



Journal of Science, Technology and Innovation Research

Special Issue 2 | June 2026

Fish Assemblages and Sales Price Along the Coast of Ondo State, South Western Nigeria

Igejongbo, T. F. and *Ogunyemi, M. B.

Department of Fisheries and Aquaculture Technology, Federal University of Technology, Akure, Ondo state, Nigeria.

Correspondence: mariamogunyemi17@gmail.com

ABSTRACT

This study examined fish assemblages and market price dynamics in the coastal fish landing communities in Ondo State, Nigeria, which include Okesiri, Igbokoda, and Obinehin. Data were collected through structured questionnaires administered to 200 fishers, processors, transporters, and traders complemented by direct market observations at selected landing sites for more than four months (May - September, 2025) descriptive and inferential statistical analyses were conducted using Python-based analytical tools. Results indicate that respondents were predominantly young (20–40 years) and male (70%), although women played critical roles in fish processing and marketing. Okesiri accounted as the major landing site, accounting for approximately 70% of sampled respondents. The dominant species recorded included the African catfish (*Clarias gariepinus*), Nile tilapia (*Oreochromis niloticus*), cassava croaker (*Pseudolithus senegalensis*), and bonga shad (*Ethmalosa fimbriata*). Market observation revealed significant variability in fish prices across species and seasons. Bonga shad exhibited the highest and most volatile prices due to its dual (fresh and processed) market demand, whereas African catfish, Nile tilapia, and cassava croaker displayed relatively stable price patterns. Seasonality, fish size, and preservation techniques emerged as the primary determinants of market prices, with prices consistently higher during the dry season than in the rainy season. Socioeconomic factors also influenced income distribution, with tertiary-educated traders and vendors earning significantly higher revenues. Fish smoking was identified as the dominant preservation method, although high transportation costs and inadequate infrastructure constrained market efficiency and profitability. Notably, nearly half of respondents reported declining fish availability, growing pressure on coastal fishery resources. The study revealed that fish assemblages and sales price in Ondo State are principally dominated by economically valuable species such as catfish, tilapia, croaker, and bonga shad. Price variations are influenced by seasonality, preservation techniques (smoked, dried) species rarity and demand fluctuations. logistics analysis which includes boat and motorcycle as the dominant factor. Based on discussions of this study, Ondo State is recommended to invest in Key factors: Prioritize improved landing facilities, cold storage, and processing centres at Okesiri, which is one of the major landing sites. There is also a need to improve transport networks, they should also educate the active age about over fishing and destruction of habitat.

Keywords: Fish assemblages, sales price, seasonality, preservation, Ondo state.

doi.org/10.51459/jostir.2026.2.Special-Issue-1.0282

Introduction

Fishing is an ancient human traditional activity involving the hunting and gathering of products as food from water which is an indispensable natural resource on earth (Ita,1993). Fishing communities are known to be the oldest type of settlements with men as the predominant fishers on wild species. However, these have changed with children, men and women acquiring better skills and improved technology for various operations in the fishing industry resulting in improved livelihood and better survival (Williams, 1987)

Nigeria has a coastline of 800km, maritime area of 46,300km² and inland waters of 125, 470.82km² which can accommodate over six billion small scale artisanal fishers. This can contribute to 85% of domestic fish consumption in Nigeria (Fish for All Submit, 2005). Fishers from neighboring countries migrate and depend on the fisheries resources as the main source of sustenance, assets and investment capital (Fish for All Submit, 2005). Over 98% of fishing communities depend on artisanal fishery and related services for their livelihood, supplying 75% of the animal protein intake (Akankali and Elenwo, 2015). Fish production and marketing is one of the oldest livelihood income generating activities of man since the time immemorial. According to Ovie and Raji (2006), fish is crucial to Nigerian economy contributing 5.4% of the gross domestic product (GDP). Nigeria is home to many natural resources, both on land and in its many water bodies. Nigeria has the highest fish diversity in all of Western Africa, with over 270 different fish species inhabiting its freshwater bodies. Fish are the most numerous vertebrate groups on the planet, accounting for half of all vertebrate species. Fish consumption is frequently a staple of the human diet due to its high digestibility and flavour. Fisheries are also important sources of income for many communities (Charlton

et al., 2016). So far, 33,000 fish species have been identified throughout the world (Oostin *et al.*, 2019).

