THE ROLES OF COOPERATIVE SOCIETIES IN AQUACULTURE DEVELOPMENT: A CASE STUDY OF IJEBU ODE, ERIWE FISH FARM OGUN STATE.

***Obasan, T. A[1], ILO, B. M[2], Ologbon, O. A. C[1] & Adetayo, A. E[3]**
[1]Department of Cooperative and Rural Development
[2]Department of Banking and Finance
[3]Department of Business Administration
[1,2,&3]Olabisi Onabanjo University, Ago-Iwoye, Ogun State, Nigeria
*Corresponding author : E-mail: tawa.obasan@oouagoiwoye.edu.ng
Phone : +234(0) 8056816198

Abstract
Agricultural cooperatives have continued to remain an important vehicle for catering for the needs of farmers and offering a broad range of services that provide the required supports for farming activities in Nigeria. In recent years, fish farmers in Nigeria have embraced the cooperative model for achieving financial and social security, exchange of ideas , improved standard of living, employment generation for members and national economic growth. This study examined the roles of cooperative societies in Aquaculture development in Ogun State Nigeria using Eriwe fish farm in Ijebu Ode Local Government Area . A multistage sampling procedure was adopted to select fifty-two (52) managers and owners of Eriwe fish ponds. Primary data was used and were obtained with the aid of structured questionnaires. Descriptive and inferential statistics were used to analyse the data. The findings of this study revealed that majority (73%) of the were male, with the highest proportion (44%) within 20-40 years of age, implying that larger population of this study were youth, having farming experience of between 11 and 20 years. Majority (38%) of the farmers hold a relatively large pond size of 40m by 45m (1,800m2).The study concludes that cooperatives has significance contribution to the development of Aquaculture, but poor managerial skill remains a bottleneck for cooperative development. The study therefore suggests that cooperative societies at all levels should be strengthened though regular training and.be made more efficient in the discharge of their statutory roles for the sustainable development of aquaculture in Ogun state.

Keywords: Role, Cooperative, Farmer, Aquaculture, Development

Introduction

There are many opportunities for the Nigerian economy to grow and flourish, and the nation's natural resources, which are plentiful, should be fully utilized for Nigeria's overall economic success in the global economy. Promoting cooperative mobility is arguably a key step in achieving this objective (Anyanwu,1996).

Cooperative societies are defined by the International Cooperative Alliance (ICA 2005) and Gabor (2005) as an independent group of people who willingly unite as a single entity to address their shared social, cultural, and economic needs and desires with the assistance of a jointly owned and democratically run business.

The cooperative society model has been used by Nigerian fish farming in recent years in order to achieve social security, employment creation, economic progress, and the sharing of ideas and money. Nigeria imports more than 900,000 metric tons of fish a year due to a demand for fish that greatly exceeds local output (Ozigbo et al. 2013). Fish availability from ocean fisheries has drastically decreased due to overfishing, habitat damage, and pollution, which has resulted in a significant fish shortage (Adedeji & Okocha 2011). According to federal department of fisheries statistics, aquaculture production is rapidly increasing (Federal department of Fisheries, 2017) The country's local fish production will be improved if the cooperative society model is used in aquaculture at a steady pace and with sustainability.

The government and other international agricultural institutions have expressed major concerns about food security. The majority of Nigerians continue to struggle with malnutrition and an inadequate food supply, according to Okunola & Oludare (2011). Nigerians consumed 225 kcal per day on average, compared to the minimum 2500–2800 kcal per day that is internationally assessed. Approximately 13–15 million people, primarily children, pass away each year from illnesses linked to a lack of seafood protein, United Nations (2012). This was because more than 20% of Nigerians were living below the poverty line and could not afford the food needed for children's healthy development (Okumadewa, 2006).

Animal ownership and household food security are positively and significantly correlated, according to Obasan et al. (2017) study on the factors influencing rural household food security in Ogun State. It is not gainsaying to note that food crop and animal protein components are the two main sources of protein. According to Okunlola, Oludare, and Akinwalere (2011), animal protein sources include fish, cattle, sheep, goat, poultry, eggs, milk, and milk products. Fish is the only one of these protein sources that is reasonably priced for any low-income household.

However, there are certain restrictions on the nation's fish output, which has made it difficult to meet the ordinary Nigerian's nutritional needs for protein. As a result, there has been an increase in malnutrition and other associated illnesses. The FAO (2004) states that a person should consume 55 grams of protein per day, of which 10.6 grams should come from animal sources. 4.82 grams of animal protein, or almost 10% of the required total protein intake, are consumed in Nigeria, according to the country's food balance sheet (Ajayi, 1985 cited in Adekoya 2004).

