

Influence of socioeconomic characteristics on artisanal fishing in Andoni L. G. A. of Rivers State, Nigeria

Sixtus Onwukwe Anyanwu^{1*}, Godwill Ibim Wilcox², Beatrice Belema Okafor³, Constance Eneyo⁴

^{1,2,3,4}Department of Agriculture, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt,

Rivers State, Nigeria. ¹sixtus.anyanwu@iaue.edu.ng / sixtusanyanwu@yahoo.com,

²godwill.wilcox@iaue.edu.ng, ³belema.okafor@iaue.edu.ng, ⁴constancenyo@yahoo.com

*Correspondence: sixtusanyanwu@yahoo.com

Received: March 27, 2022 | Accepted: April 15, 2022 | Published: April 25, 2022

Abstract

Rivers State possesses abundant natural and ecological resources for sustainable fish production in Nigeria, but the overall output level implied that these resources had not been optimized. Therefore, research is needed to isolate the missing link in the artisanal fish production value chain. The study examined the impact of socioeconomic characteristics on artisanal fish production among fisher folks in Andoni Local Government Area, Rivers State, Nigeria. Thirty artisanal fisher folks randomly selected from four communities through structured questionnaires and interview schedules were used for the study. Descriptive statistics involving frequencies and percentages and regression equations were utilized in the analysis. Age, household size, educational level, Artisanal fishing experience and extension contact played significant roles in determining the output and gross income of artisanal fishermen folks in Andoni L.G.A. To change the direction of management of affairs towards increased artisanal fishery in Rivers State, Nigeria, the study recommended that relevant government agencies saddled with the responsibility of making and implementing decisions in the fishery sub-sector should give pride of place to variables such as age, household size, educational level, Artisanal fishing experience and extension contact.

Keywords: Artisanal fish, Influence, Socioeconomic characteristics, Nigeria

1. Introduction

Nigeria (especially) Rivers State is endowed with extensive rivers, freshwater, saltwater and mangrove ecosystem needed in artisanal fish production, which probably, made Food and Agricultural Organization (F.A.O., 2005) see Nigeria as a country with enormous capacity in fish production in the agricultural value chain. In addition, published statistical records have shown that Nigeria is an abundant fisheries grower in Africa, with a yearly output of more than 635,399 tonnes, constituting about 4 percent of the nation's G.D.P. 2007 (FMAWR, 2008). Unfortunately, Nigeria takes the lead on fish importation among developing countries of the world, with yearly imports of

reasonably close to 560,000 tonnes of fish as of 2006 (F.A.O. 2007). This implied, therefore, that the leadership position of Nigeria in fisheries is not reflected in average protein intakes. It also points to the fact that Nigeria's abundant natural and ecological endowments have not been maximized. In other words, a wide scope for improvement through resource allocation still abounds in the fishery sub-sector of the economy. Therefore, evidence-based research is needed to ascertain this weakest link in the fisheries production value chain, which determines the strength and resilience of fisheries output in Nigeria.

There are three major sources of fish supply in the country- industrial, aquaculture and artisanal fishery. Artisanal fishery contributed about 95% of 0.7 million metric tons of fish produced in Nigeria (Aminu, Ojo & Adekunle, 2017). There have also been many technical advances in fish breeding and production with potential application in the tropics; however, both the domestic efforts of the industrial and artisanal fisher folks in Nigeria and technical advances in aquaculture have not been able to provide the requisite elixir to the inadequate protein supply to the average Nigerian. Therefore, efforts must be made through research to identify the variables responsible for the poor output of fisheries, either from the industrial, aquaculture, or artisanal, for appropriate policy interventions. This research, however, focused on the possible influence of socioeconomic characteristics of artisanal fish producers on fisheries in Andoni Local Government Areas of Rivers State in Nigeria.

