



Research Paper

Socio-Economic Analysis of Artisanal Fisheries in Three Local Government Areas of River State, Nigeria

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ABSTRACT: This research addressed the existing gap of socio-economic analysis of artisanal fisheries, through discoveries of prominent factors limiting its production and maintaining of these resources for maximum sustainability. Structured questionnaires were used to collect primary data randomly from one hundred and fifty respondents in three communities (Bugunma, Harristown and Obonnoma) in Kalabari Kingdom of Rivers State. The data from the respondents were analyzed, using descriptive statistics, budgetary analysis and regression analysis (ANOVA). The results indicate that 69.5% of the respondents were in the age bracket of 36-55yrs, 52.5% of a typical artisanal fisher have a household size of 5, while 39.7% have SSCE/WASC as their highest educational qualification. 51.06% has 11 – 15 years fishing experience, 54.6% has their major source of capital from personal saving.

KEYWORDS: Socio-Economics, Artisanal Fisheries, Fish Products, Rivers State, Nigeria

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I. INTRODUCTION

Artisanal fish supplies in the Nigerian markets over the past decades have continuously witnessed a total decline in different parts of the country. The reason is a reduction in catch using local fishing skills and crude technology and other variables such as pollution and over fishing which are responsible for this anomaly (Akinrotimi *et al.*, 2015). Moreover, Olawusi-Peter (2008), noted that fish is a rich source of complete protein. The flesh of fish is closely related to red meat in quality. However, fish has a higher water concentration and is easily digestible when compared to red meat. Hence, fish production is very relevant in the economy of Nigeria because it provides the cheap source of protein and other basic products from fish when scaled with bush meat, pork, beef and chicken (Gabriel *et al.*, 2007; Akinrotimi *et al.*, 2011). Many vitamins such as A, B, C, D, and vitamin E can be derived from fish in sufficient quantities. Conversely, Ajayi (2017) confirmed that fish is good substitute to meat as a result of high cost of meat when viewed from the income of an average Nigerian. In Nigeria, fish products can be drawn from three major sources such as aquaculture, frozen fish (through importation) and from the natural waters (wild). The wild sources are categorized into industrial and artisanal (Akinrotimi and Edun, 2013).

Artisanal fishing is a sub sector of fish production that uses small motorized and un-motorized canoes as craft in hunting fish in riverine and coastal water front's (FAO, 2016). However, Akegbejo-Samson (1997) postulated that artisanal fishery employ over 500,000 persons and their family. Many people rely on Artisanal fishery for income generation both locally and international. Men and women of the coastal and inland communities derived their livelihood in fishing and other related activities. Some are engaged in fish processing and marketing, while others are in fishery research activities (Ajayi and Talabi, 1992; Adeola, 2017). The basic features of artisanal fisheries are low operational cost, local technology, low capital investment and stressful labour (FAO, 2016). Artisanal fishery subsector according to Berdgue (2016), is one of the untapped potential in the entire African continent. Also, CBN (2014) reported that the subsector accounts for an average of 4.8% of the Gross Domestic Product between the year 2000 and 2012. The development shows poor representation of Nigeria, considering the sufficiency of varieties of water resources of many inland and fresh waters, lakes rivers, swamps, flood plains and vice versa. On the whole it is postulated that fishery activities contributes to

the economy in generation of employment of over 10 million people in Africa and food for over 20 million people in the world (Williams, 2006).

The Nigerian Artisanal Fisheries support the Socio-economic development of the economy. FDF (2016) reported that the sub sector serves as an income source, facilities development of cottage industries and provides employment opportunities for the large number of people engaged in fishery production, processing and marketing. Moreover, Oji (2002) equally reported that the subsector as protein supplement to meat protein because of the inflationary cost of meat. However, Ajayi and Talabi, (1984) noted that Nigeria had one the best water resources for the development and expansion of artisanal fisheries. Conversely, artisanal fisheries, according to Onefeghara (2014) artisanal fisheries accounts for about 500,000 – 510,000 metric tons of valued 800,000 metric tons of domestic fish production in the country. This indicates 63 – 64%, never-the-less domestic fish supply has a shortfall compared to demand, mainly due to population explosion and inflationary variables. (Adams, 2014).