Faturoti (2010) reported that artisanal fisheries provide over 82% of Nigeria's domestic fish supply, supporting millions of fishermen and 5.8 million people in the secondary sector. Nigeria is Africa's largest fish consumer, consuming over 1.5 million tonnes annually, yet imports over 900,000 metric tonnes while domestic catch is only 450,000 metric tonnes/year (Ozigbo *et al.*, 2013). The aim is to assess the relationship between fish assemblages and the sales price of fish species from local market along the coast of Ondo state, Nigeria.

Materials and Method

Study areas

This study was conducted in the coastal region of Ondo State, Southwestern Nigeria. The coastal communities of Ondo State, predominantly inhabited by the Ilaje and Ijaw ethnic groups, have a deep-seated socio-economic and cultural dependence on marine and estuarine resources, with fishing being the primary occupation (Adebola *et al.*, 2016). According to Figure 1, The study focuses on three strategically selected locations within the Ilaje Local Government Area: Igbokoda, Okesiri, and Obinehin. These sites were the major coastal areas in ondo state, represent the major landing site and market integrating of fish. This selection allows for a comprehensive analysis of fish assemblage and dynamics of sales price variations across different nodes of the fish supply chain.

Methods of Data Collection

Primary data source was only employed for the study. The data were collected with the aid of structured questionnaire administered to the randomly selected



Figure 1: Map of the study area

respondents. Structured questionnaire was prepared and used for collections of the primary data were tested for its reliability. The questionnaires with pre-test questions were distributed randomly to 200 respondents in the study areas. Additional hands (people living in the community and well educated) were engaged in the interpretation of the context of the questionnaires to some respondents who are aged, the illiterates and or little learned. The questionnaire was distributed to the farmers at random, this was done monthly for over four months. Two hundred (200) questionnaires were distributed over four months and at the end a total of two hundred (200) questionnaires were obtained and for analysis.

Sample Location

Data and information were collected directly from fisher folks/fishermen, fish consumers, transporters and fish trader using a questionnaire, also through survey and at the market where fish is being transacted.

Data Analysis

Data collected from the field were coded and analyzed using python statistics libraries(pandas). Descriptive statistics summarizes the number of valid responses across all survey variables. Core demographic and socioeconomic variables such as age, gender, education, livelihood role, and income had complete or near-complete responses (200each), ensuring a reliable foundation for analyzing respondents' background characteristics.

Results

Figure 2 shows the age-range distribution of respondents. The survey population is dominated by young and middle-aged with two-thirds are 20–40 years old, signaling an active, Labor-intensive fishery and processing sector; teenagers and over-50 years and above together account for barely 15 %, indicating

limited generational overlap and a potential future skills gap.

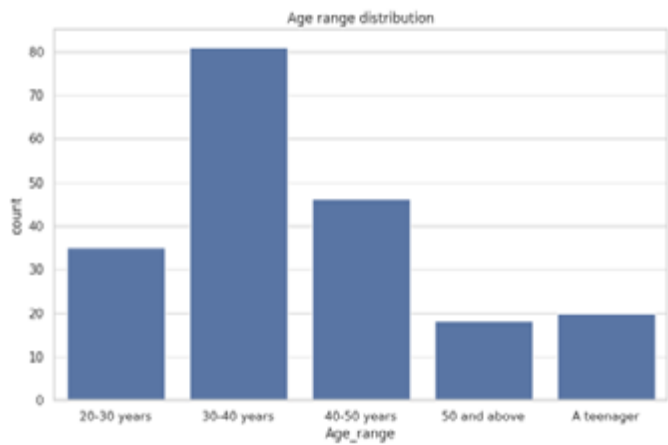


Figure 2: Age-range distribution of respondent

Table 2. shows the gender composition of respondents. The value-chain is male-dominated with approximately 70%, but yet women constitute more than one-quarter of actors mainly as processors and traders while a small “Prefer-not-to-say” group reflects growing sensitivity to gender identity questions.