Furthermore, in the human diet and general nutrition, protein is not only indispensable but an irreplaceable nutrient. Esobhawan et al. (2008) reported the deficiency in animal protein security among Nigerians, with respect to that suggested by organizations such as F.A.O. This implied that Nigeria, at the current level of technology, is still grappling with the minimum per capita protein consumption gap of 24.7g/day. Another scholar Ndubizu (2003) argued that the daily per capita animal protein intake by Nigerians as of 2003 was 6grammes; far below the World Health Organization (WHO) stipulated 12 grams level. It is paradoxical, therefore, that in the midst of the abundance of both natural resources and endowments, Nigeria is still struggling with the problem of protein deficiency. Some scholars have argued that socioeconomic factors could be implicated in the participation of some farmers in some aspects of the agricultural value chain (Kuwornu et al., 2014, Simtowe, 2010, Oluwatayo 2009; Marchetta, 2011). Furthermore, Alwang et al. (2005) showed that better-educated households were more likely to diversify into agro-processing than the less educated ones. Empirical evidence from rural Ethiopia Sisay (2010) showed that socioeconomic factors (such as level of education and household size) played significant roles in the determination of participation in certain agricultural practices. It becomes apposite, therefore, to use empirical research to also examine the magnitude and direction of influence of socioeconomic factors on fishery production in Nigeria.

However, studies such as Aminu, Ojo and Adekunle (2017) showed the profitability of artisanal fishery using descriptive statistics and budgetary analysis. Other published works such as Anyanwu (2014) and Anyanwu et al. (2012) discussed topics other than the influence of socioeconomic characteristics of artisanal fisher folks on fish production in Rivers State. It becomes apposite, therefore, to update current literature by determining influence of socioeconomic characteristics of artisanal fisher folks on fish production in Andoni L.G.L.G.A. Rivers State, Nigeria.

2. Research methodology

Andoni is one of the twenty-three L.G. As in Rivers State with headquarters at Ngo Town. It has 76 towns, comprising 11 wards and located at longitude 4°-28' 21.79 North and latitude 7°22' 57.50 East. Andoni has a land area of over 233km², with a population of 311,500. Andoni is bounded in the North by Khana L.G.A. and by Opobo/Nkoro L.G.A in the East and West by Bonny L.G.A. It also has boundaries with Atlantic Ocean in the South.

The notable occupation of the people is fishing. Four major towns, namely Ekede, Muma, Ngo and Iwogono, were purposively selected for the study due to the concentration of artisanal fisher folks in these communities. From each of the four communities, thirty artisanal fisher folks were chosen at random, which gave a total sample size of 120 artisanal fisher folks. Structured questionnaires and interview schedules were used in eliciting relevant data. Different statistical tools such as frequencies, means and multiple regressions were employed in data analysis. Implicit form of the model used include

$$Y = f (X_1, X_2, X_3, X_4, X_5)$$

Where X₁ represent respondents Age in Years

X₂ shows respondents Household size in numbers

X₃ represents the educational level in years.

X₄ = years of Fishing experience

X₅ = Extension contact (Number)

e = Error terms

3. Results and discussions

Table 1: Socioeconomic characteristics of respondents

Variables	Male (n=120)		
	Freq.	Per cent (%)	Mean
Age (Years)			43.07
21-30	12	10.0	
31-40	33	27.5	
41-50	54	45.0	
51-60	21	17.5	
Marital Status			
Married	87	72.5	
Single	23	19.2	
Widow	0	0	
Widower	0	0	
Divorced	10	8.3	
Educational Status			
Primary	27	22.5	
Secondary	54	45	
Tertiary	39	32.5	

Years of Experience			
1-10	60	50	12.4
11-20	39	32.5	
21-30	18	15	
31-40	3	2.5	
41-50	2	2.1	
Household Size			
2-4	48	40	5
5-7	60	50	
8-10	6	5	
11 – 13	6	5	
Output(Naira)			
10 – 100000	96	80	90233.75
101 - 200000	15	12.5	
201 – 300000	3	2.5	
Above 300000	6	5	

Source: Field Survey (2019).

