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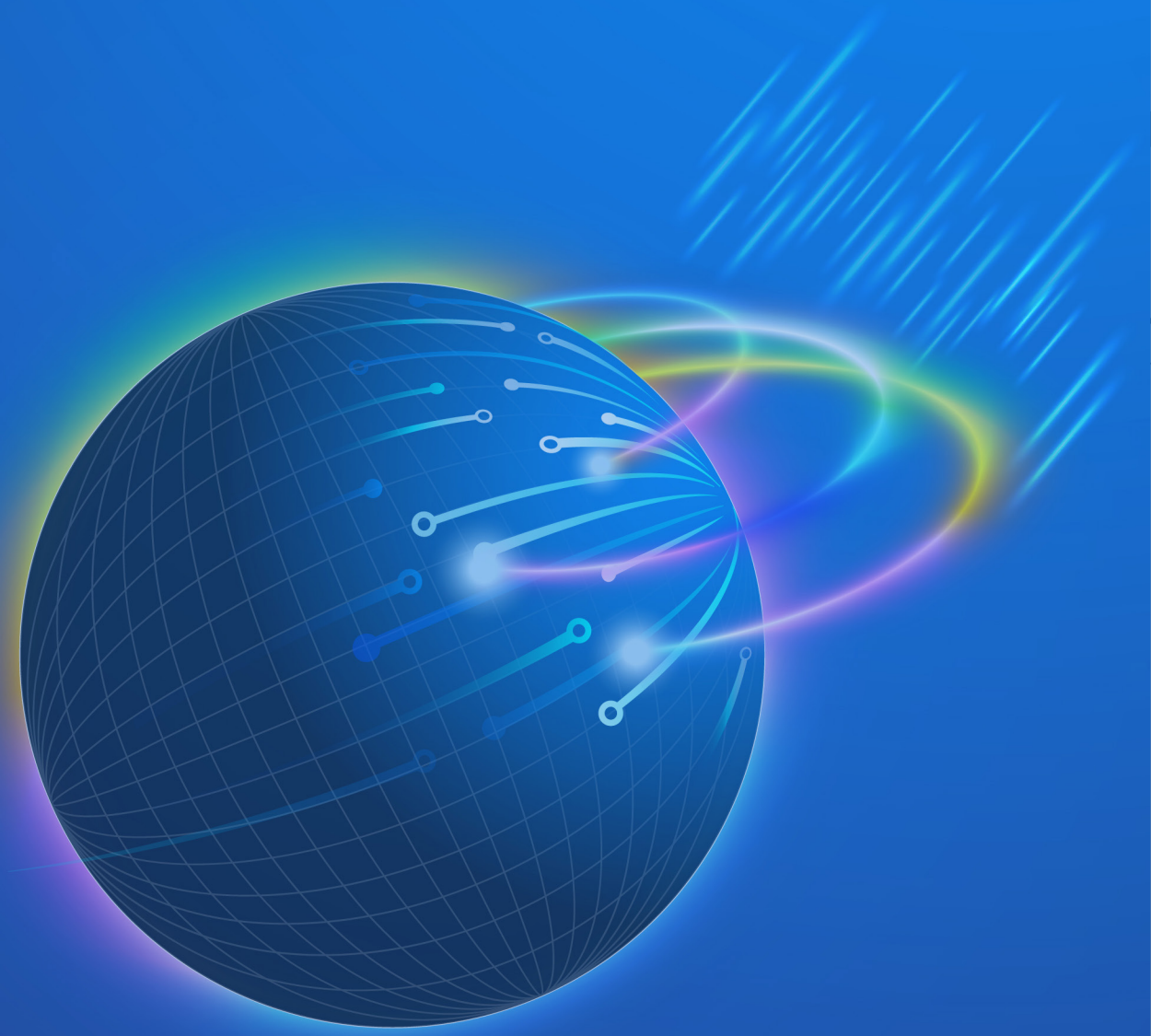

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Perceived Impact of Oil Spill on Cassava Production in Oguta Local Government Area of Imo State, Nigeria

