

# RESPONSIBLE FISHERIES IN ENHANCING POVERTY ALLEVIATION OF FISHING COMMUNITIES OF LAKE KAINJI

By

MSHELIA, M.B, OKAEME, A.N, BANKOLE, N.O DANTORO, B.F., ABIODUN, J.A.  
OLOWOSEGUN, O.M AND YEM, I.Y.

*National Institute for Fresh water Fisheries Research, P.M.B. 6006,  
New-Bussa, Niger State.*

## ABSTRACT

*The attributes of responsible fisheries in enhancing Poverty alleviation of fishing Communities of lake Kainji were appraised. After impoundment in 1968, the catch per unit effort of fish continued on a downward trend, which suggested a decline in the fish population as a result of improper fishing methods such as the use of small mesh size nets, fish poisoning, destructive fishing gears like beach seine nets. The Nigerian-German (GTZ) Kainji Lake Fisheries Promotion Project intervention brought an increase in yields for the lake in 1996. The estimated annual yield was put at 38,244 metric tonnes in 1996, an increase of 18% from the yield recorded in 1995 due to improvement in fishing and conservation methods. The result of catch assessment study carried out in 2003 as a follow up to GTZ intervention is presented. This reveals 15 family and 40 species of fish recorded. Which, shows that Lake Kainji still has very high diversity and abundance of fish species. The paper suggests ways to encourage fishing communities to adopt new innovation or strategies in their fishing practices. It also solicits for proper disbursement of loans to fishing communities by the government and non-governmental organization, which will go a long way in alleviating poverty among the fisher folks.*

## INTRODUCTION

Lake Kainji in the Northern Guinea Savanna vegetation zone of central Western Nigeria was impounded in 1968 by damming of River Niger. Although, the lake's primary function was for hydroelectric generation, an important small scale fishery developed within the lake, which attracted scientific research that concentrated mainly on the changes in the abundance of fish species and the or investigations, rather than the development of community based fishery (Abiodun, 2002). Early yield after impoundment reached 28,639 tonnes in 1970 (Bagizos, 1972) after which the yield declined to 4,500 tonnes in 1978 (Ekwemalor, 1978). After this period regular monitoring of the fisheries ceased. Presumed increase in fishing pressure and use of undersized gears led to further declines in daily capture (Balogun, 1985).

A sustained monitoring of the Kainji lake fishery through a reduction in sampling effort and the development of infrastructure and expertise of counter part institution has been a problem and prime concern until the intervention of GTZ under the Kainji lake fishery promotion. A new catch assessment survey method for the lake was therefore developed in May 1994 and upgraded with new field findings (Turner, 1996). However, while efforts were made to enhance fish yield of the lake, there is relatively little information available on the poverty status or livelihood activities of rural people dependent on fisheries and aquatic resource in northern Nigeria. However, given the close association between fisheries and poverty in many parts of the developing world, fishing communities have been characterized as " the poorest of the poor" (Bailey, 1985) there must be cause for concern for the situation. One of the major reasons why fishing communities are often threatened by poverty is because fisheries are susceptible to over exploitation, typically due to the impact of increased fishing effort within an open-access and unmanaged fishery.

Fishermen are unable to realize sufficient income to maintain an acceptable standard of living unless they can find alternative employment due to the fall in catch returns with increasing over exploitation (Smith, 1979). Wright (1990) reported that dissipation of economic surplus (resource rent), which commonly attends over exploitation means that an important source of relief from poverty for the community at large has effectively been lost.

The purpose of this study is to call attention to the need for better management strategies of the inland fisheries as a way to sustain the resources and to increase benefits, so as to alleviate poverty and improve the means of livelihood of the fishing communities.

#### DEFINITION OF RESPONSIBLE FISHERIES

Responsible fisheries refer to the proper fishing operations that promote sustainability of fisheries resources in a given community. It involves adequate fishing methods, handling, processing, transportation and marketing. Fisheries are susceptible to over exploitation, typically due to the impact of increased fishing effort within an open-access and unmanaged fishery, which is one of the reasons why fishing communities are often threatened by poverty.