Table 2: Data of respondents

	N	Least	Highest	Average	Standard Deviation
Age	120	25.00	56.00	43.0750	8.08792
Size	120	2.00	12.00	5.4750	2.05783
Educ	120	.00	16.00	11.5500	3.63422
Fishexper	120	2.00	32.00	12.4250	8.41334
Extcontact	120	.00	1.00	.7667	.42473
Valid N (listwise)	120				

Field Survey, 2019

4. Discussion

Age of the respondents

In traditional agricultural production and artisanal fishery, age plays a significant role in at least two aspects, namely, increased productivity and increased rate of adoption of innovations. Artisanal fishery production system relies on rudimentary fishing gears powered by human muscle. The implication of this scenario is that very old artisanal fishermen and women will face severe energy constraints and will thus be less productive than the younger and more energetic ones.

Table 1 revealed that the majority (45. %) were within the age bracket of 41 years and 50. Analysis further showed that 10%, 27.5% and 17.5% were within the age bracket of 21-30, 31-40 and 51-60, respectively. The age distribution also showed that the minimum and maximum age of the fish

farmers were 25 and 56, respectively, with a mean age of 43.07 years. This implied that the mean age is slightly higher than that of Anyanwu et al. (2012) in Rivers State, Nigeria, who found it to be 42. This shows that the fishers in the area were dominated by an age range considered to be economically active and highly productive. Age is a crucial factor and determinant of attitude job performance (Ebewore, 2010). Most agricultural developmental programmes might be willing to work with them.

Marital Status of the respondents

Results in Table 1 further indicated that 72.5% of these fishers were married while only 19.2% and 8.3% were single and divorced, respectively. This suggests that the majority of the participants were married. This corroborates the findings of Daudu, Matanmi, Oladipo, Aliyu & Olatinwo (2015) and Oladipo *et al.* (2016), who reported that married household heads tended to be more involved in agriculture. However, marital status shapes social rural participation and acceptance and is perceived to confer responsibility on individuals. (Ebewore, 2010).

Household Size of the Respondents

The analysis of household size indicated a mean household size of 5 persons per household. Analysis of Table 1 showed that 50% of these artisanal fish farmers in Andoni L.G.A. have 5-7 persons per household. Results further showed that 40% and 5% of the artisanal fish farmers had household sizes of 2-4 persons and 8-10 persons per household. This reflects that the artisanal fish producers in the study area had relatively large family sizes and free labour that could be used for agricultural activities. This scenario is highly commendable because fish producers tended to rely more on their families for cheap labour supply (Daudu, Matanmi, Komolafe & Ajibola, 2014).

Educational status of the respondents

Table 1 showed the educational attainment of the artisanal fish producers in Andoni L.G.A. this result suggests that the majority of the artisanal fish producers (45%) had secondary education. Results of data analysis on the educational level of these fish producers showed that (22.5%) and (32.5%) had primary and tertiary education, respectively. This finding suggests that most of these artisanal fish producers were literate.

Artisanal fish production experience

The study revealed that the majority (60%) of these fish producers had between 1 and 10 years of artisanal fish production experience. Results of analysis further showed that 39% and 18% had artisanal fish production experience of between 11- 20 years and 21 -30 years, respectively. This implies that these artisanal fish producers were well experienced and reliable.

Fish Income

Result in Table 1 reflects that 80% of the artisanal fish growers earned between N10,000 and 100,000 while (12.5%) and (3%) of the respondent earned between 101000 – 200000 and 201000 – 300000 respectively. About 6% of these artisanal fish producers earned more than N300,000 per month. High-income earnings are expected to boost interest in artisanal fish production.

Influence of Socioeconomic Factors on Artisanal Fish Production in Andoni L.G.A Table 3: Multiple Regression Results of Influence of Socioeconomic Factors on artisanal fish Production in Andoni L.G.L.G.A. Rivers State.