An in depth study and knowledge of social and economic variables of fish production and the relationship existing between these two factors is very essential for the future development and sustainability of the sector (FAO 2001; Akpo, 2003). Moreover, an awareness of the problems affecting the growth and improvement of the unit is important for the achievable development of fisheries policies and programmes targeted at harnessing the activities of artisanal fisheries in coastal communities of Niger Delta. Various attempts to improve and increase fish production have not yield results in productivity, profitability and alleviate the problems of artisanal fishermen in coastal waters. The study will provide data on the socio-economic information about artisanal fishermen in the studied Local Government Areas which will be of interest to scholars and policy making authorizes. The results will also provide an information guide that will enhance the quality of life and standard of living of local fishermen with output increase in the supply of fish food to satisfy national goals and aspirations. Hence, the objective of this study is to assess the socio-economic of artisanal fishermen and distribution of fish species in three Local Government Areas of Rivers State namely: Asari Toru Local Government Area, Degema Local Government Area, Akuku Toru Local Government Area.

II. METHODOLOGY

Study Area

The study was carried out in Buguma, Obuama and Abonnenma communities respectively in Asari Toru, Degema and Akuku Toru Local Government Areas of Rivers State, Nigeria. These areas are surrounded by large water bodies and the natural vegetation in this area varies from the mangrove to the freshwater swamp forests. The prevailing climate hydrographic conditions thus favour a thriving fishery, artisanal and aquacultural activities.

Sampling Procedures and Data Collection

The samples for the study were drawn by using random sampling from these communities in the three Local Government Areas; fifty respondents were randomly selected from each community to give a total sample size of 150. Data for this study were collected through a structured questionnaire administered in these areas. These data include socio-economic characteristics.

Data Collection

The primary and secondary data sources were used for the study. A set of structured questionnaires were used to collect the primary data on socio-economic variables such as sex, age, level of education household size, fishing experience, access to extension services and availability of credit facilities. Also, secondary data were obtained from African Regional Aquaculture Centre Port Harcourt, Federal Department of Fisheries Office in Port Harcourt, and Fisheries Department, Rivers State University, Journals as well as other published and unpublished materials relevant to this study on domestic fish production, fish trade and population of fishermen in Nigeria.

Analysis of Data

Descriptive Statistical technique such as mean, frequency distribution and percentage were used to obtain the objectives of the study. Cost and return analysis were carried out using OLS regression analysis.

III. RESULTS

Questionnaire Distribution and Retrieval

One hundred and fifty (150) questionnaires were administered to the respondents as explained in the methodology. The result of the questionnaire distribution and retrieval is shown in Table 1. As indicated in Table 1, a total of one hundred and fifty (150) copies of the questionnaire were distributed. 145 (96.7%) were retrieved while 5 (3.3%) were not retrieved. 2 (2.8%) of the retrieved questionnaire were discarded for not been properly

or completely filled. One hundred and forty-one (141) representing 97.2% of the retrieved questionnaire were useful. The usable sample size of the study in the presentation and analysis of data therefore was one hundred and forty-one (141). Data cleaning as an essential preliminary to data analysis was carried out to ensure that only useful data were used in the presentation and analysis, consequently, 4 copies (2.8%) of the retrieved questionnaire were discarded.

Socioeconomic Features of the Respondents

Age of the Respondents

The age of the respondents are shown in Figure 1. The results below indicated that majority (41.13%) of the respondents were in the age brackets of 46 to 55 years, it implies that the respondents were still in their active age. However, 17.7% were over 55 years while 12.7% were within 26 to 35 years.

Marital Status of the Respondents

The results of the marital status of the artisanal fishers in the three communities under consideration are shown in Figure 2. Majorities (56.74%) of the respondents were married, while those that single were 25.53%, divorced (13.48%), and widowed (4.29%).

Household Size of the Respondents

The results of the household size of the respondents are shown in Figure 3. The results obtained indicated that majority (52.48%) of the respondents had a household size of 1-5, while 36.17% of the respondents had a household size of 6-10, whereas 7.80% of the fishers had a household size of 11-15 and 3.55% recorded a household size of 15 above.