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ABSTRACT

This research explores the perceived impacts of oil spill incidents on cassava production in Oguta Local Government Area of Imo State, Nigeria, specifically focusing on the perception of local communities and farmers on the environmental impact of oil spills inherent in cassava production. Utilizing a correlation research design method, the study employs the Pearson Product-Moment Correlation (PPMC) technique and purposive sampling to investigate how these perceived environmental impacts correlate with various issues experienced by farmers and affected communities. The research focuses on understanding the relationship between oil spill occurrences and their effects on cassava cultivation, including soil contamination, yield reduction, and disruptions to farming activities. Data were collected through structured surveys and interviews, which were then analyzed to uncover patterns and trends in the perceived environmental impacts of oil spills. The findings from the correlation analysis revealed a significant correlation between the frequency of oil spills and negative environmental outcomes such as soil degradation and reduced cassava yields. The results indicate that local communities and farmers perceive oil spills as a major threat to cassava production, contributing to significant environmental and agricultural challenges. Key recommendations include enhanced environmental regulations, improved soil response strategies, and community awareness programs to mitigate the adverse effect of oil spills. Policymakers and environmental agencies should prioritize restoring contaminated soils and supporting sustainable agricultural practices. Additionally, engaging local communities in monitoring and reporting oil spills can help in early detection and response, reducing the long-term impacts on cassava production.

INTRODUCTION

The perceived impact of oil spills can vary widely depending on factors such as the location of the spill, the volume and type of oil spilled, the ecosystem affected, and the response efforts deployed (Sandifer *et al.*,, 2021). Oil spills can cause significant harm to ecosystems, including marine habitats, wetlands, and coastal areas. Oil coats plants and animals, suffocating marine life, disrupting food chains, and damaging sensitive habitats. Long-term impacts may include reduced biodiversity and ecosystem resilience. Oil spills can have severe economic consequences for communities dependent on affected natural resources, such as fisheries, tourism, and agriculture. Osuagwu & Olaifa (2018) demonstrate that increasing levels of oil spill and oil production negatively affects fish production in the Niger Delta region of Nigeria. Loss of income, employment opportunities, and property values can occur due to reduced productivity and contamination of resources. Exposure to oil and its associated chemicals can pose health risks to humans and wildlife. Inhalation, ingestion, or skin contact with oil and its toxic components can lead to respiratory problems, skin irritation, reproductive issues, and long-term health effects. Ewim *et al.,* (2023) presents a comprehensive analysis of the issue of wastewater due to oil spills and pollution in the Niger Delta region of Nigeria. Oil spills can disrupt social cohesion and community well-being by displacing populations, undermining traditional livelihoods, and straining social support networks. Communities may experience stress, anxiety, and trauma as they cope with the aftermath of a spill and the uncertainty of recovery efforts. Indigenous communities and cultural groups with deep connections to the affected environment may experience profound cultural impacts from oil spills Ejiba *et al.*,, (2016)

This research on the perceived impact of oil spills on cassava production in Oguta Local Government Area, a study area situated in Imo State, Nigeria, occupies a strategic position within the Niger Delta region, renowned for its abundant oil reserves and extensive petroleum exploration and production activities. The area's proximity to oil-rich deposits has contributed to its socio-economic significance, but it has also exposed local communities to environmental risks and challenges, including oil spills. Cassava (Manihot esculenta) cultivation is a cornerstone of agricultural livelihoods in Oguta, providing sustenance, income, and employment opportunities for thousands of residents. However, the sustainability of cassava production is threatened by the potential impacts of oil spills, which can contaminate soil, water sources, and crops, leading to reduced yields, loss of income, and adverse health effects. Despite the critical

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importance of cassava production to local livelihoods, there is a notable gap in understanding how oil spills are perceived by stakeholders involved in the agricultural sector in Oguta Local Government Area. Previous studies have focused primarily on the ecological and economic impacts of oil pollution in the Niger Delta, overlooking the specific implications for cassava cultivation and the perceived impacts on the affected farmers and local communities. The effect of oil spills on farmlands has greatly hampered agricultural activities in the Niger Delta including oil-producing areas of Imo State as there have been records of oil spills covering farming areas and water bodies resulting in loss of soil fertility, decrease in farm productivity and deterioration of farm produce.