Variable	Linear	Semilog	Double Log	Exponential Function
Constant	-95113.07 (-5.311)***	-982426.0 (-6.034)***	-10.736 (-4.863)***	2.396 (8.703)***
Age	3928.05 (1.732)	-2653.29 (-0.862)	0.016 (0.390)	0.121 (3.465)***
Household size	3.228 (2.430)**	27114.26 (3.398)***	0.330 (3.054)***	4.869E-5 (2.385)***
Educational level	0.542 (3.154)***	7530.01 (1.069)	0.339 (3.550)***	1.506E-5 (5.696)***
Fishing experience	33.652 (4.484)***	247666.5 (5.307)***	3.461 (5.469)***	0.00 (4.051)***
Extension contact	1123.58 (5.004)***	40924.96 (5.131)***	0.693 (6.404)***	0.016 (4.564)***
R ²	0.78	0.72	0.83	0.83
F-ratio	81.17	57.948	111.218	111.43

Source: Field survey, 2019. ** = 5% level of significant, *** = 1% level of significant.

T-ratios are in brackets

Regression results of the analysis of socioeconomic factors influencing artisanal fish production in Andoni L.G.A. are presented in Table 3. Four functional forms, namely the linear model, semi-log model, double log and exponential functions, were fitted to the data. The linear and double log models produced four (4) statistically significant explanatory variables at a 5% level of probability. The semi-log and exponential functions, on the other hand, produced three (3) and five (5) explanatory predictors that were statistically significant at a 5% level of probability. The coefficient of multiple determination (R^2) for the linear model was 0.78 while that of the semi-log was 0.72. The coefficient of multiple determinations for double log and exponential function was 0.83 in each case. Therefore, based on the number of statistically significant explanatory variables, the signs on the estimated parameters and the R^2 , exponential function is chosen for further analysis of the data.

In the exponential function, age was statistically significant at a 1% level of probability. In addition, age was positively correlated with the output of these artisanal fish producers. This implied that an increase in the age of the artisanal fish producers in Andoni L.G.A. Rivers State, Nigeria, will lead to increased output and revenue. Age is, therefore, a statistically significant determinant of output and revenue among producers. This finding is consistent with that of Aminu, Ojo and Adekunle (2017) and Ifejika et al. (2007), who reported that fish producers in Borgu L.G.A. of Niger State were in their active, productive years of between 41-50 years.

Household sizes of the artisanal fish producers in the Andoni Local Government Area of Rivers State were also statistically significant at a 1% level of probability and positively correlated with the output of the artisanal fish producers. This implied that an increase in household sizes would lead to

increases in the revenue base of these fish producers since most of them leveraged free family labour from their households. Household size is also a significant determinant of output and revenue among artisanal fish producers in the study area. Akanni (2010) also found a direct relationship between output and household sizes. This finding is also consistent with Adegbite and Oluwlana (Adegbite & Oluwlana 2004).

Results of data analysis, as shown in Table 3, indicates that the educational level of fish producers was statistically significant at a 1% level of probability and positively correlated with their output. Level of education was not only a statistically significant determinant of fish production in Andoni L.G.A., but it also impacts positively on their productivity. Aminu et al. (2017) observed the positive impacts of education especially with respect to leveraging opportunities in the fishing industry and improved technologies. This finding is in agreement with Fawole and Fashina (2005) with respect to the role of education in the adoption of organic fertilizer. Olaoye et al. (2012) however, disagrees with this finding.

Fishing experience was statistically significant at a 1% level of probability and possessed the expected positive sign. This implies that an increase in the number of years of fishing by the respondents would lead to increased output and revenue *ceteris paribus*. The fishing experience was also a statistically significant explanatory variable determining fish production in Andoni L.G.A. Rivers State. Dey et al. (2002) agrees with this finding.

Extension contact was positively correlated with the output of artisanal fish producers in Andoni L.G.A. Rivers State. The implication here is that increased contact with extension agents leads to significant increase in the output of fishes in Andoni L.G.A. Rivers State, Nigeria. This is expected because extension agents build the fishing capacities of artisanal fish producers through the dissemination of improved fishing technologies and innovations in the fishing industry. Coefficient of multiple determination ($R^2 = 0.830$) shows that about 83% of the changes in the output and gross income have been explained by the model.