Respondents' Education Status and Level

The respondent's educational status and levels are presented in Figures 4 and 5 respectively. The results revealed that majority (79.43%) of the respondents had formal education, while (20.57%) had no formal education. Conversely, majority (39.72%) of the fishers had secondary education (WASC/SSCE), while 29.08% had FSLC, even as 9.93% had ND/NCE, and 0.71% of the respondents had a degree certificate.

Fishing Site Ownership

The results of fishing site ownership among the fishers in the study area are presented in Figure 6. The results revealed that the majority (73.76%) of the respondents operated a communal site ownership, while (26.24%) were by rent.

Table 1: Questionnaire Distribution and Retrieval

Questionnaire	Frequency	Percent
Distributed	150	100
Not retrieved	5	3.3
Retrieved	145	96.7
Useful Response	141	97.2% of retrieved questionnaire
Discarded Response	4	2.8% of retrieved questionnaire

Source: Field Survey, (2019)

Respondents Occupation:

The major and minor occupations of the respondents in the study area are presented in Table 2 and Table 3 respectively. The results obtained indicated that majority (64.41%) of the respondents had fishing as an occupation, 21.28% are civil servant, 7.80% engaged in hunting and 4.51% take on farming. In minor occupation of the fishers the results indicates that majority (41.84%) of the respondents were farmers, 22.70% were civil servants, while 20.57% are into fishing and 14.89% engaged in hunting.

Respondents' Fishing Experience:

The fishing experience of the respondents in the study area is shown in Table 4. The results obtained indicated that majority (51.08%) of the respondent had above 15 years above, while 23.40% had 11-15 years, whereas 14.89% had 6-10 years and 10.64% of these fishers had 1-5 years.

