

FISHING GEAR SURVEY OF LAKE ALAU
BY
N.O. BANKOLE, A. RAJI, I.A. ADIKWU AND E.C. OKWUNDU

NATIONAL INSTITUTE FOR FRESH WATER FISHERIES
RESEARCH P. M. B. 6006 NEW BUSSA NIGER STATE.

INTRODUCTION

Due to the varied habits and habitats of the arrays of fish species peculiar to water bodies, an assorted array of fishing gears are equally employed to catch them (fish). Also, seasonal changes both in species diversity and abundance necessitates changing over to varied gear several times in the year. Different gears are thus used to fish by different fishermen depending upon the season and period (du feu *et al* 1997).

Recent advances have also led to improvement in the types of fishing gears employed by the artisanal fisherfolks (Reed *et al*, 1967). These gears are mostly imported and invariably more expensive than the locally available or 'primitive ones'. Nonetheless they are more efficient in catching the target fish species. This however, is not to say that the so called 'primitive' gears are not effective. Infact they could still complete most favourably with the modern or new gears. Gears could be distributed according to tribal pattern or tribal lines. Gears employed could also be attributed to the peculiarity of the physical characteristics of the reservoir on which they are used as evidenced by Alau Lake. It could also be used to target particular species (du Feu *et al* (1996). Omorinkoba and du feu, (1996) reported cupeids as the target species for the Beach seine net while du feu *et al* (1996) also reported long lines to target clupeids on Kainji lake. The aim of this study is to assess the diversity of gears employed by the fishermen as well as the contribution of each to the overall fish catch on the reservoir.

MATERIALS AND METHODS

Three landing sites on the reservoir were assessed, which were chosen from earlier frame and catch assessments. These were Abari, Kedari and Alau Ngaufate. They were assessed twice. One during low water (may) and the other at high water (Sept) of the year 2000. The number of fishermen were assessed in frame while the diversity and number of gears used and the catches were recorded. The contribution of each gears was estimated with their seasonal contribution to the catch efficiency of each gears used. Gear performances at the different seasons were also observed.

RESEARCH AREA

Lake Alau is located between latitudes 11° 40' and 12° 05' N and longitudes 13° 05' and 13° 20' E. the inflow of water into the lake depends mainly on runoff and annual seasonal flow of river Nyadda which has a tenuous connection with the Yebberam in the Sambisa Swamps area. In years of low rainfall, the contribution

from these sources are greatly reduced. Based on a 14 year record (1964-1978). The average annual inflow into lake Alau was calculated to be 329 thousand cubic metres of water (Mshelizah, 1986).

The Alau lake is about 20 km away from Maiduguri the capital of Borno State.

RESULTS AND DISCUSION

The list of gears identified in the three sites on the lake is given in Table 1. The contribution of each gears is also given in Table 2. The most commonly employed fishing gears on the lake is the gill-net which produced over 60% of the catches particularly the monofilament gill-net. All the fishermen employ it for fishing. It was found to be available in meshes ranging from 50mm-100mm. The most widely used mesh is 76mm. As catches reduced, the mesh sizes also reduces. This particularly results in generally small sized catches and the most, susceptible species with the gill-net was the *Tilapia spp*, *Sarotherodon galilaeus*, *Oreochromis niloticus* and *Tilapia zilli* and of recent *Heterotis niloticus* a newly emerged species in the reservoir.

The Malian gura rank next to the gill-net (23.20%). Other gears used on the lake included the longlines, castnet and drag nets. In terms of ranking the Malian gura was next to the gill net during the low water but longline contributed more during the high water. Both gears targeted clarias species while the *Tilapia* species constituted the secondary target.

The Malian gura had a great toll on small sized fish. It could serve both as a qualitative and quantitative gears for sampling the lake. It had a veritable fishing gears for the collection of live fingerling of both clarias and *Tilapias* (the choice aquacultural species in the country). Most of the fish caught with the gears remained alive. As stated earlier the contribution of the longline was more during the high water. The most abundant hook size was size number 14, other sizes were in descending order of application were 13, 12, 10 and 9. The longlines also targeted clarias species as observed by du feu *et al*. (1997). The success of the malian gura was due to the generally shallow depth of the lake. Its mean depth is about 4.3m while most of its areas fall within the ranges of 1.5m to 2.8m.

Clap nets featured mostly during the high water and was employed only downstream of the lake. With the reservoirs spill ways being opened to spill, a lot of fish get flushed to the downstream of the reservoirs and attract fishermen who migrate to other places like Lake Chad, Kiri, Dadinkowa, and as far away as Goronyo in

Sokoto State for fishing with clap nets.

