



## SURVEY OF SOME ASPECTS OF ARTISANAL FISHERIES OF SABIYEL LAKE, ALIERO, KEBBI STATE, NIGERIA

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### ABSTRACT

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A survey was conducted to assess some aspects of artisanal fisheries in fishing households of Sabiyel Lake in Aliero local Government Area, Kebbi State, Nigeria between 2014 and 2015. One hundred (100) questionnaires were administered in seven (7) communities surrounding the Lake. Data was analyzed using descriptive statistics. Results revealed that 100% of the sampled households were married. The age of the respondents vary with 43% below the age of 50, 32% above 50 years of age. All of the households sampled were male. Respondents with no formal education accounted for 77%. Majority of the respondents still use traditional gears, methods and crafts. Most respondents (53%) were involved in only selling of fresh product as a means of livelihood. The fish species caught in Sabiyel lake comprises of *Hyperopesus bebe*, *Oreochromis niloticus*, *Sarotherodon gallieus*, *Clarias gariepinus* and *Heterotis niloticus*. Most respondents (42%) sold their fish fresh without processing or preservation. Regarding the role of women, 28% of the respondents mentioned that women participate in the processing of fish. Most of the respondents (87%) stated lack of both modern fishing gears and crafts as the major problems confronting their fishing activities. The study suggested that state government should address the major constraints to fishing in the study area by supplying and subsidizing fishing gears, crafts and adequate processing and preservation equipment.

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## INTRODUCTION

The Nigeria fisheries industry consist of three (3) broad sub-sectors; the artisanal or small scale fisheries; the industrial (or large scale fisheries) and aquaculture. Out of these three subsectors, artisanal fisheries constitute the most significant sub sector in terms of number of people, employment and contribution to total fish output in the country (Oladimeji et al., 2013). Available records from the Federal Department of Fisheries Statistics reveal that total fish production in Nigeria for 25 years average about 4,08,000 MT per annum. According to Mathieu (2001), artisanal fishing account for more than 80 percent of the total fish production in Nigeria. But in spite of contributing the lion share to domestic fish output in Nigeria, artisanal fisheries remain the most impoverished fisheries sub sector with fishermen generally living at the subsistence level. Several reasons had been offered for the poor standard of living of artisanal fisherman which culminates in various poverty levels in the fishing communities.

Though the riverine communities benefit from species diversity, Bada (2005) noted that Nigeria requires approximately 1.5million MT of fish annually in order to meet its daily protein needs. However, Nigeria has not been able to provide the quantity of fish needed by its citizens and this has led to importation to supplement local production. To stimulate the country to become self-sufficient in fish production over the next four years through a 25% annual fish import cut, an annual baseline fish import figure has been set for 2014 which reduced the allowable quantity of imported fish to 5,00,000 MT (Fishsite, 2014).

Nigeria has been listed among the 25 poorest nations in the world for several years. Yet, the country is endowed with human population of over 160 million people in addition to rich vegetation and abundant water resources; about 2,86,200km<sup>2</sup> of waterarea (Shimang, 2005), which apart from capability of supporting a large population of livestock and crop irrigation, as well supports production of enough fish and fish products not only for domestic consumption but also for export (FAO, 2003). Suffice to note also that despite Nigerians abundant fishery resources, the country is still largely a protein deficient nation. It is well documented that Nigerians per capital intake of high quality animal protein is too low (Rahji et al., 2011).

Nigeria is blessed with over 14 million of hectares of reservoirs, lake, ponds and major rivers capable of producing over 9,80,000MT of fish annually (FDF, 2007). Statistical survey have shown that the demand for fish in the country exceed supply and also the domestic production is still very low, considering the increasing human population. The annual fish consumption/demand in Nigeria has been estimated to be over 1.3 millionMT and the total domestic production is just about 4,50,000 MT per annum (Tsadu et al., 2006). With increase in human population in Nigeria, less fish will be available per capita annually (Eyo, 1999). In this regard, several studies have been conducted on the assessment and conservation of various lakes and rivers in Nigeria (Araoye, 2009; Abubakar and Auta, 2012; Ahmed *et al.*, 2014). Despite the rich nature and importance of Sabiyel lake in the provision of animal protein and income to the vast majority of people in the study area, no such research have been conducted.