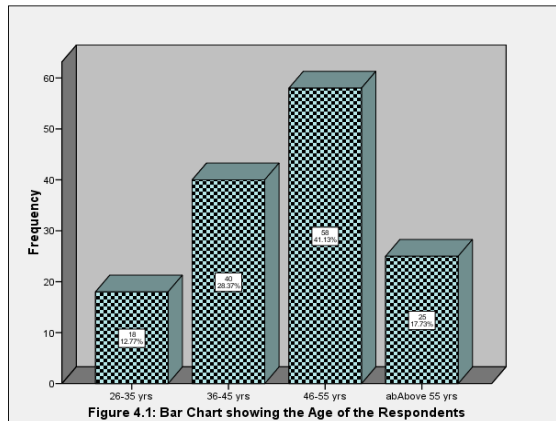


Figure 4.1: Bar Chart showing the Age of the Respondents

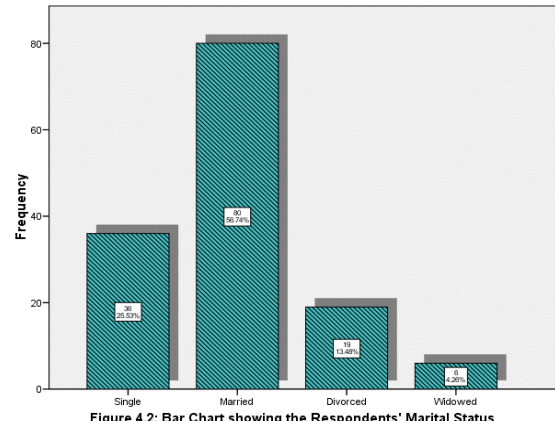


Figure 4.2: Bar Chart showing the Respondents' Marital Status

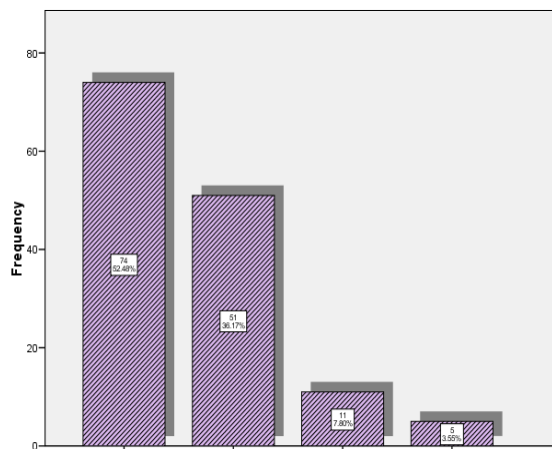


Figure 4.3: Bar Chart showing the Respondents' Household size

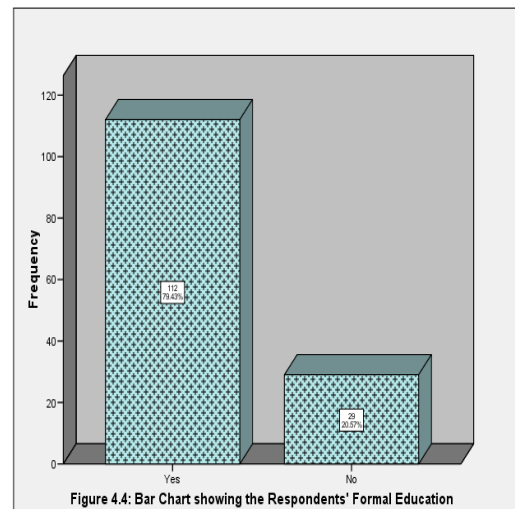


Figure 4.4: Bar Chart showing the Respondents' Formal Education

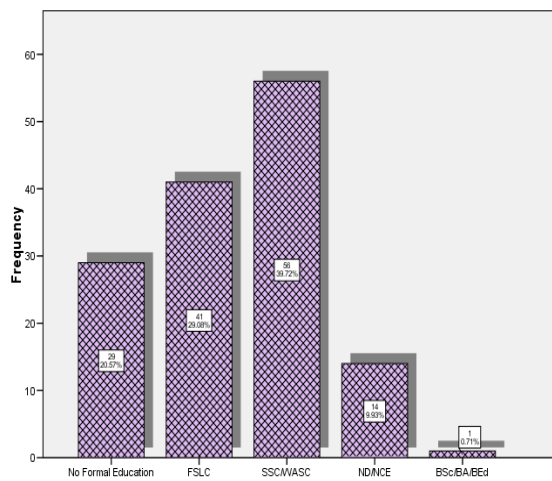


Figure 4.5: Bar Chart showing Respondents' Highest Educational Qualification

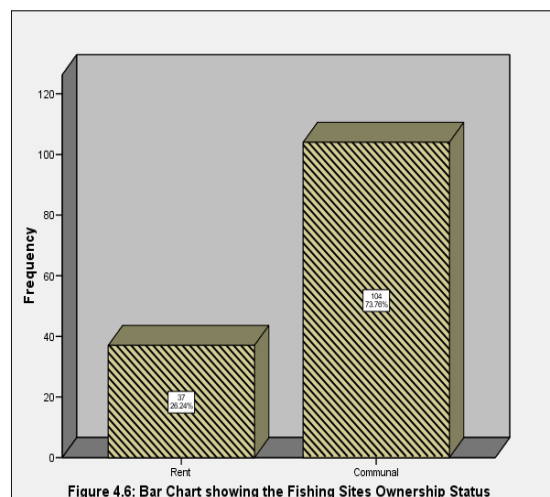


Figure 4.6: Bar Chart showing the Fishing Sites Ownership Status

Table 2: Respondents' Major Occupation

Major Occupation						
		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Farming	12	8.5	8.5	8.5	
	Civil Service	30	21.3	21.3	29.8	
	Hunting	11	7.8	7.8	37.6	
	Fishing	88	62.4	62.4	100.0	
	Total	141	100.0	100.0		

Source: Field Survey, (2019)

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Table 3: Respondents' Minor Occupation

Minor Occupation					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Farming	59	41.8	41.8	41.8
	Civil Service	32	22.7	22.7	64.5
	Hunting	21	14.9	14.9	79.4
	Fishing	29	20.6	20.6	100.0
	Total	141	100.0	100.0	

Source: Field Survey, (2019)

Table 4: Respondents' Fishing Experience

Fishing Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 yrs	15	10.6	10.6	10.6
	6-10 yrs	21	14.9	14.9	25.5
	11-15 yrs	33	23.4	23.4	48.9
	Above 15 yrs	72	51.1	51.1	100.0
	Total	141	100.0	100.0	

