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Fishing Activities at Lake Liambezi of Caprivi Region in Namibia

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ABSTRACT

A research was conducted in Lake Lambezi in the Caprivi region of Namibia for one month to have an in depth knowledge of fishing activities. A total of 50 questionnaires were administered within the fishery. The results revealed that 55% of the fishers were part-time, 43% fulltime and 2% were seasonal fishers. With respect to fish catches, 77% of the fishers indicated that the catches were good and the best time to fish was summer periods and winter was considered the worst time to fish. The majority of fishers (65%) fished without a permit. Furthermore, many fishers (70%) preferred sharing fishing grounds with those they knew, that is friends and relatives. A variety of fishing methods/gears were employed by fishers viz-a- viz dragnets, driving fish into nets by bashing on water using sticks, small-meshed nets and stationery gillnets.

Keywords: Fishing Activities, Caprivi Region, Namibia, Lake Liambezi

INTRODUCTION

The Caprivi region in Namibia is a narrow strip of land that extends eastward from the north-eastern corner of the country, and is bordered by Angola and Zambia to the north, Botswana to the south and Zimbabwe to the east. The region is flat and is characterized by numerous swamps and slow flowing rivers (Seaman et al, 1978). Lake Liambezi is part of the wetland which is located on the eastern part of the Caprivi bulge. Lake Liambezi is an ephemeral lake which is situated between the Namibia/Botswana border, between the Linyanti channels in the west and the Chobe in the east (Hay et al., 2002; Hay and Van der Waal, 2009), is inhabited by 43 fish species.

Lake Liambezi has a strange history because about 50 years ago it did not exist. However, in 1958 the Zambezi River rose to the highest level ever recorded when compared to all previous records. The entire eastern side of Caprivi region was flooded causing it to pour water into a broad depression situated south of Katima Mulilo leading to the creation of what is known as Lake Liambezi (Van der Waal, 2010). The lake receives water from four sources (Van der Waal, 1980; Van der Waal, 2009), (Figure 1). To the west, the Kwando River, which originates in the Angolan Highlands, forms the boundary between Angola and Zambia. Passing through the Zambezi Region, the Kwando percolates through the Linyanti swamps on the Namibian-Botswana border before feeding into Lake Liambezi. A second important source is direct rainfall and surface run-off from the area to the north of the lake, which also feeds the lake. Floodwaters from the Zambezi enter the lake from the east in two directions during high flood years. The Chobe River reverses flow direction annually when the Zambezi floods and enters the lake from the southeast, while the Bukalo channel enters the northeast of the lake from the Caprivi floodplain.

When full, Lake Liambezi is a shallow lake that does not exceed 6m depth at peak water levels. Because of its shallowness, nutrient recycling is efficient, making the lake highly productive. Previous reports on the Lake Liambezi fishery and its production potential have been presented by Van der Waal, (1980) and Tweddle et al., (2011). In 1974, fish production from Lake Liambezi was approximately 1 400t/yr but in 1976 it dropped down to 115 tons. This is considerably lower than an estimated value of 1 700 tonnes reported by Tweddle et al., (2009).