Description of gears and their Design characteristics.

Gill-Net:

Nylon gill nets were the dominant gears used by lake Alau fishers. Net webbing of mesh sizes are 75 to 114mm and twine of 210/3 to 210/6, were in use. They were mounted by passing the head and foot ropes through the marginal meshes at each side of the webbing and fastening. Styrofram/cork floats and sinkers such as lead and heavy object were fastened at the foot ropes. This is to keep the gear up right in the water body.

The minimum and Maximum length of the gill net. Ranges from 100m to 300m. This were set across the water body as a passive gear (i.e the set in the evening time and check the catch in the morning hours of the day).

Gill-net design is as a result of tapering ratio. The cutting in to desire shape of the net webbing them mounting it on the required length of head rope and the foot rope with the presence of other accessories as float sinkers (Fig. 1).

Cast net:

Cast nets which is otherwise known as throw nets is common in lake Alau. The size of cast net varies according to individual preference and type of fish designed to catch. The sizes prages from 3m diameter and 10mm. Mesh size to 6m and 9m diameters and 25mm mesh size.

Cast net are occasionally braided by hand, but nowadays most are made from machine made webbing and only the centre or crown is hand-braided. Most of the fishermen do the braiding work themselves.

Cast net is conical in shape. Great skill is required to throw a cast net in such a way that it will unfold in the form of a large circle and cover the greater possible area. It is an active gear that can be operated by one person when at the bank of the river, lake or stream while on board, the crew member are two (I.e the net caster and the boat/ canoe paddler).

Gura-trap:

The malian gura trap is mostly 1.5 to 2.5 metres long. 60 to 100cm, diameter and the size of the square meshes is about 6mm to 9mm. Gura are made from many fine strips liane or vine, bound together into twines, which makes them rigid and strong. The principle of non-return valve is used. This allow fish to enter and disallow fish from escaping. The materials, for the construction are fine mesh size of net webbing and liana or Raffia woods. It is a model of the malian fishermen. It is either baited or unbaited when used.

Long Line:

This is characterised by a major rope (head rope) being attached at every interval of 30cm to several twine 210/3-6 attached to a hook each at the end of each branch twine (snood).

The design of long line varies according to the size of hooks used. When using the smallest hook of No_

14 the space between hooks is usually about 100mm. And the snoods are 60 cm long. While larger hooks as No. 2,3,9, etc were spaced 120mm. The smaller type is the most commonly use in lake Alau its has small weak floats at intervals of about each twenty hooks the float are made from either synthetic materials such as Styrofoam or cork, long line can be baited or unbaited.

Clap net:

Clap net is mostly utilised during high water period at Late Alua down stream by swimming fishermen. Clap net varies in size from 50cm to 2 metres across the month, smaller ones being used mainly by children. The nets are tailored from machine-made webbing of 10 to 30mm. Mesh size. It can be made in few hours.

They are used in a variety of different ways either alone or together with certain traps and fish fence.

CONCLUSION

Gill nets. Cost nets. Malian gura trap and long lines are typical gears employed on the Alau lake. The most prominent among them is the Gill-net. The clap net which is used during the high water and down stream of the lake can encourage a fishing festival to be introduced during high water period.

The gill net at appropriate mesh size (50-100mm) proof highly efficient and it is durable when properly maintain. It has no discrimination in selecting species to be entangle or gilled in to net, hence fishermen enjoy the usage. As a passive gear it can be set and other daily activities can be possible for the fishermen such as farm and marketing. Long line is an efficient gears, it hook mostly the carnivorous fishes. But it is labour intensive, time waisting, both during construction and operation. But the fishermen enjoyed the high market value of the catch. Cast net (an active gear) the usage is seasonal and it select suitable water body. Fishermen at lake Alau enjoyed the usage during the high water level with low current. It catches species such as Tilapia, mormyrus and heterotis species. Clap net were use during the high water period at the down stream to collect pelagic fish species such as Tilapia niloticus and Momyrus rume.

Recommendation

- (1) The government should encourage the use of large mesh sizes to avoid future over exploitation of lake Alau.
- (2) More future research work on lake Alau should be encourage to study the distribution and abundance of fish and fisheries activities taken place around the lake Alau.