Table 2: Gender composition of respondents

Genders	Count	Share (%)
Male	82	70.1
Female	32	27.4
Prefer not to say	3	2.6
Total	117	100

Fish Species Assemblage and Distribution

Figure 3 and Table 3 shows the respondent distribution across landing sites. Okesiri accounted for 70% of the total fish assemblages recorded in the study area reflecting its prominence as the busiest fishing node along the Ondo coast, while Igbokoda and Obinehin each supplied roughly a 27% of respondents.

Table 3: Distribution of Respondents Across Communities/Landing Sites

Landing site	Respondents Share (%)
Okesiri	70.1
Igbokoda	12.0
Obinehin	15.4

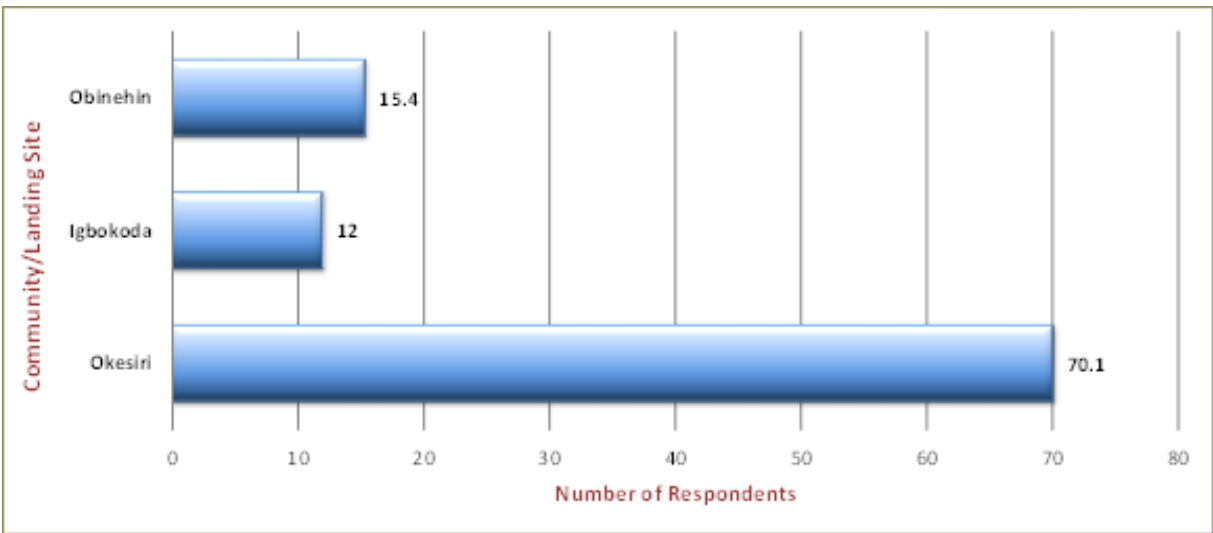


Figure 3: Distribution of Respondents Across Communities/Landing Sites

Price Analysis

Table 4 shows the summary statistics of retail fish prices across five commercial species landed in Ondo coastal markets. Bonga shad commands the highest and most variable price with mean of 5,143, and max

20,000 NGN for premium de-boned product, while African catfish, Nile tilapia and cassava croaker cluster tightly around 3,000 NGN kg⁻¹ with low dispersion while pufferfish shows the narrowest spread (N500 std-dev), confirming its low-value niche and minimal quality differentiation.

Table 4: Summary statistics of retail fish prices across five commercial species in Naira

	Price_African Catfish	Price_Cassava Croaker	Price_Nile Tilapia	Price_Bonga Shad	Price_Puffer fish
Mean	3003.44	2858.29	3063.38	5143.29	3500
Std	9000.54	1373.04	1589.07	6674.91	500
Min	45	8	7	3	3000
25%	3000	2750	2375	2750	3250
50%	3500	3000	3250	3000	3500
75%	4000	3750	4125	3750	3750
Max	2700	4000	5000	20000	4000

Figure 4 shows the mean retail price (NGN kg⁻¹) of four commercial species in relation to seasonal demand peak. It's shows the mean prices NGN/kg by

season premium flag with the current selling prices of fish during the dry season premium.

