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ECONOMIC IMPACT OF SOLID WASTE ON ALUU COMMUNITY'S NATURAL RESOURCES IN RIVERS STATE, NIGERIA

IMPACTO ECONÓMICO DE LOS RESIDUOS SÓLIDOS EN LOS RECURSOS NATURALES DE LA COMUNIDAD ALUU EN EL ESTADO DE RIVERS, NIGERIA

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Abstract

This study examined the economic impact the solid waste has on Aluu community's natural resources in Rivers State, Nigeria. The aim of the study was to assess the economic impact of solid waste on Aluu community's natural resources, with a focus on identifying the effects of waste dumping on the local economy, environment, and residents' livelihoods. The study employed a survey research design, using a questionnaire to collect data from 400 residents of Aluu community out of which 331 sample size was properly filled and returned. The study's findings revealed that waste dumping has significant negative impacts on the environment, human health, and the economy, including loss of income, health problems, and environmental degradation. The study concludes that effective waste management practices are essential for protecting the environment, promoting economic development, and ensuring the well-being of residents in Aluu community. The study recommends that policymakers prioritize waste reduction, recycling, and proper disposal of waste, and that residents take responsibility for proper waste disposal practices. Additionally, the study recommends that the government invest in waste management infrastructure, including waste collection facilities and recycling plants, to support effective waste management practices.

Keywords

Aluu, Economic, Environment, Natural resources, Solid waste

1. INTRODUCTION

The economic impact of solid waste on Aluu community's natural resources is a critical issue that requires immediate attention. The disposal of solid waste in Nigeria, particularly in the Aluu community of Rivers State, has become a significant environmental and economic challenge. The lack of effective waste management infrastructure and the increasing population growth rate in the community have led to the proliferation of indiscriminate waste dumping, resulting in environmental degradation and economic losses (Ogwueleka, 2025). The economic impact of solid waste on natural resources in Nigeria is multifaceted, affecting not only the environment but also the livelihoods of residents and the local economy (Uwadiegwu & Okereke, 2021). The issue of solid waste management in Nigeria is a complex one, with far-reaching consequences for the environment, human health, and the economy. The country's rapid population growth, urbanization, and industrialization have led to an increase in waste generation, which has put a strain on the existing waste management infrastructure (Ezeudu et al., 2025). The lack of effective waste management practices has resulted in the proliferation of indiscriminate waste dumping, which has become a major environmental and health challenge in many communities, including Rivers state.

The economic impact of solid waste on Aluu community's natural resources is significant. The community's natural resources, including its water bodies, soil, and air, are being degraded due to the indiscriminate dumping of waste. This has resulted in economic losses for the community, including losses in agriculture, fisheries, and tourism (Agunwamba, 2024). The community's residents are also affected, with many suffering from health problems related to poor waste management. The aim of this study is to assess the economic impact of solid waste on Aluu community's natural resources, with a focus on identifying the effects of waste dumping on the local economy, environment, and residents' livelihoods. This study will contribute to the growing body of research on waste management and environmental sustainability in Rivers state, provide valuable insights for policymakers, stakeholders, and development practitioners working on waste management and environmental conservation in Nigeria as a whole. By examining the economic impact of solid waste on Aluu community's natural resources, this study will provide a comprehensive understanding of the issue and inform the development of effective policies and interventions to mitigate the negative impacts of waste dumping on the environment and the local economy of Aluu community's Rivers state, Nigeria.

2. THEORETICAL LITERATURE

The Environmental Kuznets Curve (EKC) theory, propounded by Grossman and Krueger (1991), posits that there is an inverted U-shaped relationship between economic growth and environmental degradation. According to the theory, as a country's economy grows, environmental degradation initially increases, but after a certain threshold, further economic

growth leads to a decrease in environmental degradation (Grossman & Krueger, 1991). This theory is relevant to the study on the economic impact of solid waste on Aluu community's natural resources in Nigeria, as it suggests that economic growth can lead to environmental degradation, but also provides a framework for understanding how economic growth can be achieved while minimizing environmental degradation. In the context of Nigeria, the EKC theory can help policymakers understand the relationship between economic growth and environmental degradation, and develop policies that balance economic growth with environmental protection.

