UKR Journal of Economics, Business and Management (UKRJEBM)
Homepage: https://ukrpublisher.com/ukrjebm/
Email: submit.ukrpublisher@gmail.com
Volume 1, **Issue** 4, 2025 **ISSN:** 3049-429X (Online)

Effect of Plastic Waste Pollution on Fishing: Case of Selected Local Government Areas of Rivers State

Davis Ojima[1], Kenechi Kingsley Onuigbo[2]

[1,2] Department of Economics Faculty of Social Sciences Ignatius Ajuru University of Education, Port Harcourt. Rivers State. Nigeria

***Corresponding Author**: Davis Ojima

DOI: *10.5281/zenodo.16888884*

Article History
Original Research Article
Received: 10-08-2025
Accepted: 14-08-2025
Published: 17 -08-2025

Citation: Davis Ojima, Kenechi Kingsley Onuigbo, (2025), Effect of Plastic Waste Pollution on Fishing: Case of Selected Local Government Areas of Rivers State, UKR Journal of Economics, Business and Management (UKRJEBM), 1 (4), 156-163

Abstract

The study examined plastic waste pollution and fishing activities in Rivers State. Some coastal Local Government Areas of Rivers State were selected for the study. Population of the study were twelve coastal Local Government Areas of Rivers State with a sample of 384 respondents thus, purposive sampling. The study data were analysed using simple linear regression analysis. Findings of the study revealed that plastic waste disposal has positive and significant effects on fish production in River State. The study concludes that plastic waste pollution has significant effect on fishing and recommends that Government should implement stricter regulations on plastic waste management especially in our rivers, and the entire ecosystems. Furthermore, public awareness campaign should be carried out by the Government to rid the coastal lines of plastic waste dumping which are hazardous to aquatic lives and generally, the blue economy.

Keywords: *Plastic Waste, Fishing, Blue Economy, Coastal*
JEL Code: I 10, I18, Q53.

1. Introduction

Plastic waste pollution is a growing environmental and economic concern both on land and the marine ecosystems. This concern is also borne out of the perceive dangers on the economy. The increasing production and use of plastics, especially single-use item used as food and beverage packages have led to the accumulation of plastic waste in our rivers and waterways. This situation is phenomenal in less-developed climes like Nigeria and its Regions where poor waste management and illiteracy exacerbates pollution. Plastic waste includes, plastic bottles, sachet water disposals, cellophane bags, and other microplastics contaminates the several river tributaries, estuaries, and such aquatic environments thereby, posing serious threats to marine lives and even the communities that borders on the rivers that rely on these resources either for drinking water, food, trade and commerce and socio- cultural system. Plastic pollution affects marine species in multiple ways. For instance, large plastic debris such as discarded fishing nets could cause entanglement to fishes, turtles and other see animals leading to injuries or death of such aquatic organisms. Many species, including fish and seabirds inadvertently float and got harmed by plastic fragments wrongly disposed for food. If ingested by the organisms could practically cause mortality. Microplastics infiltrate aquatic food chains, accumulating in fish tissues and leading to bioaccumulation and biomagnification effects, which have far-reaching ecological and economic implications.

The toxicological effects of plastic waste further threaten fish production. Plastics contain harmful additives such as phthalates, bisphenol A (BPA), and persistent organic pollutants (POPs), which leach into marine environments. These chemicals disrupt endocrine functions, weaken immune systems, and impair reproductive health in aquatic species. High concentrations of these toxicants in industrial and urban areas pose increased risks, leading to reduced fish populations and biodiversity loss. Plastic pollution also alters the natural behaviors of fish and other marine organisms. Changes in feeding habits, predator avoidance, and mating behaviors affect population stability and ecosystem balance (Osibanjo and Otitoju,2020). Plastic

waste facilitates the spread of invasive species, disrupts indigenous marine habitats, and contributes to harmful algal blooms that deplete oxygen levels, making waters uninhabitable for many fish species.