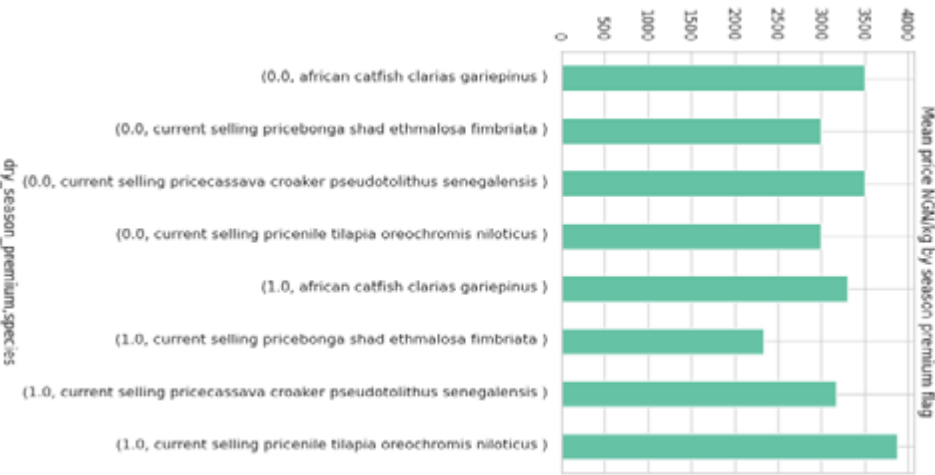


Figure 4: The mean retail price

Figure 5 and Table 5 shows the most frequently mentioned price drivers. Seasonality dominates price formation (24 mentions), followed by fish size/weight (18) and preservation method (15), confirming that

temporal scarcity, physical attributes and post-harvest handling are the principal levers traders use to set or negotiate prices; species rarity, quality/freshness.

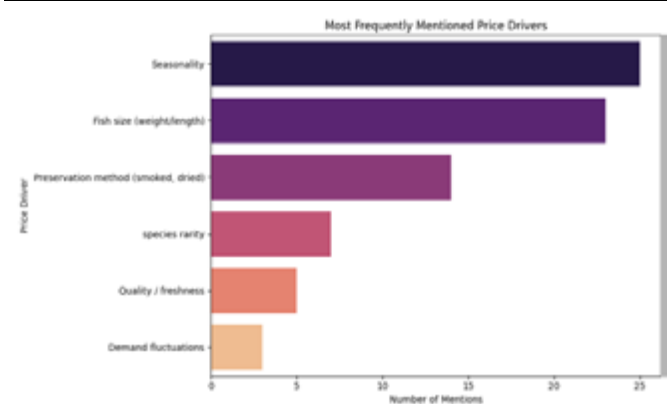


Figure 5: Most frequently mentioned price drivers

Table 6 reported seasonal price pattern with nearly half of the respondents (52) state that prices peak during the dry season (Nov–Apr) when reduced freshwater input tightens supply and smoking demand rises, while 38 perceive a rainy-season high (May–Oct) linked to post-harvest losses and transport disruptions; a minority report no clear cycle (18) or other drivers (9), underscoring that seasonality is the dominant but not unanimous price signal across landing sites.

Table 6: Seasonal price pattern

Seasonal perception	Share (%)
Dry-season high (Nov–Apr)	44.4
Rainy-season high (May–Oct)	32.5
No clear pattern	15.4
Other / mixed	7.7

Socio-Economic Factors With Income/Prices

Figure 6 shows the mean monthly income from fish-related activities by highest education level. Income rises monotonically with schooling: tertiary graduates average ₦410,000, leveraging technical skills (pond management, accounting, digital marketing) to access higher-value nodes, while primary-educated

Table 5: Most frequently mentioned price driversa

Price drivers	Mentions
Seasonality	24
Fish size (weight/length)	18
Preservation method (smoked, dried)	15
Species rarity	11
Quality/freshness	9
Demand fluctuations	7

operators earn ₦180,000 with barely half the tertiary mean and the “None / Other” group falls to ₦ 95 000, underscoring that human capital, not just fishing effort, is a key determinant of profitability along the Ondo coast.

