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Research Article

SOCIO-ECONOMIC DISASTER OUTCOMES OF ARTISANAL REFINING IN THE FRINGES OF IMO RIVER

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Abstract

Artisanal refining along the Imo River, Rivers State, Nigeria, presents a multi-dimensional socio-economic challenge. This study employed a mixed-methods design and the sample size was determined by using the Taro Yamane equation of sample size determination and a sample size of 400 was obtained. Descriptive statistics was used to summarized the data whereas Kruskal–Wallis H tests (χ^2) was adopted for analysis of social and economic disaster outcomes across communities. The results showed that 75.4% of the respondents were aware of artisanal refining in the area, and over 80% observed it "often" or "quite often," indicating entrenched activity pointing poverty (15.1%), unemployment (12.6%), economic incentives (18.1%), and multifactorial causes (27.6%) as major drivers of this hydra-headed issue. The inability of communities to tackle this matter decisively was influenced by fear (30.2%), economic benefits (22.6%), and grievance-related justification (15.1%) as captured in their responses. Social outcomes included crime escalation (WM = 3.18), youth restiveness (WM = 3.17), prostitution (WM = 3.16), and family disintegration (WM = 3.18) while the economic concerns were uniform: income loss (WM = 3.21), farmland destruction (WM = 3.19), loss of fisheries (WM = 3.20), and increased cost of living (WM = 3.17), with χ^2 tests confirming no significant inter-community differences ($p > 0.05$). On the basis of the findings, recommendations focused on integrated community development, corporate social responsibility, livelihood diversification, and coordinated regional interventions.

Keywords: Artisanal Refining, Disaster Outcomes, livelihood Diversification, Social Crises.

INTRODUCTION

Oil theft and illegal refining did not start today in the Niger Delta, rather it started around the late 1970s to early 1980s, during the military regime. It was carried out under the command of top military personnel who used it to enrich themselves and forcefully maintain political stability (Katsouris & Sayne, 2013). The emergence of illegal refining in the Niger Delta has been discussed by several schools of thought highlighting several factors that prompted this thriving business of oil theft and illegal refining in the Niger Delta region. According to Brock (2012), it was as a result of many years of neglect, marginalization, and underdevelopment of the region by the Federal Government and the Multinational Oil Companies (MNCs) operating in the area, including organized criminal groups, called oil bunkerers in our local parlance who specialize in stealing, illegal refining and transporting of Nigeria's crude oil to the international blackmarket. Some of the identified underlying causes of this scourge include poverty, corruption, unemployment, ineffective law enforcement and poor governance, inordinate ambition to amass wealth, poor policing /protection of oil pipelines, inadequate community participation in the management of resources in their communities, pollution of the environment, dearth of economic activities in communities, increasing criminality and insecurity of the coastline, flourishing of the oil black market in Nigeria and high foreign demand of Nigeria crude oil (Okere, 2013; Okoli & Orinya, 2013; Igbuku, 2014). However, the illegal activities took a new turn during the youth militancy agitation for resource control (Ikelegbe, 2005; Katsouris & Sayne, 2013). Initially, the agitation by the region's youths was primarily political with youths demanding an increase in the derivation fund (a specific percentage of oil rents accrued to the federal government), but when the government was unable to meet all their demands, many of these youths took up arms against the government and engaged in criminal activities such as kidnapping, destruction of oil facilities, oil theft and sea piracy (Ikelegbe, 2005; Katsouris & Sayne, 2013). Artisanal refining which is also known as illegal crude oil refining or oil bunkering is regarded as the activities or processes that include the theft of crude oil and its local refining, using resources found locally, traditional knowledge and skills, and little or no use of modern-day technology (Douglas, 2018). Some people believed that it was ethnic marginalization and neglect that were the major factors responsible for the spread and expansion of artisanal refining in the Niger Delta Region. Political exclusion/inequity was identified as a contributory factor. Incidentally, the host communities see illegal refining as expedient and justifiable, given the absence of gainful employment in the cities, towns, and rural communities of the region. The perpetrators of these illegal businesses boast that the security operatives cannot stop them andthat their products are as good as the imported or produced in the main refineries. Some of those interviewed on this said that the illegally refined petroleum products such as fuel, kerosene, and diesel support local demand and contribute to the sustenance of the Nigerian economy such that if they stop operation over a period of time, there would be an energy crisis in Nigeria as some of their products are also bought and distributed nationwide by tanker drivers and registered marketers (Resource Justice, 2017).