Cooperative societies can play a significant role towards accelerating the mass productivity of fish and other relative aquaculture for human consumption and industrial uses. This makes it imperative to investigate the roles of cooperative societies in aquaculture development in the study area. This study will provide an insight into the fish production, challenges and cooperative success of fish farm production in Eriwe Fish Farm in Ogun state, Nigeria. The specific objectives of this study were to examine the role of

cooperative societies in aquaculture development, assess the challenges encountered by cooperative societies in operating aquaculture in Ogun state and examine the roles of cooperatives income on aquaculture development. Beyond the objectives of the study, the following hypotheses were formulated for the study.

Research Hypotheses

Hypothesis 1: Cooperative Society makes no significance contribution to the development of Aquaculture.

Hypothesis 2: Poor managerial skills is a bottleneck for cooperative development

Hypothesis 3: Assigning roles and responsibilities promote cooperative commitment

Hypothesis 4: Social integration promotes cooperative income among aquaculture farmers.

Literature Review

A number of problems confront the production of catfish in Nigeria. Prominent among these are: Poor management skills, inadequate supply of good quality seed, lack of capital, high cost of feed, and marketing problems. In the same vein, George,et. al (2010) reported in their study that the major problem hindering the promotion and development of the aquaculture industry in Nigeria has been the scarcity of fish fingerlings. According to Oota, (2012) high cost of input, lack of credit to fish farmers at low interest rate, lack of skilled manpower and an ineffective aquaculture extension service system has been the reasons for low production in the aquaculture sector of Nigeria.

In general, credit can be evaluated based on its capacity to stimulate other production elements. Cooperatives have played a variety of roles in the development of aquaculture, by enhancing members' finances, and it also avail their members the opportunity to enjoin economies of scale in the purchase of inputs and sale of output. Cooperative societies buy agricultural inputs like machinery, chemicals, and fingerlings and teach farmers about contemporary farming and management methods (Nweke et al.,2005). Adebayo (2002) and Okwoche et al. (1998) have found a connection between Nigerian farmers' adoption of agricultural practices and their ability to obtain financing. The effect of Nigerian Agricultural Cooperative loans on fish farming businesses in Ogun State, Nigeria, was investigated by Olaoye et al. (2012), the study found a strong correlation between aquaculture progress and the loan secured by the fish farmers. This implied that the majority of farmers had expanded their fishing businesses using the credit they had received, and that the income level of those who benefited from the cooperative loan had significantly increased.

Poor marketing channels, high feeding costs, and insufficient funding were the main obstacles to fish farming. They suggested that in order to support future development, cooperatives should boost funding for the fishing industry.

Problems of Aquaculture in Nigeria

Nigeria's aquaculture development faces a number of sustainability-related issues, some of which are as follows:

Government policy: Unstable government financial policies pose risks to capital utilization, and many fish farms have failed as a result of these policies' instability or change.

Land: Ownership has an impact on land use, so Nigeria's land tenure systems severely restrict aquaculture development.

Water and pollution: Both the quantity and quality of water are essential for the successful production of fish. According to Olowosegun et al. (2008), oil exploration, dredging of some water bodies, and the disposal of toxic industrial effluents have made most of Nigeria's fishing grounds unusable, and pollution has also been found to have an impact on the industry's yield (Akanni and Akinwunmi 2007).

Production Management: Many once-enthusiastic farmers have experienced massive failures as a result of inadequate management skills and technical issues related to fish production. Seed availability: The Nigerian aquaculture sector still needs to investigate the potential of genetics and contemporary breeding technology to enable the development of high-quality fish seed.

Marketing and Distribution: In Nigeria, transportation is seen to be a significant issue in fish marketing and distribution, in addition to seasonality, scarcity, and preservation methods, which are the primary issues with fresh fish marketing. Additionally, Nigerian fish farmers must network and look into foreign markets.

Research Methodology

The Study Area

The study was carried out in Ijebu-Ode Local Government Area of Ogun State South-West, Nigeria. The Eriwe farm village is West Africa's first and largest co-operator based fish farm estate as established on its 156 hectares farmland. The fish farming in the estate alone engages over 120 youths and women workers who serve as farm hands, security, diggers etc.