This research work has the primary goal of identifying the socioeconomic characteristics, type of fishing gears and crafts, dominant fish species caught, processing methods used, size and distribution of fishing communities, role of women in fisheries activities and the social and economic constraints that limit development of the fisheries of Sabiyel lake in order to suggest ways for effective management.

## MATERIALS AND METHODS

### Study area

The survey was conducted in the fishing communities around Sabiyel lake, Aliero Local Government of Kebbi state. Sabiyel lake is a eutropic, perennial standing fresh water body, located between latitude 13° 6'- 4°15" North and longitude 12°27"- 47" East. The lake is at the centre of Sabiyel, Kashinzama, Laga, Tari, Kambaza, Bami Mairuwa, and Kyara villages, 13km away from Aliero town, Aliero Local Government Area, Kebbi state, Nigeria (Figure 1). It covers a length of 9km between the one extreme to other extreme of the lake. It is almost covered by emergent plants, dominantly cattail.

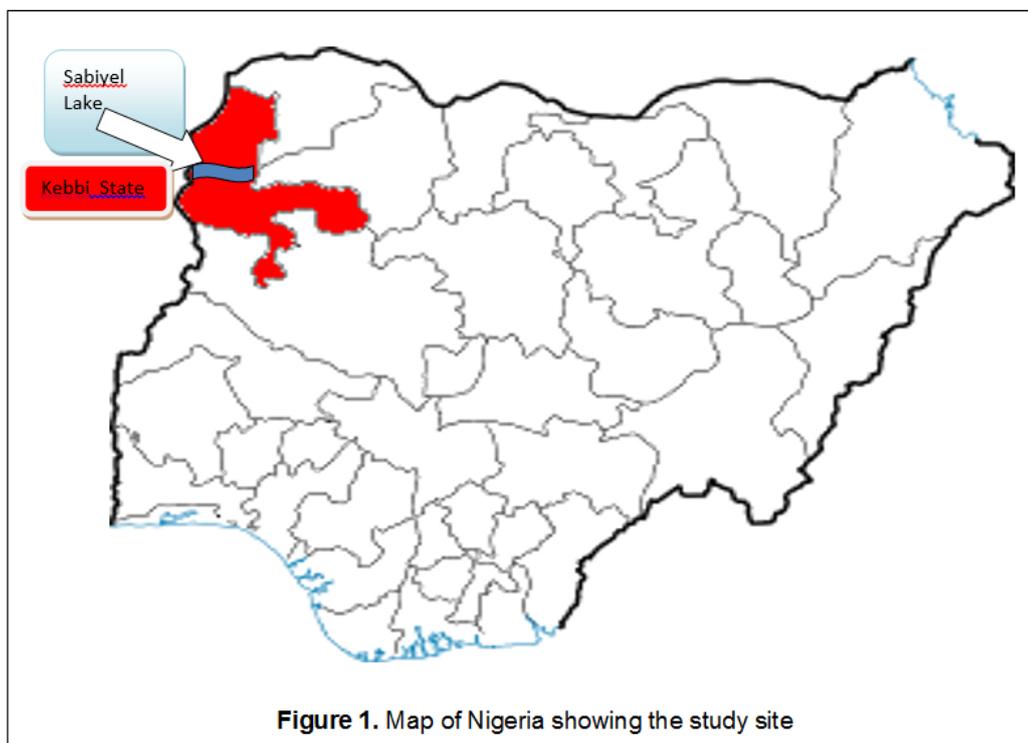


Figure 1. Map of Nigeria showing the study site

#### Sampling procedure and sample size

There are seven (7) villages surrounding Sabiyel lake. Thus, these villages were purposively selected for this study. Based on the relative number of households in each of the seven (7) villages, a total of 100 respondents were considered. A respondent's involvement in a particular fishing activity was the basis of selection for the interview. The villages covered and numbers of respondents were as follows: Sabiyel (22), Laga (15), Kyara (05), Kashinzama (21), Kambaza (05), Bami mairuwa (15) and Tari (17).

#### Data collection

The study was based on the primary data obtained from the household heads in the study area with the aid of structured questionnaires. Data were collected on socioeconomic background of fisher folks, information on the type of fish species caught, methods used in processing and preservation of fish, major constraints to fishing activities, fishing rights, roles women play in fisheries and in value addition to fish products.