The Niger Delta region of Nigeria is the crude oil and natural gas hub of Nigeria with several networks of product pipelines (both surface and subsurface) criss-crossing the entire landscape which has created a social problem of vandalization of product pipelines and artisanal refining and the associated environmental hazards (Amangabara & Njoku, 2012). In Nigeria, over 90% of the nation's foreign exchange profits come from the exploration and exploitation of crude oil (Uma & Hajj-Ottman, 2017). Despite these huge foreign exchange profits, Romson (2022) and Ufuoma (2022) observed that approximately 250,000 barrels of crude oil are stolen daily in

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Nigeria with the majority sold internationally while about 25% stay in the Niger Delta for illegal oil refining and consumption. Artisanal refining emerged as a response to socio-economic challenges such as poverty, unemployment, and a lack of access to formal economic opportunities (Adekola & Mitchell, 2011). This activity involves the crude and often unsafe processing of oil using makeshift refineries, leading to significant environmental pollution and adverse health effects on surrounding communities (Sojinu & Ejeromedoghene, 2019). The widespread prevalence of artisanal refining has resulted in the pollution of air, water, and soil resources, posing severe risks to biodiversity and the health of local populations. The Imo River axis especially in Oyigbo, Omuma and Etche has become a hotspot for artisanal refining of crude oil, raising significant concern for the stability of communities and the broader environment. The activities of artisanal refining in riverine areas, especially around the Imo River region are greatly generating great volumes of wastes which are not properly managed and indiscriminately released into the environment. According to Osaji *et al*. (2022), the challenges experienced in the area ranges from infrastructural cum developmental neglects, poverty, loss of means of livelihood, health deterioration, to environmental degradation emanating from black soot. The deadly black soot surge observed to be caused by illegal oil bunkery remains a threatening experience faced by the people. Similarly, Ebegbulem *et al.,* (2013) asserted that activities of illegal oil refining contribute to depleted the fishing and farming output, resulting in the subsequent loss of income base, thereby accentuating poverty, which in turn created divisive tendencies leading to endemic social conflict. On the premise of the foregoing, this study was initiated to examine the community perception of the socio-economic disaster outcomes of artisanal refining in the communities along the Imo river in Rivers State, Nigeria.

MATERIALS AND METHODS

Study Area

The study area includes Etche, Omuma and Oyigbo Local Government Areas straddling the Imo River in Rivers state. The area is located within latitude 6° 58'N to 7°20'N and longitude 4° 48'E to 5°12'E (Figure 1). Omuma LGA occupies a total area of 170 sq. km with an estimated population of 171,832 inhabitants with majority of the dwellers being members of Etche ethnic group (Abbey & Onyebueke, 2020). The provisional boundaries of Oyigbo is about 247km^2. There are seventeen notable villages in Oyigbo with an estimated population of about 222,687 (NPC, 2006)· and because of its energy related industries it is apopular destination for immigrants (Udogu, 2005) whereas Etche LGA occupies a total area of 805 square kilometers and an estimated population of 249,454 people.The study area lies within the Wet equatorial climate; high cloud cover and fewer sunshine hours cause damp weather conditions throughout most parts of the year. The major vegetation in the study area comprises mangrove and freshwater swamp. The mangrove forest extends from Sapele (Delta state) connecting with the freshwater swamp some few kilometers inland, which in turn gives way to the rainforest inland (Ministry of Environment, 2003). The landform was created from accumulated marine and deltaic sediment over 50 million years ago in the upper Cretaceous period (UNEP, 2011). The sediments deposited by fluvial processes centuries ago led to the formation of a relatively flat alluvium basin like natural levees and ox-bow lakes (Shittu, 2014). The deltaic plain is flat lying at about 40m above sea level towards the interior, and less than 8m above sea level on approaching the coast (Shittu, 2014). A high rainfall regime, shallow aquifer, and flat topography cause perennial inundation when rivers overflow their banks. The UNEP (2011) reported that there is only one aquifer serving both shallow and deeper boreholes; the shallowest water table is about 0.7m below ground level while the deepest is around 14m below ground level. The National Population Commission data of 2006 for each of the LGAs was used as the base year and projected to 2024 using an annual growth rate of 3.2%. On the other hand, the Malthus Exponential Model was adopted to project the current population of the study areas. The formula for the Malthus Exponential Model is given thus:

$$P_t = P_o e^{r*t} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where P_t = Population to be projected, P_o = population of the base year; t = time, r = rate of increase (natural increase divided by 100), e= exponential factor and constant at 2.718. In order to obtain an optimum sample of the target population, the Taro Yamane (1967) formula for sample size determination was utilized;

$$n = \frac{N}{1 + N\,(e)^2} \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where: e= Level of precision (0.05),
N= Population,
n= Sample size,
1= Constant

A simple random sampling technique was adopted in the selection of 400 respondents leading to the design of 400 copies of questionnaire which were administered to households heads in the area to elicit relevant information for the study as indicated in Table 1.The resulting data were analyzed using descriptive statistics such as frequency counts, percentages and tables whereas the Kruskal Wallis H test (at 95% level of significance).