Understanding the health impacts of oil spills on cassava farmers is essential for several reasons. Firstly, it provides insights into the direct human costs of environmental degradation, highlighting the need for targeted health intervention and support systems. Secondly, it underscores the broader socio-economic implications, as poor health among farmers can lead to decreased productivity and economic instability. Lastly, it informs policy decisions and regulatory frameworks to mitigate the adverse effects of oil spills and promote sustainable agricultural practices. The research question that enabled the research to be achieved is: What opinions do farmers, local communities, and other stakeholders have about the effects that oil spill incidents connected to the production of cassava in Oguta Local Government Area have on the environment?

The study addresses this situation by employing a descriptive survey design and utilizing the Pearson Product Moment Correlation (PPMC) technique for data analysis.

LITERATURE REVIEW

There has been interest in recent research papers regarding the perceived impact of oil spills on cassava production in Oguta Local Government Area, Imo State. An increasing number of academics have looked into how oil spills affect this region's agricultural activities, especially cassava production. Here are a few researchers who worked on the impact of oil spills on agricultural activities especially cassava in the region. Inoni *et al.,* (2006) on how crop output and farm revenue in Delta State, Nigeria, are affected by oil spills. For more than thirty years, the oil-rich Niger Delta region has seen wanton environmental deterioration that has had a disastrous impact on the people living there in terms of their social, economic, and health. The detrimental effects of oil spills on crop production were highlighted using a sample of 262 crop farmers who were chosen at random from 10 communities and 5 local government areas in the oil-producing agro-ecological zones of Delta State. 10% more oil spills led to a 1.3 percent drop in crop yield and a 5 percent drop in farm revenue, significantly reducing farm income and land productivity. The authors advocate for the implementation of policies to lower the extreme level of poverty and ensure a better standard of living for the populace, as well as the enactment and enforcement of strict environmental laws to protect the Niger Delta environment and stop its ongoing degradation. Abah (2020) on "Differential Effects of Oil Spillage on Cassava Farmers' Livelihood in Eleme and Ogoni Land Areas of River State, Nigeria". This study analyzed the effects of oil spills on cassava farmers' livelihood in Eleme and Ogoni Land Areas of Rivers State, Nigeria. The study specifically examined the causes of oil spillage in the study area, examined the livelihood effects of oil spills and factors influencing the effects of oil spills on cassava production in the study area. A structured questionnaire was used to collect data from 400 cassava farmers selected through a multi-stage sampling procedure. Percentage score, mean and Z-test were used to analyze the data collected. The result revealed that pipeline vandalization was identified as the major cause (88.0%) of oil spillage in the study area. Non-payment of compensation to victims of oil spillage (M = 2.6), lack of access to credit/loan (M = 2.5), lack of access to improved varieties of cassava and weak implementation of environmental laws and policies (M = 2.4) were considered as factors promoting the effects of oil spillage on the livelihood of farmers. The result further showed that the mean effect of polluted farm respondents 2.3968; SD = 0.89, while the mean effect of non-polluted farm respondents on cassava production is 2.5510; SD = 0.5822 with a mean difference of 0.1542, and thus implies the existence of a significant difference. The study concludes that oil spill had devastating livelihood effects on cassava farmers in the study area and therefore recommend effective implementation of mitigation measures for oil spill in the area. Ukhurebor *et al.,* (2021) on Assessment of the environmental effects of petroleum spills in Nigeria's Niger Delta region. Environmental pollution is one well-known example of a manmade activity that, when combined with the effects of climate change, is a worldwide concern. This has resulted in a number of hazards, such as the bioaccumulation of toxic substances, pollution of the aquatic environment, rapid deterioration of soil structure and texture, health risks, a high degree of ecosystem imbalance, and elevated levels of toxicity in both the environment and humans. In conclusion, the study cautiously provides a way forward by submitting that effective research and development measures ranging from public health assessments of petroleum contamination to an all-embracing application of bioremediation technology should frequently be carried out as a matter of urgency with resilient adaptation, mollification and management of these menaces.

