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Residents' Perceptions of Dredging Activities in Chokocho Community, Etche Local Government Area, Rivers State, Nigeria.

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ABSTRACT

The removal of underwater sediments such as sand and silt can stir up and resuspend materials that may contain pollutants accumulated on the seabed. These activities can significantly affect water quality, often leading to pollution through sediment dispersion and contaminant release, thereby affecting people's livelihoods. The study aimed at examining residents' perceptions of dredging activities in Chokocho Community, Etche Local Government Area, Rivers State. Using a cross-sectional survey design, the study reports questionnaire responses from 249 retrieved questionnaires, supplemented by interviews and observation. The findings showed that dredging activities have led to the death of fish and have made the water unsuitable for drinking and other recreational activities. It was further affirmed that water pollution resulting from dredging has greatly affected people's livelihoods, as most respondents reported reduced fish catches, lower daily profits, and longer travel distances to reduce the negative effects of dredging on fishing activities. It was recommended that the government regulate dredging activities by restricting dredgers from operating in fishing communities.

KEYWORDS: Dredging, Livelihood, Chokocho, Pollution, Perceptions.

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1. Introduction

Nigeria is rich in various mineral resources, such as oil, natural gas, coal, tin, limestone, and iron ore (Taiwo & Omotehinse, 2022). Additionally, the country's diverse geology supports significant sand formations critical for construction and infrastructure development. These minerals play a vital role in the Nigerian economy, enhancing sectors like energy, mining, and construction. As mining profitability in Nigeria rises, the economy benefits through job creation, infrastructure development, and increased government revenue for public services (Melodi et al., 2022). With the growing number of construction projects in Nigeria, there is a higher demand for sand, leading to more dredging sites established across the nation. Nowadays, dredging has turned into a popular business in Nigeria, attracting numerous investors (Chuka et al., 2022). Dredging refers to the global practice of extracting sediment from bodies of water, such as seas, rivers, or lakes, and relocating it elsewhere. This process also aims to deepen these areas to facilitate navigation and support construction needs. Typically conducted underwater in shallow waters or freshwater areas, dredging involves gathering bottom sediments and widening channels (Ogbu et al., 2018). This method not only helps maintain navigable waterways but also creates clear paths for vessels. Additionally, dredging can be employed to replenish sand on public

beaches that have eroded over time. Certain dredging techniques are also used in fishing to catch edible clams and crabs. However, harmful substances like heavy metals can become trapped in seabed sediments. The processes of dredging and disposal may release these toxins into the water, which can then be absorbed by marine life (Osu et al., 2014). Environmental issues arise when the extraction of gravel, sand, and other sediments outpaces natural replenishment processes. Therefore, the primary goal is to ensure waterways remain accessible (Mmom & Chukwu, 2011; Adebimpe & Oladejo, 2012; Podila, 2017). Moreover, sand dredging should undergo an environmental impact assessment (EIA) in affected areas or local communities (Podila, 2017) to allow sediment excavation while minimizing degradation and erosion at the site. The extraction of sand poses significant challenges to riverbeds, highlighting the lasting effects of ongoing sand dredging on river ecosystems (Ugbebor & Ntesat, 2019).

For a long time, Nigeria has seen noticeable extractive activities. Along the coast of the River Niger and the Niger Delta creeks, artisanal sand mining has been happening for many years. In Rivers State, many coastal communities have been overwhelmed by the actions of sand miners aiming to meet the building demands of developers in and around the Etche Local Government Area. Sand extraction occurs continuously, often without considering its environmental impact. This has led to serious ecological problems, including the disruption of local livelihoods and ecosystems, harm to marine life, deterioration of access roads at mining sites, and the ongoing deepening and widening of rivers. These activities commonly cause land degradation, damage to riverbeds, a decline in the area's natural beauty, a loss of agricultural land, and the destruction of riparian habitats. The rise of sand dredging machines, or suction pumps, in the sand mining business has generated serious worries for both the environment and the people reliant on it. These dredging practices usually take place without proper regulation and disregard for legal standards. This situation persists, as communities hosting these dredging operations seem powerless, struggling due to the lack of land ownership rights in Nigeria. However, in the Chokocho Community, while the sand dredging is essential for projects like keeping waterways navigable and reclaiming land, it also brings serious environmental and social issues. The process of sand dredging can harm ecosystems, disrupt local economies, and potentially cause erosion and degrade water quality.