Fishing is a dominant and prevailing occupation among the people of coastal region. It is an economic activity which entails catching fish and other aquatic species either for sell for monetary reward for or for consumption. There are instances too where people are engaged in fishing as a sporting or recreational engagements. Be that as it may, fishing industries contribute to the economies of most coastal countries, such as Norway, Greece, Mexico, Argentina, etc. (World Bank). Its sustainability conserves the availability of fish and supports the ecosystem. The conservation also promotes the viability of fishing occupation because it preserves the sufficiency and regular supply of fish. The fishing sector in Nigeria account for about 4 percent to the nations Gross Domestic product and promote employment opportunities of over 6 million Nigerians who engages as fishermen, processors, traders and transporters (National Bureau of Statistics). In addition, Fishing contributes to food availability and sufficiency in Nigeria. Fish provides source of nutrients as protein are sourced from fish and meeting the growing need fish fats and oil.

Fish supply continues to decline probably due to habitat abuse and degradation arising from contamination which eventually affect the fish economy and loss of revenue. It has been opined that marine pollution such as plastic, chemical runoff, and oil pollution has caused increased harm to aquatic lives including fishes leading to the extinction of certain fish species. Providing a sustainable remedy to plastic waste pollution will avail of the challenges and create a beneficial economic system.

Statement of the Problem

In Rivers State, robust waste management systems and strict environmental protection policies have not gained the support and awareness it deserves especially with the residents and require programs essential to prevent indiscriminate of waste disposal. Our waterways, rivulets and rivers are the victims of this act of degradation. Unfortunately, it is the rivers and the waterways that sustain the marine ecosystem and preserve the blue economic resources. Aquatic animals would thrive without the threats of harm posed by plastic debris, broken plastics that act as traps, and other trappy objects floating haphazardly on the waters. Some of them toxic pollutants that endangers aquatic lives.

Plastic waste pollution has become pervasive in Rivers State following its coastal environment. Some of them are deposited by the flooding of upland environment due to heavy and windy rainfall which frequently occur in the State in particular and the region generally. In most cases, inadequate waste management procedure and enforceable legislations, rapid urbanization, and lack of public necessitates poor plastic waste management and worsens the effect on our rivers. Fish and other marine animals are often found entangled or in the web of plastic waste, whereas, many ingest plastic particles and are severely affected. Because these pollutants are toxic, it endangers the sea organisms and marine lives. Against this background, this study seeks to determine the effect of plastic waste pollution on fishing. Select coastal Local Government Areas of Rivers State were identified for this study.

2. Literature Review

Conceptual Clarifications:
Fishing and Aquaculture

Fishing and aquaculture are long occupation of the blue economy that provides food, generate employment and income globally. They represent two of the most vital and traditional sectors of the economy, contributing significantly to food security, economic stability, and employment in every economy. Fisheries involve the harvesting of fish from natural water bodies, while aquaculture is regarded as fish farming and involves the controlled breeding, rearing, and harvesting of fish and other aquatic organisms in artificial or controlled environment. This sector supplies the substantial portion of the world's protein intake, with nearly three billion people depending on seafood as primary source of protein (Anderson & Franklin, 2020). Despite the importance, both fisheries and aquaculture face significant challenges of sustainability as a result of overfishing. The is the practice of extracting more fish than necessary from the ecosystems than it can replenish. Overfishing has led to severe decline in fish populations and marine biodiversity (Gomez & Tilley, 2022). This unsustainable approach does not only threaten marine ecosystems, but also impacts and negatively so on the livelihood of the dependent fishing populace who rely on fishing for income. Bycatch, also so known as incidental capture of non-target species such as dolphins, turtles, and seabirds, further exacerbates the depletion of fish stock, contributing to the loss of biodiversity (Cheng & Kim, 2023).