Source: Field Survey, (2019)

IV. DISCUSSION

Socio-Economic features of the Artisanal fishers. Fisheries analyses are essential means to analyze the performance of a fishery within the social, economic, biological and environmental framework in which it was investigated. In this study, the percentage age distribution of the respondents indicates that the majority (41.13%) of the respondents were in the age brackets of 46 to 55 years. The next year bracket was 36-45 years (28.37%) of total respondents. Lower values were recorded in the age bracket of 26-35 years and 55 years and above. The age of the fishers sampled from the three selected communities conformed to the economically active and productive age of the countries work force or labour force as reported by FAO (2016). The observed result was in agreement with the report of Ayotunde, and Oniah, (2012) in assessment of artisanal fishermen in some local government area of Cross Rivers State. This implies that most of the fisher folks were still within their active and productive age group for efficient fish production. The result equally indicated that most of the fisher folks were within the economically active age of the population and therefore, constitutes a good labour force in fish production, since efforts are being made to increase fish production from the artisanal sector by the Federal Government of Nigeria in recent years. There was sharp decline in the number of fisher folks that were between the age range of 26-35 years and 56 years and above. However, those fisher folks that were between the ages of 56 years who are supposed to be dependent age group were still active in fishing. The implication of this might due to the fact that the fisher folks took fishing as a way of life and many communities that are located near river, lakes and seas depend on fishing for food and their livelihood (Almeida *et al.*, 2018).

In this study majority of the respondents had household size of 1-5 (52.48%) persons while 33.17% of the respondent had household size of 6-10 members. The household size is related to the availability of seasonal workforce, the reduction of cost of the production, hence increase profit. The implication of the result is that the lower the number of household size dependent on artisanal fishing the better the fishing performance because less time is spent on family issues and more on fishery. This work is in agreement with the reports of Olaoye *et al.* (2013), but contradict the report of Adegbite and Oluwalana, (2014). However, Clark *et al.* (2015) asserted that the more the household size, the more likelihood for labour efficiency on fisher folks. In the study area, the most common labour source was purely family members. The moderate family size kept by the fisher folks in this study might be because the fisher folks have knowledge of family planning and the campaign for keeping moderate family sizes still continue in each of the health centre's that are within the various communities in these areas..

Most of the fishers in this work are married. The implication of this finding is that artisanal fishing is a marital dominated occupation (Onemolease and Oriakhi, 2011).. This affirms the fact that the marriage institution is highly valued and a pointer of economic responsibilities of the respondent in caring for their dependents (Jibowu 1992; Okeowo *et al.*, 2015). The result in this study further shows that the married were more interested in fishing than the single and this may be due to the fact that most of the respondents rely in fishing to cater for their household, since they depend on water for their livelihood and will be more committed to their households. The single might not be interested in fishing, perhaps, they were involved in other jobs to earn their living in the nearby cities/ urban areas. Despite the fact that Nigeria is blessed with 14 million hectares of inland waters, rivers and lakes, yet fish production remain underdeveloped in most of those waters which are often surrounded by poor communities in need of assistance (Anene *et al.*, 2010).

Most of the respondents had one level of education or the other, while lower percentage of the respondents was without any formal education. The work is in conformity with the report of Ele (2008) in Cross River basin. Conversely, Kasali *et al.* (2018) described education as an essential economic and social tool for development. It is a continuous process of growth and also plays a key role in technological adoption. This finding indicated that fisher folks in the study area had high educational qualification and it can impact positively on technological acceptance, and their level of productivity. The literacy levels of the fisher folks were high in the study area and this justified one of the goals of the Rivers State government in making education their paramount in social development across the state. This result implies that the fisher folks would have basic knowledge in the fishing operations and would be easier for them to adopt innovations from extension agents and research institutes for efficient productivity. The call for a great increase in domestic fish production from inland waters in the country can only be successfully achieved through education. Education aids sustainable development (Ogundiwin, 2014).

