

**POVERTY ALLEVIATION AMONG FISHERMEN WITHIN THE FLOODPLAINS OF KADUNA RIVER:
IMPLICATION FOR INTRODUCING COMMERCIAL FISH FARMING AT VILLAGE LEVEL IN DOKO LOCAL GOVERNMENT AREA OF NIGER STATE, NIGERIA.**

BY

***YARO, I. AND **GANA, F. S.**

**Department of Fisheries Technology and **Agricultural Economics and Extension Technology, Minna.*

ABSTRACT

A diagnostic survey was conducted among the fishermen in six selected villages in Doko Local Government Area of Niger State. One hundred and fifty fishermen were randomly selected and interviewed to find out whether or not they had interest in commercial fish farming aimed at improving their livelihood. The dwindling fish catches in the natural flood plain ponds and Ex-bow Lakes continued to have a serious negative effect on the socio-economic well being of the village communities in question. A break on natural regular annual flooding of the plains had resulted into very low natural fish recruitment. Data analysis using simple descriptive statistics revealed that land tenure system, educational status, inadequate infrastructural facilities, religious taboos, existing fish species among others were found to be favourable indices for commercial fish farming. However, serious conflicts among the fishermen concerning the ownership status of these natural fish ponds are found to be major obstacles to commercial fish farming despite that the traditional ownership of the ponds were vested in the hands of individuals and village communities. Extensive fish farming and small-scale fish farming in the ponds and Ex-bow Lake with improved management practices are considered to be profitable venture. Despite the fact that fish seeds supply and extension effort are still inadequate, the fish farmers have indicated willingness to adopt commercial fish farming in the Ex-bow Lakes and flood plains in order to restore abundant fish production thereby providing for their food security and also increasing the daily income.

Key concept: Commercial fish farming within the flood plain ponds and Ex-bow Lakes for poverty alleviation of fish farmers.

INTRODUCTION

The main occupation in the study area are fishing and farming, hence intervention strategy should be focused on productive resources development in fishing and farming sectors among other basic needs like education, healthcare and security etc. Poverty could be regarded as one of the causative and negative source of evil. For this makes some poor people to engage in bad practice like stealing, armed robbery etc.

Poverty, in the perception of the poor, is believed to involve the lack of access to basic needs, combined with impaired access to productive resources. Among the basic needs are nutrition, shelter, water and sanitation, healthcare, basic education, working skill and tools, security, and political as well as civic rights to participate in decision making. In the absence of these facilities, the poor tend to see themselves as marginalized, powerless, voiceless, and unable to participate in matters affecting their own economic well being (Adekoya, 2002).

In the opinion of the late mother Teresa of India poverty is a kind of deprivation from something, which every human being has a natural right to have and enjoy. Generally, poverty

has everything to do with scarcity, dilapidation, ill health, needfulness, feebleness, adversity, illiteracy, begging and filthiness. A poor man has no vision, no mission, little hope and foresight and in our society, no voice and no friends. Hunger is a direct and immediate consequence of poverty and hunger distorts one's reasoning while anointing his temperament with aggressive instincts as sad as the situation is, many Nigerians are daily being buffeted by it and many more drifting into penury with each passing day (Silidion, 1999).

Socio-economically, flood plains are important because in semi-humid regions, communities concentrate along the major rivers. In such areas, increased fish production in the floodplains benefits a major part of the production (Verdegam *et al.*, 1988). This was the case in the study area.

Over the years and before the creation of Shiroro Lake on the upstream of River Kaduna at Shiroro village, the Kaduna River floodplains remained the treasure of large human population that inhabited the area. Thus, the area was endowed with natural fish production, which became source of cheap food fish as well as cash earnings and source of commercial activity for the populace. This was because the nature provided the recruitment of fish stock through the yearly flooding regime. The situation, however, changed after the creation of Shiroro dam across River Kaduna, which resulted in artificial break of the natural regular annual flooding of the floodplains downstream of the dam, the study area inclusive. The effect of which equally disrupted the usual and yearly natural fish stock recruitment, which depleted in natural fish production. Since then, the problem has been a general out-cry by the large concentration of the communities along the floodplains downstream on the decrease of fish catches since the construction of the dam. The objective of this study was therefore to conduct a diagnostic survey to find out the implication of introducing "Commercial Fish Farming at village level" in the study area with a view to alleviating their poverty and regain the lost glory of natural food fish production. The scheme would take the form of introduction of culture-based fisheries in natural floodplains ponds and ex-bow lakes as well as extensive aquaculture in reservoirs in stream flow valleys of the study area.

