
| 101,000-150,000 | 15 | 14.2% |
| 151,000 & above | 5 | 4.8% |
| Total | 105 | 100 |

Source: Field survey 2019

Table 2 shows the result of annual income level of respondents where 81.0% earned annual income of between N50, 000 to N100, 000, and 14.2% of respondents earned between N101, 000-150,000 while only 4.8% of respondents

earned from N151, 000 and above. This result implies that in spite of all the energy and resources put into fishing activities by fishermen, a large proportion of them still earn so little probably due to lack of information on weather, market conditions and price fluctuations. Again, several wastage and losses occurred due to lack of appropriate preservation, storage and value addition mechanisms. The result further corroborated the assertion of FAO (2020) that there is a decrease and an increase of fish stocks from artisanal fishermen.

Table3. Distribution of Respondents by the type of fishing Vessel

| Type of fishing vessel used | Frequency | Percentage |
|------------------------------------|------------------|-------------------|
| Canoe | 100 | 95.2% |
| Engine boat | 5 | 4.8% |
| Trawler | 0 | 0.0% |
| Total | 105 | 100 |

Source: Field survey 2019

The result of Table 3 shows that 95.2% of the respondents used canoe for fishing and only 4.8% used engine boats for fishing while none of them used trawler. The high use of canoes by fishermen reflect the level of poverty in the region as majority could not afford even the engines to be mounted on their canoes talk less of purchasing an engine boat. In spite of the oil rich Bakassi Penninsula, poverty in the area is a disgrace as the government is yet to carter for the displaced fishermen as a result of the dispute with Cameroon ceding the Penninsula to them. The result

agreed with earlier studies report that although a minor section of fisherfolk depending on traditional practices of fishing (FAO, 2020).

Table 4. Distribution of Respondents by Ownership of fishing Vessel

| Ownership of fishing vessel used | Frequency | Percentage |
|---|------------------|-------------------|
| Own | 30 | 28.6% |
| Rental | 75 | 71.4% |
| Royalty | 0 | 0.0% |
| Total | 105 | 100 |

Source: Field survey 2019

Table 4 presents the result for ownership of fishing vessels and it indicates that 71.4% of respondents rent the fishing vessel that they used and only 28.6% owned their fishing vessels. However, none of them was using any vessel on royalty. Another glaring state of poverty was shown by the ownership of the fishing vessel that despite the threats to life and properties, majority of the displaced fishermen hardly own canoes instead they rent from those older and retired fishermen who can no longer go the voyage to the sea. Some inherited from their parents but have to pay rents to keep the older men alive as their livelihoods depend on fishing.

Weather forecast Information Needs of Fishermen

Table 5. Distribution of Respondents by Weather Forecast Information Needed

| Weather Forecast Information Needed by Fishermen | Frequently | Sometimes | Never |
|---|-------------------|------------------|--------------|
| Weather parameter needed (content) | | | |
| a.) Wind speed | 90 | 15 | 0 |
| b.) Wind direction | 75 | 30 | 0 |
| c.) Thunder Storms | 60 | 45 | 0 |
| d.) Sea currents | 80 | 25 | 0 |
| Language preference | | | |
| a.) English | 35 | 70 | 0 |
| b.) Efik | 100 | 5 | 0 |
| Medium of transmission | | | |
| a.) SMS | 90 | 10 | 5 |
| b.) Radio | 80 | 25 | 0 |
| c.) Television | 60 | 60 | 0 |
| d.) Through Ext, Agents | 100 50 | 5 50 | 0 5 |
| e.) Internet | | | |
| Timing of information Dissemination | | | |
| a.) Morning | 50 | 50 | 5 |
| b.) Afternoon | 75 | 30 | 0 |
| c.) Evening | 65 | 30 | 10 |
| d.) Night | 15 | 30 | 60 |
| e.) Anytime | 40 | 40 | 25 |

Source: Field survey 2019

Table 5 results shows the weather forecast information needs of fishermen in the study area with 90, 75, 60 and 80 fishermen requiring weather information frequently on wind speed, wind direction, thunder storms and sea currents respectively. On the other hands, 15, 30, 45 and 25 fishermen respectively requires

same weather forecast information sometimes but none of the fishermen that do not require information on weather forecast. This result disagreed with the findings of earlier studies that globalization has changed the landscape of fishing with criminal elements invading the sector (Leroy, 2016, Kuemlangan et al., 2016, OECD, 2016).