Aquaculture practices the cultivation marine resources typical of fishes, shellfish, seaweed, etc. in a controlled enclosure such as ponds. This practice is often viewed as a solution to overfishing. However, aquaculture creates

environmental concerns in that, intensive aquaculture can lead to habitat destruction, water pollution, and the spread of diseases to wild fish populations (Smith & Robinson, 2021). However, recent advancements in sustainable aquaculture practices, such as integrated multi-trophic aquaculture (IMTA) and recirculating aquaculture systems (RAS), tend to mitigate the impact. The IMTA involve farming multiple species inclusive of others thus, create a balanced ecosystem where waste from each species serves as food for another. This reduces environmental pollution (Jiang et al., 2019). On the other hand, Recirculating Aquaculture System RAS, significantly reduces water usage and pollution. Policy initiatives and regulatory frameworks have been developed globally to address sustainability challenges in fisheries and aquaculture. International agreements, such as the United Nations' Sustainable Development Goal (SDG) 14, aim to conserve and sustainably use oceans, seas, and marine resources, promoting the reduction of overfishing and the adoption of responsible aquaculture practices (Thompson et al., 2023). The promotion of sustainable fisheries management practices, such as setting quotas, establishing marine protected areas, and implementing traceability systems, has also proven effective in rebuilding fish stocks and ensuring long-term sustainability (Lee et al., 2023)

Effects of Plastic Waste Disposal on Fish Production

Plastic waste introduces significant ecological disruptions within aquatic systems, ranging from alteration of habitats to the ingestion of micro plastics by marine organisms. According to Auta et al. (2023), micro plastics have been widely detected in Nigerian ecosystems, including the Lagos Lagoon, where studies found them in water, sediment, and commercially valuable fish species such as Oreochromis niloticus and Chrysichthys nigrodigitatus. These pollutants impede essential biological processes in fish, such as feeding, reproduction, and growth. The ingestion of microplastics causes physical blockages within fish digestive systems leading to reduced nutrient intake, lower energy reserves, and impaired growth, all of which hinder fish production. Studies have consistently reported similar patterns, highlighting the ability of microplastics to absorb and concentrate toxic chemicals, which then enter the food chain through fish consumption. Sani et al. (2022), examined freshwater environments in Nigeria and found alarming levels of microplastic contamination in fish harvested from urban water bodies in Nigeria. This contamination emphasized the pervasive nature of plastic pollution across various aquatic systems including in areas without direct coastal access. Plastic debris in aquatic ecosystems also degrades fish habitats and further exacerbating the decline in fish catch.

The economic challenges imposed by plastic pollution on fish catch is particularly severe in developing nations where small-scale fishing is predominant and thus, impeding local economies and food security. In Nigeria, the decline in fish catch has directly translated into low economic return, lower incomes for fishermen, and increased market prices for fish. Adewale (2023), observed that plastic pollution drives changes in the migratory behavior of fish species. They then become less accessible to local fishermen who rely on traditional methods. As fish migrate further away to escape polluted environments, local fishermen face diminished yields and increased costs associated with longer fishing expeditions. Moreover, fish contaminated with microplastics pose significant risks to public health, leading to consumer hesitancy and reduced demand for fish. As highlighted by Ogunmodede et al. (2023), microplastic contamination detected in fish from the Osun River has alarmed consumers thereby, affecting fish sales. This chain reaction negatively impacts fish markets, fisher incomes, and overall fish production, creating a cyclical pattern of environmental degradation and economic instability.

One of the most alarming consequences of plastic pollution in aquatic systems is its impact on food safety and human health. Microplastics and associated pollutants accumulate within fish tissues, which are then consumed by humans. These pollutants include persistent organic chemicals such as polycyclic aromatic hydrocarbons (PAHs) and heavy metals, all of which pose significant health risks. The contamination of fish stocks with microplastics thus reduces the perceived safety of fish as a food source, potentially decreasing its consumption and demand in markets. Ogunmodede et al. (2023) detailed how fish contaminated with microplastics, harvested from Nigerian rivers, alarm public health experts due to the presence of carcinogens and other harmful substances. The ingestion of contaminated fish poses significant risks to vulnerable populations, particularly in regions where fish forms a significant component of the diet. Reduced fish consumption arising from these concerns not only threatens nutritional security but also directly impacts the economic sustainability of the fishing industry.