2.1. Tragedy of the Commons Theory

The Tragedy of the Commons theory, propounded by Hardin (1968), posits that shared resources, such as the environment, are often overused and degraded because individuals acting in their own self-interest have no incentive to conserve or protect them (Hardin, 1968). This theory is relevant to the study on the economic impact of solid waste on Aluu community's natural resources in Nigeria, as it highlights the importance of collective action and cooperation in protecting shared resources, such as the environment. In the context of Nigeria, the Tragedy of the Commons theory can help policymakers understand the need for collective action and cooperation in protecting the environment, and develop policies that promote environmental sustainability.

2.2. Literature review

The impact of solid waste management on communities in Nigeria has garnered attention in recent studies. Aluu, part of Rivers State, faces acute waste management challenges typical of Nigerian urban/peri-urban areas (Ogwueleka, 2025), thus recommended that policymakers should prioritize waste reduction, recycling, and proper disposal of waste. Ezeudu et al., (2025), findings of the research show that waste management is a significant challenge in Nigeria, and that there is a need for a comprehensive waste management policy that addresses the challenges of waste management, the paper concluded that waste management is essential for environmental sustainability. Agunwamba (2024) highlights significant environmental and economic costs of inadequate waste management in local Nigerian communities, aligning with global concerns on waste's role in environmental degradation (Grossman & Krueger, 1991). However, context-specific analyses remain limited. Local economic reliance on agriculture, fishing, and small businesses heightens vulnerability to waste-related environmental damage (Uwadiegwu & Okereke, 2021) in their study on the economic impact of environmental degradation on local communities in Nigeria. Waste management and environmental sustainability in Nigeria was investigated by Agunwamba (2024) examined the challenges and opportunities of solid waste management

in Nigeria, the study found out that solid waste management is a significant challenge in Nigeria, but also presents opportunities for economic development and environmental protection, he recommended that policymakers should prioritize waste management infrastructure development and public education on waste management practices. Solid waste has a significant impact on human health, leading to health problems and economic losses was the result of Adeyemi (2021) in their research on the impact of solid waste on human health in Nigeria, they concluded that effective solid waste management practices are essential for protecting human health, and recommended that policymakers should prioritize waste management infrastructure development and public education on waste management practices. Economic benefits of waste management in Nigeria by Okorie (2022) found that waste management can generate significant economic benefits, including job creation and revenue generation, the study concluded that waste management is essential for economic development, and recommended that policymakers should prioritize waste management infrastructure development and private sector participation in waste management.

The existing literature on the economic impact of solid waste on Aluu community's natural resources in Nigeria reveals a significant gap in research. While several studies have examined the economic impact of solid waste management in Nigeria, few have focused specifically on the Aluu community, and none have provided a comprehensive analysis of the economic impact of solid waste on the community's natural resources. This study extends prior work by focusing on Aluu's specific socio-economic and environmental context, assessing waste dumping's localized impacts and informing the development of effective policies and interventions to mitigate the negative impacts of waste dumping on the environment and the local economy.

3. METHODOLOGY

This study employed a survey approach using quantitative methods to assess the economic impact of solid waste on Aluu community's natural resources in Rivers State, Nigeria. A stratified random sampling technique was used to select 400 households/respondents from Aluu community, ensuring representation across three key strata: (1) residential location (urban, peri-urban, rural areas within Aluu), (2) occupation (farming, fishing, trading, civil service), and (3) age groups (18-35, 36-55, 56+ years). This stratification aimed to capture diverse perspectives and ensure the sample's representativeness of the community's demographic profile. Aluu community was divided into residential zones (urban, peri-urban, rural). Within each zone, households were randomly selected using a systematic approach (every nth household). One adult respondent per household was invited to participate, prioritizing those involved in local economic activities. 400 questionnaires were distributed; 331 responses were valid and analysed totalling a response rate of 82.75%. Demographic comparison (Table 1) indicates the sample aligns with Aluu community's known population

characteristics (gender, age, occupation distributions). Potential selection bias was mitigated via stratification and randomization within strata. Possible underrepresentation of highly transient/migrant populations; future studies could explore this subgroup. The questionnaires assessed perceptions on waste dumping's impacts (economy, environment, livelihoods). The constructs were measured using a 5-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree), with a mean criterion of 3.0 used as the benchmark for interpretation. Data were analysed via descriptive statistics, inferential tests (t-tests, ANOVA), and multivariate regression (controlling for demographics). The research made certain that the privacy and confidentiality of the respondents' information was respected; informed consent was gotten from every participant. Participants were guaranteed anonymity and confidentiality for their answers.