In terms of language preference for disseminating information, almost all (100) fishermen prefer information be shared frequently in Efik local language instead of English language, only 5 fishermen want the information Efik disseminated sometimes. For English language, 35 fishermen want it shared frequently while 70 others prefer it shared sometimes. For medium of transmission of information needs, 90 fishermen prefers short message service (sms) sent frequently, 10 fishermen want it sent sometimes and 5 never want it shared through sms. Other media such as radio, television, Extension Agents and Internet, 80, 60, 100, and 50 fishermen respectively want them to be disseminated frequently. However, when it comes to timing of information dissemination frequently, 50, 75, 65, and 15 respondents prefer the dissemination of information needs in the morning, afternoon, evening and nights respectively while 40 respondents want the information disseminated frequently anytime. Most fish catches are carried out in the nights, hence, their willingness for majority of the information to be disseminated during the day. Although some of the respondents preferred anytime

for the facts that their mobile phone device can work anytime but sometimes due to network fluctuations and erratic power supply, it becomes difficult for the respondents to cope. This result is in line with the studies that the rate of demand for fish farming which is a major sub-sector of agriculture in Nigeria calls for urgent information and knowledge sharing to fish farmers (Ejiogu-Okereke *et al.*, 2016). Also it goes further to agree with the assertion that in order to enhance local fish production in the country, there is need to improve access to information communication technologies (ICTs) (Akinbile & Alabi, 2010).

Table 6. Distribution of Respondents by Other type of Information Needed

| Other type of Information Needed by Fishermen | Frequently | Sometimes | Never |
|--|-------------------|------------------|--------------|
| a.) Market conditions | 105 | 0 | 0 |
| b.) Price fluctuation | 105 | 0 | 0 |
| c.) Manufacturing of nets | 50 60 | 50 43 | 5 2 |
| d.) Boats | 75 | 20 | 10 |
| Manufacturing | 100 | 5 | 0 |
| e.) Uses of waste fish | 90 | 15 | 0 |
| f.) Health Information | | | |
| g.) Value added fish prod | | | |

Source: Field survey 2019

The result of Table 6 shows that all the respondents (105) need both market conditions and price fluctuation information frequently, 100 respondents require health information frequently and only 5 respondents require the same information

sometimes. However, 75 respondents need information on uses of waste fish frequently, 20 respondents need the same information sometimes but only 10 respondents never require such information. This result indicates that respondents are in dire needs of other information to enable them market their fish products, sought for spare parts in their engine boats and possibly replace older and worn-out canoes. Their health is also of paramount importance as well as adding value to their products. This result agreed with studies of Idiku et al., (2015) that information has become a valuable commodity in the global world where nations that have acquired the necessary ICT infrastructures have been moving rapidly into the post-industrial information-based economy. More so, it agreed with result of earlier studies that fishermen needs information in other areas such as the applications of sonar for locating fish, mobile phones for information exchange, emergencies and trading, etc (FAO, 2020).

Conclusion

Information is a management and decision-making tool. Fishermen require proper weather forecast information and other sundry information to remain relevant in their chosen profession. Hence, all hands must be on desk to provide the needed information which can go a long way to prevent incidence of death and injuries to fishermen on the high sea. Information will also enhance their livelihoods and bring about a win-win situation for all concern in Nigeria.

Conflict of Interest: The authors have no conflict of interest to declare.

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