MATERIALS AND METHODS

Survey Area

A preliminary survey was conducted among the fishermen in five randomly selected villages of Kaduna River floodplains in Doko Local Government Area of Niger State. The villages were Doko, Nku, Fokpo, Gbade, and Mambe.

Sampling Technique

Five villages were randomly selected for the field survey. In each village, twenty-five fishermen were selected totally one hundred and twenty five (125). Each respondent was interviewed independently during a single visit and his responses recorded in the prepared questionnaire.

Method of Data Collection

Structural questionnaires scheduled were used to collect information from the respondents. The task was achieved with the assistance of the Village Extension Agents (VEA's) as enumerators. After the survey, some questionnaires were examined to clear some ambiguities with the enumerators. Among the information collected were the bio-data of the respondents, educational qualification, religious inclination and occupation etc. The respondents decision on the adoption or otherwise of the new technology were recorded.

Statistical Analysis

Descriptive statistics involving simple tools such as means, frequency and percentages were employed to compare individuals or group of individuals in the sampling units. The tables produced were interpreted accordingly.

RESULTS AND DISCUSSION

The age of the respondents is the key factor in the level of participation in the fishing and farming activities. Table 1 shows the ages of the respondents. Thus, 33.06% of the respondents aged between 31-39 years; 28.08% were between 22-30 years while 12.8% and 12.0% were of the ages 21 years and below and 40-49 years respectively. These are the majority groups of the respondents that formed substantial number of the respondents in the economically active group. Hence, the tendency to accept the introduction of fish farming technology at village level.

Table 1: Age distribution of the respondents

Age groups	Frequency	Percentage
< 21 years	16	12.8
22 – 30	36	28.8
31 – 39	42	33.6
40 – 49	15	12.0
50 – 69	7	5.6
60 >	9	7.2
Total	125	100

Source: Field Survey, 2004

Education Status of the Respondents

An educational status is the literacy level of a person. It plays a key role of any new technology or innovation (Sen, 1994). The level of education of the fishermen interviewed is shown on table 2.

Table 2: Education Status of the Respondents

Education Status	Frequency	Percentage
No formal education	23	20.4
Adult education	29	25.7
Quranic education	49	40.7
Primary education	7	6.2
Secondary education	7	6.2
Total	125	100

Source: Field Survey, 2004

Over 79% of the respondents had one form of education or the other. At least members of these groups can be able to read and write in English, Hausa and Arabic. Normally those that easily accept innovations are those with educational background. This is because they can easily read at least simple manuals, advantages and disadvantages of the introduced new technology. Majority, 40.7% however had Quranic education and 6.2% each had primary and secondary education respectively. Studies on the adoption have often cited early adopters as more educated etc (Sen, 1995).

Occupational Status of the Respondents

Gainful employment is a hope and wish of every serious person. An employed person is always useful to himself and to his family members, community and the entire nation. Farming and fishing are among the oldest occupations of man since time immemorial. Table 3 shows the occupational status of the respondents. 80% and 20% were full time and part time fishermen respectively. When merge together, they formed 100% of the respondents who may likely welcome the introduction of the new technology since they are easily compatible.

Table 3: Occupational Status of the Respondents

Occupational Status	Frequency	Percentage
Full-time fishermen	100	80.0
Part-time fishermen	25	20.0
Total	125	100

Source: Field Survey, 2004

One-fifth of the respondents were part-time fishermen. It is possible that they were once full-time fishermen but because of the dwindling fish catches (Table 4) due to probably over-fishing among other reasons

Table 4: Experience of Dwindling Fish Catches by the Respondents

Response	Frequency	Percentage
Yes	11.5	80.0
No	10	20.0
Total	125	100

Source: Field Survey, 2004

Such people could easily be lured back into full action if the new technology is introduced. It is envisaged that anything that would improve the income of full-timers, part-timers and even people outside the profession would contribute to adoption of the new farming system.