TABLE 1. DISTRIBUTION OF FISHERIES, BOATS AND GEARS ALONG THE SHORES OF ALAU LAKE IN SEPTEMBER, 2000

Landing Site	Type of fishing Site	No of Fishermen		Types of Gear				
		Boat owners	Assistants	Gill net	Cast net	Gura traps	Long Lines	Clap Net
Lanyeri	Village	8	0	-	-	X	X	-
Abari	Fishing Camp	84	16	X	X	X	X	-
Kedari	Fishing Camp	12	3	X	-	X	X	-
Aligunan	Village	10	0	X	-	X	X	-
Kulomari	Village	6	0	X	-	X	X	-
Birman	Village	5	0	X	-	X	X	-
Burteri	Village	5	0	X	-	X	X	-
Alau Ngaufate	Resttlement							
	Village	14		X	-	X	X	-
Total		144	19					
Below	other	35						
The Dam								

Foot note: -stand for absent of type of gears
x stand for present of type of gears

Table: 2 Percentage contribution of fish caught gears type in lake Alau

Fish spp	Total weight (kg) of fish	Gear Used				
		Fish caught by gears type				
		Gill net	Cash net	Malian gura	Long line	Clap net
<u>Clarias spp</u>	348.90	15.80	0	43.985	40.25	0
<u>Tilapias spp</u>	581.33	80.15	0.05	15.06	4.20	0
<u>Synodontis</u>	11.60	90.35	0	9.65	0	0
<u>Brycinus spp</u>	11.19	97.80	0.20	2.0	0	0
<u>Schilbe spp</u>	92.01	91.35	0.15	0	8.50	0
<u>Gnathonemus spp</u>	5.33	100.00	0	0	0	0
<u>Protopterus spp</u>	7.05	100.00	0	0	0	0
<u>Polypterus spp</u>	0	0	0	0	0	0
Total	1057.41	575.45	0.4	71.235	52.95	

Downstream

Clarias spp

Clap Net

100%

Tilapias spp

100%

Brycinus spp

100%

Schilbe spp

100%

*The composition of fish caught by clap net at downstream were 100% compared to other gears type.

Table : 3 Weight (kg) contribution of fish caught by gear types

Gill net	Cast net	Malian gura	Long Line	Total
638.92kg	0.45kg	245.37kg	172.67kg	1057.41kg
60.42%	0.40%	23.20%	16.33%	100%

REFERENCE

1. Du Feu, T.A. Abayomi, O.S., and Seisay M.D.B (1997). Fishing gear seisay, Kainji Lake, Northern Nigeria, 1996. Report submitted to Nigeria German Kainji Lake fisheries promotion project NCKLEPP. Technical report series No.6 Page 46-50.
2. Omorinkoba W.S. and du feu T. (1996). The beach seine fishery, Kainji Lake. Unpublished report submitted to Kainji Lake fishery promotion project 26.
3. Mshelizah D.I. (1986) Alau Dam case study in Borno State Nigeria M.S.C thesis Loughborough University of Technology.
4. Reed, W. Burchard, J., Hopson, A. J., Jenness, J. and Yaro Ibrahim. (1967) fish and fisheries of Northern Nigerian published by Ministry of Agric, Northern Nigeria. 226p

Table : 4 Catch composition for selected villages for May and September, 2000

	MAY		2002		SEPTEMBER		2000		GRAND TOTAL		
	Abari	Kedari	Alau N	Total	%	Abari	Kedari	Alau N.	Total% Grand Total wt (kg) %		
<u>Clarias Spp</u>	56.70	83.25	32.26	172.21	33.08	59.48	82.39	34.82	176.69 33.00	32.991	348.90
<u>Tilapia spp</u>	190.64	11.49	83.89	286.02	54.94	199.96	11.37	83.98	295.31	55.01	581.33
<u>Synodontis</u>	5.53	01	0.10	5.64	1.08	5.80	0.10	0.15	5.096	1.11	11.60
<u>Brycynus spp</u>	5.29	0.09	0.07	5.45	1.05	5.55	0.09	0.10	5.74	1.07	11.19
<u>Schilbe spp</u>	38.31	5.64	2.13	46.08	8.85	40.19	5.59	0.15	45.93	8.56	92.01
<u>Gnathonemus spp</u>	1.56	0.08	0.15	1.79	0.34	1.64	0.08	1.82	3.54	0.66	5.33
<u>Protopterus spp</u>	2.43	0.94	-	3.37	0.65	2.55	0.93	0.20	3.68	0.69	7.05
<u>Polypterus spp</u>	-	-	-	-	-	-	-	-	-	-	-
Total	300.46	101.50	118.60	520.56	100.00	315.17	100.46	121.22	536.85	100.00	1057.41

100%