#### Data analysis

Data obtained were analyzed with help of descriptive statistics such as percentage, frequency and means using software MS Excel.

## RESULTS

#### Socio economic characteristics of respondents

Socioeconomic characteristics of the respondents are presented in Table 1. The results indicated that 100% of the respondents were married and 75% are between the age ranges of 31-50 years. Majority of the respondents (53%) indicated that their main source of income is the sale of fresh fish products. Most respondents (77%) have attended Qur'anic education with little having formal education. The primary occupation of the respondents is fishing as indicated by 51% respondents.

Results for fishing activities of household members around Sabiyel fishing communities indicated that 86% of the respondents engage in fishing activities for sale and family consumption while 7% each engage in fishing either for sale or for family consumption.

**Table 1.** Distribution of respondents according to socioeconomic characteristics

Characteristics	Frequency	Percentage	Mean	SD
<b>Marital status</b>				
Single	0.0	0.0		
Married	100	100		
Divorced	0.0	0.0		
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>0.0</b>
<b>Age range (years)</b>				
18-30	5	5		
31-40	43	43		
41-50	32	32		
Above 50	20	20		
<b>Total</b>	<b>100</b>	<b>100</b>	<b>25</b>	<b>12.26</b>
<b>Educational level</b>				
Tertiary education	0.0	0.0		
Secondary education	6	6		
Primary education	10	10		
Qur'anic education	77	77		
Adult education	7	7		
No education	0.0	0.0		
<b>Total</b>	<b>100</b>	<b>100</b>	<b>25</b>	<b>34.70</b>
<b>Household main source of income</b>				
Sale of fresh product	53	53		
Farming	26	26		
Wage employment	0.0	0.0		
Own business	21	21		
Others	0.0	0.0		
<b>Total</b>	<b>100</b>	<b>100</b>	<b>3.33</b>	<b>40.57</b>
<b>Occupation(fishing)</b>				
Primary occupation	59	59		
Secondary education	41	41		
<b>Total</b>	<b>100</b>	<b>100</b>	<b>50</b>	<b>9.05</b>
Sold	7	7		
Family consumption	7	7		
Sold and given to family	86	86		
Animal consumption	0.0	0.0		
<b>Total</b>	<b>100</b>	<b>100</b>	<b>25</b>	<b>30.02</b>

Source: Field survey (2015)