Theoretical Framework

Throwaway Society Theory:

Throwaway Society Theory by Vance Packard in 1991, describes consumer culture of excess consumption and disposability. It states that products are designed for short-term use and rapidly disposal rather than durability and sustainability. Packard believed that mass production, aggressive marketing, and industrial advancements lead to shift in societal values and encouraging people to discard items instead of reusing or recycling them. This behavior

driven by economic growth and convenience, creates massive waste generation, especially plastics and packaging materials. Throwaway Society theory significantly contributes to plastic pollution hence; individuals and industries frequently discard plastic items without considering their long-term environmental impact. Single-use plastics in form of bottles, bags and other packaging materials, dominate the waste streams and often end up in marine environments. Consequently, the rivulets, waterways, rivers, and oceans have become dumping heavens for plastic wastes and have affected the aquatic ecosystems whereas, the livelihoods of most coastal communities depend on marine resources.

Plastic waste pollution has direct consequence on the throwaway culture and poses serious threats to fish production and fishing. In region like Rivers Stat where fishing is one of the prevailing occupations of the rural coastal communities, high propensity of plastic waste dump in the rivers poses a threat to fish lives thus, reduces fish catch. Fishes ingest plastic particles, mistaking them for food which later results in malnutrition, organ damage, and death. Microplastics accumulation in fish tissues introduces toxic chemicals into the food chain, which eventually affects human health on consumption of contaminated fish. Debris from wasted plastics also obstruct fish breeding space and coral reefs affects fish breeding and availability to declining fish stocks and economic losses.

Remedying the effect of Throwaway Society theoretic consequences requires sustainable strategic waste management, strict and enforceable plastic waste disposal regulations. on plastic use, and community awareness campaigns to promote responsible consumption and disposal. Without intervention, the continuous disposal of plastics will further degrade marine ecosystems, threatening the sustainability of fish production and food security.

Pollution Haven Hypothesis:

Pollution Haven Hypothesis (PHH), was developed by two economists, Gene Grossman and Alan Krueger, in the 90s. The theory suggests that industries of developed nations relocate their pollution-intensive operations to the developing countries which have weaker environmental regulations. This creates environmental degradation concerns in those nations as they then become “pollution havens”. As a result, it becomes evident that pollution from industrial activities including plastic waste, industrial effluents, and toxic chemicals, contaminates the entire environment of air, water, and soil causing harm both to the entire ecosystems and humans. The PHH significantly affects fish production and by extension fishing. Accumulation of toxins are worsened by the discharge of industrial wastes from plastic manufacturers, oil refineries, and Agricultural processing plants discharge which threatens the rivers and coastal waters. This leads to the destruction of fish habitat leading to declining fish populations.

A major consequence of this is the accumulation of toxic pollutants such as heavy metals, plastics, and persistent organic pollutants (POPs) in aquatic ecosystems. Fish ingest these pollutants, leading to physiological stress, reduced reproduction, and increased mortality. further infiltrate the food chain, posing significant health risks to humans through bioaccumulation. Consuming contaminated fish can cause serious health issues, including cancer and endocrine disorders. Plastic pollution leads to abysmal death rate of fingerlings thereby, affecting fish availability for fishing and market fish supply. The theory directly bears to the subject matter following that plastic waste dump is created out of the desire for industries to get rid of wastes. To them it does not matter where their dump heaven is provided that it is outside their premises.

Theory of Planned Behavior:

Planned Behavior Theory developed by Icek Ajzen in 1985, explains how human behavior is influenced by three key factors namely; attitude toward the behavior, subjective norms, and perceived behavioral control. It suggests that individuals are more likely to engage in a specific behavior if they have a positive attitude toward it, believing that others will support same or expect them to behave in that manner.

This theory is widely applied in environmental studies to buttress behaviors related to conservation, sustainability, and resource management. Planned Behavior theory helps to explain why fishermen and the coastal communities either engage in sustainable fishing practices or contribute to environmental degradation. For instance, when fishermen perceive sustainable fishing as beneficial to their livelihoods and the marine ecosystem, they are more likely to develop responsible practices including regulated fishing, conservation of the environment and attitudinal behavior towards waste management. However, if they view conservation efforts as restrictive or unprofitable, they may continue harmful activities such as overfishing, indiscriminate plastic waste dumping and illegal fishing methods.

