

RE-EMPHASIZING THE IMPORTANCE OF LAKE CHAD FISHERIES IN NIGERIAN ECONOMY: BORNO STATE EXPERIENCE

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ABSTRACT

Nigeria with an estimated population of about 120 Million people requires about 2.3 Million metric tones of fish and fisheries product for good health at the recommended 19 kg/caput/year by FAO. Lake Chad fisheries resource of Borno State is a blessing in disguise to the Nigerian economy. It has potentials of producing over 300,000 Metric tones of fish protein annually representing about 12.2% of the total fish demand of Nigerians. In spite of this laudable potentials Lake Chad fisheries resources of Borno State has been on the decline for the past two decades due largely to lack of or in adequate attention by the government, private and commercial organization, lack of social economics and infra-structural facilities for rational exploitations and management of its resources. This paper re-emphasizes the importance of Lake Chad Fisheries of Borno State in the Nigerian Economy. The fisheries resources, its environment, exploitation, potential, marketing, role of law enforcement and foreign agencies, constraints and potentials are discussed. Nigeria stands a better position to derive a substantial proportion of its fish demand from Lake Chad fisheries of Borno State alone with the adoptions of some proffered strategies including combined efforts of the private and public sectors in the rational management of the fisheries resource of Lake Chad in Borno State.

INTRODUCTION

Fish and fishery products which still remain a cheap and major source of animal protein contributing about 40% of local animal protein intake of Nigerians especially our rural poor is in short-supply. This is largely due to galloping demographic growth, declining live stock industry with consequent increasing and unaffordable prices of its products (Talabi, 1984), fish importation restriction, embryonic stage of agricultural development in Nigeria, post harvest losses of fish products etc.

In Nigeria, the estimated fish demand is put at 1,800,000 metric tones using the population figure of about 120,000,000 based on per capital consumption of 15kg (FAO, 1998) regarded on a global basis, as adequate for the maintenance of good health in fish eating population like Nigeria. However, an average of 504, 073 tones was produced between 1985 and 1994 indicating a gross deficit of 1,295,925 tones (Table 1).

The Lake Chad fishery, basically an Artisanal sub-sector, plays significant role in the Nigerian economy in the supply of fish and employment generation. Most significantly is the contribution of this lake to the total annual domestic production, which is over 48,166 tones (see Appendix 1). The processed (smoked) Lake Chad fish is distributed in trucks, lorries, etc to major markets across the country to feed millions of Nigerian families.

The Lake Chad has been described as one of the richest fisheries in the world with production figures 80 – 100kg/ hectare and engaging over 10,000 full and part time fisher men and about 100,000 local labour force benefiting from its fishery (Sagua, 1982). Despite the socio-economic contribution of Lake Chad to the national economy in terms of employments generation and the enormous supply of the 'scarce fish protein' to the people of Nigeria, Lake Chad Fishery seems to be declining, not because of the recession of its water in the 70s, but largely due to in adequate attention by government, private and commercial organizations for its effective conservation on management and lack of provision of socio economics and infrastructural facilities for rational exploitation of its resources as compared to the maritime state.

Lake Chad fisheries has enough potentials to meet substantial proportion of fish demand of Nigerians provided the country can properly harness the resources, applied correct fishery rules and regulations and put in place basic and adequate socio-economic and infrastructural facilities in the lake.

This paper attempts to re-emphasize the importance of Lake Chad fisheries to the Nigerian economy from the perspective of its current environment, problems and

potentials and to proffer policy strategies for its rational exploitation.

TABLE 1: NIGERIA FISH SUPPLY BY SECTORS 1985 – 1994 (MT)

YEAR (MT)	ARTISANAL (MT)	INDUSTRIAL (MT)	IMPORT (MT)	AQUACULTURE (MT)	TOTAL (MT)
1985	201,383	26,1423	61,704	15,000	304,229
1986	267,136	25,042	65,242	14,881	372,301
1987	248,987	24,900	209,042	15,221	498,150
1988	297,624	36,549	113,603	15,764	463,54
1989	303,454	33,645	313,987	25,607	676,693
1990	283,193	25,529	118,219	7,607	434,548
1991	291,799	36,226	253,278	15,297	596,600
1992	283,907	39,363	378,414	19,770	721,454
1993	140,000	29,247	515,184	8,500	692,931
1994	132,496	17,210	123,120	7,481	280,307
TOTAL	2,449,979	293,853	2,151,793	145,128	5,040,753
% of Total	49	6	42	3.0	-