It is against this backdrop the study examined residents' perceptions of dredging activities in Chokocho Community, Rivers State, Nigeria.

Thus, the study aimed at examining the Residents' perceptions of dredging activities in Chokocho Community, Rivers State. The objectives of the study are to; (1) investigate the perceptions of the residents on the impacts of dredging activities on the water and surrounding environment in Chokocho Community, Rivers State. (2) investigate the residents' perceptions on the effects of dredging activities on their livelihood. (3) ascertain the mitigation measures on dredging activities in Chokocho Community, Rivers State.

2. Literature Review

In the study conducted by Udoinyang *et al*. (2023), the focus was on the environmental hazards caused by sand dredging in the Eleme Local Government area of Rivers State, Nigeria, specifically using Aleto River as a case study. The research aimed to explore the connection between sand dredging and environmental risks. Utilizing a survey based on a 4-point Likert scale, the researchers applied the Taro Yamane formula to obtain a sample size of 400, with 386 responses collected. The methodology involved purposive sampling techniques for this investigative project. Findings indicated that sand dredging brings numerous environmental threats, such as damaging homes, reducing farmland, causing bridge destruction, claiming lives, harming local roads, and creating conflicts between local farmers and sand miners, leading to land degradation. The study suggested that environmental agencies should enhance and establish strict, enforceable regulations for managing the sand dredging and small-scale mining sectors. Additionally, it was recommended that various villages, clans, and municipalities should develop, supervise, and enforce bylaws, potentially requiring the implementation

of reclamation strategies and bonds. To lessen the environmental hazards linked to sand dredging in Eleme LGA, the study concluded that the government ought to adopt these recommendations.

Ohaeri *et al*. (2021) examined the environmental effects of sand mining on certain coastal communities within Port Harcourt Metropolis, Nigeria. The goal of this research was to evaluate how sand mining activities impact the environment in these coastal regions. Three communities, Choba, Abuloma, and Chokocho, were chosen for their convenient access to waterfronts and the frequent complaints from residents due to significant environmental degradation. The study employed formal interviews with sand mining operators and other stakeholders, along with distributing questionnaires to gather data about the characteristics of these activities in the selected communities. Results showed that sand mining had serious consequences including soil erosion, road damage, loss of vegetation, and noise pollution within these coastal areas. Specifically, Choba experienced soil erosion at a rate of 27%, Abuloma reported noise pollution at 33%, and Chokocho identified soil erosion as a major impact at 32%. Thus, the study highlighted that despite its economic benefits, sand mining is causing more harm than good. Consequently, it was recommended that stringent environmental regulations must be established to monitor and mitigate these adverse effects.

Ugbebor and Ntesat (2019) conducted research on the Environmental Impact of Sand Dredging in the Otamiri River, particularly along the Chokocho-Etche Axis in Rivers State, Nigeria. They selected four key sites labeled A through D for a comparative analysis, with location A acting as the control point for the river. Various in-situ assessments were performed, measuring pH, temperature, flow velocity, water dimensions, total dissolved solids (TDS), total suspended solids (TSS), and electrical conductivity (EC). Additionally, heavy metal content was evaluated using a standard instrument known as an Atomic Absorption Spectrophotometer. The findings revealed an average pH of 5.70, which suggested the water was slightly acidic and above the acceptable range set by the WHO of 6.5-8.5. During the wet season, TDS levels at sites A-D varied from 1350.8 mg/l to 1780.9 mg/l, while in the dry season, they ranged from 1225.8 mg/l to 1658.2 mg/l, both surpassing the WHO recommended limit of 1000 mg/l for drinking water. The average concentrations of Zinc (Zn) in the water samples collected from A-D during both seasons were between 4.34±0.38 mg/l and 5.33±0.48 mg/l, with Copper (Cu) ranging from 2.84±0.13 mg/l to 3.67±0.40 mg/l, Iron (Fe) between 2.64±0.29 mg/l and 3.19±0.24 mg/l, and Lead (Pb) from 0.16±0.01 mg/l to 1.04±0.63 mg/l. The analysis indicated that metal enrichment followed the order Zn>Cu>Fe>Pb, with all values exceeding WHO safe limits: zinc at 3 mg/l, copper at 2 mg/l, iron at 0.3 mg/l, and lead at 0.01 mg/l. The researchers recommended that sand dredging should occur far from residential areas and only after an approved Environmental Impact Assessment (EIA).