#### FISHERIES OF LAKE KAINJI

##### Pre-GTZ era.

The first seven years of experimental gill net sampling program that started in 1969 showed that catch per unit effort continued to drop, suggesting a decline in the fish population.

**Table 1. Gill net fish catch-per unit effort in Kainji Lake by number and weight, 1969-1974**

	1969	1970	1971	1972	1973	1974
No. of sampling sites	5	4	4	5	6	6
Catch/effort, no. of fish		41.0	54.0	26.0	11.0	10.0
Catch/effort, wt./kg of fish	95.0	11.2	11.5	4.9	3.3	8.4
	36.6					

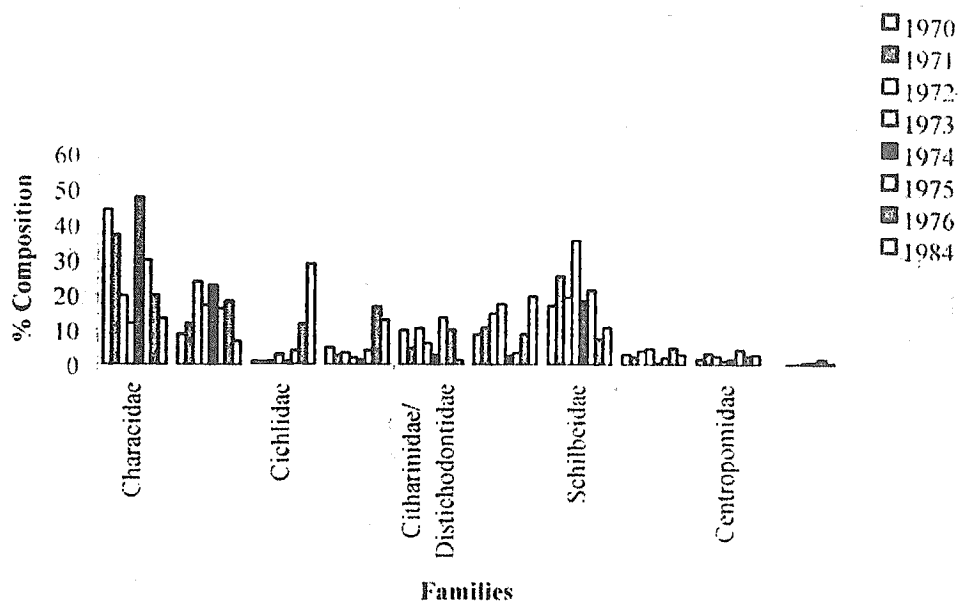


Figure 2: Percentage composition by number of fish families in the regular gill nets sampling in 1970-1976 and 1984

The decline in the fish catch in the lake is evident from general observation of experimental gill net data and quantitative estimates from catch assessment surveys. (Table 1 and Figure 1) The projected fish catch for 1974 and 1975 shows a maximum of 7,320.9 and 6,048.1 metric tonnes respectively as compared with 11,000 and 10,000 from 1972 and 1973 respectively. This fluctuation has compelled the local fishermen to reduce their gill-net meshes drastically from 7 inches (1970-1971) to 1½ -3 inches from 1972 to the present time in order to improve on their catches (Figure 2). As a result, juveniles of most fishes are indiscriminately cropped. Thus, the fishing pressure increased several folds. Other sources of increased pressure include use of poisonous and explosive methods by local fishermen, which usually cause mass mortalities of different juvenile fish species over large expanse of the lake, and also the use of beach-seine fishing, which can cause nearly as much as damage as the use of poisons and explosives. In 1970 there was a dramatic decrease in numbers of Citharinidae / Distichodontidae, Mochokidae and Mormyridae. Then populations had since remained very low. Pelagic feeders, especially Characidae and Schilbeidae took over the dominance from the bottom detritus/ insect feeders and remained dominant from 1970 until recent years. By 1976, the Cichlidae ranked third in terms of number. Between 1976 and 1984, Cichlidae completely dominated the lake fishery, being the most abundant fish and mostly restricted to the inshore waters (Figure 2). It is confirmed that the low catches of Cichlids in early post-impoundment survey was due to low population and not inadequacy of the static gill nets. In 1976, Bagridae ranked sixth in terms of numbers (Figure 2)