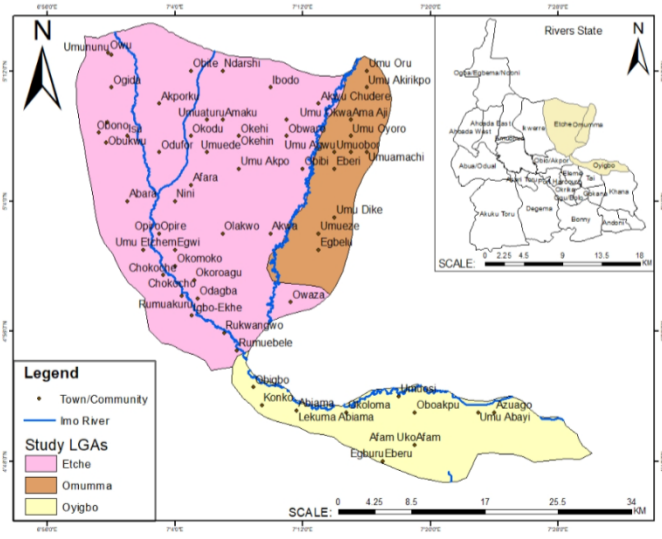

Figure 1. Study Area: Etche, Omuma and Oyigbo LGAs around Imo River

RESULTS

Table 1. Projected Population of the Study

LGA's Of Study	Sampled Communities	2006 Population (NPC)	Projected Population (2024)	Percentage in Projected Population	Questionnaire Proportion (Target Population)
Etche	Odagba, Igbo-Ekhe, Ogida, Elele, Rumuebele	249,936	444,886	52.5	210
Oyigbo	Obete, Okpontu, Nkpukpu, Ekerenta, Umuagbai, Mrihu	125,331	223,089	26.4	106
Omuma	Akwu-Chudere, Obibi, Umuobor, Obwaro, Umuokwa	100,366	178,652	21.1	84

Source: National Population Commission (2006)
Researcher's Fieldwork (2024)

Table 2. Respondents perception of the social disaster outcomes of artisanal refining activities among the communities in the study area

Social Disaster of Artisanal Refining Activities	SA (n/%)	A (n/%)	D (n/%)	SD (n/%)	Total (n/%)	WM
Crime began and became increased with the onset of artisanal refining	175 (44)	159 (40)	40 (10)	24 (6)	398 (100)	3.21
Young people started being in possession of weapons and cultist activities also started	167 (42)	155 (39)	48 (12)	28 (7)	398 (100)	3.16
Different cult groups began to spring up and fight over control of bunkering locations	159 (40)	167 (42)	48 (12)	24 (6)	398 (100)	3.16
Drug peddling and addiction set in among the youths	171 (43)	159 (40)	44 (11)	24 (6)	398 (100)	3.2
Young ladies got involved in prostitution	163 (41)	167 (42)	44 (11)	24 (6)	398 (100)	3.18
Increased cases of kidnapping and abduction related to artisanal refining	155 (39)	171 (43)	48 (12)	24 (6)	398 (100)	3.15
Breakdown of social order and communal trust due to illegal activities	167 (42)	159 (40)	48 (12)	24 (6)	398 (100)	3.16
Rise in school dropouts among youths engaging in artisanal refining	159 (40)	171 (43)	44 (11)	24 (6)	398 (100)	3.17
Family disintegration caused by the lure of quick money from artisanal refining	171 (43)	159 (40)	44 (11)	24 (6)	398 (100)	3.2
Increased clashes between communities and security agencies over artisanal refining activities	163 (41)	167 (42)	44 (11)	24 (6)	398 (100)	3.18