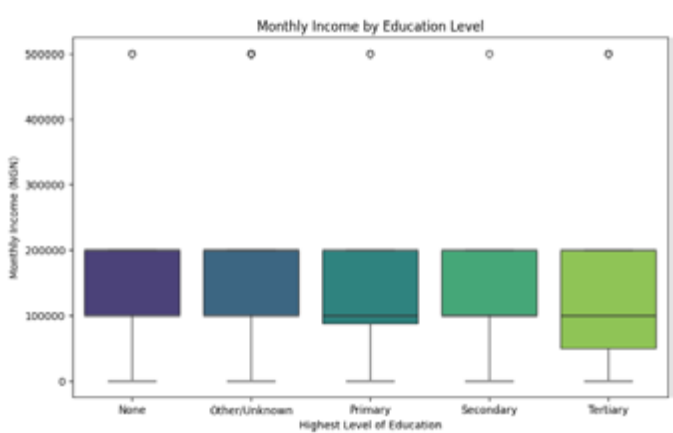


Figure 6: Mean monthly income from fish-related activities by highest education

Preservation and Logistics Analysis

Figure 7 represents the mode of transport used by fish value-chain actors to reach coastal markets. Motorcycles (Okada) dominate (34 respondents), prized for speed and flexibility on poor laterite roads; boats (28) serve riverine landings, pick-up trucks (20) cater to bulk traders, while head portage (12) and

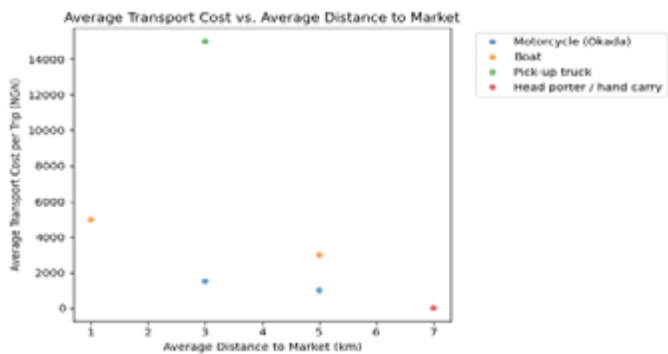


Figure 7: The average transport cost

other means (7) remain residual, highlighting that transport choice is dictated by distance, volume and road condition, and underscoring the scope for fuel-efficiency and cold-chain investments along the most-travelled Okada and boat routes.

Income Sufficiency And Trends

Figure 8 shows the perceived sufficiency of fish-related income to cover household needs.

Roughly two-thirds of respondents (69) declare their fish sales are “Yes, fully” sufficient, while 43 % (48 respondents) admit coverage is only “Partial”, revealing that despite active participation in the value-chain a sizable minority still face a livelihood gap as a key entry point for profit-enhancing interventions (cold-storage, value-addition, market linkage) to push the partial-sufficiency group above the household break-even line.

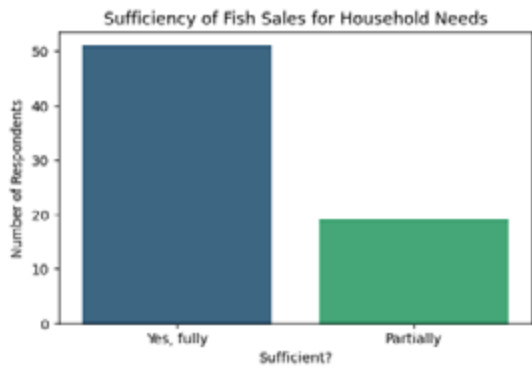


Figure 8: Sufficiency of Fish Sales for Household Needs

Table 7: The Average Transport Cost

Mode	Avg distance (km)	Avg cost (₦)	N
Boat	4.0	12 000	28
Pick-up truck	5.0	8 000	20
Motorcycle (Okada)	2.5	2 000	34
Head porter / hand	1.5	750	12

Table 8 shows the fishers’ and traders’ perception of catch trends over the past five years.

Half of respondents (52) report “Declining” availability, reinforcing documented of over using of fishing gear and habitat destruction, while 31 % (36) perceive “Stable” stocks and only 17 % (20) see an “Increasing” trend; the notable “Unsure” segment (9) highlights weak data visibility.