In a different study, Nze *et al*. (2018) focused on the Effects of Dredging Operations on Fishing Sites in Nigeria's Niger Delta Basin. They investigated both the ecological and economic consequences of dredging on fishing sites within this region. Data obtained from secondary sources underwent thorough empirical analysis, leading to the conclusion that dredging operations notably impact fishing sites. The extent of these effects was reflected in the economic damage incurred, the number of affected fishing sites, and farmlands due to dredging activities. Ultimately, the study emphasized that while dredging is crucial for the area's economic sustainability, it is essential to conduct regular assessments before such operations. This would ensure dredging is carried out in an environmentally responsible manner, adhering to international standards to prevent ecological disruption in the basin.

Adesina and Adunola (2017) explored the perceived impact of sand dredging on the livelihood diversification of artisanal fishermen in Lagos State, Nigeria. Their research focused on how sand dredging affects the ability of these fishermen to diversify their sources of income. To select participants for the study, a multi-stage sampling method was employed. Specifically, the local government areas (LGAs) of Eti Osa, Ibeju Lekki, Epe, and Ikorodu were chosen due to their significant sand dredging operations. According to their data, the number of registered artisanal fishermen in these LGAs were 310, 350, 380, and 320, respectively. From each LGA, 20% of the population was randomly selected, resulting in 272 respondents who were interviewed. An interview schedule was used to gather information on the socio-economic characteristics of the respondents, their knowledge of sand dredging, their diversification of livelihoods, and their views on how sand dredging impacts fishing. The information was analyzed through descriptive statistics, Pearson Product Moment Correlation, and independent sample t-tests. Findings indicated that the average age of the fishermen was 37 years (± 8), with 92.1% being male and 81.4% married, in households ranging from 1 to 16 individuals. More than half (over 50%) of the respondents lacked formal education. Their monthly income varied between

₦5,000 and ₦60,000, averaging ₦22,892 (± 13,564), while a majority (92.9%) were part of social groups. Most participants had diversified into off-farm jobs such as commercial bike riding, security services, and technical work. Just over half (55.7%) believed that sand dredging negatively affects fishing activities. The statistical analysis revealed significant connections between knowledge of sand dredging and its impact on fishing ($r = 0.35$), monthly income ($r = -0.181$), and membership in social groups ($\chi 2 = 2.886$) with the perceived effects of sand dredging. They recommended that targeted policies should be developed to address sand dredging issues, to limit its adverse impacts on the livelihood diversification of artisanal fishermen. This approach would ultimately improve the contribution of artisanal fisheries to the overall Gross Domestic Product (GDP), job creation, and total domestic fish production.

Adekunbi *et al*. (2018) conducted a study on the effects of sand dredging on both the ecosystem and the local community in the Ibeshe region of Nigeria's Lagos Lagoon. The research focused on understanding how sand dredging impacted the coastal environment and the people living there. To gather data, researchers took samples of surface water and bottom sediments from two distinct areas of the lagoon: the dredged Area (DA) and the Undredged Area (UA). They also distributed questionnaires to local residents and sand miners to gauge their views and experiences. The findings revealed notable differences in the quality of water and sediment between the Dredged and Undredged areas. Additionally, there was a strong connection identified between sand dredging and detrimental ecological practices in Ibeshe. A one-way ANOVA test showed that, apart from turbidity and nitrate levels, there were no significant differences in water quality parameters between the two areas ($P > 0.05$). Similarly, sediment parameters, except for moisture content, did not show significant variation ($P > 0.05$) when comparing Dredged and Undredged areas. The study further explored how dredging affected local fisheries and fishing businesses. Results indicated that increased turbidity due to dredging could harm fish populations, and the community displayed a lack of concern for conservation, largely due to ignorance. Overall, sand dredging operations were found to adversely affect both the ecological resources and the water quality in the region. The study recommended stricter regulations and enforcement to help mitigate environmental damage and address the challenges faced by the lagoon ecosystem.