It follows that in climes where sustainable fishing and environmental protection rules are observed, aforementioned instances are adhered to. However, in areas where harmful practices are common and widely accepted,

social pressure may encourage unsustainable behaviors. When fishermen recognize the benefits of sustainability, they may not adopt irresponsible practices. Applying this theory to fish production requires targeted interventions that educate communities, strengthen positive social norms, and provide resources to ensure that sustainable fishing practices are both feasible and beneficial for all stakeholders.

Empirical literature

Akpan and Ekong (2020), investigated the impact of plastic pollution on fish populations in the Cross River Estuary of Nigeria. The study applied a mixed-methods approach and combined field sampling of fish species with laboratory analysis of plastic ingestion rates in commercially important fish like Tilapia guineensis and Liza Grandisquamis. 200 artisanal fishers were surveyed to assess changes in fish availability and income over a decade. The study found that 35% of sampled fish had ingested microplastics, mainly polystyrene and polyethylene. Fish exposed to higher plastic concentrations exhibited stunted growth, reproductive issues, and increased mortality rates. Moreover, plastic pollution disrupted the estuary's food web, reducing prey availability for larger fish. Fishers reported a 40% decline in catch sizes over ten years, attributing it to pollution, habitat destruction, and declining water quality, alongside overfishing. The study concluded that plastic waste was a critical factor affecting fishing in the region. It thus recommended regulated waste management practice and marine control protocol is necessary to control and protect the water ways from waste dumping.

Adewuyi and Okoro (2020), carried out a study on Plastic Pollution in Coastal Nigeria: Impact in the region on Aquatic Life and Fisheries. The study aimed to assess the extent of plastic contamination in the Nigerian coastlines, particularly focusing on Lagos State. The researchers employed a mixed-methods approach involving water sampling, waste analysis, and interviews with local fishermen. Their findings indicated significant contamination levels, with plastics accounting for approximately 60% of debris in coastal waters. They observed that plastic debris entangled fish, impaired mobility, and disrupted the breeding grounds, impacting fish availability for local fisheries. The study concluded that plastic pollution posed an immediate threat to the livelihoods of coastal communities' dependent on fishing. The researchers recommended establishing community-driven plastic collection initiatives and government-supported recycling programs to reduce waste entering marine environments. This research aligns with the present study's focus on examining the effects of plastic pollution on marine life and associated economic activities, emphasizing the critical link between pollution and community livelihoods. It concluded that plastic pollution posed a threat not only on fishing but also in the lives of coastal area dwellers and recommended community driven plastic collection initiatives and government sponsored waste recycling enterprise amongst others.

Eze and Chukwuemeka (2021), examined the Effects of Plastic Waste on Marine Biodiversity and Human Health in Niger Delta Communities. The study investigated the effect of microplastics and associated toxins accumulate in marine organisms in Rivers State, Nigeria. It used laboratory analysis of fish samples and human health surveys in the community. It was discovered that high concentrations of micro-plastics in fish tissues were subsequently consumed by the locals who consumed the fish. Their results exposed the danger of micro-plastics entering the food chain, with implications for local diets and public health. The study concluded that plastic waste management is important for safeguarding both marine life and human health. The study recommended awareness campaign on proper waste disposal, promoting biodegradable alternatives, and implementing strict enforcements of environmental regulations. This study has a direct relationship with the current research by providing a foundational understanding of the toxic and health-related effects of plastics which is crucial for examining both environmental and human health impacts of plastic pollution. The study find that plastic waste Management is necessary to safeguard both marine life and protect human health especially for coaster inhabitants that depend on the natural water resources for drinking. Among others, the study recommended awareness campaign and environmental regulatory adherence.

Jones and Walker (2023), investigated the Influence of Plastic Waste on Marine-Dependent Communities and Ecosystems. The study sought understanding of the multi-faceted impact of plastic pollution on marine ecosystems and communities reliant on these resources. The research focused on coastal communities in Queensland, Australia, where it conducted ecological assessments alongside socio-economic surveys. The findings revealed that plastic pollution led to habitat degradation, disrupt the ecosystems, and limit resources for local fishing. It therefore, concluded that marine-dependent communities bear disproportionate burden of plastic pollution's effects. Marine pollution also negatively influences the economic stability and cultural practices of the people. Thus, recommended government-funded clean-up projects and incentives for adopting circular economic principles whereby, it recycles plastics for re- use. The relevance of this to the current research indicates that plastic pollution is not only harmful marine

life but also affects lives of people negatively. It found that marine waste is hazardous to human life and aquatic organisms and therefore, recommended government funded waste clean-up along the coastal water ways to preserve aquaculture for the survival of blue economy.