SOURCE: FEDERAL DEPARTMENT OF FISHERIES (1994)

2.0 THE LAKE CHAD ENVIRONMENT

2.1 BACKGROUND OF THE LAKE

Lake Chad, located at the extreme North Eastern corner of Nigeria was once the largest Lake in the world 15,000 years ago with an area of about 90,000 sqr miles (Hopson), 1967). It is now one of the four largest lakes in Africa. It is shared by four countries namely Tchad, Nigeria, Niger, and Cameroun by the 1906 London convention as follows:

To the Republic of Chad – 50%
 Republic of Niger – 25%
 Republic of Nigeria – 17%
 Republic of Cameroun – 8%

Despite the Sahelian drought in the 1970s, the Nigerian sector of the Lake still retains surface water of about 550,000 ha (Ita et al 1993). The lake depends mostly for its water on the Chari and Lagone rivers which rises from Cameroun mountains, rainfall and other rivers like Hadeija and Yobe. The Lake has an average depth of 4 – 12 meter (fig 1)

2.2 SEASONALITY OF LAKE CHAD WATER

The Lake Chad water is marked by two characteristic features every year namely:

A High water level

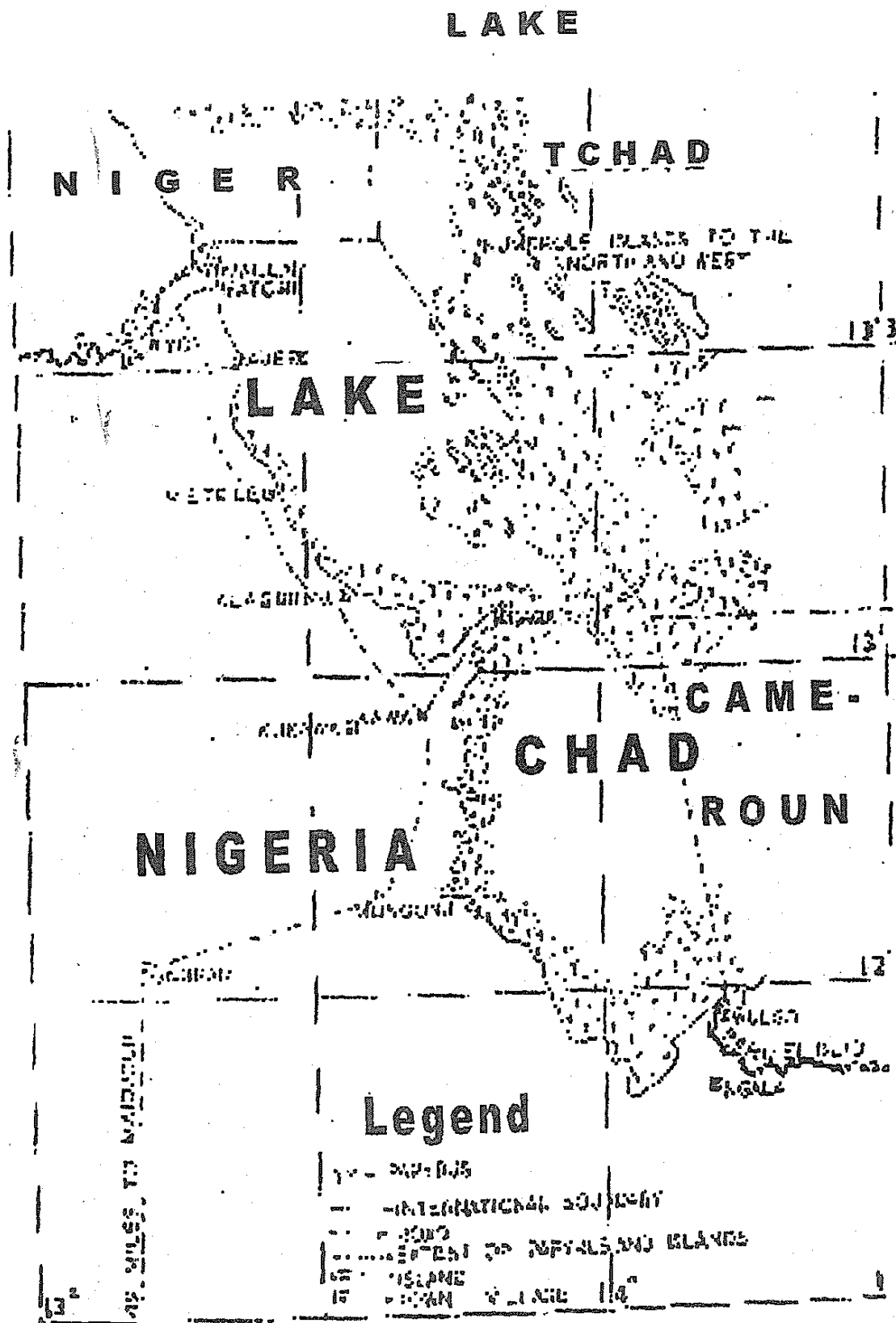


Fig. 1 The Nigeria part of lake Chad

B. Low water level (Recession)

These periods are likened to the high and low tidal water of the sea except this last longer.

The high water level starts in early August up to January with peak in December when the lake water stabilizes with average depth of about 2 – 4 meters towards the in in shore and 6 – 4 meters off-shore. This period coincides with the cold harmattan season in Lake Chad with water temperature going down to 18°C. This period is important as the beginning of raining season and breeding period for loads of gravid fish that moves with the water from the deeper part toward the shore. This period marks the low production season in October, November, December and January (Sagua, 1982).