In the study area, majority of the respondents were operating on communal site ownership, while minorities of the farmers were operating on rent site. This implies that cost of production will be low and increase gross margin, although the problem of unrestricted site may lead to overfishing of the stock (Adegbite and Oluwalana, 2014). Fish resources are susceptible to environmental and man-made stress and can deteriorate rapidly particularly when man act concurrently to limit production. Collapses of fisheries due to overfishing have been well documented in different parts of Niger Delta (Udoh. and Nyienakuna, 2008). Moreover, Olaoye *et al.* (2013) observed a reduction in mean sizes (that is length and weight) in fish species and changes in species composition due to both recruitment and ecosystem overfishing in some communities of Niger Delta.

In this study majority of the respondents were into fishing this implies that fishing is dominant occupation in the study area. The sampled respondents were also engaged in other economic activities to augment their source of income and sustain their livelihood. This finding agrees with the report of Okeowo *et al.* (2015) in Lagoon Waters of Epe and Badagry Areas of Lagos State, Nigeria. An implication that the fisher folks in these area cannot rely on fishing as the only source of income to meet the pressing daily demands of their household. Alternative income source becomes necessary and imperative. Considering the fact that majority of the respondents were into fishing, some of them were also engaged in farming during the flooding season and do get back to fishing when they have free time between harvest and planting season.

In these fishing communities under consideration, most of the fishers had above 15 years of fishing experience. This finding is line with Udoh, and Nyienakuna, (2008) in some fishing communities of Akwa Ibom State. These authors agreed that experienced fishers have ready and precise information on fishing ground, water current and where fishes are more in abundance in a particular period of time. On the other hand, Olaoye *et al.*, (2013) reported that good skills and better approaches to fish farming business are expected with more years of experience while those with less years of experience may face many risks in the early days of their fish farming business. Conversely, Pauly (2005) noted that in improving productivity of small scale fishing, experience is a great influence that could also enhance the ability of the fishers' folks to maneuver or handle fishing gears effectively. While, Ruddle (2016), remarked that in process of economic development, technical efficiency is influenced by technical knowledge and the understanding of socio-economic environment with which the fishers must take decision.

V. CONCLUSION

This study provides information on the fishers' socio economic status and fishing activities in the in three communities from Asari- Toru, Akuku-Toru and Degema Local Government Areas of Rivers State. Based on the findings of the study it was found out that the study indicated that good majority of the respondents (69.5%) fall within the age bracket of 36 and 55 years. This is an economic active age and it impacted on the quantity of fish catch. 56% are married, identifying artisanal as a marital trade. 68.6% have Household Size of 1 and 10 membership, the large household impacted significantly to productivity of the business. 79.4% have formal education and the highest educational Qualification 39.7% (SSCE/WASC). The Highest Educational Qualification of the fishers influenced the quantity of catch positively. 73.8% of communal fishing ownership

was observed, the distribution of respondents by occupation showed that 62.4% are fishers, with greater majority alternating fishing with the livelihood activities of farming (41.8%), Civil service (22.7%) and hunting (14.4%). Most of the respondents have more than 15 years fishing experience which is a remarkable pointer to the fish productivity. The research work has addressed the existing gap of socio- economic predictors of artisanal fisheries in selected communities of Kalabari ethnic nationality in Rivers State, through the discoveries of prominent predictors limiting its production and profitability. More so, Household Size, Highest Educational Qualification, Fishing Experience, Age and Capital have significant impact on fishing output level. Fishing Experience, Highest Educational Qualification impacted more on output of the studied area

VI. RECOMMENDATIONS

Based on the discoveries from the research work, it is therefore recommended that:

1. Government organs and policy makers should develop and promote the advancement of both artisanal and aquaculture so as to meet the fish demand deficit in Nigeria. This will generate supplementary income and the diversification of livelihood activities. This will in turn arrest over dependence on oil income and youth restiveness and communal crises.
2. Fisher folks should be encouraged to form cooperative societies that will assist them in procuring modern day fishing gears that would boost their fish production
3. Banks, Financial institutions and Government agencies should encourage the practicing fishers by granting credit facilities at a reduced interest rate. Collateral for accessing such credits should be made easy by allowing the fishers and their relatives as guarantors for securing such credits.