Sample size and Sampling Technique

The data for the study were essentially from primary source collected with the use of structured questionnaire. A multistage random sampling technique was used to select eighty (80) managers and owners of Eriwe fish ponds. The First stage involved a purposive selection of Eriwe fish farm in Ijebu Ode local government due to high concentration of fish farmers, then in the second stage, a list of registered fish farmers from the farm was established from the cooperative society records to generate a sampling frame, each manager on the sampling frame was assigned a number and finally, a random selection of eighty managers was made using balloting, but only fifty-two (52) responses were considered suitable for the purpose of analysis.

Methods of Data Analysis

The data collected were subjected to both descriptive and inferential analysis. The descriptive statistics describe the socio-economic characteristics of the fish farmers by means of frequency distribution and simple percentages, while Chi Square was adopted to investigate all the relationships of interest in our hypotheses testing.

Results and Discussion

Personal characteristics of the fish farmers

Table 1 presents the personal characteristic of fish farmers, the results show that while 27% of respondents were female, the bulk of respondents (73%) were male. With the majority of survey participants being male, this suggests that the aquaculture sector is predominantly dominated by men. This further demonstrates the time-consuming nature of aquaculture development. In their study on the roles of cooperative societies in the development of aquaculture in Rivers State, Nigeria, Edun et al. (2018) found that 70.0% of the respondents were female, which is in contrast to this conclusion.

Findings revealed that almost half (44%) of the respondents were within 20-40 years of age, 42% were within 41-60 years, while 14% were aged 61years and above. This is an indication that the cooperative farmers are still in their active age for effective aquaculture development and corroborates fingings of (Gabriel et al, 2015). The result also indicates that the larger population of this study were youth, and to some extent, the industry could help solve the problem of unemployment among the youth. Table 1 further reveals that over a third (38%) of the fish farmers had secondary education. Same proportions (29%) of the fish farmers each had primary and tertiary education, while 4% had no form of formal education.

Table 1: Distribution of Fish Farmers by Personal Characteristics

Variables	**Frequency**	**Percentage**
Sex		
Male	38	73
Female	14	27
Ages (Years)		
20-40	23	44
41-60	22	42
61-above	7	14
Educational status		
No formal Education	2	4
Primary Education	15	29
Secondary Education	20	38
Tertiary Education	15	29
Tribe		
Hausa/Fulani	-	-
Yoruba	38	73
Igbo	10	19
Others	4	8
Total	52	100

Source: Field survey, 2024

This implies that majority of the respondents were secondary school certificate holders. Lastly, it was observed that 73% of the respondents were Yoruba tribe, 19% were Igbo, while 8% were from other ethnic groups of the country excluding the Hausa /Fulani. This implies that most of the respondents of this study were Yorubas.

Table 2: Distribution of Respondents by Fish Operations, n=52

Variables	Frequency	Percentage
Business status		
Partnership	7	13
Co-operative	40	77
Sole proprietors	5	10
Years of operation		
0-10 years	15	30
11-20 years	30	57
21 – above	7	13
No of Ponds		
One pond	5	10
Two ponds	24	46
Three and above	23	44
Size of Pond		
40m by 45m	20	38
30m by 35m	17	33
20m by 25m	15	29
Sales (Daily)		
≤ 25kg	21	40
26kg- 50kg	15	29
51kg-75kg	14	27
Above 75kg	2	4
Total	52	100

Source: Field survey, 2024

Fish Farmers Operational Characteristics

Table 2 shows the distribution of the fish farmers by farming operation characteristics. It is clearly shown that 13% of the respondents operated partnership business, 77% operated Co-operative business, while 10% of the respondents operated as Sole proprietors. This implies that larger parts of the population of this study operates Co-operative. Also, it was observed that 30% of the respondents have been in the business within 10 years, 57% were of (11-20) years business experience, while 13% of the respondents have over 20years of business experience.This suggests that between 11 and 20 years of business operation expertise are had by the majority of study participants. This result is consistent with that of Adekunle and Hardeson (2007), who claimed that skill development and experience go hand in hand and are essential to the effectiveness and efficiency of any job operations.The result implied that most cooperative society members had acquired reasonable years of experience in fish farming which could have spread effect on aquaculture development It was revealed that 10% of the respondents possessed one(1) fish pond, (46%) possessed two(2) fish ponds, while 44% possessed three (3) fish ponds and above. This implies that most of the respondents of this study have more than two ponds. More than a third, (38%) of the respondents possessed fish pond size (40m by 45m), 33% possessed fish pond size

(30m by 35m), while 29% of the respondents possessed fish pond size (20m by 25m). This indicates that most of the respondents of this study have fish pond size of (40m by 45m). Also, 40% of the respondents recorded an average of (25kg) daily sales, 29% recorded an average of (50kg) sales daily, and 27% recorded average of (75kg) sales daily, while 4% recorded sales above 75kg on their farms during the harvest period.