Mensah and Awotwi (2021), examined plastic pollution and its effects on marine ecosystems in the Gulf of Guinea. It aimed at the effect of plastic waste on the health of marine species along Ghana's coastline. Observational and experimental methods were used to monitor plastic ingestion and entanglement in marine animals. Their findings indicated that plastic waste disrupts species' migration patterns, feeding behaviors, and reproduction. Its conclusion emphasized the interconnectedness between plastic pollution, species health, and marine biodiversity. Therefore, recommended regional collaborations to establish clean-up initiatives and strict legislation to manage industrial plastic waste. The study emphasized the interconnectivity between plastic waste pollution, species health and marine biodiversity. It thus recommended strict adherence to regulations and further study on the environmental impact of plastics waste.

3. Methodology

The study adopts survey method. This approach enabled the collection of quantifiable data from a representative sample of the target population. The findings of the study can be generalized. It selected and surveyed twelve coastal Local Government Areas in Rivers State, namely; Andoni, Bonny, Okrika, Opobo/Nkoro, Ogu/Bolo, Asari-Toru, Akuku-Toru, Degema, Ahoada West, Abua/Odual, Emohua, and Obio/Akpor. The selected areas have rivers and rivulets with high density of rainfall and are rich in tropical rain forest which depend largely on aquatic economic activity for food, income, and employment and other occupations and vocations to eke a living. It has combined population of approximately 3,851,400.

Adopting the Taro Yamane's theorem, a sample size of 310 respondents were sampled for the study. Data were collected through structured questionnaires and interviews. Specifically, fishermen/women, boat drivers, boat passengers, environmental marine workers, and waste management personnel form part of the respondents and interviewees. The instrument, which consisted of both demographic and objective-specific items were rated on a four-point Likert scale, and validated. The data were analyzed using the Statistical Package for Social Sciences (SPSS), employing descriptive statistics and Linear regression analysis to test the hypotheses postulated in the study and consisting of 0.05 level of significance.

Model Specification

The model used in this study was based on the description of the effect of the predictor on the criterion variable of the research. The simple linear regression model was adopted. Thus:

$$FP = \beta_0 + \beta_1 Q_{pw} + \beta_2 D_{pw} + \beta_3 C + \epsilon$$

Where:

- FP: Fish production
- Q_{pw}: Quantity of plastic waste disposed
- D_{pw}: Degree of plastic waste dispersion
- C: Control variables (e.g., water temperature, nutrient levels)
- β_0: Intercept (baseline fishing)
- $\beta_1, \beta_2, \beta_3$: Regression coefficients for independent variables
- ϵ: Stochastic error term

4. Result and Analysis

Table 4.1: Descriptive Statistics

	N	MIN	MAX	MEAN	STD. DEV.
Fish production (*FP*)	310	2.30	2.94	2.8509	.13739
Quantity of plastic waste disposed (Q_{pw})	310	2.30	2.94	2.8230	.14788
Plastic waste dispersion (D_{pw})	310	2.20	2.94	2.8120	.14109
Control variables (*C*)	310	2.30	3.00	2.8562	.14023

Table above shows the descriptive statistics of the dynamics and variability of factors influencing fishing, marine transportation, and tourism, highlighting both areas of significant variability and consistency. Variables such as the quantity of plastic waste disposed (Q_{pw}) and plastic waste dispersion (D_{pw}) exhibit substantial variation, showing their critical role in determining outcomes. This variability may stem from differences in waste management practices, population density, industrial activity, and

geographical characteristics. For instance, regions with higher plastic waste disposal are likely to experience more and pronounced environmental degradation, potentially disrupting fish ecosystems, obstructing waterways, and diminishing the visual appeal necessary for tourism.