The low water level generally referred to as the recession period begins in February and lasts up to late July. This period coincides with active fishing activities with peak production months of April, May, June, July and August. The daily temperature ranges between 37°C – 45°C.

2.3 COMPOSITION OF FISHERMEN

There are over 200 permanent and semi-permanent fishing communities/islands inhabiting about 40,000 fishermen on the Nigerian sector of the Lake. The Nigerian fishermen form about 86% while about 14% are fishermen from other nationalities like Mali, Cameroun and Chad Republics. Of the total number about 80% are full time fishermen and 20% part-timers. The major tribes from Nigeria include the Agatus, Hausa, Jukuns, Kanuris, Ijaw, Shuwas, Urhobos, Nupes, Ilaje and Ijebu and aliens like Malians Kotokos, Masa and Kulumbus (see Appendix 2). The Hausa constitute the Majority (19%) fishermen on the Nigerian part followed closely by the Jukuns (16%), Agatus (11%). The Malians constitute majority of the alien fishermen on the Lake.

2.4 LAKE CHAD FISH PRODUCTION

The importance of Lake Chad as the major supplier of fresh water fish to Nigeria economy is obvious. Between

1985 – 1994, Lake Chad fishery contributed 10% of the 5,040,753 tones of the total National fish supply. (See Appendix 3).

It is the highest producer among the inland States providing over 46% of the 1,056,390 tones from the 28 inland States within the period (1985 – 1994) (see appendix 4) and 12% of the total domestic production of 3,858,597 tones (See Appendix 5).