### Fishing gears, methods and crafts used by the fishing communities

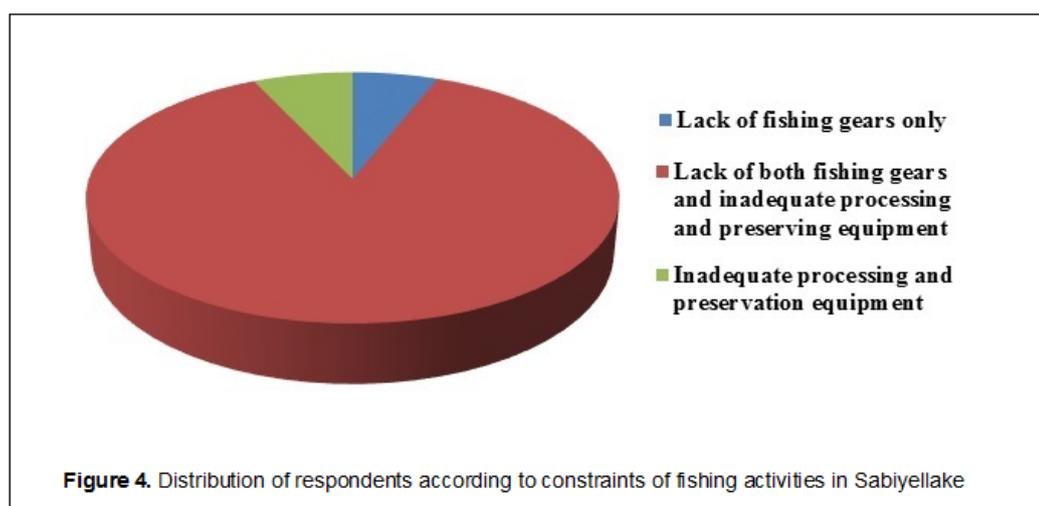
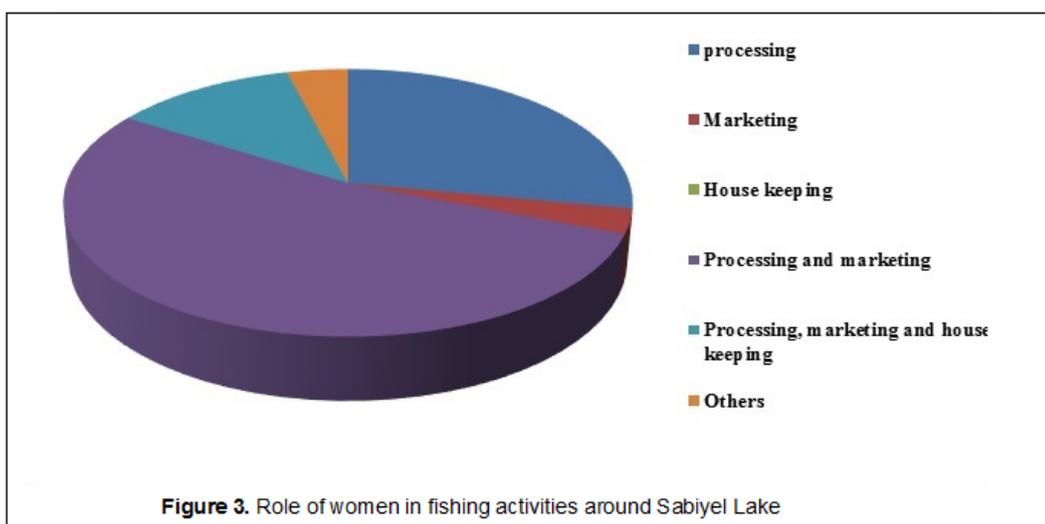
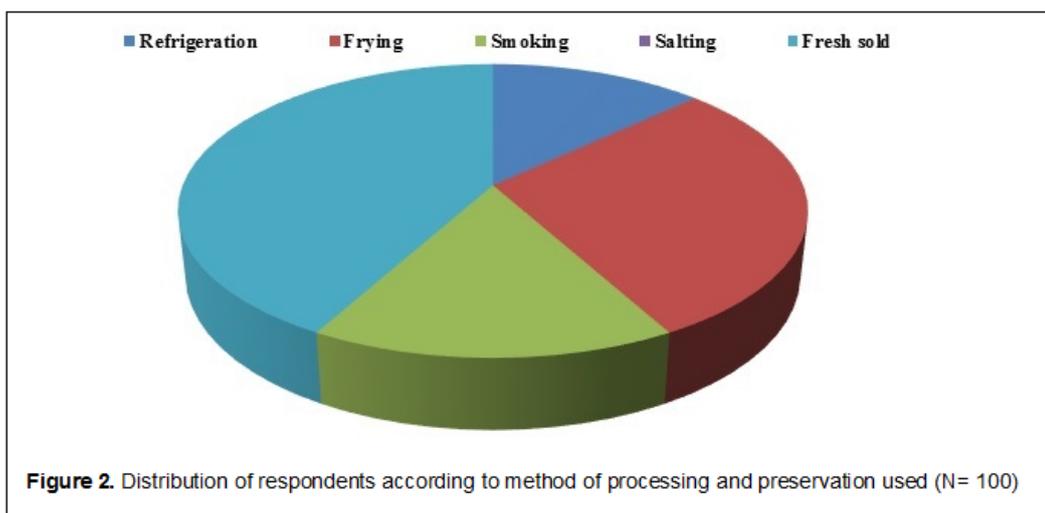
Table 2 presents the result for fishing gears, methods and crafts used by the respondents. Passive gears were used by 69% of the respondents such as gill net, hook and line. Seventy one percent (71%) of the respondents engaged in night fishing where they use light and 100% use canoe for fishing.

### Processing and preservation methods

Results for the processing and preservation methods used are presented in Figure 2, with forty two per cent (42%) of the respondents selling their fish in fresh form.

### Role of women in fishing activities around Sabiyel lake

Most respondents (53%) reported that women engaged in processing and marketing, 28% of the respondents said women engaged in processing and only 3 respondents said women engaged in marketing. Figure 3 present results for the role of women in fishing activities in fishing communities around Sabiyel lake.