Dwindling Fish Catches

Majority (80.0%) of the respondents (Table 4) have agreed that there is dwindling fish catches over the years. 20.0% however, could not sense the decline. They attributed the decline (Table 5) due to over-fishing; dam construction and use of obnoxious fishing methods. Majority 73.6% however, put more stress on the dam construction i.e. Jebba and Kainji dams.

Table 5: Factors Responsible For Dwindling Fish Catches

Factor	Frequency	Percentage
Over-fishing	22	17.6
Dam construction	92	73
Use of obnoxious fishing methods	2	6
Others	9	1.6
		7.2
Total	125	100

Source: Field Survey, 2004

This is a fact, because, the hydrology of the River Niger below the dams had changed thereby altering natural annual flood regime with all its rich debris that used to be deposited on the floodplains of the entire Niger River Valley. This natural annual event usually developed natural fish food for the fish as well as providing larger spawning grounds for the variety of fishes. This statement is in agreement with Devendra (1995) who stated that wild fish have been known to have flooded rice fields naturally, but the situation has been depleted due to reduce stocks of wild fish as a result of degeneration of water resources among other factors.

Dams have a major effect on fisheries downstream. They act as barrier to upstream and downstream migration. They also regulate water flow so as to change the amount and timing of discharge and can prevent the regular inundation of downriver floodplains. The loss of floodplains below major dams has been observed and recorded in a few cases. In fact most of the existing information and knowledge on the impact of changes in water flows on fisheries comes from the response of the Niger River to the sahelian drought and to fisheries in such rivers as the Niger and the Senegal to dam building (Welcome, 2003). Introduction of commercial fish farming of village level at this juncture would be a break through to poverty alleviation in the area.

Persistent failure of flooding has also been recorded below the Kainji dam on the Niger River (Sagua, 1978). The effect becomes more marked in systems already stressed by low dam fell by about 50% in three years (1967-69) in Jabba-Lokoja reach (Otobo, 1968) and by 60% in the lower Anambra basin downstream (welcome, 2003).

Over-fishing and obnoxious fishing methods (Table 4) formed 17.6% and 1.06% of the respondents. Some of the indices of over-fishing are the use of under meshed size (Table 6) of 1" - 2" which formed the majority (68%) of the respondents. Only 48% of the respondents used 2½" - 3", which is the minimum, recommended size while 7.2% used 3½" and above. The use of under meshed size or obnoxious fishing methods are all considered to be irresponsible fishing methods, and should be discouraged. These have further contributed to depletion of fish stock in the area, hence the need for introduction of new technology

Table 6: Mesh Size Used by the Respondents

Mesh Size	Frequency	Percentage
1" - 2"	85	68
2½" - 3"	31	24.8
3½" >	9	7.2
Total	125	100

Source: Field Survey, 2004

The freshwater fish species of Nigeria is the richest in West Africa (Olaosebikan and Raji, 1998). Different type of fish species caught are *Clarias* and *Tilapia* with 90.4% and 9.6% respectively. (Table 7) The two species have been widely used in aquaculture worldwide.

Table 7: Main Species Commonly Caught in the Study Area as Indicated by the Respondents

Species	Frequency	Percentage
<i>Clarias</i>	113	90.4
<i>Tilapia</i>	12	9.6
Total	125	100

Source: Field Survey, 2004

This is a pointer to the proposed farming system in the area. Also, the problem of non-marketability of the harvests due to the consumer preference does not arise because the species were already favorable arise because the parts of the communities diet especially the *Clarias* which is loved all over the country, Nigeria.

Source of Income

Income is the money received during a given period by individuals or corporate bodies from business transaction. The fishermen and farmers earn their incomes from the sales of fish, fish products and farm produce. During the survey (Table 8), the sources from which the respondents obtained their incomes were from fishing and farming etc. thus, from the sales of fish, rice, upland crops etc.