The Perception of Local Communities', Farmers, and the Public Towards Oil Spills and the Impact on Cassava Production

The way that local communities and farmers view oil spills and their impact on cassava production can vary based on a number of circumstances, including the extent of the spill, how close the spill is to their farmlands, and

how well response and mitigation efforts work. Farmers may hold the following common perceptions:

Negative Impact on Soil Health

Farmers may perceive oil spills as a significant threat to the health of their soil. Oil contamination can lead to soil degradation, reducing fertility, and hindering the growth of crops like cassava. This perception is particularly strong if the spill is extensive and not adequately cleaned up.

Crop Contamination

Farmers may worry about the contamination of their cassava crops by oil residue. This can affect the quality and safety of the cassava, making it unsuitable for consumption or sale. Even if the cassava appears unaffected, there may be concerns about long-term health effects.

Loss of Livelihood

For many farmers, cassava production is not just a source of food but also a source of income. An oil spill that damages or destroys cassava crops can have devastating economic consequences for local communities. Farmers may struggle to recover financially, especially if they rely heavily on cassava farming for their livelihoods.

Health Concerns

Oil spills can pose health risks to farmers and their families. Exposure to contaminated soil, water, and air can lead to various health problems, including respiratory issues, skin irritation, and long-term health effects. This perception of health risks may further exacerbate the anxiety and stress experienced by farmers.

Environmental Concerns

Beyond the immediate impact on cassava production, farmers may also be concerned about the broader environmental consequences of oil spills. They may worry about the contamination of water sources, damage to ecosystems, and the long-term effects on biodiversity and natural resources.

The perception of local communities' farmers towards oil spills and their impact on cassava production is likely to be negative, reflecting the serious challenges and risks posed by environmental disasters in agricultural settings. Effective response, cleanup, and support measures from authorities and organizations can help mitigate these concerns and support the recovery of affected communities.

The economic impact of an oil spill on a community's farmers and their cassava production can be profound, echoing far beyond the immediate aftermath of the disaster. When the dark tide of oil sweeps across the land, it doesn't just stain the soil—it leaves an indelible mark on the livelihoods of those who depend on the earth for their sustenance.

For the community's farmers, whose hands toil tirelessly in the fields to nurture their cassava crops, an oil spill represents more than just a temporary setback—it's a threat to their very means of survival. As the oil seeps into the soil, it suffocates the delicate balance of nutrients that sustain the cassava plants, stunting their growth and diminishing their yields. What was once a source of abundance and prosperity has become a battleground, where farmers must wage a daily struggle against the encroaching tide of contamination.

MATERIALS AND METHODS

Study Area

Oguta Local Government Area is located in Imo State, which is in the southeast of Nigeria. It is surrounded by several Local Government Areas, including Ohaji/Egbema to the west, Oru East to the north, and Ngor Okpala to the east. It has an estimated area of 484.58 km2 and a population of 142,340 persons (Udoka *et al.*,, 2016). Because of its proximity to the Imo River and Oguta Lake, the landscape is characterized by a combination of lowland plains, riverine areas, and wetlands. The region is renowned for having a diverse range of wildlife, including plant and animal species. The latitude and longitude of Oguta Local Government is approximate: latitude: 5.7083°N and longitude: 6.8144°E. Two significant water bodies, Oguta Lake and the Imo River, have a major impact on the drainage system in the Oguta Local Government Area. Located in the northern region of Oguta Local Government Area, Oguta Lake, commonly referred to as "Oguta Blue Lake," is one of Nigeria's largest natural lakes. It is a freshwater lake and serves as a vital source of water for irrigation, fishing, and domestic use for communities around its shores. The lake and its associated wetlands contribute to the overall drainage pattern of the area. Additionally, there may be smaller streams, creeks, and marshlands scattered throughout the local government area, further contributing to its drainage network.