Table 8: Fishers’ and Traders’ Perception of Catch Trends

Perceived trend	Share (%)
Declining	44.4
Stable	30.8
Increasing	17.1
Unsure	7.7

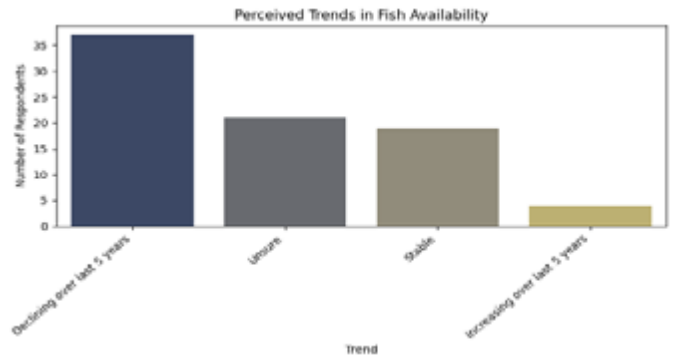


Figure 9: Perceived Trends in Fish Availability

Discussion

Demographic Characteristics of Respondents

The demographic profile in table 2 and 3 shows the revealed that fishing in the studied coastal communities is predominantly male -dominated with most respondent falling within the active age of 20-40. This findings agrees with Adeleke *et al.* (2023). who reported that artisanal fishers in Igbokoda and other Ondo coastal communities were mainly in their economically active years.

Gender distribution also follows established patterns in Nigeria's coastal fisheries. Approximately 70% of respondents were male, while 27% were female, mainly as fish processors and traders.

Fish Assemblages And Landing Sites

The spatial distribution of respondents and fish landings in Table 4 and figure 3 shows that Okesiri accounted for 70% of the study population, making it the core central for fish marketing and processing. This shows reflects the site's as one of the major landing site and market structures compared to Igbokoda (12%) and Obinehin (10%). Olalekan et al. (2021) also documented that landing sites with better road access and cold storage facilities attract more fishers and traders, leading to a self-reinforcing cycle of growth.

Fish composition and biodiversity of the area. African catfish (*Clarias gariepinus*), Nile tilapia (*Oreochromis niloticus*), cassava croaker (*Pseudotolithus senegalensis*), bonga shad (*Ethmalosa fimbriata*) and pufferfish were the principal species recorded.

Price Drivers and Seasonal Trends

Seasonality was the dominant price driver, with 44.4% of respondents in Table 7 reporting dry-season price highs. This finding aligns with Akinwumi and Fapojuwo (2022) and Olagunju *et al.* (2019), who observed that fish prices rise during the dry season due to reduced freshwater inflows, lower catches, and heightened demand for smoked fish.

Other significant price drivers included fish size/weight, preservation method (smoked or dried), freshness and demand fluctuations increases the prices of fish, Larger fish command higher prices, smoking and drying improve the shelf life of fish which directly influence price.

Preservation and Logistics Analysis

Smoking dominated as the major preservation method, used by over 80% of fishers, processors and traders in Nigeria Table 8 reflects smoking method is effectiveness in extending shelf life by reducing losses when stored for a period of time. The results shows a trend in the availability of fish in the next five years.

Transport analysis showed motorcycles (Okada) and boats as the dominant modes, with boats incurring the highest costs (₦12,000 per trip for 4 km) compared to motorcycles (₦2,000 per 2.5 km). These findings are similar to Akinwumi and Fapojuwo (2022), who documented high transport costs in Ilaje LGA due to poor roads and high fuel prices.

Income Sufficient and Trends

Figure 8 and figure 9 shows that nearly half of respondents reported declining in fish availability over the past five years. Only 17% saw an increase,

and a notable minority were unsure, indicating weak data visibility. Interestingly, more educated respondents were more optimistic, perhaps because they have access to better information. Figure 8 shows the perceived sufficiency of fish-related income cover for their household needs. Roughly two-thirds of respondent declares that fish sales are full sufficient for their household while 42% admit partial sufficient for their household.