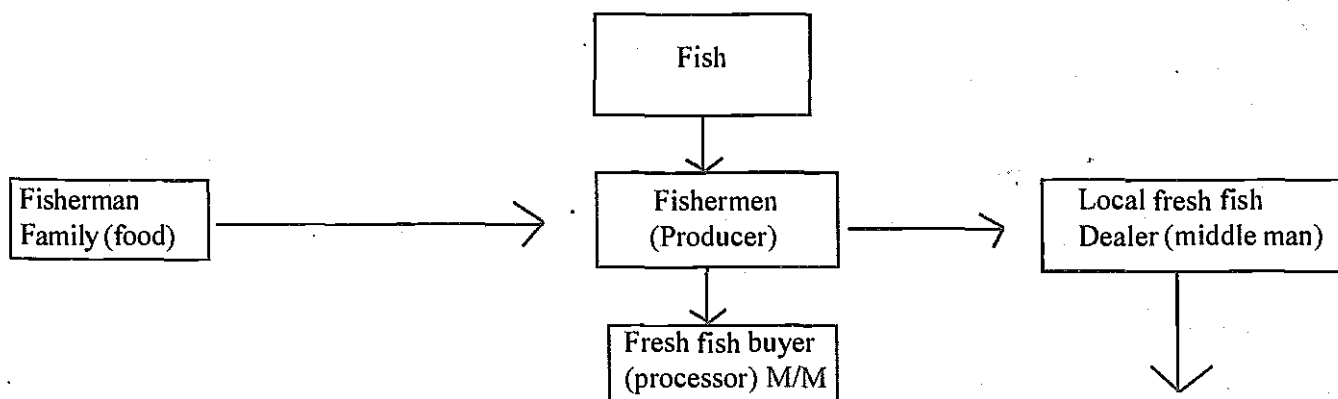
A preliminary collection of fish production from Nigeria sector of Lake Chad by Federal Department of fisheries, Maiduguri indicated a total production of 525,085 metric tones between 1995 and 2000 averaging about 87,514 metric tones per annum. (Appendix 6). According to personal communication with NIFFR staff on research conducted by them on fish marketing and distribution from Doro-Baga in Lake Chad, fish production of 44,563 metric tones yielded (valued) about N2.6 Billion per year.

2.5 MARKETING AND DISTRIBUTION OF FISH FROM LAKE CHAD

The fish are marketed either in fresh or smoked (Banda) form. The smoked banda fish from the lake are favoured by most Nigerian consumers. Figure 2 shows the marketing and distribution of Lake Chad fish. The major markets for Lake Chad smoked fish includes:- Onitsha, Lagos, Abuja, Suleja, Kano, Enugu, Ibadan, Ilorin, Oshogbo, Aba, Jos, Markudi, Kaduna, Lafia, Damaturu etc.

The distribution pattern of fish products from Lake Chad is the interposition of series of middlemen between the producer (Fishermen) and the consumer (FIG 2). In most cases, the fishermen depend on middlemen for credit to operate their business because of their relative poverty. The implication is that the middlemen make all the profit while the fishermen get little for their effort while the consumer buys at high price.

About 90% of fish from the landing sites are transmitted to Baga and Muna fish market in Maiduguri for distribution to the fish markets across the country.



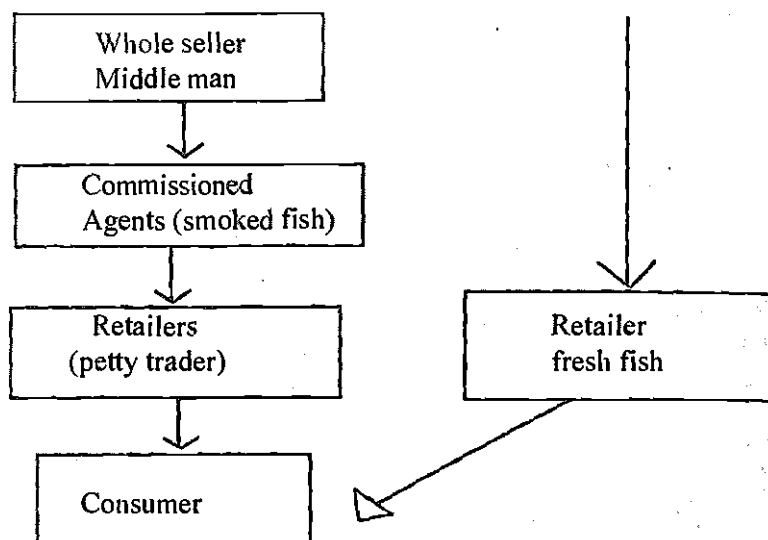


Fig.2. Pattern of fish distribution of lake chad fresh and smoked fish

3.0 FISH RESOURCE POTENTIAL OF LAKE CHAD

The potential yield of the Nigeria part of Lake Chad has not been well document compared with lake kainji (Ajayi et al, 1984) Sagua (1982) observed that accurate data as regard the standing stock of fishery in lake Chad is lacking. The few available data are still conservative and seem repeated. Some of the few estimated potential yield of lake Chad include:- Hopeson (1967) 42,250 – 60,000 to Sagua (1982) 41,250 – 55,000; the annual catch of 200,000 tones in 1973/74 decreased to 100,000 tones in 1979 (Sagua, 1982). Tobor (1982). Tobor (1990) noted that this yields which are in agreement, implies that the reduction in water surface area did not substantially affect the yield but must have concentrated the fish in a relatively smaller surface area.