Table 3: **The roles of Cooperative Societies in Aquaculture Development in Ogun State**

Variables	SA(4)	A(3)	D(2)	SD(1)	Mean	Rank
Promotes rural development	22(42)	15(30)	7(13)	8(15)	2.98	2nd
Promotes socio cultural development	18(34)	22(42)	6(12)	6(12)	3.0	1st
Poverty alleviation	15(30)	18(35)	12(23)	7(13)	2.79	3rd

Source: Field survey, 2024; Note: Figures in brackets are percentages

Table 3 presents the analysis of respondents' opinions based on a 4-point Likert scale on the roles of cooperative societies in Aquaculture development in Ogun State. The result reveals that all the weighted means are above the mean weighted score of 2 which is the borderline for disagreement. This suggests that most respondents agreed that cooperative societies has contributed to Aquaculture development through rural development, socio cultural development, and poverty alleviation. In addition, in terms of relative importance index, promoting socio cultural development ranked highest with mean weighted score (mws) of 3, followed by promoting rural development (*mws= 2.98*). Poverty alleviation ranked lowest with mean weighted score of 2.79. This implies that among all the opinions raised, Cooperative Societies mostly promote socio cultural development through the activities of Aquaculture farmers. This depicts that there is strong and positive correlation between Cooperative societies and socio cultural development through Aquaculture activities of farmers in Ogun state.

Table 4: The challenges encountered by Cooperative Societies in operating Aquaculture in Ogun State

Variables	SA(4)	A(3)	D(2)	SD(1)	Mean	Rank
Level of risk	20(38)	14(27)	6(12)	12(23)	2.81	1st
Lack of commitment	18(35)	12(23)	11(21)	11(21)	2.71	3rd
Low capital	20(38)	12(24)	10(19)	10(19)	2.81	1st

Source: Field survey, 2024; *Note: Figures in brackets are percentages*

Table 4 presents the analysis of respondents' opinions based on a 4-point Likert scale on the challenges encountered by Cooperative Societies in operating Aquaculture in Ogun State. The results reveals that all the weighted means are above the mean weighted score of 2 which is the borderline for disagreement. This suggests that most respondents agreed that all the variables are challenges to cooperative societies in operating aquaculture in the study area. In addition, in terms of relative importance index, The level of risk that offered assistance and low capital contribution of members which limit the amount of loan members can access ranked highest with mean weighted score(mws) of 2.81, followed by lack of commitments and responsibilities among members (*mws= 2.71*). This implies these hindered the operations of Aquaculture farmers.

Table 5: Improving Cooperative Societies in enhancing Aquaculture Development

Variables	SA(4)	A(3)	D(2)	SD(1)	Mean	Rank
Assigning members roles	18(35)	15(29)	8(15)	11(21)	2.77	3rd
Qualified employees	17(33)	15(29)	12(23)	8(15)	2.79	2nd
Leaders check and balances	20(38)	13(25)	8(15)	11(21)	2.81	1st

Source: Field survey, 2024; *Note: Figures in brackets are percentages*.

Table 5 presents the analysis of respondents' opinions based on a 4-point Likert scale on ways to improve cooperative societies in order to promote aquaculture development. The results reveals that all the weighted means are above the mean weighted score of 2 which is the borderline for disagreement. This suggests that most respondents agreed that all the variables would help to improve cooperative societies. In addition, in terms of relative importance index, placing checks and balances on managerial activities ranked highest with mean weighted score(mws) of 2.81, followed by employing qualified personnel (*mws= 2.79*). Assigning roles and responsibilities to members ranked lowest with mean weighted score of 2.77. This implies that among all the suggestions raised, placing checks and balances is the most important means to improve the performance of cooperative societies towards enhancing aquaculture development in Ogun State.

Table 6: The Roles of Cooperative Income on Aquaculture

Variables	SA(4)	A(3)	D(2)	SD(1)	Mean	Rank
Social integration	15(29)	15(29)	10(19)	12(23)	2.63	2nd
Promote job creation	12(23)	15(29)	12(23)	13(25)	2.5	3rd
Poverty alleviation means	18(35)	13(25)	11(21)	10(19)	2.75	1st

Source: Field survey, 2024; *Note: Figures in brackets are percentages*.