### Constraints of fishing activities

Eighty seven per cent of the respondents said the major constraints to fishing are lack of both fishing gears and inadequate processing and preservation equipment, 6% complained of lack of fishing gears and 7% mentioned lack of processing and preservation equipment. Figure 4 present the results for constraints of fishing identified in Sabiyel lake.

### Cooperative society and value addition

Table 4 present results for respondent's participation in cooperative societies and value addition to fish. The results indicated that 62% respondents participated in cooperative societies and 76% add value to their fish commodity for sale.

**Table 2.** Distribution of respondents according to fishing gears, methods and crafts used.

Gears	Frequency	Percentage	Mean	Standard Deviation
<b>Active Gears</b>				
Cast net, seine net and clap net	19	19		
Cast net and clap net	13	13		
Cast net and Gura trap	12	12		
Cast net only	20	20		
Cast net and seine net	14	4		
Clap net	7	7		
Seine net, cast net and Induruttu	7	7		
Clap net and Gura trap	8	8		
<b>Total</b>	<b>100</b>	<b>100</b>	<b>14.29</b>	<b>29.65</b>
<b>Passive gears</b>				
Gill net	16	16		
Gill net and hook and line	69	69		
Hook and line and Induruttu	5	5		
Hook and line only	10	10		
<b>Total</b>	<b>100</b>	<b>100</b>	<b>25</b>	<b>880.66</b>
<b>Use of light</b>				
Yes	71	71		
No	29	29		
<b>Total</b>	<b>100</b>	<b>100</b>	<b>50</b>	<b>29.69</b>
<b>Crafts used</b>				
Canoe	100	100		
Others	0.0	0.0		
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>0.0</b>

Source: Field survey (2015)

**Table 3.** Dominant fish species identified and caught in Sabiyel Lake

Scientific name	Local name	Common name
<i>Heterotis niloticus</i>	Balli	Slap water
<i>Clarias gariepinus</i>	Kullume	Mud fish
<i>Sarotherodon galilieus</i>	Gargazafalga	Tilapia snout
<i>Oreochromis niloticus</i>	Gargazabahausa	Nile tilapia
<i>Hyperopesus bebe</i>	Kuma	Mormyrid

Source: Field survey (2015)

**Table 4.** Distribution of respondents according to participation in cooperative society and value addition

Cooperative society	Frequency	Percentage	Mean	SD
Yes	62	62		
No	38	38		
<b>Total</b>	<b>100</b>	<b>100</b>		
<b>Value addition</b>				
Yes	76	76		
No	24	24		
<b>Total</b>	<b>100</b>	<b>100</b>	<b>50</b>	<b>73.49</b>

Source: Field survey (2015)

## DISCUSSION

The socio-economic characteristics of the fisher folks considered include name of the respondent, village area, household main source of income, marital status, total family size of the fishermen, member of family who go for fishing, amount of fish caught by household which is consumed by the house hold. Because of the overwhelming influence the household head has on the household decision- making process in the traditional Africa setting, most of the socio-economic characteristics discussed were peculiar to the household heads (Ayinla, 2004).

Marital status indicated that 100% of the sampled households were married. This implies that majority of the fisher folks shoulder a lot of responsibilities. Adeleke (2013) also observed that the married were more interested in fishing and attributed that to reliance on fishing to cater for their households. It also shows the availability of family labour in the fishing communities. Age of the respondents vary with 43% of the respondents below the age of 50 years, 32% above 50 years. Eighty per cent of the respondents are below the age of 50 years while only 20% are above the age of 50. Those below 50 years indicated that they were mainly within the economically active age group and physically fit to paddle the canoe. All of the households sampled were male. This implies that the fishing is more popular among men in the study area. This also conforms to FAO (1998) findings that women are rarely involved in fish capture at sea or in lakes because of its inherent dangers, long fishing voyage and their dominant role in household activities.