It may be possible that Nigeria part of lake Chad with surface of 530,000 is capable of producing about 300,000

tones provided the following factors are met:-

- a. Efficient and effective management of the lake fishery resources
- b. Reduction to the barest minimum of post harvest of fish through effective preservation and processing method
- c. Effective computerization of fish consumed by local fishermen families and other families at the lake shore etc.

4.0 CONSTRAINTS AND RECOMMENDATIONS

These are discussed together for easy understanding. The problems of Lake Chad fishery are mainly infra-structural, socio-economics, management and security.

Table 2 below shows constraints (problems) of lake Chad fishery with possible policy recommendations to increase fish production of the lake.

Table 2: CONSTRAINTS (PROBLEM) FACING LAKE CHAD FISHERY

CONSTRAINTS	CONSEQUENCES	RECOMMENDATIONS	ACTION BY
1. INFRASTRUCTURAL FACILITIES A. Lack of shore-based facilities e.g landing jetties, ice making plants, Nets loft, engine repair workshops spare parts B. Bad road to landing sites	- Increased post harvest losses due to spoilage. - Lack of motorised canoes for effective fishing and transportation, of fresh fish and other fish product	- provision of portable landing jetties - construction of good roads - supply of inputs at subsidized, rate.	- Govts, NGOs, Cooperative, societies - Govt. communities - Govts, NGOs, Cooperative societies.

<p>2. SOCIAL AMENITIES</p> <p>a. No schools b. Portable drinking water c. Electricity d. Health clinic e. Recreational centres f. Good toilets</p>	<p>- Generally life becomes unbearable -Drift of Potential fishermen, (young ones) to urban towns in quest of education -Old ones left behind in fishing -Fish production is reduced.</p>	<p>- provision of these facilities in fishing communities to boost moral and improve standard of living of fishermen</p>	<p>- Government - NGOs -Cooperative societies -Private Organizations</p>
<p>3. Lack of good fish markets, and storage facilities for fish products</p>	<p>-Unhygienic products -Infestation by insects -Increased spoilage due to rain -Overall economic losses.</p>	<p>-Construction of good fish market at Doro-Baga, Maiduguri with cubicles -Construction of fish storage facilities</p>	<p>-Government -Cooperative societies -NGOs -Private/Commercial organisations</p>
<p>4. Lack of appropriate fishing inputs e.g nets, hooks</p>	<p>-Uncontrolled obnoxious fishing methods-fishermen use any type of net available to them.</p>	<p>-Supply of fishing inputs at subsidized rate to fishermen</p>	<p>-Govts. -NGOs -Cooperative societies</p>
<p>5. Non-implementation of fisheries rules and regulations (Inland fisheries Decree No. 108 of 1992) and State fisheries, edict</p>	<p>-Rampant bad fishing methods -Over-exploitation of young fish (see Appendix), Brood Stock.</p>	<p>-Need for joint effective implementation of the fisheries, rules and regulation -Cooperation of the L.G. As, Lawal, Bulamas and fishermen, leaders in the fishing communities</p>	<p>-Federal department of fisheries -State fisheries -L.G.A.s -Lawal -Bulamas -Fishermen Leaders</p>
<p>6. Water transport or Navigational problem caused by weeds eg -Free floating water lettuce (<i>Pistia Stratiotes</i>) -Duck weed (<i>Lemna panicostata</i>) -Hippo grass (<i>VossisGespidata</i>) -Papyrus (<i>Cyperus Papyrus</i>)</p>	<p>-Impeded effective transportation, of fresh fish from fishing grounds to landing sites -Impedes effective fishing activities -Encourages post harvest, lossess of fish e.g physical loss.</p>	<p>-There is urgent need to undertake, regular monitoring of the ecological changes of the lake -To organize weed clearance</p>	<p>-Research organisation e.g LCRI -Governments(Federal, State and LGAs</p>
<p>7. Fish cooperative societies, -Few -Unorganized -Untrained personnel</p>	<p>-Lack of access to credit facilities -Uncoordinated fishing activities -Uncoordinated marketing and distribution systems. -Lack of extension services.</p>	<p>-Reactivation of fish cooperative society</p>	<p>-Govt -Fisher folks</p>