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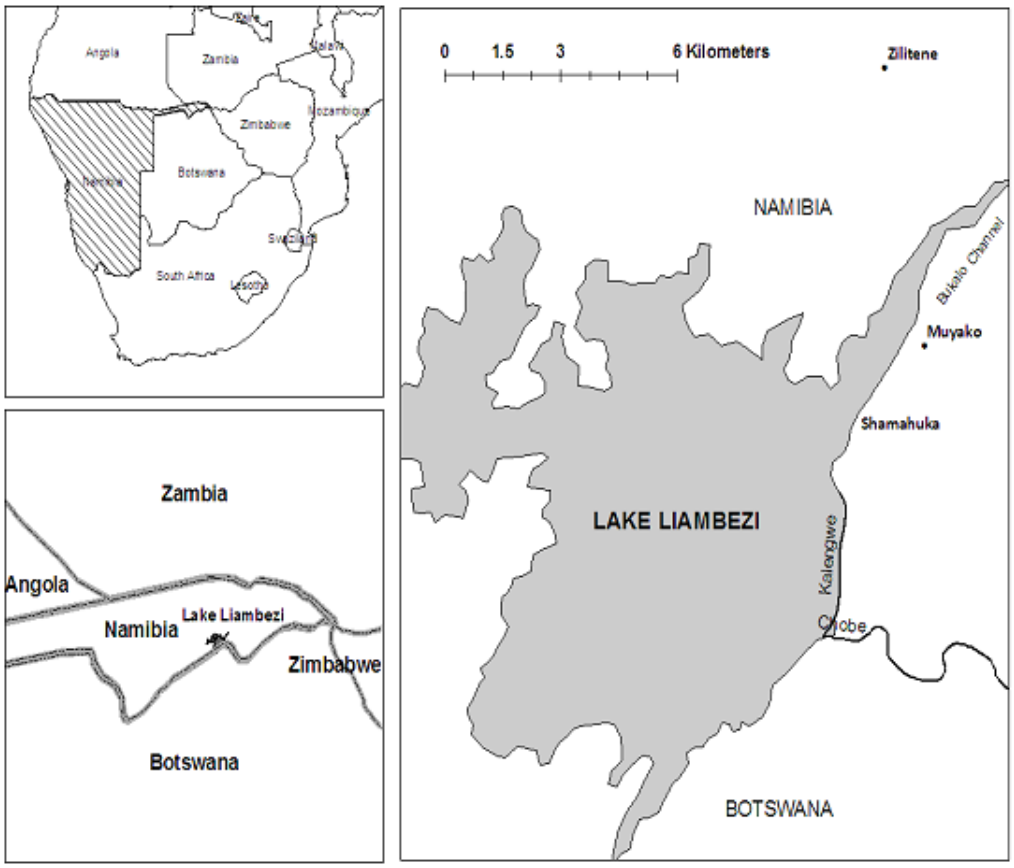

Figure1. *Map of Southern Africa, showing* **(a)** *Namibia,* **(b)** *the Zambezi Region, and* **(c)** *Lake Liambezi, generated using ArcGIS 9.3. (Adopted from Simasiku, 2014)*

According to Van der Waal (1980), the fishery on the lake started in 1959 and was typically a seasonal and part-time activity carried out by men only (Windhoek Consulting Engineers, 2000), with fishermen returning to their villages in spring to plant crops and resuming fishing methods after the rains (Van der Waal, 1980). With the exception of spears, no traditional fishing activities were used and the main gear used by fishermen was the multifilament nylon gillnet, with variable stretched mesh sizes between 3" and 7" (inches) (Van der Waal, 1980). Nets were initially homemade from raw materials such as motor tyre cords, but these were replaced with nylon nets in the 1960s.

The number of fishermen fishing the lake decreased from a maximum of 120 in 1974 to a minimum of 17 during 1976 and 47 fishermen in 1980 (Van der Waal, 1980). The decline was linked to a temporary lowering in catch rates with a rise in lake levels during 1973-1976 (Van der Waal, 1980). After 1981, very little floodwater from the Zambezi or the Linyanti Swamp entered the lake because of a decline in water level in 1985. A drop in the numbers of fishermen also coincided with a bloom of Phragmites mauritianus, which hampered access to the preferred fishing grounds (Seaman et al., 1978). In 2011, it was estimated that there were 125 fishermen and 91 canoes (Tweddle, et al., 2009) at Lake Liambezi.

The present study was conducted in order to have an informed impression of the fishing activities at Lake Liambezi in the Caprivi region of Namibia. Armed with such knowledge, sustainability can be ensured.

MAIN BODY

Since there was no previous knowledge on the exact total number of fishers, the 2011 survey that estimated number of fishers at 125 was used as baseline with respect to the total population of fishers at Lake Liambezi. Questionnaires were administered to 50 fishers employing simple random sampling in Muyako and Shamahuka fishing villages since that's where most of the fishers were concentrated. Furthermore, these two fishing villages were easily accessible. Fishers were interviewed on issues pertaining to: fishing permits, fishing methods, impression of the catches, how long they fished during the year and sharing of fishing grounds. The data were analyzed in EXCEL.

RESULTS AND DISCUSSION

The results indicate that more than half (55%) of the fishers were part-time, 43% fulltime and 2% were seasonal fishers (Figure 2). Majority of the fishers were part-time fishers because; apart from fishing they also engaged themselves in crop and animal farming.