The responses in Table 2 reveal the perception among community members that artisanal refining activities have unleashed serious social disaster outcomes in their communities. Almost all the indicators show high proportions of respondents either strongly agreeing or agreeing with the listed outcomes, with weighted means (WM) clustering between 3.15 and 3.21. This indicates a high level of consensus that the effects of artisanal refining go far beyond environmental degradation, penetrating deeply into the social fabric of the communities. A large proportion of respondents (44% strongly agreed and 40% agreed) felt that crime began and escalated with the onset of artisanal refining. This suggests that the illegal oil business created new opportunities and incentives for criminality, including theft of crude oil, diversion of refined products and violent disputes over control of refining operations. This perceived rise in criminal activity is reinforced by 42% strongly agreeing and 39% agreeing that young people have increasingly acquired weapons and become involved in cultist activities. The overlap between cult groups and artisanal refining points to the emergence of organized networks that control territories and use violence to defend their economic interests. The perception that different cult groups have sprung up and are fighting over control of bunkering locations shows how artisanal refining has restructured the local power dynamics. Forty percent strongly agreed and 42% agreed with this, while only a small minority disagreed or strongly disagreed. This pattern indicates that artisanal refining has introduced a form of competition and conflict reminiscent of gang rivalries, destabilizing communities and undermining traditional authorities. Another significant outcome is the belief that drug peddling and addiction have set in among the youths. With 43% strongly agreeing and 40% agreeing, respondents are highlighting how the influx of easy money and exposure to criminal networks associated with artisanal refining encourage substance abuse and trafficking. This has serious implications for public health and for the prospects of young people in the area.

Social morality and gender dynamics are also implicated, with 41% strongly agreeing and 42% agreeing that young ladies have been drawn into prostitution as a result of the artisanal refining economy. This indicates that the social disruptions linked to illegal refining activities also increase vulnerabilities among women and girls, eroding family stability and exposing them to exploitation. The perception of increased cases of kidnapping and abduction related to artisanal refining underscores the extent to which insecurity has grown. Thirty-nine percent strongly agreed and 43% agreed on this point, suggesting that illegal refining networks have normalized violence and abductions as tools of control or retaliation. This climate of insecurity further isolates communities and discourages legitimate economic activity. Respondents also linked artisanal refining to the breakdown of social order and communal trust. Forty-two percent strongly agreed and 40% agreed that illegal activities had damaged traditional bonds, making people more suspicious of each other and weakening social cohesion. This breakdown is reinforced by the perception of rising school dropouts among youths engaging in artisanal refining, which 40 percent strongly agreed and 43 percent agreed with. This suggests that the lure of quick money is pulling young people out of school and robbing them of future opportunities. Family disintegration was another strong theme, with 43% strongly agreeing and 40% agreeing that the lure of money from artisanal refining had caused serious strain within households. This could be due to disagreements over the morality of participation, generational conflicts, or the destabilizing influence of sudden wealth and risk-taking behaviour.

Finally, increased clashes between communities and security agencies over artisanal refining activities also attracted high agreement levels (41% strongly agreed, 42% agreed). This reflects the adversarial relationship between local populations and state security forces who are tasked with shutting down illegal refineries, often leading to raids, arrests, or violent

confrontations. Taken together, these results show that residents perceive artisanal refining not only as an environmental and economic problem but also as a profound social crisis. Crime, cultism, drug abuse, prostitution, kidnapping, breakdown of communal trust, school dropouts, family disintegration, and violent clashes with authorities all form part of a complex web of social disaster outcomes. The uniformly high weighted means underscore the depth of community concern and the urgency of addressing artisanal refining not only with environmental policies but with social rehabilitation, education, and security strategies.

The perception of the people on the economic consequences of artisanal refining on households and the wider community in the area is shown in Table 3. The combined agreement ranging from 81–85%), and weighted means cluster between about 3.13 and 3.21 on a 4-point scale, indicate that majority of the activities are economically damaging. The only ironical outlier is the statement that the operation of artisanal refineries has created a "bustling business environment."Kerosene explosions rendering residents homeless and destroying property (83% agree) points to immediate, acute economic shocks. Explosions destroy homes, personal assets and productive equipment, forcing households into emergency spending, temporary shelter costs, and loss of stored produce or tools. The ripple effects include loss of collateral for loans, interruptions to schooling, and psychological trauma that undermines work capacity. These shocks tend to push vulnerable households into debt and can erase years of wealth accumulation, particularly for those without insurance or savings.