CONCLUSION

Fish is a renewable resource that requires effective and efficient conservation and management strategies for increased production. The lake Chad in Borno State is a reservoir of abundant fish species which if properly managed will meet substantial proportion of fish demands of Nigerians and serves as foreign exchange earner for the country. The concentrated efforts of Government (Federal, States and Local Governments) and all fishery Stake-holders in the lake are required to improve the productivity of the Lake.

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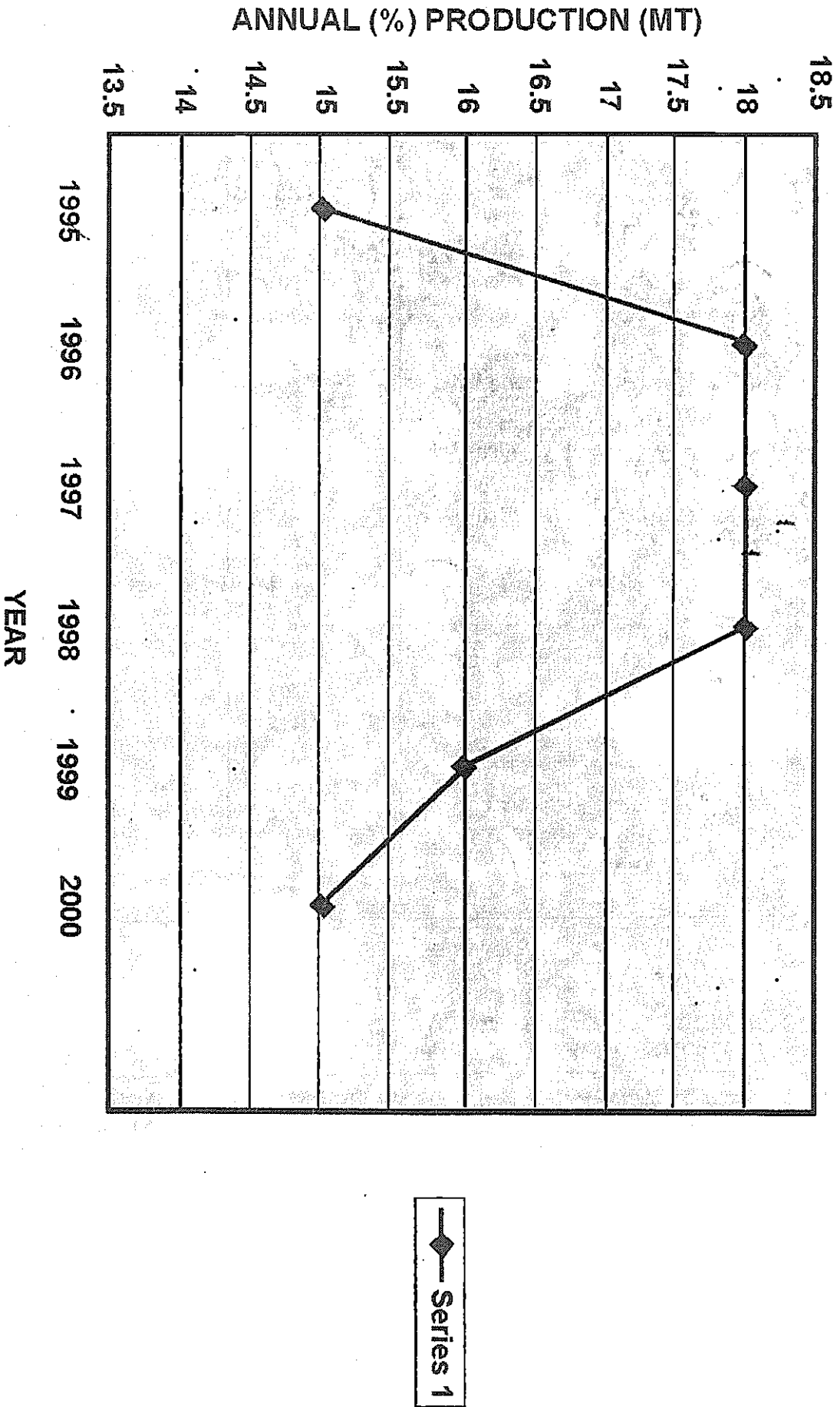
APPENDIX 1