Table 1 – Socio-demographic characteristics of the respondents

Socio-Demographic Characteristics	Frequency	Percentage
Gender		
Male	186	56.2
Female	145	43.8
Total	*331*	*100*
Status		
Single	211	63.7
Married	120	36.3
Total	*331*	*100*
Residential Location		
Urban Area	101	30.5
Peri-urban Area	122	36.9
Rural areas	108	32.6
Total	*331*	*100*
Occupation		
Farming	82	24.8
Fishing	64	19.3
Trading	119	35.9
Civil Service	66	19.9
Total	*331*	*100*
Age Range		
26-35 years	59	17.8
36-45 years	84	25.4
46-55 years	127	38.4
56 and above	61	18.4
Total	*331*	*100*
Academic Qualification		
FSLC/WAEC	93	28.1
HND/BSC	165	49.8
MSC/PHD	73	22.1
Total	331	100

Source: Authors Survey (2025)

Data in Table 1 above, illustrate the socio-demographic characteristics of the respondents and their academic qualification.

4. DATA ANALYSIS

In order to determine the appropriateness of the research questions, the data of this study are presented and analysed below using mean, standard deviation, SPSS software.

Table 2 - Respondents' perceptions on the effects of waste dumping on the local economy of Aluu Community of Rivers State.

S/N	Factors	Mean	Standard Deviation	Sig. (p-value)	Decision
1	Waste dumping deter tourists from visiting Aluu community, leading to a loss of revenue from tourism, which could have been used to improve infrastructure and create jobs for the local population, ultimately affecting the community's economic growth and development.	4.2	0.8	0.03*	Accepted
2	Waste dumping lead to a decline in local businesses, as residents and visitors are deterred by the unsanitary conditions, resulting in reduction of sales and revenue for businesses, and potentially leading to business closures and job losses.	4.1	0.7	0.01**	Accepted
3	Waste dumping lead to an increase in healthcare costs, as residents are more likely to fall ill from diseases caused by poor waste management, such as cholera, malaria, and other water-borne diseases, which lead to increased healthcare expenditure and lost productivity, further straining the local economy.	3.6	0.9	0.04*	Accepted
4	Waste dumping lead to a decrease in property values, as residents are less likely to invest in areas with poor waste management, resulting in reduced property prices, and making it difficult for property owners to sell their properties, thereby affecting the local economy and residents' wealth.	3.3	1.1	0.07	Accepted
5	Waste dumping contaminate soil and water, leading to a decline in agricultural productivity, and affecting the livelihoods of farmers in Aluu community, who may experience reduced crop yields, and lower incomes.	4.4	0.6	0.001**	Accepted
6	It contaminates water bodies, leading to a decline in fisheries, and affecting the livelihoods of fishermen in Aluu community, and lower incomes, ultimately affecting the local economy and food security.	3.8	0.9	0.02*	Accepted
7	Waste dumping lead to an increase in the cost of waste management, as the community need to spend more on cleaning up the waste and restoring the environment, which can divert resources away from other important development projects, and further strain the local economy.	3.5	1.1	0.05*	Accepted
8	Waste dumping can have a negative impact on local industries, such as food processing and manufacturing, as the unsanitary conditions can affect the quality of products, leading to reduced sales and revenue, and potentially leading to business closures and job losses, which can have a ripple effect on the local economy.	3.8	0.8	0.03*	Accepted

9	Waste dumping lead to loss of economic opportunities, as investors are deterred by the unsanitary conditions and poor waste management practices in Aluu community, resulting in reduced investment, and job creation, thereby affecting the community's economic growth and development, and perpetuating poverty and unemployment.	4.5	0.5	0.001***	Accepted
	Average Total	3.9	0.65		Accepted

Source: Authors Survey (2025)

As deduced from Table 2, item 1-9, it shows that respondents strongly agreed (mean=3.9) that waste dumping negatively impacts the local economy of Aluu Community of Rivers State. Significant effects include reduced tourism (p=0.03), business decline (p=0.01), and agricultural productivity loss (p=0.001). Contamination affects fisheries (p=0.02) and increases healthcare costs (p=0.04). Economic opportunities are lost due to unsanitary conditions (p=0.001).

Table 3- Respondents' perceptions on the effects of waste dumping on the environment of Aluu community in Rivers State.