Table 4. 2 Regression Results

Variables	Beta	R	R2	Adj. R2	F-statistic	T-statistic	P-value
Constant	50.21	.683[a]	.642	.610	23.76	9.85	<0.001
Q_{pw}	-1.65					-3.67	.001
D_{pw}	-2.40					-3.43	.002

Source: Researcher's Computation using SPSS 27.0 (2024)

The regression results clearly show that plastic waste pollution significantly reduces fishing. The baseline fishing activity is 50.25 units when plastic waste is absent. However, each unit increase in plastic waste quantity (Qpw) leading to a 1.65-unit drop in fishing, while a one-unit rise in waste dispersion (Dpw) causes a 2.40-unit decline. These results highlight how plastic waste disrupts fish habitats, contaminates waters, and affects fish breeding and migration. The model's R^2 of 0.64 and adjusted R^2 of 0.61 indicate strong explanatory power, while the F-statistic and low p-values confirm statistical significance. The findings show the need for effective waste management policies in order to reduce plastic pollution and enhance fishing success.

4.1 Discussion of the Findings

The finding of the study indicate that plastic waste has a positive and significant effect {Coeff. = 50.21 (p-value = <0.001)} on fishing. This highlights how Indiscriminate disposal if plastic waste affect fishing. This finding aligns with the finding of Auta et al. (2023) where he stated that microplastics have been widely detected in Nigerian marine ecosystems, including the Lagos Lagoon, where studies found in water, sediment, and commercially valuable fish species such as Oreochromis niloticus and Chrysichthys nigrodigitatus. They emphasized that these pollutants impede essential biological processes in fish, such as feeding, reproduction, and growth. The ingestion of microplastics causes physical blockages within fish digestive systems, leading to reduced nutrient intake, lower energy reserves, and impaired growth, all of which hinder fish production. Sani et al. (2022) also found out alarming levels of microplastic contamination in fish harvested in freshwater environments in Nigeria. They emphasized the contamination pervasive nature of plastic pollution across various aquatic systems, even those in areas without direct coastal access. They observed that plastic debris in aquatic ecosystems also degrades fish habitats, further exacerbating the decline in fish production and that breeding grounds and essential feeding areas are increasingly cluttered with plastic waste, particularly in shallow coastal regions, estuaries, and lagoons where fish reproduce and juveniles develop. Adewale (2023), noted that plastic pollution drives changes in the migratory behaviour of fish species, making them less accessible to local fishers who rely on traditional methods and that as fish migrate further away to escape polluted environments, local fishers face diminished yields and increased costs associated with longer fishing expeditions.

5. Conclusion

Our study examined the effects of plastic waste pollution on fishing in Rivers State. Arising from our analysis and findings, significant insights were drawn to the effect that, there is a relationship between plastic waste management and fishing. This result demonstrates that plastic waste disrupts marine ecosystems, subsequently, affect fishing activities. The explosion of disposal of plastic waste introduces toxins and pollutants that degrade aquatic habitats, reduce biodiversity, and negatively impact on the reproductive health of marine species. Consequently, the contamination of these habitats indirectly correlates with the altered levels of fish availability, underlining the urgent need for sustainable waste management to mitigate these adverse effects.

6. Recommendations:

i. Government should implement strict adherence to regulations not only on plastic waste management but to all aspects of our economic life and ensuring that waste does not enter marine ecosystems which disrupt fish habitats.

ii. Sustainable aquaculture practices should be encouraged, while placing priority on cleaner water and protect the biodiversity to mitigate the effects of existing plastic pollution.

iii. Public awareness campaigns especially in the rural areas should be launched to educate communities, industries, and stakeholders about the environmental and economic impacts of plastic waste on marine ecosystems and fish production, promoting responsible disposal and recycling practices.

iv. Investment in innovative waste collection and recycling infrastructure such as floating barriers, waste-to-energy technologies, and community-based waste retrieval programmes should be prioritized to reduce both the quantity and dispersion of plastic waste in aquatic environments.

REFERENCES

1. Adeolu, A. (2023). Plastic pollution and fish migration behavior in Nigerian rivers: Economic implications for small-scale fisheries. *Nigerian Journal of Environmental Studies*, *19*(3), 101–115.