### Nigeria-German Technical Co-operation (GTZ) era

The report of the declining fishermen catches prompted the start of a nine-year technical co-operation project "The Nigerian-German Kainji lake fisheries promotion project" in 1993. The main goal of the project was to improve sustainable fish yield and the standard of living of fishing communities around lake Kainji, through the sustainable management of the fisheries and other aquatic resources of the lake. This goal is expected to be achieved by full participation of the fishing communities through the implementation of a community based fisheries

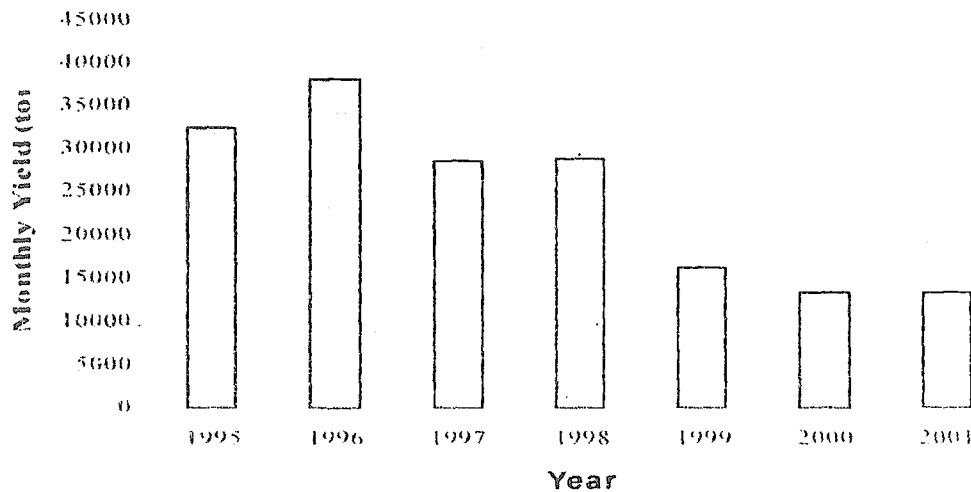


Figure 3: Estimated monthly fish yield (tonnes) for Kainji lake

plan.

The total estimated annual yield for the lake in 1996 was 38246 metric tonnes, an increase from 32474 recorded in 1995. The peak landing was 1996 and it continued to decline till 2001 (Figure 3)

The decline in total yield from 1996-1998 (Abiodun, 2002) can be attributed to a fall in the beach seine yield. The yield from gill nets and trap fishery increased from 1995-1998, while the yield from drift net and long line fishery decline up to 1997 then increased. The cast net annual yield remained constant. The highest yielding gear is beach seine followed by gill nets. Beach seine, although contributing 42% by weight on average to the lake yield only contributed a mean of 26% to the income from landed fish sales due to the lower valued clupeid and small size of by-catch species. Overall gill nets were the most important gear realizing 29% of all revenue over the four years, while beach seine gear yield is significant, it contributes the greatest challenges for fisheries conservation because of the by-catches which threaten sustainable fishing.

## Present catch record and fish diversity

Catch assessment carried out in 2003 for the Lake is shown below.