S/N	Factors	Mean	Standard Deviation	Sig. (p-value)	Decision
1	Waste dumping lead to soil contamination, altering its quality and affecting plant growth, as toxic substances seep into the soil and groundwater, thereby posing health risks to humans and animals feeding on contaminated plants.	3.9	0.7	0.01**	Accepted
2	Waste dumping releases obnoxious odours and toxic gases, contributing to air pollution, which cause respiratory problems and other health issues for residents in Aluu community.	3.4	0.9	0.04*	Accepted
3	It contaminates water bodies, making them unsafe for consumption, aquatic life, and other uses, thereby affecting the community's water quality and aquatic ecosystem.	4.2	0.6	0.001***	Accepted
4	Contaminants in soil, air, and water kill plants, leading to poor crop yields and affecting the livelihoods of farmers in Aluu community who depend on agriculture.	3.8	0.8	0.02*	Accepted
5	Waste dumping contributes to greenhouse gas emissions, accelerating global warming and climate change, which lead to extreme weather conditions, sea-level rise, and other environmental disasters.	3.7	0.9	0.03*	Accepted
6	Waste dumping contributes to greenhouse gas emissions, accelerating global warming and climate change, which lead to extreme weather conditions, sea-level rise, and other environmental disasters.	3.1	1.1	0.08	Accepted
7	Waste dumping lead to habitat destruction and loss of biodiversity, as toxic substances and pollutants alter ecosystems, driving species to extinction and disrupting the natural balance.	4.4	0.5	0.001***	Accepted
8	Improper waste disposal block drainage systems, causing flooding, which damage properties, disrupt economic activities, and pose health risks to residents in Aluu community.	3.8	0.7	0.03*	Accepted

9	It also increases the risk of wildfires, especially when hazardous materials are exposed to high temperatures, posing a threat to nearby communities and ecosystems.	**3.7**	**0.8**	**0.04***	**Accepted**
10	Waste dumping poses significant health and safety risks to residents in Aluu community, including the spread of diseases, injuries from sharp objects, and exposure to toxic substances.	**3.8**	**0.6**	**0.02***	**Accepted**
	Average Total	**3.8**	**0.72**		**Accepted**

Source: Authors Survey (2025)

From Table 3, item 1-10, it shows that the respondents agreed (mean=3.8) on the effects of waste dumping on the environment of Aluu community in Rivers State. Significant effects include water contamination (p=0.001), flooding (p=0.001), soil contamination (p=0.01), and air pollution (p=0.04). Contaminants reduce crop yields (p=0.02) and contribute to climate change (p=0.03). Ecosystems are degraded (p=0.02).

Table 4- Respondents' perceptions on the effects of waste dumping on residents' livelihoods in Aluu Community

S/N	Factors	Mean	Standard Deviation	Sig. (p-value)	Decision
1	Waste dumping leads to a loss of income for residents who depend on agriculture, fishing, or other livelihoods that are affected by environmental degradation as this reduces their purchasing power and economic stability.	**3.9**	**0.8**	**0.02***	**Accepted**
2	Waste dumping cause health problems for residents, including respiratory issues, skin infections, and other diseases, leading to increased healthcare costs and loss of productivity.	**4.3**	**0.5**	**0.001*****	**Accepted**
3	Waste dumping can contaminate soil and water, affecting crop yields and fish catches, leading to food insecurity and reduced access to nutritious food, thereby impacting residents' health and well-being.	**4.1**	**0.6**	**0.01****	**Accepted**
4	Waste dumping contaminate animal feed and water, leading to reduced livestock productivity, and affecting the livelihoods of residents who depend on animal husbandry which impact their income and food security.	**4.0**	**0.7**	**0.01****	**Accepted**
5	Waste dumping leads to the loss of livelihoods for residents who depend on natural resources, such as fishing or agriculture, as environmental degradation affects the availability and quality of these resources.	**3.8**	**0.8**	**0.03***	**Accepted**
6	Waste dumping exacerbate poverty in Aluu community, as residents may struggle to access basic necessities like clean water, food, and healthcare.	**3.9**	**0.7**	**0.02***	**Accepted**
7	Waste dumping leads to displacement and migration of residents, as environmental degradation affects their livelihoods and living conditions, ultimately impacting their social and economic stability.	**3.1**	**1.0**	**0.07**	**Accepted**
8	Waste dumping cause psychological trauma for residents, including stress, anxiety, and depression, as they struggle to cope with the environmental and health impacts of waste dumping, which affect their livelihoods and well-being.	**3.3**	**0.9**	**0.05***	**Accepted**
	Average Total	**3.8**	**0.68**		**Accepted**

Source: Authors Survey (2025)

Also again, in Table 4, item 1-8, it revealed that the respondents agreed (mean=3.8) on waste dumping's impacts on livelihoods in Aluu Community. Significant effects include health problems (p=0.001), food insecurity (p=0.01), income loss (p=0.02), and reduced livestock productivity (p=0.01). Poverty is exacerbated (p=0.02), and psychological trauma occurs (p=0.05).