REFERENCES

- [1]. Adams, M. E. (2014). *Agricultural Extension, in Developing Countries*. Longman Hones Burnt. Mill Harlew, Essex USA.
- [2]. Adegbite, D. A., & Oluwalana, E.O. (2014). Revolving loan scheme as a poverty alleviation strategy: A case study of women Groups in UNAAB Extension villages”, *Federal University of Agriculture Journal*7 (2), 18 – 32.
- [3]. Adeola, A. N. (2017). *Fresh Water Fish Seed Resources in Nigeria*. Assessment of Fresh Water Fish Seed Resources for Sustainable Aquaculture. FAO Fishers Technical Paper. NO. 501. Rome. FAO.
- [4]. Ajayi T.O. & Talabi O.S. (1984); Potential of Fisheries resources in Nigeria. In: Tobor, J.G. (ed). Fish Production and processing in Nigeria. *NIOMR Technical paper*, 22, 6-12.
- [5]. Ajayi, J. D. (2017). Tilapia as a Culturable Fish Species for the Nigerian Rural Fish Farmers. A Paper Presented at the Fison Public Lecture, Port Harcourt, and 14th November, 2001. Fish Network 1: pp 30 - 36.
- [6]. Akegbejo-Samsons Y. (2007). Introduction to Aqua – Culture & Fisheries Management in Nigeria. Abeokuta: Good Education of Publishers. Pp 5 – 7.
- [7]. Akinrotimi, O.A., Abu, O.M.G., & Aranyo, A.O. (2011). Environmental Friendly aquaculture: key to sustainable fish farming development in Nigeria. *Continental Journal Fisheries and Aquatic Science*, 5(2), 17-131.
- [8]. Akinrotimi, O.A., Edun, O.M & Makinde O.O (2015). Seasonal variation of heavy metals in selected sea foods from Buguma and Ekerekana creeks, Niger delta. *International Journal of Innovative Studies in Aquatic Biology and Fisheries*, 1 (1):46-53.
- [9]. Akinrotimi, O.A., & Edun, O.M. (2013). Impact of climate change on brackish water aquaculture development in the coastal areas of the Niger Delta. Pp. 140 – 145. In P.E. Ndimele (ed) Proceedings of the 28th annual conference of fisheries society of Nigeria, 25th – 29th November, 2013, Abuja, Nigeria.
- [10]. Akpo, J.A. (2003). State of artisanal fisheries in coastal areas of Nigeria. *African Journal of livestock Extension*, 2, 13 – 18.
- [11]. Almeida, O. J. McGrath, D., Arima, E, & Ruffino, M. L. (2018) Production Analysis of Commercial Fishing in the Lower Amazon. *Journal of Fisheries Management and Ecology*, 8, 198 – 214.
- [12]. Anene, A, Ezech, C. I., & Oputa, C. O. (2010). Socio- Economic Characteristics of Artisanal Fisheries in Oguta, Imo State, Nigeria. *Journal of Development and Agricultural Economics*, 1(1), 4-9.
- [13]. Ayotunde, E. O., & Oniah, M. O. (2012). The socio-economic status of artisanal fishers in Cross River, Cross River State, Nigeria. *World Journal of Fish and Marine Sciences*, 4, 72-678.
- [14]. Berdgue, J. A (2016). *Rural Diversity, Agricultural Innovation Policies & Poverty Reduction Argen Network Papers No. 122*. ODI.
- [15]. Central Bank of Nigeria CBN (2014). Central Bank of Nigeria Annual Report and statistical Bulletin. 34pp.
- [16]. Clark, C.W., Munro, G., & Sumaila, U. R. (2015). Subsidies, buybacks, and sustainable fisheries. *Journal of Environmental Economics and Management*, 50, 47-53.
- [17]. Ele, I. E. (2008). An empirical analysis of fish production in the major fishing systems of the Cross River Basin, Nigeria. Unpublished Ph.D thesis, University of Calabar, Calabar
- [18]. FAO, (2016). Increasing the Contribution of Small-Scale Fisheries to Poverty Alleviation & Food Security. 1st Edn, Food & Agriculture Organization, Rome, Food and Agriculture Organization,
- [19]. Federal Department of Fisheries (2016). Fisheries Statistics of Nigeria, Abuja 4th Edition. Federal Office of Statistics (2009). Annual Abstract of statistics, 1999 Edition, Abuja, Nigeria. PP 342 – 345.
- [20]. Food and Agricultural Organisation (2001). “Fishery Statistics Capture Production”. Year Book 91/ 1 Rome
- [21]. Food and Agricultural Organization FAO (2016). “A catalogue of small scale fishing gears”. Fishing News Books 2nd ed Rome.
- [22]. Gabriel, U. U., Akinrotimi, O. A., Bekibele, D. O., & Anyanwu, P. E. (2007). Locally produced fish feed: Potentials for aquaculture development in sub Saharan Africa. *African Journal of Agricultural Research*, 2(7), 287 - 295.
- [23]. Jibowo, A.A. (1992). *Rural Social Change. In A.A Jibowo (Ed) Essentials of Rural Sociology* (Second Edition). Abeokuta: Cobemi Sodipo Press. 228pp.
- [24]. Kassali, R., Baruwa, O. I., & Mariama, B. M. (2018). Economics of fish production and marketing in urban areas of Tillabery and Niamey in Niger Republic. *International Journal of Agricultural & Rural Development*, 4(2), 65-71.
- [25]. Ogundiwon, D. I. (2014). Survey of Artisanal Fishing Gear and Craft. A Master’s Thesis in International Fisheries Management, Faculty of Bioscience, Fisheries and Economics, The Arctic University of Norway, 98 pp.
- [26]. Oji, K.O. (2002). Basic Principle of Economics for Agricultural projects and policy Analyses. Prize Publishers, Nsukka, Nigeria.