5. Recommendation

It is therefore, recommends that relevant government agencies saddled with the responsibility of making and implementing decisions in the fishery sub-sector of the Nigerian economy should factor in variables such as age, household size, educational level, Artisanal fishing experience and extension contact if increased artisanal fish output is the overriding objective of the country.

6. Conclusion

In Nigeria, Rivers State belongs to the States that are endowed with extensive bodies of water and mangrove ecosystem needed in artisanal fish production at a sustainable level. Also available statistical records have shown that Nigeria is the biggest fisheries grower in Africa, with a yearly output greater than 635,399 tonnes making up about 4 per cent of the nation's G.D.P. 2007. Regrettably, Nigeria leads in fish importation among developing nations of the world with yearly imports reaching 560,000 tonnes of fish as of 2006 despite her natural endowments and potential in the artisanal fishery. Some scholars have argued that some socioeconomic factors could be responsible for poor outputs among smallholder farmers or artisanal fisher folks. The role of socio-economic characteristics of artisanal fish farmers on fish production was examined. This study used

120 artisanal fisher folks selected at random from each of four communities. Relevant data were sourced through structured questionnaires and interview schedules. Frequency tables, means and percentages as well as multiple regression equations were used in data analysis. Results of data analysis showed that age, household size, educational level, Artisanal fishing experience and extension contact played significant roles in determining the output and gross income.

7. Funding

This research paper received no internal or external funding

References

1. Adebite, D. A., & Oluwalana, E.O. (2004). Revolving loan schemes as a poverty alleviation strategy: A case study of women groups in UNAAB extension villages. *Faman Journal* 7(2): 18-32.
2. Akanni, K. A. (2010). Fishing technologies and catch levels among small scale fishers in Lagos State, Nigeria. *North American Journal of fisheries management*, 30: 309-315.
3. Alwang, J., Jansen, H. G. P., Siegel, P. B., & Pichon, F. (2005). *Geographic space, assets, livelihoods and well-being in rural Central America. Empirical Evidence from Guatemala, Honduras and Nicaragua*. Washington, DC: International Food Policy Research Institute.
4. Aminu, F.O. and M. F. Adekunle (2017) Socioeconomic analysis of artisanal fish production in Lower Ogun River basin areas of Lagos State, *Nigeria Ghana Jnl Agric. Sci.* 51, 63-72.
5. Anyanwu, S. O. (2014). Quantitative analysis of fish consumption in Rivers State, Nigeria. *American Journal of Experimental Agriculture*, 4(4): 470-475.
6. Anyanwu, S. O., Manilla, H. A., & Ibekwe, U.C. (2012). Econometric analysis of demand for meat and fish in Rivers State, Nigeria. *Journal of Vocational Education and Technology* 9(2): 137-145.
7. Daudu, A. K., Matanmi, B. M., Komolafe, S. E., & Ajibola, B. O. (2014). Perceived benefits of National Fadama Development project III among rural farmers in Kwara State, Nigeria. *Journal of Agricultural Resources and Development*, 13(2): 56-68.
8. Daudu, A. K., Matanmi, B. M., Oladipo, F. O., Aliyu, A. S., & Olafinwo, L. K. (2015). Effect of gender on farmers level of involvement in Araba crop production activities in Kwara State, Nigeria. *Journal of Production Agriculture and Technology*, 11 (2): 23-31.
9. Dey, M. M., Rab, M. A., Paraguas, F. J., Piumsumbon, S., Bhatta, R., Alam, F. M., Koeshendrajana, S., & Ahmed, M.(2002). Socioeconomics of fresh water fish production to benefit poor households in Asia. File//AI/ fish supply and demand in Asia progress report. World fish centre: 1-14.
10. Ebewore, S. O. (2010). The role of women in Nigerian agriculture production and development: The challenges of agriculture in national development. (Unpublished undergraduate project submitted to the faculty of Agriculture), University of Nigeria Nsukka.
11. Esobhawan AO, Ojo SO, Ikheloa EE.(2008). Profitability, Input Elasticity and Return to Scale of Agricultural Production in Lagos State. *Proceedings of 4th Annual Conf. Agriculture in Nigerian Wetlands held at FUTF.U.T.ure*; 219-222.
12. Fawole, O.P., & Fashina, O. (2005). Factors predisposing farmers to organic fertilizer use in Oyo State, Nigeria. *Journal of Rural Economics & Development*,14: 81-90.
13. Food and Agricultural Organization (2005). Report of the FAO-World Fish Centre Workshop on Small-Scale Aquaculture in Sub-Saharan, Africa: Revisiting the aquaculture Target Group