Table 8: Main Source of Income by the Respondents

Main Source	Frequency	Percentage
Fishing	109	82.7
Farming	12	9.6
Others	4	3.7
Total	125	100

Source: Field Survey, 2004

It is therefore pertinent that the respondents would embrace the technology that is envisaged to bring more profit for the alleviation of the their poverty, since there is dwindling fish catches and no other alternative in place.

The net income of the respondents (Table 9) shows that the net income from fishing per week are in categories of N135.00, N136 – N269, N270 – N400, N405 – N539, and N540 > at 2.4%, 65.6%, 0.8%, 18.4% and 12.8% respectively. This shows that the largest number of the respondents in the study area i.e. 65.6% of the respondents earned N136 - N269 per week, which is grossly under the poverty line internationally. This agrees with the observation of Silidion (1999) who stated that the established indicators abound to lend credence to the fact that about 80% of Nigeria's over 100million population are barely existing even below the internationally recognized poverty line of \$1 (About N135) per day, lacking a combination of food, shelter and clothing and operating within an extreme poverty bracket. This situation, justifies the introduction of the new technology. In addition, the programme would provide employment for the masses i.e. both men and gender in economic and social empowerment.

Table 9: Net Income from Fishing by the Respondents Per Week

Income	Frequency	Percentage
< N135.00	3	2.4
N136 - N269	82	65
N270 – N400	1	0.8
N405 – N539	23	18.4
N540 >	16	12.8
Total	125	100

Source: Field Survey, 2004

Ownership of the Natural Ponds or Ex-Bow Lakes

Land tenure system in some communities in Nigeria, especially the highly populated areas, is a very controversial and sensitive issue. Majority 90.4% own natural ponds or and ex-bow lakes (Table 10)

Table 10: Whether the Respondents Own the Natural Ponds or Ex-Bow Lakes

Ex-Bow Lakes	Frequency	Percentage
Yes	113	90.4
No	12	9.6
Total	125	100

Source: Field Survey, 2004

Conflicts

Cases of land disputes in the area have been experienced (Table 11). The findings showed that 82.4% of the respondents testified that there have been conflicts, while 17.6% did not admit probably because of suspicion.

Table 11: Encounter of Conflict During Fishing in the River, Ponds and Ex-bow Lakes

Response	Frequency	Percentage
Yes	103	82.4
No	22	17.6
Total	125	100

Source: Field Survey, 2004

This is a serious issue, which I feel could be tackled amicably by the authority. Special committee to resolve this issue is suggested. Development is only possible when there is peace.

On the issue of ownership status (Table 12), the land is either owned by the individuals, the family units, the community as a whole and the landlord i.e. highly traditional title-holders in the society. Sometimes, it is easier to convince individuals or family units than a whole community on accepting certain innovations such as this new farming system. Individuals and the family had 26.4% and 21.6% respectively, it is expected that acceptance of the innovation may meet with minimum resistance.

Table 12: Status of Ownership of the Natural Ponds or Ex-Bow Lakes

Ownership	Frequency	Percentage
Individual	33	26.4
Community	64	51.2
Family	27	21.6
Landlord	1	0.8
Total	125	100

Source: Field Survey, 2004

The community ownership was 51.2%. This however, may not present any serious problem if the community leaders could convince the members. The landlords may not easily yield to the changes that would take place. Luckily, they formed only 0.8% of the respondents in the study area. On the whole, the land tenure system is unlikely going to be a hindrance in the

introduction of the new technology. This is because; there is a general outcry of depleted fish stock in the recent times resulting to poor catches. Secondly, since fish farming is not common in the area, many respondents would be eager to embrace the technology. Nevertheless, there is need for more research to properly understand the land tenure system in any community in which the new technology is intended and it requires the use of land (Sen, 1995).

Consent to Improvement of Natural Fish Ponds or Ex-Bow Lakes

Although aquaculture or fish farming has gained popularity worldwide and had been practiced in many parts of the world for long, it is yet to take its rightful position in Nigeria. In this survey, fish farming was not observed anywhere in the study area. However, the consent to improvement of their natural fish ponds (floodplain ponds) or ex-bow lakes (Table 13) indicated that 90.4% were willing to accept the new technology, while 4% were undecided.