The research area is located in the hydrological province of southern Nigeria's coastal sedimentary lowlands, which has two different seasons: the wet and the dry. The majority of the four rivers that pour into Oguta Lake are the Njaba, Awbana, Utu, and Orashi (Ahiarakwem & Onyekuru 2011). While the perennial Utu Stream empties into Oguta Lake during the rainy season, the Njaba and Awbana Rivers discharge into the lake year-round. In the southwest of the lake, the Orashi River passes by. It was calculated that the yearly total inflow from the rivers and streams would be approximately 25,801.60 m3. The anticipated annual recharge of the lake from precipitation is approximately 693,000 m3, whereas the annual return and overland flow into the lake are around 69,000 and 138,000 m3, respectively. The projected yearly inflow of groundwater into the lake is 2,750,400 meters. Therefore, the total annual input of water substantially exceeds the entire annual outflow. According to these figures, Oguta Lake receives sufficient recharging throughout the year (Udoka *et al.*,, 2016). Ofomata (1975) classifies the land surface of southeastern Nigeria into three namely: the

plains and lowlands (including the river valleys), cuesta landscapes and highlands. According to Ofomata, the plain is the predominant feature in the region resulting from alternating gradational and denotational activities. The cuesta landscape consists of the Nsukka-Okigwe cuesta and the Akwa-Orlu uplands. The Akwa-Orlu uplands are the scene of intensive gully erosion while the Nsukka-Okigwe cuesta is a result of differential resistance to erosion of the different rock components of the area. The highlands are the western extension of Cameroon mountain range, which is made up of a series of crystalline and recent volcanic rocks.

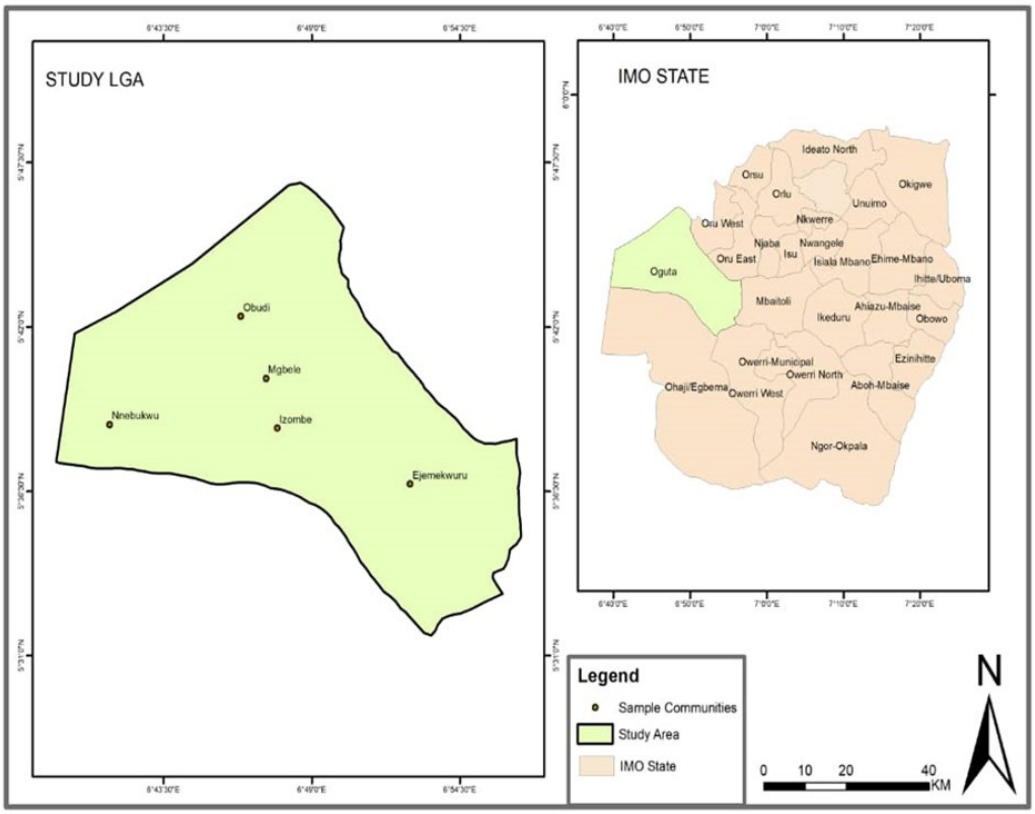

Figure 1: Map of Imo State Showing Oguta Local Government with Sample Communities (Study Area)
Source: GIS Lab. Geography & Environmental Studies Department, Ignatius Ajuru University of Education, Rumuolumeni, Rivers State