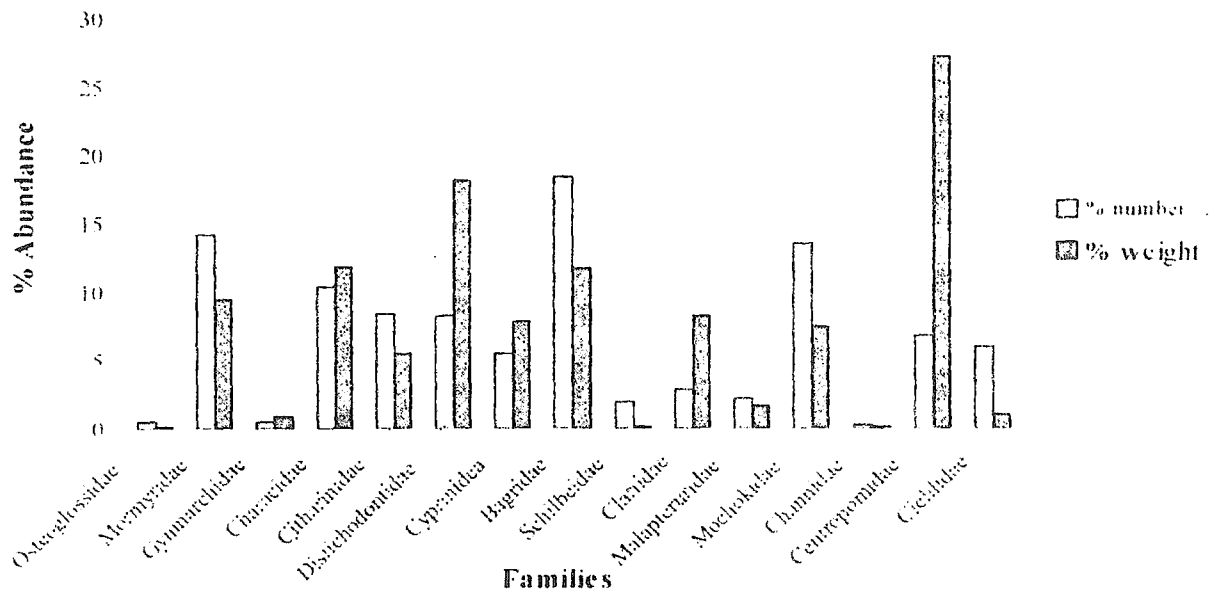


Figure 4: Percentage abundance by number and weight in each for 2003

15 families and 40 species of fish were recorded during the period of study, which corroborate the fact that Lake Kainji still has a high variety and abundance of fish species. Family Bagridae was the most abundant; making up 18.37% in terms of number, followed by Mochokidae at 13.55%. Osteoglossidae and Gymnarchidae have the same number at 0.48% abundance. Channidae has the lowest at 0.24% of the total.

(Figure 4). Bagridae also recorded the highest number in terms of different species abundance within a family. Characidae and Mochokidae follow it by Mormyridae then closely. This may be as a result of their ability to inhabit all habitats.

The family Centropomidae takes the lead in terms of weight at 27.22% of the total catch. Distichodontidae is next with 18.13% and Mormyridae at 9.44%, while Channidae has the lowest with 0.11% of the total weight (Figure 4). The significant of this finding is the lake Kainji can sustain large variety of fish species if fishing method does not skew the food change and in particular the carnivores to herbivores ratio.

### PROBLEMS RELATED TO RESPONSIBLE FISHERIES OF LAKE KAINJI

(i) Comparing the catches realized after impoundment to the total fish production of Kainji Lake seems to be declining. This could be attributed to over fishing, lack of investment capital available to fishermen and inadequate fish handling and processing methods. Fishing is one of the few primary production sectors of the economy of Lake Kainji communities. Fishermen cannot sustain or even increase their catches and thereby their income is not evident.

(ii) Following the observable declining trend world wide, fishermen use small and smaller mesh sizes and indulge in dangerous fishing methods such as fish poisoning, water beating e.t.c. often, the fish is kept at the bottom of the canoe, which is often dirty and unkempt lying there in a pool of

warm water and this accelerates spoilage (Eyo, 1977). Furthermore, especially during farming seasons, fishermen set their gill nets for a period of about 36 hours before checking, this also results in fish spoilage (Sule, 1994).