Table 6 presents the analysis of respondents' opinions based on a 4-point Likert scale on the roles of cooperative income on Aquaculture. The results reveals that all the weighted means are above the mean weighted score of 2 which is the borderline for disagreement. This suggests that most respondents agreed that Cooperative income helps in promoting jobs and reducing poverty rates among Aquaculture farmers. In addition, in terms of relative importance index, poverty alleviation ranked highest with mean weighted score (mws) of 2.75, followed by social integration (*mws= 2.63*) in this context, is known to promote income of the farmers, and promoting job creation ranked lowest with mean weighted score of 2.5. This results further suggests a positive correlation between cooperative income & poverty reduction.

Test of Hypotheses

Hypothesis 1: Cooperative Society makes no significance contribution to the development of Aquaculture.

Hypothesis 2: Poor managerial skills is a bottleneck for cooperative development

Hypothesis 3: Assigning roles and responsibilities promote cooperative commitment

Hypothesis 4: Social integration promotes cooperative income among aquaculture farmers

Table 7: Summary on Test of Hypotheses

Variable	X^2 Cal	df	T value	Remark
Cooperative society	11.2	3	7.82	Significant
Poor managerial skill	5.22	3	7.82	Significant
Roles and responsibilities	4.46	3	7.82	Significant
Social Integration	1.39	3	7.82	Significant

Source: Author's computation

The hypotheses were tested up based on the responses of the farmers to the issue being examined. The hypothesis were tested at 5% level of significance. The

results showed that Cooperative society has significance contribution to the development of Aquaculture, poor managerial skill is a bottleneck for cooperative development, assignment of roles and responsibilities promote members cooperative commitment and social integration promotes cooperative income among aquaculture farmers.

Conclusion

Attempts were made in this study to assess the roles of cooperatives in aquaculture development in Eriwe Fish Farm in Ijebu Ode Local Government in Ogun State. It can be concluded in this study that the fish business was highly dominated by males and youths. Poor managerial skill was a bottleneck for Cooperative Development in the study area. It was very evident that Cooperatives in the study area influenced aquaculture development in terms of employment generation, boosting the income of the fish farmers and helping in poverty alleviation. The results of the hypotheses being tested also confirmed that Cooperative society has significant contributions to the development of Aquaculture.

Recommendations

1.There should be adequate sensitization of the women folk to join cooperatives to improve their fish farming business.

2. Skilled and talented leaders should be elected in all cooperatives for smooth and effective running of the enterprise, this can be achieved by regular training and workshop.

3. Finally, it is recommended that the existing cooperatives societies should be strengthened and be made more efficient in the discharge of their statutory roles for the sustainable development of aquaculture in Ogun state.

4. Finally, the government should further help ensure through the Ministry of Cooperatives that regular and proper monitoring of the activities of cooperatives be carried out to check the activities of the co-operative leaders to prevent them from short changing their members.

References

Adebayo, K. (2002). Simulation models of the Adoption Process in small-holders farming systems in Nigeria.Unpublised Ph.D Thesis. Department of Agricultural Extension & Rural Development, UNAAB, Abeokuta.

Adedeji, O. B, & Okocha, R. C (2011). Assessment level of heavy metals in prawns (macro brachium macribrachion) and water from Epe Lagoon. *Advances in Environmental Biology* 5(6), 1342-1345.

Adekoya, B.B & Miller, J.W (2004). Fish Cage Culture Potential in Nigeria: An Overview National Agriculture *Forcus. 1(5) Pp10.* Agricultural News Magazine published by Foundation Consultations Limited Abuja.

Adekunle, B., ,& Henson, S.J (2007). The Effect Of Cooperative Thrift And Credit Societies On Personal Agency Belief: As Study Of Entrepreneurs in Osun State Nigeria. *Afr. J. Agric. Res. 2(12):678-686.*

Ajayi, S.S (1985). Wild life in Crisis: Conservation the antidote:

Inaugural lecture University of Ibadan, Ibadan Nigeria.

Akanni K. A, & Akinwunmi, J. A (2007). Determinants of variations in fish catch levels in artisanal fishing of Lagos state, Nigeria. *Re. J. Fish and Hydrobiol. 2(1), 1-12.*

Anyanwu, J. C. (1996) Towards capital market, Market Integration in Africa, "In Mensah SCED African Capital Markets" Contemporary Issues Rector press, leveret Massachusetts, 210-229.