Data Collection and Processing

The data collection process for this study involved a combination of primary and secondary sources to ensure comprehensive coverage of the research topic. Primary data were gathered through direct observations, structured questionnaires, interviews, and fieldwork. Direct observations were conducted to visually assess the environmental impact of oil spills on cassava production. The self-designed questionnaire, titled "Perceived Impact of Oil Spill on Cassava Production Questionnaire (PIOSCPQ)", was utilized and divided into two sections; demographic information of the respondents and responses of respondents' feelings and opinions regarding the impact of oil spills, using a 4-point Likert scale. Additionally, semi-structured interviews were conducted with selected cassava farmers to gain deeper insights into their experiences and perceptions of the environmental impacts of oil spills. Fieldwork involved collecting soil and water samples from affected cassava farmlands for laboratory analysis to corroborate the survey data. Secondary data involved a comprehensive review of existing literature such as textbooks, journals, government reports, professional manuals, academic thesis and dissertations, and articles from magazines and newspapers. Data from the National Population Commission Publications (1941, 1976, and 2006) were used to contextualize the population and socio-economic conditions of the study area. A purposive sampling technique was employed to select respondents from the study area. This method was chosen due to the sensitive nature of the research and the need to engage directly with cassava farmers impacted by oil spills. The sample consisted of 219 respondents, predominantly cassava farmers from the most affected communities in Oguta Local Government Area. The study area was divided into impacted and non-impacted communities based on the presence of oil spill incidents, with a focus on communities predominantly engaged in cassava farming and significantly affected by oil spills. Table II shows the location characteristics of sampling points. The sample size was determined using Krejcie & Morgan's 1970 Statistical formula:

The formula is as follows:

$$N = n = E2 + Z2 \times p \times (1-p) \quad (1)$$

$$NZ2 \times p \times (1-p)$$

Where:

- n = required sample size
- Z = Z-score corresponding to the desired confidence level (e.g., for a 95% confidence level, = 1.96Z = 1.96).
- p = estimated proportion of the population that possesses the attribute of interest
- E = desired margin of error (expressed as a proportion)
- N = population size

For this study, the research was limited to five (5) communities where the sample points were preached in the study area. The five communities were those predominantly into cassava farming and who, from the research work, were confirmed to have suffered various forms of oil spill necessitating this research. The affected communities in this category are shown in Table 1 and the location characteristics are shown in Table 2

Table 1: Sampled Communities in Oguta L.G.A Impacted by Oil Spill

S/N	Community	Oil Spill Impacted	Cassava Farming Impacted
1	Obudu	Yes	Yes
2	Mgbele	Yes	Yes
3	Nnebukwu	Yes	Yes
4	Izombe	Yes	Yes
5	Ejemekwuru	Yes	Yes

Table 2: Location Characteristics of Sampling Points

S/N	Community	Latitude (N)	Longitude (E)
1	Obudu	5.54780	6.89410
2	Mgbele	5.68090	6.84780
3	Nnebukwu	5.70180	6.78820
4	Ejemekwuru	5.59320	6.92230
5	Izombe	5.63440	6.85920

The collected data were processed and analyzed using several steps, initially, raw data from questionnaires and interviews were checked for completeness and accuracy. Incomplete or inconsistent responses were discarded. Cleaned data were then entered into the Statistical Package for Social Sciences (SPSS) software, version 2023, for analysis. Basic statistical measures such as mean, standard deviation, and frequencies were computed to summarize the demographic characteristics of the respondents and their perceptions of the environmental impacts of oil spills. Pearson's Product-Moment Correlation (PPMC) was used to test the relationships between oil spill incidents and various perceived impacts, such as soil degradation, yield reduction, and disruptions to farming activities. The significance level was set at 0.05, the correlation results were interpreted to understand the strength and direction of the relationships between oil spills and their perceived environmental impacts on cassava farming. Additionally, interview data were transcribed and analyzed thematically to identify common themes and insights related to the farmers' perceptions and experiences.

RESULT AND DISCUSSION

The result analysis is categorized into three sections: demographic analysis of respondents; perception of local communities, and farmers regarding the environmental impact of oil spill associated with cassava production, and Hypothesis result.