(iii) Small-scale fishing is widely practiced throughout the country and the practitioners mainly, artisanal fishermen face myriads of problems, which militate against high productivity, improved income and high standard of living. Some of the problems emanate from the following characteristics peculiar with small-scale operators in the Agricultural sector.

(iv) Artisan fishermen are itinerant in nature because they migrate with the seasons, water movement geographical fish abundance and schools of fish. This makes it difficult to get them settled for the purpose of development.

(v) Fishermen are dispersed in rural, sometimes remote areas, making monitoring of their activities difficult.

(vi) The remoteness of fishing villages makes it difficult to provide social and fishing infrastructure for the improvement of their environment and activities.

(viii) The high perishability of fish coupled with lack of access roads between fishing villages and urban markets expose fishermen to exploitation by middlemen who buy at landing site at ridiculously low prices to resell with high profit margins.

(ix) The introduction of modern fishing technology, like outboard engines, inboard canoes e.t.c is beset with the problem of non-availability of fuel in the rural areas to enhance acceptability and efficiency.

(x) Lack of capital, which makes procurement of modern fishing inputs almost impossible (Igun, 1991).

(xi) The problem associated with the introduction of formalized credit to the rural fishermen, which presently makes it difficult to operate fishing loans and to obtain the credit and capital necessary for a productive innovative small-scale fishery.

### **Efforts so far**

With reference to the fisheries sector in Nigeria, policy since 1960 has centered on a technology-led and protectionists approach, with the general aim of establishing a modern fishing industry (Ladu and Neiland, 1997). Overall, the performance of Nigerian fisheries policy has been poor and few, if any of the major development aims have been achieved. However, small-scale fisheries remain an important part of the rural economy in many parts of Nigeria, and support the livelihood of thousands of rural people for whom National Government is remote and ineffective in meeting their needs. This outcome, in terms of fisheries development, can be explained by a range of factors which include in-appropriate choice of policy framework (one which emphasized a modernist ideology rather than capitalizing on indigenous strengths), the unstable political and economic context of policy (frequent changes of Government and policy have undermined fisheries development efforts) and the nature of artisanal fisheries (small-scale fisheries have shown a huge resilience and adaptability in face of modernization pressures).

In terms of poverty alleviation policy, the Nigerian Government has attempted to design and implement various strategies since 1960, principally through large public investment schemes with the series of national development plans. Although there has been some success, policy implementation for poverty alleviation has faced major problems including poor planning, under or intermittent resourcing and instability caused by frequent government and administrative changes and thus ineffective execution of policies.

The current policy continues to focus on a range of activities commenced in the National Rolling plan of 1990-1992. Programs include; economic programs for the empowerment of women, Primary Health Care (PHC) programs and the Agricultural Development programs (ADP). According to the policy documents, "The thrust of current Nigerian Government policy against poverty is to enable the poor and more vulnerable sections of society to achieve

sustainable livelihoods. The approach is to economically empower communities, families and individuals through a sustained, well -coordinated and comprehensive programs of poverty alleviation (CAPP) UNDP Agenda 21.

Kainji lake Research Institute Fisheries division has come out with various research findings into ways of diversifying fishing activities on the lake rather than intensifying the usage of modern fishing methods for only selected species. The research findings are aimed toward the untapped fishing resources not yet exploited by the traditional methods. Such modern gears include the paired-boats trawling method, which has been found commercially viable for sardine (Clupeid) fishery.

### **New strategies**

To tackle the problems in the area, the Federal Department of Fisheries together with the state fisheries Departments concerned (Niger and Kebbi state) and the National Institute for Freshwater Fisheries Research presently undertake joint efforts to improve the living conditions of the fishing communities around the lake. They are supported by the Nigerian-German Kainji lake fisheries promotion project, which aims at preparing a management plan for the lake to support an increase of fish production on a sustainable basis.