- [27]. Okeowo, T. A., Bolarinwa, J. B., & Ibrahim, D. (2015). Socio Economic Analysis of Artisanal Fishing and Dominant Fish Species in Lagoon Waters of Epe and Badagry Areas of Lagos State. *International Journal of Research in Agriculture and Forestry*, 2, 38 – 35.
- [28]. Olaoye, O. J., Ashley – Deju, S. S., Fakoya, E. O., Ikeweinwe, N. B., Alegbeleye, W. O., Ashadu, F. O. & Adelaja, O. A. (2013) Assessment of Socio – Economic Analysis of Fish Farming in Oyo State, Nigeria. *Global Journal of Science Frontier Research, Agriculture and Veterinary*, 13 (9),45 – 55.
- [29]. Olawusi-Peters, O.O. (2008). Ecological Evaluation of the Effect of Anthropological Activities on Sustainable Fish production in Agboyi creek. Lagos State, Nigeria, Ph.D. Thesis University of Ibadan. 344pp.
- [30]. Onefeghara, F.A. (2014): Nigeria Wetlands: an overview. In. T.V.I. Akpata and D.U.U. Okali (eds). Nigerian Wetlands UNESCO/MAB Port Harcourt, pp14 -26.
- [31]. Onemolease, E.A. & Oriakhi H.O. (2011). Prospects and Constraints of Artisanal Fishing in selected communities in Delta State Nigeria. *Journal of Applied Science Enugu, Nigeria* 4(2), 18-24.
- [32]. Pauly, D. (2005). Fisheries management: putting our future in places. In Newell; D and R.E. Ommer. (eds). Fishing places, fishing people, traditions and issues in Canadian small scale fisheries. University of Toronto press.
- [33]. Ruddle, K. (2016). Formulating Policies for Existing Community-based Fisheries Management Systems. *Journal of Policy Studie*,s1(1), 23-41
- [34]. Udoh, A. J. & Nyienakuna, M.G. (2008). Examining Socioeconomic Characteristics and Adoption Trend of Artisanal Fisheries of Akwalbom state of Nigeria, *Journal of Agricultural Science*, 4,141-146.
- [35]. Williams, J.N. (2006). “Economics analysis of crayfish production, Processing and Marketing among Rural Women in Rivers State” Nigeria. Unpublished M.Sc Thesis, Department of Agriculture. Economics University of Nigeria Nsukka, Nigeria.