Respondents Demographic Analysis

This research included three demographic variables. They were: Gender, Age, and Work Experience. The findings in the tables below reflects distribution according to demographic variables of the sampled individuals.

Table 3: Gender Profile of the Respondents

Variable	Frequency	Percent %
Male	84	42.63
Female	113	57.36
Total	**197**	**100**

Source: Researcher's Field Survey 2023

Gender of Respondents

Table 3 reveals that 84 (42.83%) of Respondents were males, while 113 (57.36%) were females. It indicates female respondents were more interested in the research than male respondents were.

Table 4: Occupation Profile of the Respondents

Variable	Frequency	Percent %
Cassava farmers	145	73.60
Civil servants	52	26.39
Total	**197**	**100**

Source: Researcher's Field Survey 2023

Occupation of Respondents

Table 4 reveals that 145 (73.60%) of Respondents were cassava farmers while 52 (26.39%) were civil servants. It indicates cassava farmers' respondents were more interested in the research than the civil servants were.

Table 5: Educational Qualification Profile of the Respondents

Variable	Frequency	Percent %
FSLC	110	55.83
First degree	54	27.41
Post graduate	33	16.76
Total	**197**	**100**

Source: Researcher's Field Survey 2023

Educational Qualification of the Sample

Table 5 shows 110 respondents (55.83%) FSLC; 54 respondents (27.41%) first degree; 33 respondents (16.76%) respondents post graduate degree holders.

Table 6: Age Profile of the Respondents

Variable	Frequency	Percent %
30-35	110	55.83
36-55	54	27.41
65 and above	33	16.76
Total	**197**	**100**

Source: Researcher's Field Survey 2023

Table 6 shows 110 respondents (55.83%) aged 30-35 years; 54 respondents (27.41%) aged 36-55years; 33 respondents (16.76%) respondents (8%) aged 65 and above.

Perception of Local Communities, Farmers Regarding Environmental Impact of Oil Spill Associated with Cassava Production

What are the perceptions of local communities, farmers, and stakeholders regarding the environmental impact of oil spill incidents associated with cassava production in Oguta Local Government Area? Table 7 shows responses to perceptions of local communities, farmers and stakeholders regarding the environmental impact.

Table 7: Responses on perceptions of local communities, farmers and stakeholders regarding the environmental impact of oil spill incidents associated with cassava production in Oguta Local Government Area

Response	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Agree	108	56.25	56.25	56.25
Agree	42	21.31	21.31	21.31
Disagree	27	13.70	13.70	13.70
Strongly Disagree	20	08.74	08.74	08.74
Total	**197**	**100**	**100**	**100**

Source: Researcher's Field Survey 2023

The above table reveals the responses given concerning perceptions of local communities, farmers, and stakeholders regarding the environmental impact of oil spill incidents associated with cassava production in Oguta Local Government Area. Of the 197 respondents, 108 respondents representing 56.25% gave a strongly agree response that oil spill directly correlate with environmental impacts on cassava production in the study area. Similarly, 42 respondents representing 21.13% agreed that oil spill affects the environment of cassava production in the study area. However, 27 representing 13.70% disagreed with the fact that oil spill propels environmental impacts in the study area. This was followed by 20 respondents representing 8.74% who strongly disagreed that oil spill correlates with environmental impacts in Oguta Local Government Area.

Hypothesis Result

The study was tested using Pearson's Product Moment Correlation Coefficient with the aid of SPSS, version 20.0. Dana's (2001) correlation decision framework was used to interpret the outcomes of the tested hypotheses. The correlation decision framework includes;

a) 0.00 – 0.19 (very weak)
b) 0.20 – 0.39 (weak)
c) 0.40 – 0.59 (moderate)
d) 0.60 – 0.79 (strong)
e) 0.80 – 0.99 (very strong)
f) 1 (perfect).

Ho1

There is no significant relationship between the perceptions of local communities, farmers, and stakeholders regarding the environmental impact of oil spill incidents associated with cassava production in Oguta Local Government Area.