Although basic fisheries research under taken by the Nigerian-German Kainji Lake Fisheries Promotion Project is at a very early stage, it is obvious that the anticipated management plan will include recommendations concerning introduction of new fishing methods, changes in mesh sizes used and possibly innovations in fish handling, processing and marketing (Sule *et al.* 1994)

The investment capital of fishermen is high while their income / returns is low, consequently any new technique or idea, which requires capital investment has to look very profitable to them for it to be accepted / adopted. For these reasons, fishermen have to be supported financially to facilitate innovation adoption.

When the high cost of capital from these sources, which is as high as 50% is considered (Abiodun, 2002) one would see that a major problem confronting the artisanal fishermen is non-availability of credit.

With easy accessibility to credit, the fishermen will be able to procure modern fishing inputs like outboard engines, fiberglass canoes, boats and fishing gears, which form capital items for increased fish production.

It should be noted that the current wave of unemployment among school leavers could be reduced if credit is made available to attract them into the fishing industry. By this process, literate artisanal fishermen could be produced who would be versed and interested in keeping records of catch, income, sales e.t.c. a lack of which is one of the problems limiting smooth operation of fishing loan at present.

The problem poised by shortage of manpower could be ameliorated through the modification of or introduction of special banking to accommodate rural and small-scale entrepreneurs, through community participation approaches.

### **RECOMMENDATION**

The focus of management efforts should be placed on reducing the early fishing mortality by banning of the beach seine and the small meshed gill and cast nets

Extension messages should not only focus on the simple comparison of sizes of fish caught, if they were caught now or later after they have grown, Innovations should be designed in close co-operation with fishing communities who are the end users. Any introduction of innovation has to be supported by massive and consistent extension campaigns.

The financial burden experienced by fishermen under the rural informal financial market can be minimize by properly packaged delivery mechanism.

## REFERENCES

- Abiodun, J. A (2002). Evaluation of fisheries catch trend on Lake Kainji, in Nigeria. (1995-2001). J. of Applied Sciences and Environmental Management. Vol. 7(2) Pp.9-13.
- Bailey, C. (1985). The blue revolution: The impact of Technology innovation on third world fisheries. *The Rural Sociologist*. 5(4): 259-266.
- Balogun, K (1985). The fisheries of Lake Kainji. Past, Present and Future. *The Nigerian field*.50, 29-34.
- Ekwemalor, A. I (1978). Frame survey at Kainji Lake. Report submitted to KLRI.41pp.
- Eyo, A. A (1977). An appraisal of the traditional fish handling and processing in Kainji Lake area. Kainji Lake Research Institute, Newsletter, August, P.6:New-Bussa.
- Igun, B. O. A (1991). NACB Digest: A journal of the Nigerian Agricultural and Cooperative Bank Limited. Vol.3 (4): 34-39.
- Ladu, B. M. B and Neiland, A. E (1997). A review of fisheries policy in Nigeria since 1950 (with special reference to the inland fisheries of North Eastern Nigeria) Pp. 385- 420. IN: Neiland A. E (ed). *Traditional management of Artisanal fisheries in N. Nigeria*. Final Report. DFID Research project No.R5471. CEMARE Report No.43 Portsmouth: University of Portsmouth.
- Sagua, V. O (1975). The status of fishery research in Lake kainji. *Agric. Rese. Coun. of Nigeria*. KLRI Newsletter.Vol.2. No.1.
- Smith, I. R (1979). A research framework for fisheries Development, ICLARM Studies and Reviews of Manila:ICLARM.
- Sule, A. M, Ayanda, J. O and Mdaila, M (1994). Preliminary survey on sociological problems of innovations Adoption of fishing Technology in Kainji LakeArea.Pp1-7.
- Wright, C.S (1990). Is poverty in fishing communities a matter of tragedy or choice? Paper presented at the Biennial Conference of the International Institute for fisheries Economics and trade, Santiago, Chile.