The widespread agreement that farmlands and cash crops have been destroyed by fires linked to illegal refining (81% agree) highlights seasonal and recurrent losses that reduce both food and cash crop output. When fields burn, seeds, standing crops and farm infrastructure are lost, and soil quality can be degraded, reducing yields in subsequent seasons. For communities that rely on agriculture, repeated losses erode household income, lower bargaining power in markets, and increase dependence on short-term coping strategies such as selling productive assets or taking up risky, illicit jobs. Perceptions that fish farming and aquatic livelihoods are destroyed (83% agree) underline how artisanal refining damages water-based value chains. Oily discharges and spills reduce fish survival, contaminate ponds and natural waterways, and make aquaculture unprofitable. Fishers and fish farmers lose stock and future earnings, traders and processors lose business, and protein supplies to the community decline. The result is both immediate income loss and long-term depletion of a renewable resource that previously supported many households and small enterprises. The view that artisanal refining reduces income generated from agriculture (81% agree) ties together contamination, market avoidance and productivity loss. Even where crops survive, buyers may reduce prices or avoid produce from affected areas due to contamination fears. Lower prices and reduced yields combine to cut farm incomes, discourage investment in inputs, and encourage abandonment of farming as a livelihood. Over time this dynamic can trigger occupational shifts, migration, and loss of local food security. Low demand for agricultural products from the community (about 81% agree) reflects reputational and market effects. If traders and consumers perceive produce from the area as tainted, demand falls and prices drop, creating a market failure where clean produce and contaminated produce are hard to distinguish. Lower demand compresses the entire local agri-value chain, from input suppliers to market vendors, amplifying poverty even among those not directly involved in refining. The strongest single perception in the table is that many people have lost their sources of income due to artisanal refining (85% agree, WM 3.21). This encapsulates cumulative impacts across sectors: farming, fishing, trading and small manufacturing. Loss of income is the core economic harm, because it lowers consumption, reduces school attendance for children, shrinks local markets, and raises rates of indebtedness. The scale of reported income loss suggests community-level decline in economic resilience and an increased need for social protection and livelihood diversification programs. That land resources are no longer attractive to developers or buyers (about 81% agree) signals a decline in asset values and long-run economic prospects. Land devaluation reduces household collateral, discourages formal investment in housing and business, and lowers municipal revenues tied to property development. Once land is stigmatized as contaminated or unsafe, reversing that perception is costly and slow, requiring remediation, certification and confidence-building with developers and financial institutions.

The large majority who say traditional economies have been lost (83% agree) is a warning about cultural and economic erosion. Farming, fishing and hunting are not only income sources but safety nets, cultural practices and sources of local knowledge. Their loss means fewer fallback options for households, reduced food sovereignty, and erosion of intergenerational skills. That loss multiplies vulnerability and makes it harder for communities to recover once shocks occur. The statement that artisanal refineries have created a bustling business environment yields the most ambivalent response (72% agree, 28% disagree, WM 2.97). This nuance matters: informal refinery sites do create localized demand for food vendors, transporters, fuel transporters and petty traders, generating visible short-term commerce. However, such "bustle" is often tied to an unstable, risky economy, prone to boom-and-bust cycles, crime, corruption and violence, and it rarely translates into sustainable formal employment or long-term investment. Many of the new transactions are low-value, irregular, and vulnerable to disruption by raids, fires or market collapse, so the perceived bustle masks deeper structural decline. Finally, the near-universal perception that the cost of living has increased (81% agree) reflects inflationary pressures and added household expenditures. As local production falls, scarce goods must be sourced from farther away at higher cost. Health spending rises as pollution-related illnesses increase, reconstruction after fires imposes large outlays, and prices for water and other essentials go up when local supplies are contaminated. For low- and middle-income households, this squeeze erodes savings, reduces nutrition and forces trade-offs such as pulling children out from school. Taken together, these perceptions describe a multi-layered economic shock, where immediate physical losses (homes, crops, fish stock) combine with market failures (reduced demand, lower land values), informalization of commerce, and rising living costs to produce sustained impoverishment. The distributional effects are severe: poor households, smallholder farmers, fishers, women who trade, and youth without secure employment are hit hardest. Recovery therefore requires more than enforcement; it calls for integrated responses including environmental remediation, compensation for losses, targeted social protection, livelihood diversification and skills training,

Table 3. Respondents' perception of the economic impacts of the artisanal refining activities among the communities in the study area