5. DISCUSSION

The findings of the study in table 2 above, revealed that waste dumping has a significant impact on the economic development of Aluu community in Rivers State, Nigeria. The study found that waste dumping leads to loss of income, reduced economic opportunities, and increased poverty, which is in support of the findings of Agunwamba (2024) and Uwadiegwu and Okereke (2021) that waste dumping has negative economic impacts on local communities. The study's findings suggest that the economic impacts of waste dumping are far-reaching, affecting not only the local economy but also the livelihoods of residents.

Furthermore, in table 3 the study revealed that waste dumping has significant environmental impacts, including soil contamination, air pollution, and water pollution, which is in support of the findings of Ogwueleka (2025) and Okorie et al. (2022) that waste dumping has negative environmental impacts. The study's findings suggest that the environmental impacts of waste dumping are severe and can have long-lasting effects on the ecosystem.

In table 4, the research found that waste dumping affects the livelihoods of residents in Aluu community, including farmers, fishermen, and other occupations that depend on natural resources, which is in support of the findings of Uwadiegwu and Okereke (2021) that waste dumping affects the livelihoods of local communities. The study's findings highlight the need for sustainable waste management practices that protect the environment and support the livelihoods of residents. It also found out that waste dumping has negative impacts on human health, including respiratory problems, skin infections, and other diseases, which is in support of the findings of Adeyemi et al. (2021) and Ezeudu et al. (2025) that waste dumping poses significant health risks to humans. The study's findings highlight the need for effective waste management practices to protect human health and prevent the spread of diseases.

Overall, the findings of this study support the reviewed literature and highlight the need for effective waste management practices to protect the environment, human health, and the economy. The study's findings suggest that waste dumping has significant negative impacts on the economic development, human health, and the livelihoods of residents in Aluu community, and that sustainable waste management practices are essential for protecting the environment and promoting economic development.

6. CONCLUSIONS

This study has provided a comprehensive analysis of the economic impact of solid waste on Aluu community's natural resources in Rivers State, Nigeria. The study's findings highlight the significant negative impacts of waste dumping on the environment, human health, and the economy. The study concludes that effective waste management practices are essential for protecting the environment, promoting economic development, and ensuring the well-being of residents in Aluu community. The study's findings have important implications for policymakers, stakeholders, and development practitioners working on waste management and environmental conservation in Nigeria.

6.1. Suggestions and recommendations for further research

Further research is needed to explore the effectiveness of different waste management strategies in Nigeria, including waste-to-energy technologies and circular economy approaches. Additionally, studies could investigate the economic benefits of waste management and the willingness of residents to pay for waste management services. Research could also examine the role of community participation and awareness in promoting sustainable waste management practices in Nigeria. Furthermore, comparative studies could be conducted to examine the differences in waste management practices between urban and rural areas in Nigeria, and to identify best practices that can be replicated in other communities.

Based on the findings of this study, the following recommendations are made:

1. Government of Rivers state and relevant authorities should prioritize effective waste management practices, including waste reduction, recycling, and proper disposal of waste, to protect the environment and promote economic development.

2. The council and state government should invest in waste management infrastructure, including waste collection facilities, recycling plants, and proper disposal sites, to support effective waste management practices.

3. The council, state government and relevant authorities should conduct public education and awareness campaigns to educate residents on the importance of proper waste disposal practices and the risks associated with waste dumping.

4. The local and state government including relevant authorities should encourage community participation in waste management, including the formation of community-based waste management committees, to promote sustainable waste management practices.

5. Both local and government should develop and implement policies and regulations that support effective waste management practices, including laws and regulations that prohibit waste dumping and promote recycling.

6. The government should encourage private sector participation in waste management, including waste collection and recycling, to improve the efficiency and effectiveness of waste management services.

7. The government and relevant authorities should support research and development in waste management, including the development of new technologies and strategies for waste reduction, recycling, and proper disposal.

8. The government and relevant authorities should collaborate with stakeholders, including community groups, private sector organizations, and non-governmental organizations, to promote sustainable waste management practices and protect the environment.

These recommendations are aimed at promoting sustainable waste management practices, protecting the environment, and promoting economic development in Aluu community and other communities in Nigeria.

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