- Paradigm. FAO F.A.O.me publication. Retrieved from:
<http://ftp.fao.org/docrep/fao/008/a0038e00.pdf>
14. Food and Agricultural Organization (2007) State of World Fisheries and aquaculture. FAO Rome publications. Retrieved from: <http://www.fao.org/fi/statist/fisoft/fishplu.asp>
 15. Federal Ministry of Agriculture and Water Resources (2008) National Programme For Food Security, *FMAWR, Abuja*. 4: 107.
 16. Ifejika, P. I., Ayinde, J. O., & Sule, A.M. (2007). Socioeconomic variables affecting aquaculture production in Borgu Local Government Area of Niger State. *Journal of Agriculture and Social Research*, 7(2): 20-30.
 17. Kuwornu, J. K. M., Bashiru, M., & Dumayiri, M. (2014). Farm households' livelihood diversification into agro-processing and non-agro-processing activities: Empirical evidence from Ghana. *Information Management and Business Review*, 6(4): 191–199.
 18. Marchetta, F. (2011). On the move livelihood strategies in Northern Ghana. Post-Doctorante CNRS. Clermont Université, Université d'Auvergne, CNRS, UMR 6587, Centre d'Etudes et de Recherchessur le Développement International (CERDI), F-63009 Clermont-Ferrand, France.
 19. Ndubizu, T. O. C (2003). The Role of the Private Sector in Agricultural Development in Nigeria. Paper Presented at the 43rd Annual General Meeting and Conference of The NACCIMA, Aug. 20th - 21st Grand Hotel Asaba, Delta State.
 20. Oladipo, F. O., Daudu, A. K., Bolarin, O., Bello, O. G., Aliyu, A. S., & Orire, R. O. (2016). Assessment of gender participation in Fadama III project among small-holder crop farmers in Kwara State, Nigeria. *Journal of Agriculture and Technology*, 12 (1): 57-66.
 21. Olaoye, O. J., Idowu, A. A., Omoyinmi, G. A. K., Akintayo, I. A., Odebiyi, O. C., & Fashina, A .O. (2012). Socioeconomic analysis of artisanal fish folks in Ogun water-side Local Government Area of Ogun State, Nigeria. *Global journal of science frontier research, agriculture & biology*, 12(4): 9-22.
 22. Oluwatayo, I. B. (2009, April 22–23). Poverty and income diversification among households in rural Nigeria: A gender analysis of livelihood patterns. The 2nd Instituto de Estudos Sociaise Económicos (IESE) Conference on 'Dynamics of Poverty and Patterns of Economic Accumulation in Mozambique', Maputo, Mozambique.
 23. Simtowe, F. P. (2010). Livelihoods diversification and gender in Malawi. *African Journal of Agricultural Research*, 5(3): 204–216.
 24. Sisay, W. A. (2010). Participation into off-farm activities in rural Ethiopia: Who earns more? A Research Paper presented in partial fulfillment of the requirements for the attainment of the degree of Masters of Arts in Development Studies, International Institute of Social Studies, Hague, Netherlands.



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