3. Materials and Methods

3.1 Study Area

The research area is located in Chokocho, which is part of the Etche Local Government Area in Rivers State. This local government is bordered to the north by Imo State, to the east by Omuma and Abia State, to the south by the Oyigbo and Obio/Akpor Local Government Areas, and to the west by the Ikwerre Local Government Area within Rivers State. Geographically, the area is found between the coordinates of latitude 04° 55’ 0”N to 05° 12’ 0”N and longitude 06° 55’ 0”E to 07° 15’ 0”E. Within this local government area, there are numerous communities, such as Ulakwo, Egwi, Odogwa, Ozuzu, Umuaturu, Okehi, Igbodo, Umuechem, Ndashi, Obite, Abara, Okomoko, Afara, Igbo, Umuola, and the focus community, Chokocho. The region is primarily agricultural, with activities that include logging for firewood, charcoal production, and various plantations meant for both local use and commercial sale. The Otamiri River serves as the main water source for the area. Chokocho community is positioned east of the Otamiri River, with its coordinates being between Lat. 4° 55’ 0”N and Lat. 5° 0’ 0”N as well as Long. 7° 0’ 0”E and Long. 7° 5’ 0”E. This location is marked by the impact of local sand mining or dredging, haphazard disposal of dredged materials at the study site, along with agricultural practices. Additionally, the soil composition consists of alternating layers of sand, sandstone, and clay-shale (Uma & Kehinde, 2009).

3.2 Research Design

The study adopted cross-sectional type of descriptive design. Thus, Oyegun (2003) stated that descriptive Survey involves collecting data on; and describing in a systematic manner the characteristics and facts about a given population. This type of design is applied in describing or explaining a situation/event or area of interest systematically, factually and accurately. The study applied a cross-sectional survey to gather data from the residents of chokocho community and those involved in dredging activities in the area through the use of Likert type of questionnaire. Also, key person interview and observation technique were applied for field data collection. Thus, from the 2006 population of the study area as projected, and by the application of Taro Yamane formula, the sample size for the study

was 264. With this sample size, different households in the study area were divided into stratum (stratified random sampling) for the proportionate questionnaire administration in assessing their perceptions on the subject of interest. The questionnaires were retrieved after one week in order to allow free expression and to avoid undue pressure on the respondents. The collected data was analysed by the use of descriptive statistical tools such frequency distribution and percentages. The analysed data were presented by the use of tables, bar charts and pie charts.

3. Results and Discussion

Table 1. Questionnaire Distribution and Retrieval.

QUESTIONNAIRE	FREQUENCY	PERCENT (%)
Administered	264	100
Unretrieved	15	5.682
Retrieved	249	94.318
Total	264	100

Source: Researcher's Fieldwork, 2026.

Table 1 presents the questionnaire distribution and retrieval. Here is the information on the questionnaire that was administered to the respondents in the study area to assess their perceptions on dredging activities in the study area. From the table, 264 (100%) copies of the questionnaires were administered, 15 (5.682%) copies were retrieved and the remaining 249 (94.318%) were retrieved and used for the computation.

Table 2. Sex of Respondents.

RESPONSE	FREQUENCY	PERCENT (%)
Male	208	83.53
Female	41	16.47
Total	249	100

Source: Researcher's Fieldwork, 2026.

Table 2 shows the sex of respondents in the study area. From the responses, 83.83% of the respondents were male while 16.47% were female. This shows the majority of the respondents were males.

Table 3. Age of Respondent.

RESPONSE	FREQUENCY	PERCENT (%)
Less than 35 years	49	19.68
36-50 years	114	45.78
51 years and above	86	34.54
Total	249	100

Source: Researcher's Fieldwork, 2026

Tabe 3 presents the age of the respondents. The age bracket of 36-50 years was 45.78%, 51 years and above was 34.54% while less than 35 years was 19.68%.

Table 4. Married Status of Respondents

STATUS	FREQUENCY	PERCENT (%)
Single	65	26.1
Married	168	67.5
Widowed	11	4.4
Others	5	2.0
Total	249	100

Source: Researcher's Fieldwork, 2026.

Table 4 shows the married status of the respondent in the study area. the majority (67.5%) are married, 26.1% are single, 4.4% and 2.0% are widowed and others respectively.