Table 8: The Descriptive Statistics

Variables	Mean	Standard Deviation
Environmental impact	0.1384	0.107
Oil spill	13.233	1.017
Error Term	0.5242	0.138

The result of the descriptive statistics provided the mean and standard deviation for each variable from oil spill directly correlating with the environmental impact associated with cassava production in Oguta Local Government Area.

From the values of Table 8, the mean value of the oil spill in directly correlation with environmental impacts on cassava production in Oguta Local Government Area is 0.1384 and with a standard deviation of 0.107. Oil spills gave a mean value of 13.233 and a standard deviation of 1.017. The table also indicated a difference between the mean value of changes in production and error term as 0.5242 and 13.233 respectively; while, the standard deviation of error term is 0.138.

Table 9: Correlation

Variables	Pearson Correlation	Significant
Environmental impact	0.728	0.000
Oil spill	0.500	0.000

Table 9 indicated a significant relationship in the oil spill incidences directly correlating with environmental impacts in cassava production in Oguta Local Government Area.

Table 10: Regression Analysis

Variables constant	**Standard Error**	**Beta**	**T-value**	**P-value**
Environmental impacts	0.009	0.023	2.002	0.005
Oil spill	0.021	-0.031	-1.004	0.500
Other values of Regression Analysis				
Statistics			**Value**	
R2			0.761	
Adjusted R2			0.723	
Values Explained by other variables			23.9%	
F-Statistics			80.109	
Prob (F-Statistics)			0.000	

The above regression analysis result reveals the oil spill incidences in direct correlation with environmental impacts associated with cassava production in the Oguta Local Government Area are positively related. R2 reveals that only 76.1% of variations in the independent variable of changes in cassava production in the study area are explained by the variations in the dependent variable of oil spills. This implies that the remaining 23.9% is explained by other variables not included in the model. Hence since the explanation variable is greater than 50%, it shows that the model has a good fit. The adjusted R2 value of 72.3% is slightly below the R2 of 76.1%. The model's validity is demonstrated by F-statistics, whose value of 80.109 is significantly higher than its Prob (F-statistics) value of 0.000. Therefore, we assume in our first hypothesis above that there is no meaningful relationship between the environmental implications of cassava cultivation in Oguta Local Government Area and the incidence of oil spills. The correlation result indicates a strong positive correlation of 0.728, with a p-value of 0.500 significant at only 0.05%. This means that the environmental problems inherent in the production of cassava in Oguta Local Government Area will rise with the amount of oil spilled. Therefore, the null hypothesis is rejected, while the alternative hypothesis is accepted. Thus, we could state that there is a significant relationship between oil spill incidences directly correlating to environmental impacts associated with cassava production in Oguta Local Government Area.

CONCLUSION

The result shows there is a significant relationship (r= 0.761) between oil spills and environmental impacts on cassava production in Oguta Local Government Area of Imo State. The study found that both farmers and the public perceive oil spills as severely detrimental to soil fertility, water quality, air quality, biodiversity, and community health. Soil degradation and reduced agricultural productivity, water contamination affecting drinking and irrigation sources, air pollution leading to respiratory health risks, and biodiversity loss disrupting ecosystems were major concerns. Additionally, the psychological stress of living in oil-affected environments was noted. These findings underscore the urgent need for proactive measures, including stricter regulations, effective cleanup and remediation efforts, and sustainable agricultural practices, to address and mitigate the environmental health impacts of oil spills, necessitating collaboration among farmers, government agencies, environmental organizations, and the public.

RECOMMENDATION

The following recommendations were advised by this study:

i. Implement robust environmental protection measures to prevent oil spill incidents in cassava production areas. Strengthen regulatory oversight and enforcement mechanisms to hold oil companies accountable for environmental violations. Invest in monitoring, surveillance, and early warning systems to detect and respond to oil spill incidents promptly.

ii. Promote sustainable agricultural practices that enhance soil health, water quality, and ecosystem resilience in cassava production areas. Encourage the adoption of agro ecological techniques, organic farming methods, and soil conservation practices to mitigate the impacts of oil contamination on cassava cultivation. Provide financial assistance, technical support, and capacity-building programmes to cassava farmers affected by oil spill incidents.

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