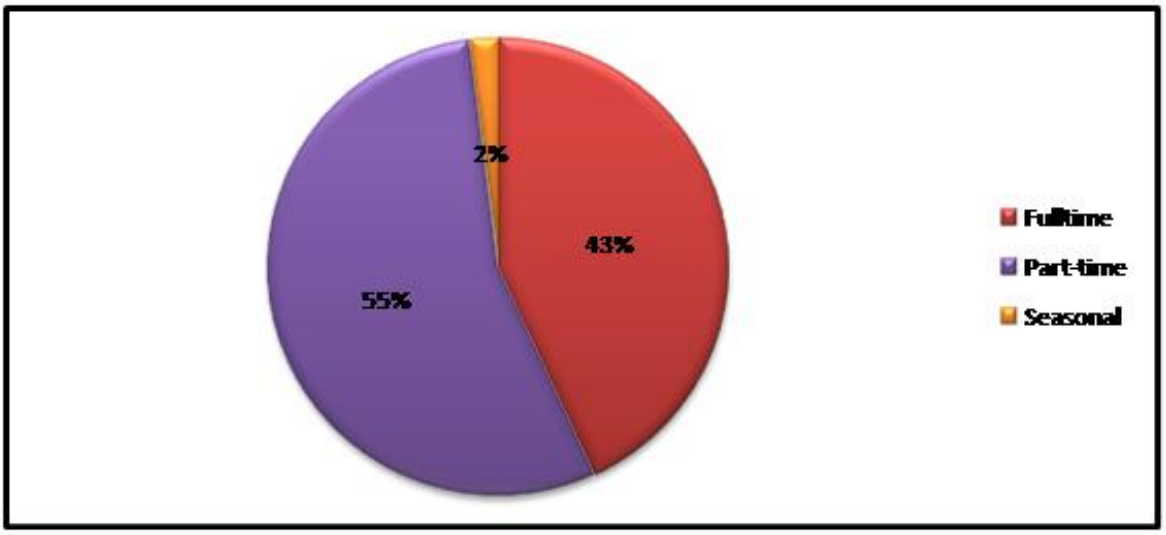

Figure1. *Categories of fishers*

Sixty five (65%) of the fishers were fishing without fishing permits whilst 25% and 10% of fishers indicated that they got permits from Indunas and government respectively. Fishing permits were critical to sustainable management. It was via such means that the fishing effort could be regulated (Beddington, et al., 1984). So what was obtaining in Liambezi fishery was saddening. Many fishers are fishing without permits. If this situation is allowed to continue, effort is bound to increase to levels that will impact negatively on the fish stocks. Most of the fishers (65%) preferred sharing fishing grounds with people they knew; that is friends or relatives whilst 35% were sharing with everyone. Reason given for sharing fishing grounds with family members or friends was that there were fewer conflicts. That arrangement implied that a larger percentage of the community had built some degree of trust and understanding, which was critical in forging partnerships that ultimately were aimed at ensuring sustainable fisheries management (FAO, 2007). Of course it was possible; to build agreements/partnerships from scratch, but far easier if some social capital already existed in the form of shared understandings (FAO, 2007).

The majority of fishers (70%) indicated that catches were good, 15 % felt that catches had declined and less than 10% of them indicated that catches were low (Figure 3).

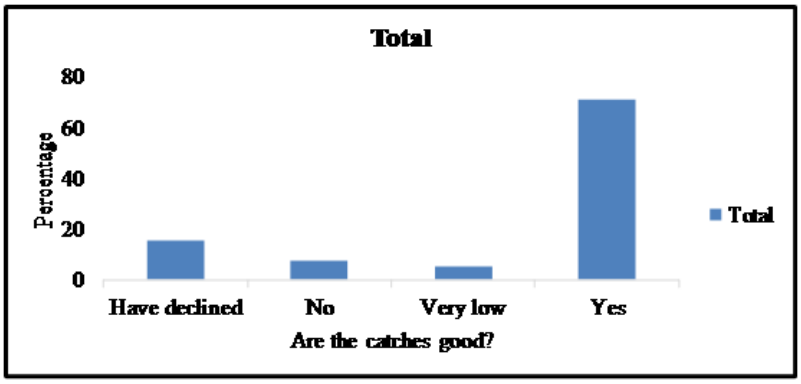

Figure3. *The opinion of the fishers on the fish catches*

Historically, fishing was an important part of the ritual and political power base in the traditional management in the Caprivi region, and also today fish occupy a central place in people's daily lives (Tvedten, et al, 1994). Demand for fish in Caprivi has increased, but the important fish species have

never changed as stated by Heider (2012). The catches were dominated by Serranochromis macrocephalus and Oreochromis andersonii both in abundance and in weight. The %IRI for these two species was 35% and 28.4%, and the percentage weight was 21.4% and 22.8% respectively. The cichlids combined contributed 79.5% of the total number and 63.7% of the total weight.