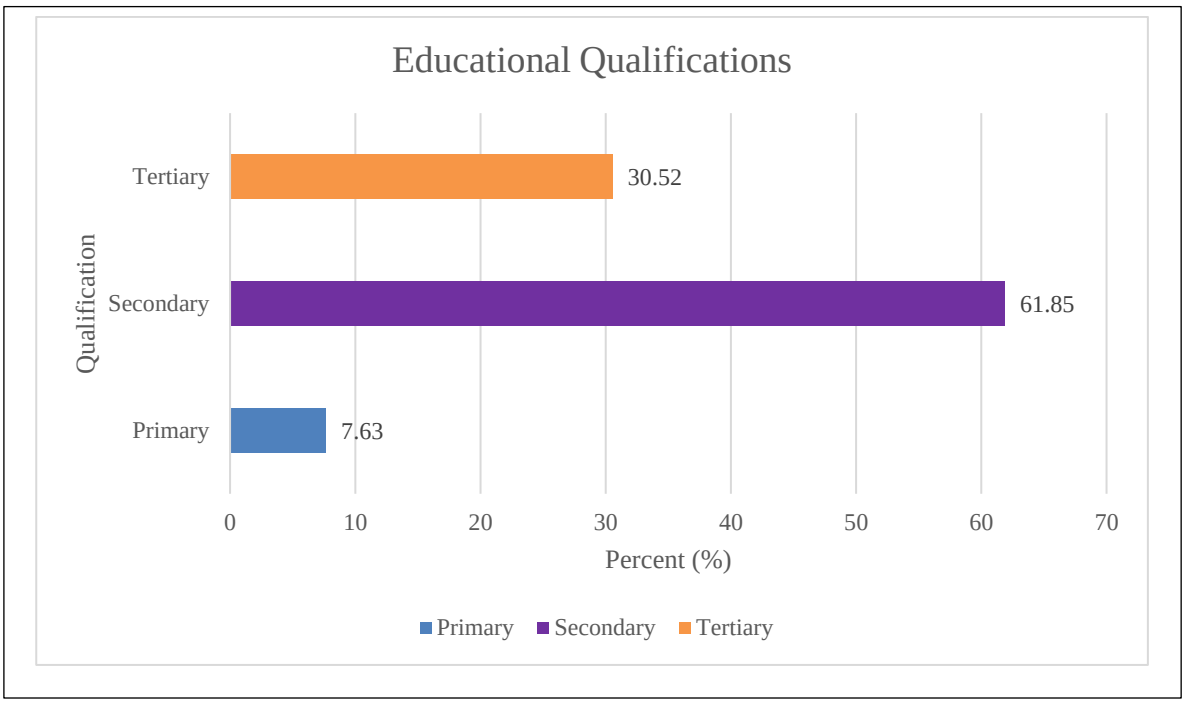


Figure 1: Educational Qualification of Respondents

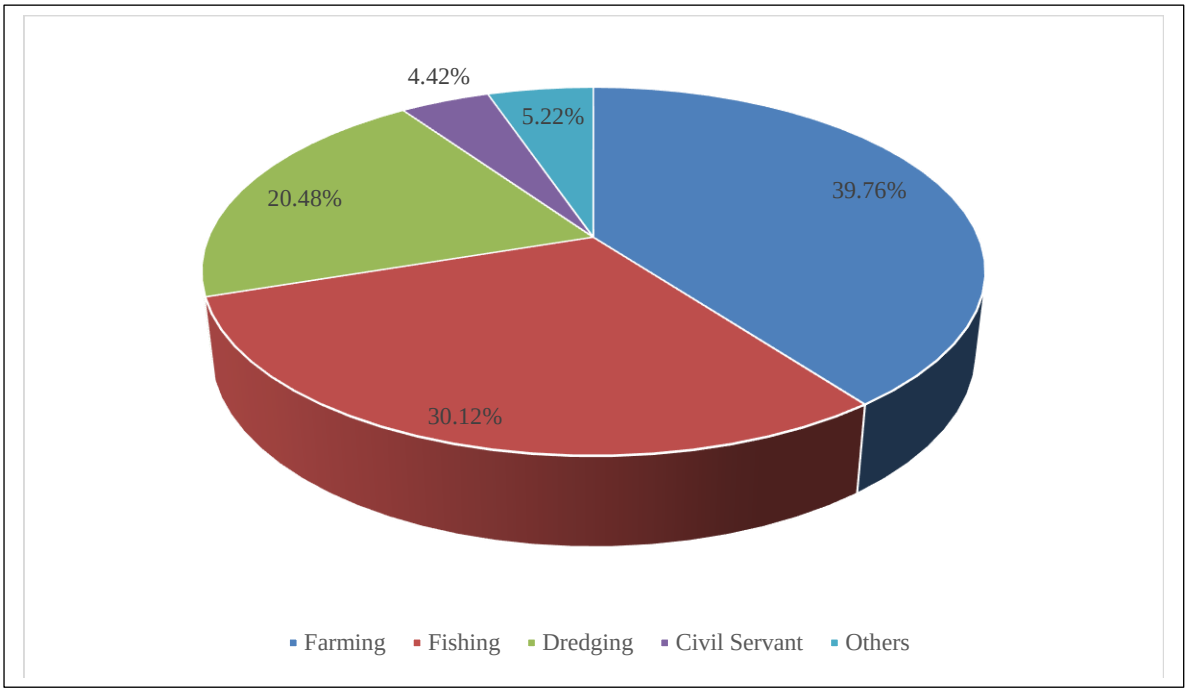


Figure 2: Occupation of Respondents

Source: Researcher's Fieldwork, 2026.