CONTRIBUTION OF LAKE CHAD FISH PRODUCTION TO NATIONAL TOTAL FISH SUPPLY (MT) 1985 – 1994

YEAR	NATIONAL TOTAL FISH SUPPLY (MT)	LAKE CHAD CONTRIBUTION (MT)	ANNUAL % CONTRIBUTION
1985	304,229	22,878	8
1986	372,301	31,352	8
1987	498,150	34,141	7
1988	463,540	53,070	11
1989	676,693	68,424	10
1990	434,548	71,639	16
1991	596,600	71,832	12
1992	721,454	46,398	6
1993	692,931	47,266	7
1994	280,307	34,657	10
TOTAL	5,040,753	481,657	10
AVERAGE TOTAL PER ANNUM	504,075	48,166	10

SOURCE: COMPUTED FROM FISHERIES STATISTICS OF NIGERIA. (FDF) 1994

NIGERIAN SECTOR OF LAKE CHAD FISH PRODUCTION 1995 - 2000 (MT)



APPENDIX 2
COMPOSITION OF FISHERMEN
(NIGERIAN SECTOR OF LAKE CHAD)

TRIBE	TOTAL NO.	FULL TIME	PART TIME	% COMPOSITION OF GRAND TOTAL
NIGERIANS				
HAUSA	7,516	6,013	1,503	19
LUKUNS	6,280	5,024	1,256	16
AGATUS	4,510	3,608	902	11
KANURIS	3,800	3,040	760	10
SHUWAS	3,720	2,976	744	9
IJAWS	4,115	3,292	823	10
URHOBOb	2,640	2,104	526	7
NUPES	910	728	182	2
ILAJES	416	333	83	1
IJEBUS	312	250	62	1
SUB-TOTAL	34,209	27,368	6,841	86
ALIENS				
MALIANS	2,847	2,278	569	7
MASA MASACA	624	499	125	2
BUDUMA'SCH	409	327	82	1
KANUNBUS	1,301	1,041	260	3
KOTOKOS	610	488	122	1
SUBTOTAL	5,791	4,633	1,158	14
GRAND TOTAL	40,000	32,001	7,999	100

Source: Computed by Federal Department of Fisheries (1998)

APPENDIX 3
CONTRIBUTION OF LAKE CHAD FISH PRODUCTION TO
NATIONAL TOTAL FISH SUPPLY (MT) 1985 - 1994

YEAR	NATIONAL TOTAL FISH SUPPLY (MT)	LAKECHAD CONTRIBUTION (MT)	ANNUAL CONTRIBUTION
1985	304,229	22,878	8
1986	372,301	31,352	8
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1991	596,600	71,832	12
1992	721,454	46,398	6
1993	692,931	47,266	7
1994	280,307	34,657	10
TOTAL	5,040,753	481,657	10

Source: Computed from Fisheries Statistics of Nigeria (FDF) 1994

APPENDIX 4
CONTRIBUTION OF LAKE CHAD FISH PRODUCTION TO
INLAND STATES TOTAL PRODUCTION (MT) 1985 - 1994

YEAR	INLAND STATES TOTAL PRODUCTION (MT)	LAKE CHAD CONTRIBUTION (MT)	ANNUAL % CONTRIBUTION (MT)
1985	60,510	22,878	38
1986	106,967	31,352	29
1987	103,232	34,141	33
1988	112,443	53,070	47
1989	132,168	68,424	52
1990	113,075	71,639	63
1991	123,075	71,832	58
1992	99,536	46,398	47
1993	94,900	47,266	50
1994	110,484	34,657	31
TOTAL	1,056,390	481,657	46