Table1. *Species composition and number, percentage weight (%W) and Index of Relative Importance (%IRI)*

Species	% No.	% W	%IRI
Clarias gariepinus	1.0	8.1	0.7
Clarias ngamensis	6.3	11	4.7
Hepsetus odoe	9.3	14.8	9.1
Mormyrus Lacerda	0.2	0.3	0
Oreochromis andersonii	18.5	22.8	28.4
Oreochromis macrochir	22.4	15.4	19.2
Sargochromis codringtonii	4.4	2.2	1.2
Schilbe intermedius	3.7	2.1	0.9
Serranochromis macrocephalus	31.0	21.4	35
Tilapia rendalii	3.2	1.9	0.8
Total	100.0	100.0	100.0

A study conducted by Peel, (2012) reported that Serranochromis macrocephalus was the most important cichlid caught with the multifilament gillnet in Lake Liambezi and this study confirms that observation. Direct comparisons with other studies in the study area was limiting, therefore comparisons were allied to previous studies conducted elsewhere in temperate regions. (Machiels et al., 1994) showed that monofilament gillnets were more efficient than multifilament gillnets for catching bream but less efficient for pike perch. Similarly, Balik (1996) found that, monofilament nets were efficient in catching pike perch than multifilament nets. Best time to fish was summer (Fig. 4) and worst time winter (Fig 5).

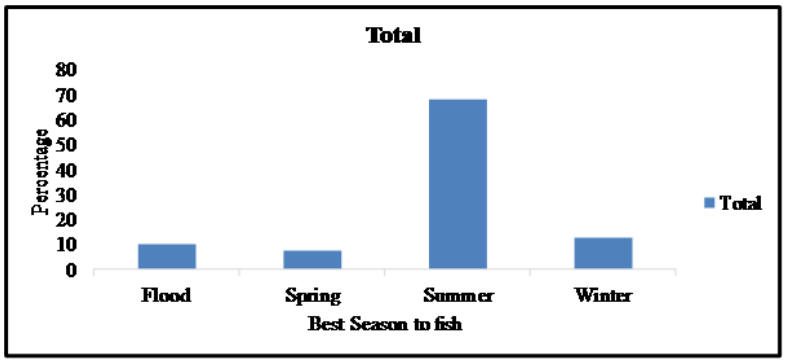

Figure4. *Best time to fish*

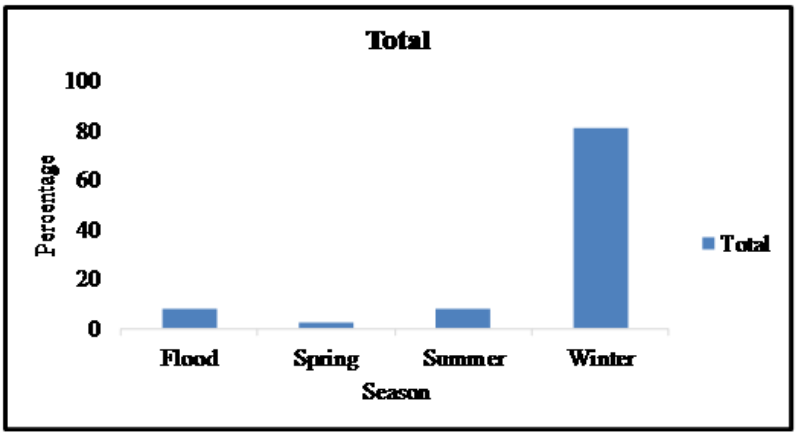

Figure5. *Worst time to fish*

Since the majority of fishers were impressed with the catches, it could be inferred that the fish stocks were sound; however, that required to be verified independently from experimental fishing because artisanal catches were not a very good index of abundance since fishers literally "chased" the fish or

set nets where they were likely to catch a lot of it. So at times even when stocks were going down, artisanal catches reflected an upward trend.

The majority (85%) of fishing methods were illegal. These included dragnets, driving fish into nets by bashing water using sticks, small-meshed nets. However, fishers were motivated to employ such gears because of high catch returns. Nevertheless, usage of illegal could result in a depleted fishery through growth overfishing and recruitment overfishing (FAO, 2008). Therefore, measures needed to be put in place to address usage of illegal gears.

CONCLUSION

Apart from part-time fishing, the majority of fishers at Liambezi were also engaged in crop and animal farming. They readily share fishing grounds with friends and relatives. Sadly, many of them employed illegal gear and they fished without fishing permits. To ensure that the fishery does not deplete, measures to address illegal fishing needed to be identified and implemented strictly.

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