Edun, O.M., O.A. Akinrotimi., & Eshiett, I.M (2018) Roles of Cooperative Societies in Aquaculture Development: A Case Study of Some Local Government Areas in Rivers State, Nigeria. *Agricultural Extension Journal 2(2):132-138*

FAO (2004) FAO Year book Vol. 92/1,2(1991) FAO year book Published by FAO, Rome, Italy P.62.

Federal Ministry of Agriculture and Rural Development (2017) Federal Department of fisheries statistics, Abuja Nigeria.

Gabriel, U.U., Akinrotimi, O.A, & Ibama, J.E(2015). The Roles of Cooperative Society in Aquaculture Development in Some Coastal Areas of Niger delta. 30th Annual Conference of the Fisheries Society of Nigeria, 22nd -27th November, Asaba, Delta State, Nigeria; p. 562- 565.

Gabor, A. & Zabo S. (2005) Cooperative identity. A theoretical concept for dynamic analysis of practices cooperation: The Dutch case paper prepared for presentation at the XIth International congress of the EAAF (Europe Association of Agricultural Economists), The future of rural Europe in the global agriculture food system; Copenhagen, Denmark August 24-27, 2005.

George, F.O.A., Olaoye, O. J., Akande, O. P. & Oghobase, R. R.(2010). Determinants of Aquaculture Fish Seed Production and Development in Ogun State, Nigeria. *Journal of Sustainable Development in Africa*,12(8), 22 –34.

Godwin, S. (2011). "Poverty Reduction Through the Use of Cooperative Societies". Kaduna: Nuhu-Bamalli Polytechnic International Cooperative Alliance (ICA) (1995). *Review of International Cooperatives*, 4(1) 85 – 86.

Hartley, C.W (2003). The improvement of natural palm grooves. *Journal of Agricultural Economics Research 1(2):38-41.*

ICA (2005) http//www.ica.coop/(accessed November, 2016)

Nweke, F.I & Akerhe, J.A (2005). Determinants of adoption of new technologies among smallholders and implications for administration of transfer programme. A case study of rice production in the plateau State of Nigeria.Agricultural Administration. 12(1),78-82.

Nweze N.J (2003). Cooperative promotion in rural communities: The project approach. *Nig. J. Cooperatives 2(2),* 76- 89.

Obasan, T.A. , Okojie, L.O., & Okunneye, P. A(2017). Determinants of

rural household food security in Ogun state Nigeria. Conference proceedings of the 18th annual national conference of the Nigeria association of the Nigerian agricultural economists held at federal university of agriculture, abeokuta, Nigeria 16th - 19th October, 2017.

Okwoche, V. A., Voh, J.P & Ogunwale, S.A (1998). Socio-economic characteristics influencing adoption behavior of women co-operators and noncooperators in Oju Local government area of Benue State. *Journal of Agricultural Extension Vol. 2, pp. 31-38. Terry A. Olowu (ed.)*

Okunmadewa, F. (2006). "Poverty production and The Nigerian Agricultural sector", El Shaddai press pp 1-7

Okunlola, J. O., Oludare, A. O. & Akinwalere, B. O. (2011). "Adoption of new technologies by fish farmers in Akure, Ondo State, Nigeria". *Journal of Agricultural Technology7(6) : 1539-1548*

Olaoye, O.J., Adelaja, A.B., Ashley-Sejo, S.S., Omoyinmi, G.A.K, Idowu, A. A., & Odebiyi, C.B(2012). Impact of Nigerian Agricultural Cooperative and Rural Development Bank Loan (NACRAB) on fish farming enterprises in Ogun state, Nigeria*".* *Nigerian Journal of fisheries 9 (1) 468-476.*

Olowosegum, O. M., Olowosegun, T., & Mohammed, H. (2008). "A review on the effect of water pollution on fish and the fishing industry of Nigeria". In proceedings of fisheries society of Nigeria (FISON) conference, Port-Harcourt, Nigeria. 14-18 Nov. 2005; Pp. 423-428.

Oota, L.(2012).Is Nigeria Committed to Fish Production. Accessed online 20th October 2012 from http://blueprintng.com/2012/07/is-nigeria-committed-to-fish-production.

Ozigbo, E., Anyaike, C., Folorunsho A., OkeChukwu R. & Kolawole, P. (2013) "Development of an automatic fish feeder". International Institute of Tropical Agricultural post-Harvest unit, Ibadan Africa *Journal of post and tuber crop, 10 (1) 127-32*

United Nations (2012) State of world fisheries and agriculture report.