Conclusion

The study revealed that fish assemblages and sales price in Ondo State are principally dominated by economically valuable species such as catfish, tilapia, croaker, and bonga shad. Price variations are influenced by seasonality, preservation techniques (smoked, dried), species rarity and demand fluctuations. Logistics analysis which includes boat and motorcycle as the dominant factor. Based on discussions of this study, Ondo State is **recommended to invest in Key factors**: Prioritize improved landing facilities, cold storage, and processing centres at Okesiri, which is one of the major landing site. There is also a need to **improve transport networks, They should also educate the active age about over fishing and destruction of habitat.**

References

- Adeleke, A., Olawale, A., & Fagoroye, A. (2023). Socioeconomic characteristics of artisanal fisherfolks in Igbokoda, Ondo State. *African Journal of Aquatic Resources*, 12(1), 45–56.
- Akinwumi, O. & Fapojuwo, O. (2022). Artisanal fisheries and gender dynamics in Ondo State coastal communities. *Nigerian Journal of Fisheries Science*, 20(2), 35–47.
- Adebola, A. O., Ojo, O. A., & Adesina, F. P. (2016). Socio-Economic Analysis of Artisanal Fishing in Coastal Communities of Ondo State, Nigeria. *Journal of Fisheries and Aquatic Science*, 11(3), 225–234.
- Akankali, J.A. and Elenwo, E.I. (2015), “The Atmospheric Input of Species to the World Oceans”, *Joint Experts on the Scientific Aspects of Marine Pollution*, Vol. 38 No 1, pp. 111.
- Charlton, K. E., Russell, J., Gorman, E., Hanich, Q., Delisle, A., Campbell, B. and Bell, J. (2016). Fish, food security and health in Pacific Island countries and territories: *a systematic literature review*. BMC Public Health, 16: 285. <https://doi.org/10.1186/s12889-016-2953-9>
- Fish For All Summit, (2005), *Proceedings of the NEPAD: NEPAD Technical Symposium and Fish for All Summit for Africa*. Nigeria, 22-25 Aug 2005. Abuja, Nigeria.
- Faturoti, O. Nigeria: *Fisheries contribute \$US1 billion to economy*. 25th Annual Conf. Fish. Soc. Nigeria, Badagry, Lagos, Nigeria, 2010.
- Nigerian Rural Sociology Association (NRSA). Ibadan, Andkolad Publishers Ltd. Pp 228- 38.
- Ita EO (1993). *Inland fishery resources of Nigeria*. CIFA. Occa. Pap. No.21. FAO, Rome, pp: 52.
- Oosting, T., Star, B., Barrett, J. H., Wellenreuther, M., Ritchie, P. A. and Rawlence, N. J. (2019). *Unlocking the potential of ancient fish DNA in the genomic era*. Evolutionary Applications, 12(8): 1513 – 1522.
- Obayelu, A., Abiola, O., & Alimi, T. (2020). Co-movement of fish prices in Nigeria: Evidence from co-integration and VAR models. *African Journal of Food and Agricultural Economics*, 10(3), 210–225.

Ovie S. I. and Raji A. (2006). Fisheries Co-Management in Nigeria: *an analysis of the underlying policy*

Olagunju, O., Adeola, S., & Yusuf, T. (2019). Post-harvest handling and price determination in small-scale. Ozigbo, E., Anyadike, C., Forolunsho, G., Okechuckwu, R., & Kolawole, P. (2013). Development of an Automatic Fish Feeder” International Institute of Tropical Agriculture Postharvest Unit, Ibadan. *African Journal of Root and Tuber Crop*, 10(1):27-32.

fisheries of Southwest Nigeria. *Journal of Agribusiness and Rural Development*, 21(2), 83–92. *process*. Niger State, Nigeria, National Institute for Freshwater Fisheries Research, 5Pp.

Olalekan, T., Ajayi, S., & Fadeyi, T. (2021). Landing site concentration and fish market dynamics in Ondo State. *Journal of Coastal Development Studies*, 9(1), 32–40.

Ozigbo, E., Anyadike, C., Adegbulugbe, T. A., & Adesina, O. (2013). Review of aquaculture production and management in Nigeria. *American Journal of Experimental Agriculture*, 3(4), 889–896.

Williams, S. B. (2002). *Women in Fisheries Development in Nigeria*. Nigerian Institute for Oceanography and Marine Research, Occasional Paper No. 5.