Table 13: Willingness for the Improvement of Natural Fish Ponds or Ex-Bow Lakes

Response	Frequency	Percentage
Yes	120	96
No	0	0
Undecided	5	4
Total	125	100

Source: Field Survey, 2004

Further more on the consent to collaborate with the government on the same (Table 14), 93.6% of the respondents agreed to collaborate with the government. 6.4% were however undecided.

Table 14: Readiness to Collaborate with the Government to Improve the Pond through Introduction of Commercial Fish Farming at Village Level

Response	Frequency	Percentage
Yes	117	93.6
No	0	0
Undecided	8	6.4
Total	125	100

Source: Field Survey, 2004

Consent on the collaboration based on the religion was also investigated. The result (Table 15) indicated that 100% of the respondents indicated that collaboration would not be on religious basis.

Table 15: Collaboration on the basis of religion

Response	Frequency	Percentage
Yes	0	0
No	125	100
Total	125	100

Source: Field Survey, 2004

It is however a very important social factor in the life of fishermen and farmers in the study area. No case of religious taboo/sanction against the consumption of fish was recorded in the study area. Therefore, the religious benefits may not hinder the adoption of the new technology.

The goal of every productive effort in making profit although loss is often recorded, fishing and farming industries are pruned to loss, because of unpredictable natural forces such as flood and drought. However, a piece of advice on the introduction of innovation is as follows:

In the introduction of any innovation two groups are usually identified, the early adopters and the lagers. The earlier these two groups are identified the better, because this would ease the task of introduction. Some of the characteristics of the earlier adopters are higher social status, high level of education and having more land or ability to acquire more land. Others include access and exposure to extension and communication channels. These factors enable them to have access to labour, land and extension services. The lagers lack these characteristics (Sen, 1994).

CONCLUSION AND RECOMMENDATION

Fishing and farming are the main occupations of the respondents in the study area. No respondent indicated the knowledge of aquaculture of any sort as means of economic activity, which is indicative of the novelty of the proposal in the rural communities, if adopted. Majority of the respondent showed their willingness to adopt the new technology as well as collaborate with the government without any religious bias among others discussed. Based on these facts, there would be no implications in introducing commercial fish farming at village level in the study area.

REFERENCES

- Adekoya, B. B. (2002). Ijebu-Ode Development Board on Poverty Reduction (IDBPR) Programme in Ijebu Land, Nigeria. Consultation, Collaboration and Coordination Ijebu-Ode, Nigeria pp. 1-10
- Devendra, C. (1995). The Integration of Agriculture and Fish Farming in Indonesia. The Management of Integrated Freshwater Agro-Piscicultural Ecosystems in Tropical Areas (Brussels, 16-19 May 1994). Proceeding Edited by J. J. Symoens and J. C. Micha. Technical Centre for Agricultural and Rural Co-operation (CTA). Royal Academy of Overseas Sciences (Brussels) pp. 329-342
- Olaosebikan, B. D. and Raji, A. (1998). A Field Guide to Nigeria Freshwater Fisheries. Federal College of Freshwater Fisheries Technology. P.M.B. 1500, New Bussa, Nigeria pp. 1-
- Otobo, F. A. (1968). Commercial Fishing in the Middle Niger, Nigeria Committee of Inland Fisheries for Africa Tech. Pap. 5: 185-208
- Sagua, N. N. (1978). The Effect of Kainji Dam, Nigeria, Upon Fish Production in the River Niger Below the d at Faku CIFA Tech. Pap.5. 209-224
- Sen, S. (1995). Socio-Economic Aspect of Integrated Farming. The Management of Integrated Freshwater Piscicultural Ecosystems in Tropical Areas. SEMINAR, Brussels. Edited by Symoens J.J. and Micha J.C. Technical Centre for Agricultural and Rural Co-operation (CTA). Royal Academy of Overseas Sciences (Brussels) pp.
- Welcomme (2003). River Fisheries in Africa. Their Relationship to Flow Regimes. In NAGA, World Fish Center Quarterly Vol. 26 No. 3 pp. 22-25