2. Adeola, M. O., Lawal, T. & Fakayode, T (2021), Environmental impact of Plastic Pollution on **Nigerian** Marine Life and economy. *Nigerian Journal of Environmental Studies* 14(2), 123-140.

3. Adewuyi, T., & Okoro, S. (2020). Plastic pollution in coastal Nigeria: Impact on aquatic life and fisheries. *Marine Environmental Research*, *45*(2), 223–238.

4. Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211.

5. Anderson, P., & Franklin, J. (2020). Fisheries and aquaculture: Challenges in sustainability. *Ocean & Coastal Management*, *193*.

6. Auta, H. S., Emenike, C. U., & Fauziah, S. H. (2023). Distribution and effects of microplastics in aquatic environments in Nigeria. *Environmental Pollution Reports*, *56*, 112–125.

7. Cheng, L., & Kim, S. (2023). Bycatch and marine biodiversity loss: Global trends and policy responses. *Environmental Science & Policy*, *143*, 84–96.

8. Central Bank of Nigeria Statistical Bulletin, 2023.

9. Eze, O. J. & Uche, K.M. (2020), Toxicological impact of plastics in aquatic ecosystem: Implications for marine life and public health in Nigeria. *African Environmental Health Journal*, 7(3), 213-228.

10. Eze, O., & Chukwuemeka, I. (2021). Effects of plastic waste on marine biodiversity and human health in Niger Delta communities. *International Journal of Marine and Environmental Health*, *12*(1), 56–70.

11. Gomez, J. A., & Tilley, D. R. (2022). Overfishing and ecosystem collapse: A global review. *Aquatic* Conservation*: Marine and Freshwater Ecosystems*, *32*(4), 715–729.

12. Grossman, G. M., & Krueger, A. B. (1993). Environmental impacts of a North American free trade agreement. In P. M. Garber (Ed.), *The U.S.–Mexico free trade agreement* (pp. 13–56). MIT Press.

13. Jiang, Y., Li, M., & Wang, H. (2019). Integrated multi-trophic aquaculture (IMTA): Reducing pollution and improving sustainability in fish farming. *Journal of Cleaner Production*, *220*, 585–595.

14. Jones, R., & Walker, K. (2023). The influence of plastic waste on marine-dependent communities and ecosystems. *Journal of Coastal Research*, *95*(2), 33–48.

15. Lee, T., Harada, M., & Benson, L. (2023). Sustainable fisheries management: Policy effectiveness and global case studies. *Marine Policy*, *147*.

16. Mensah, K., & Awotwi, B. (2021). Plastic pollution and its effects on marine ecosystems in the Gulf of Guinea. *Journal of African Marine Science*, *43*(1), 89–102.

17. National Bureau of Statistics, Nigeria.

18. Ogunmodede, O., Ajayi, F., & Fashola, T. (2023). Microplastics in Nigerian freshwater fish: Human health and market implications. *Environmental Health Perspectives*, *131*(6), 670–678.

19. Osinbajo, O. & Otitoju, R. (2020), The toxicological threat of plastic additives to marine life in Nigerian coastal waters. *West African Journal of Environmental Toxicology*, 10(1), 45-56

20. Packard, V. (1960). *The waste makers*. David McKay Company.

21. Sani, I., Okafor, E., & Bala, M. (2022). Microplastic contamination in Nigerian freshwater fish and its ecological consequences. *Journal of Environmental Management*, *315*.

22. Smith, A., & Robinson, D. (2021). Environmental impacts of aquaculture: Challenges and innovations in sustainable practices. *Environmental Research Letters*, *16*(12).

23. Thompson, B., Alvaro, F., & Carter, S. (2023). SDG 14 and the global challenge of marine conservation: Progress and setbacks. *Sustainable Development*, *31*(1), 20–35.

24. Yahaya, B. T. & Ibrahim, M. O. (2021), Assessing the impact of plastic waste on Nigeria`s marine biodiversity and ecosystem services. *Journal of Biodiversity and Conservation*, 5(2), 189-203

25. World Bank Annual Reports on Sustainable Development.