Figure 2 revealed the occupations of respondents in the study area. from the figure, 39.76% of the respondents are involved in farming, 30.12% are involved in fishing, 20.48% are dredgers, 4.42% are civil servant while the remaining 5.22% (others) of the respondents could be doing any other occupations that were not captured here.

Table 5. Response on Impact of Dredging on Water.

RESPONSE	YES	%	NO	%
Does dredging have negative impact on the water?	238	95.6	11	4.4

Source: Researcher's Fieldwork, 2026.

Table 5 revealed the response of the respondents on their perceived impact of dredging on the water. 95.6% affirmed that dredging activity have negative impact on the water while 4.4% said it does not.

Table 6. Response on Impact of Dredging on Fishes.

RESPONSE	FREQUENCY	PERCENT (%)
Dredging activities has led to death of fishes in the water and made the water unsafe for drinking		

SA A D SA	129 87 21 12	51.8 34.9 8.4 4.8
Total	249	100

Table 6 presents the response on impact of dredging on fishes. 86.7% of the respondent upheld that dredging activities has led to death of fishes in the river while 13.2% of the respondents disagreed.

Table 7. Response on the Impact of Dredging on the Environment.

RESPONSE	YES	%	NO	%
1.Does dredging have negative impact on the environment?	216	86.8	33	13.2
2. Does dredging increase flood and erosion in the area	213	85.5	36	14.5

Source: Researcher's Fieldwork, 2026.

Table 8 presents the impact of dredging on the environment. Thus, 86.8% of the respondent acknowledged that dredging impact negatively on the environment while 13.2% said no impact on the environment.

However, 85.5% of the respondents affirmed dredging activities to have led to increased flooding and erosion in the community as the remaining 14.5% of the respondents are of the opposite view.

Table 8. Response on Effects of Dredging on the People's Livelihoods.

RESPONSE	FREQUENCY	PERCENT (%)
There is reduction in fish catch and in turn, less profit because of the dredging in the river, and this has made the fishermen travel long distance in search of fishes.		
SA A D SA	135 78 24 12	54.2 31.3 9.6 4.8
Total	249	100
SA-Strongly Agree; A-Agree; D-Disagree; SD-Strong Disagree.		

Table 8 revealed the respondents' response on the effects of dredging on their livelihood.

Thus, 85.5% responded that dredging of the river affects their fishing business and that they have to go

long distance away from the dredged area before they could record some catch. However, 14.4% disagreed and said their livelihoods are not affected.

Table 9. Mitigation Measure on Dredging Activities in the Study Area.

MEASURES	FREQUENCY	PERCENT (%)
1. Compensation and livelihood restoration	59	23.7
2. Community Engagement	52	20.9
3. Habitat Restoration		
4. Timing Restriction	25	10.0
5. Rehabilitation of dredged sites	58 55	23.3 22.1

Source: Researcher's Fieldwork, 2026.

Table 9 presents the mitigation measures on dredging activities in the study area. As affirmed by the respondents; compensation and livelihoods restoration (23.7%), community engagement (20.9%), habitat restoration (10.0%), timing restriction (23.3%) as well as rehabilitation of dredged sites (22.1%).

4. Conclusion

The study concludes that dredging activities in the study area has impacted the environment as well as the livelihood of the people. As much as dredging has its own advantages such as clearing the water ways for easy navigation as well as for the accommodation of large volume of water resulting from run-off from the community, there are also environmental and social implications such as water pollution, erosion and loss of livelihoods of the people. Various mitigation measures have been spelt out to addressing the concern. These measures such as livelihoods restoration, community engagement, habitat restoration, timing restriction as well as rehabilitation of dredged sites if adequately put in place, could cushion the suffering of the people as well as restoring the environment to nearly its initial state.

5. Recommendations

It was recommended that the Government should regulate the activities of dredgers by restricting them to operate at non-fishing communities.

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