The fishing gears comprise both active and passive gears. This shows that 19% of the fisher folk were using cast net and clap net, 12% operate with cast net and Gura trap, 16% use gill nets, 16% utilize both gill nets and hook and line, only 5% utilizes hook and line and Induruttu (local fish trap in Nigeria) and 10% uses hook and line, implies that the fisher folks are still using the traditional methods in fishing activities. Among the fisher folks in the study area 71% of the respondents engaged in the fishing activities at night and 29% during the day. This show that the majority of the respondents were engaged in both night and day fishing, which means that they used light during their night fishing and also the main purpose of using the touch light and forehead light is to enable them to see where they set their gears and harvest their fish and also to reset their gears and leave them till in the morning time to come back to harvest again. Only 29% do not engage in night fishing, and also the 100% of the fisher folk household uses paddle canoe for their fishing. This clearly shows that there is a lot of fishing pressure on the lake.

Household heads that had no formal education accounted for 77% of the sampled respondents while the remaining 23% had formal education ranging from adult, primary to secondary education. This implies that very few respondents were educated and only to secondary level. This would have negative consequence on their ability to exploit latent opportunities in fisheries and also to support them in the adoption of improved technologies. Fawole and Fashina (2005) stressed the association of level of education with the use of technology.

In the study area, the 53% of the respondents were involved in only selling of fresh product as a means of livelihood while the other respondents were involved in other income generating activities to boost their income, 26% were engaged in farming activities while 21% engaged in their owned business as their main source of income. Fifty nine per cent(59%) of the respondents had fishing as their primary occupation and

41% had fishing as their secondary occupation. This implies that most households around Sabiyel lake are engaged in fishing with only few engaged in other activities like crop farming. The amount of fish caught by household is partly consumed and partly sold in the market.

The different fish species caught in Sabiyel lake comprises *Hyperopesus bebe*, *Oreochromis niloticus*, *Sarotherodon galilieus*, *Clarias gariepinus* and *Heterotis niloticus*. It was observed that the most dominant fish species in Sabiyel lake are Tilapia and it is more available throughout the year. *Heterotis* and *Clarias* species are also found in Sabiyel lake but they are seasonal, they are more available during rainy season and scarce in dry season. It was also evident that most of the fisher folks sold their fish without processing and preserving. This may be attributed to insufficient processing and preservation methods available in the locality.

Women participated in the fisheries aspect in the study area. According to Adekoya et.al. (2000), artisanal fishing is popular among the men while activities such as processing, storage in the house or housekeeping and marketing are popular among women. It is evident from this research that most women were engaged in both processing and marketing. This agreed with Bene and Merten (2008) who noted that although fish trade is undertaken by both men and women, women have a strong hold on fish trade. According to FAO (2003), fish processing is the exclusive preserve of women, except in some inland fishing communities where men participate actively such as in Lake Chad.

The distribution of major problems confronting the fisher folks in the sampled communities revealed that most of the respondents stated that lack of both fishing gears and crafts are the major problems confronting their fishing activities. The majority (62) of the fisher folk were engaged in co-operative associations and benefited from it. This is supported byILO (2002) that cooperatives are contributing towards gender equality by expanding women's opportunities to participate in local economies and societies in many parts of the world. With regards to value addition, most of the women add value during fish processing to enhance the taste and aroma of fish which increase marketability of fish. To (2015) posited that value addition to fish products enhances better income, improves processing, utilization, keeps in-phase with consumer needs and provides variety of products.

## CONCLUSION

The following conclusions were deduced from the study:

- The fisher folks in Sabiyel lake fishing households are still using the crude traditional methods in their fishing activities.
- The majority of respondents within age range of 50 years indicated that they were mainly within the economically active age group and physically fit to paddle the canoe and throwing cast nets.
- Fishing is more popular among men in the study area.
- Most respondents were involved in only selling of fresh product.
- The role of women in artisanal fisheries in Sabiyel lake is mainly in processing and value addition.
- The major constraints to fishing in the study area are the lack of fishing gears, crafts and inadequate processing and preservation equipment.

## Recommendation

- Extension services should be intensified to introduce modern methods of fishing with a view to sustainable yield
- The efforts of the economically active age group should be harnessed by educating them on technological advancements in fisheries and aquaculture.
- More fish species should be introduced in to Sabiyel lake to ensure variability and availability while the existing ones should be conserved.
- Fish processing and preservation methods in the study area should be adequately improved.
- Government should address the major constraints to fishing in the study area by supplying and subsidizing fishing gears, crafts and adequate processing and preservation equipment.

## COMPETING INTEREST

The authors declare that they have no competing interests.

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