Source: Computed from Fisheries Statistics of Nigeria (FDF) 1994

APPENDIX 5
CONTRIBUTION OF LAKE CHAD FISH PRODUCTION TO DOMESTIC TOTAL PRODUCTION
(ARTISANAL, INDUSTRIAL AQUACULTURE) (MT) 1985 - 1994

YEAR	INLAND STATES TOTAL PRODUCTION (MT)	LAKE CHAD CONTRIBUTION (MT)	ANNUAL % CONTRIBUTION (MT)
1985	242,525	22,878	9
1986	307,059	31,352	10
1987	289,108	34,141	12
1988	349,937	53,070	15
1989	362,706	68,424	19
1990	316,365	71,639	23
1991	343,322	71,832	21
1992	334,040	46,398	14
1993	177,747	47,266	27
1994	157,187	34,657	22
TOTAL	3,858,597	481,657	12

Source: Computed from Fisheries Statistics of Nigeria (FDF) 1994

APPENDIX 6
NIGERIAN SECTOR OF LAKE CHAD FISH PRODUCTION (MT) 1995 - 2000

YEAR	LAKE CHAD CONTRIBUTION (MT)	ANNUAL % CONTRIBUTION (MT)
1995	76,211	15
1996	96,413	18

1997	96,411	18
1998	94,345	18
1999	82,398	16
2000	79,307	15
TOTAL	525,085	100

**SOURCE: FEDERAL DEPARTMENT OF FISHERIES, MAIDUGURI
(PRELIMINARY FISH STATISTICAL DATA COLLECTION)**

CONSTRUCTION, EXTENSION AND EVALUATION OF THE IMPROVED SMOKING KILN (BANDA) IN KAINJI LAKE AREA

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ABSTRACT

Fish smoking, as a traditional occupation of fishermen and women in Kainji Lake Area is done using simple traditional ovens called 'Banda', the fuel for the smoking being almost hundred percent dependent on wood. A simple modification was made to the traditional 'Banda' oven using a damper to prevent burning of the fish.

A comparison of the improved and the traditional 'Banda' was made. Results indicate that fuel wood consumption was reduced by 52 percent using the improved 'Banda', which implied that 50 percent of fish processor's income could be saved through the adoption of this technology.

The most important advantage of the improved kiln, fuel wood conservation, seemed to be a problem that the fisherfolks are yet to attach an economic importance. Whilst they are aware that it is becoming much more difficult to get the needed fuelwood, the children can still conveniently collect enough for both home use and processing activities.

The cost of the components of the improved kiln, when compared with the traditional version may be considered quite significant, and hence the reluctance of the fish processors in constructing similar ones.

The training of the blacksmiths was embarked upon to help ensure that the improved kiln could still be constructed even after the project must have withdrawn her support for it.

INTRODUCTION:

Demand for fuel wood as a source of traditional energy for smoking as well as domestic cooking is growing at an alarming proportion. FAO (1974), estimated that 52% of the world's total energy comes from fuel wood. For the developing and developed countries the corresponding percentages were 80% and 20% respectively.

World wood-resources are depleting at a rapid rate and nearly one billion population is living in regions with acute wood scarcity. FAO projected using "business as usual" assumptions that this population could grow to nearly 3 billion by the year 2,000. In Kainji Lake area, dependence on fuel wood is almost hundred percent. It is therefore imperative to reverse the trend for the sake of protecting

the environment with specific reference to desert encroachment, soil erosion and pressure on already depleted forest (Dan Shehu *et al* 1995). Fish smoking is the traditional occupation of fishermen and women in the Kainji Lake area with simple traditional oven called 'banda'. There are two types of 'Banda' – Rectangular and Conical shaped types. They are either made up of clay or drum as the case may be.

The most important advantage of simple traditional oven such as these is their low capital cost. Many disadvantages have however, been reported by Clucas (1982). These disadvantages must be reduced if not eliminated when new designs of smoking kilns are to be introduced into the fishery.