Economic Impact of Artisanal Refining Activities	SA (n/%)	A (n/%)	D (n/%)	SD (n/%)	Total (n/%)	WM
Kerosene explosion has rendered many residents homeless and caused loss of valuable properties	152 (38)	178 (45)	46 (12)	22 (5)	398 (100)	3.16
Many farmlands and cash crops were destroyed by fire due to explosions associated with illegal refining activities	166 (42)	157 (39)	49 (12)	26 (7)	398 (100)	3.17
Fish farming and other economic livelihoods related to aquatic resources are destroyed by artisanal activities	160 (40)	172 (43)	45 (11)	21 (6)	398 (100)	3.17
Artisanal refining activities have caused a reduction in income generated from agricultural activities	170 (43)	153 (38)	50 (13)	25 (6)	398 (100)	3.18
There is low demand for agricultural products from the communities due to the effects of artisanal refining activities	154 (39)	168 (42)	52 (13)	24 (6)	398 (100)	3.14
Many people in the communities have lost their sources of income due to the impact of artisanal refining	162 (41)	175 (44)	40 (10)	21 (5)	398 (100)	3.21
The land resources are no longer attractive to property developers or buyers	158 (40)	163 (41)	55 (14)	22 (5)	398 (100)	3.15
The communities have lost many traditional economies such as farming, fishing and hunting due to artisanal refining activities	169 (43)	161 (40)	44 (11)	24 (6)	398 (100)	3.2
The operation of artisanal refineries has created a bustling business environment in the communities	130 (33)	156 (39)	78 (20)	34 (8)	398 (100)	2.97
The cost of living has increased in the communities due to the artisanal refining activities	157 (39)	165 (41)	50 (13)	26 (7)	398 (100)	3.13

Table 4. The Kruskal Wallis H test summary for the significant difference in the economic impacts of artisanal refining activities among the communities in the study area

Economic Impact of Artisanal Refining Activities	N	Df	X^2	Asymp. Sig.	Remark
Kerosene explosion has rendered many residents homeless and caused loss of valuable properties	398	397	4.187	0.241	Not Significant
Many farmlands and cash crops were destroyed by fire due to explosions associated with illegal refining activities	398	397	3.962	0.265	Not Significant
Fish farming and other economic livelihoods related to aquatic resources are destroyed by artisanal activities	398	397	2.811	0.422	Not Significant
Artisanal refining activities have caused a reduction in income generated from agricultural activities	398	397	5.014	0.166	Not Significant
There is low demand for agricultural products from the communities due to the effects of artisanal refining activities	398	397	3.672	0.299	Not Significant
Many people in the communities have lost their sources of income due to the impact of artisanal refining	398	397	4.398	0.221	Not Significant
The land resources are no longer attractive to property developers or buyers	398	397	3.541	0.317	Not Significant
The communities have lost many traditional economies such as farming, fishing and hunting due to artisanal refining activities	398	397	4.871	0.181	Not Significant
The operation of artisanal refineries has created a bustling business environment in the communities	398	397	2.653	0.448	Not Significant
The cost of living has increased in the communities due to the artisanal refining activities	398	397	3.782	0.286	Not Significant

market re-engagement strategies (for example, certification and clean-up to restore buyer confidence), and measures to re-establish land and property values. Without coordinated actions that tackle both the immediate shocks and the structural drivers, communities risk a long-term decline in economic wellbeing despite the short-term bustle around illegal refineries. The Kruskal–Wallis H test was used to examine whether there were significant differences in the perceptions of respondents across communities regarding the economic impacts of artisanal refining activities. As presented in Table 4, none of the variables showed statistically significant differences among the communities (all p values greater than .05). This indicates a high level of consistency in how respondents viewed the economic consequences of artisanal refining activities irrespective of their community of residence. Across the study area, respondents were in broad agreement that kerosene explosions linked to artisanal refining have rendered many residents homeless and resulted in significant loss of property ($X^2 = 4.187$, $p = .241$). There was also a uniform perception that farmlands and cash crops had been destroyed by fire due to explosions associated with illegal refining activities ($X^2 = 3.962$, $p = .265$). In a similar vein, respondents reported comparable views across communities that fish farming and other aquatic-based livelihoods were severely affected ($X^2 = 2.811$, $p = .422$) and that there had been a reduction in income generated from agricultural activities ($X^2 = 5.014$, $p = .166$). These results point to a common understanding of the disruptions to both agricultural and aquatic livelihoods. The test results further showed no significant difference among communities in perceptions regarding the low demand for agricultural products resulting from artisanal refining activities ($X^2 = 3.672$, $p = .299$), or the widespread loss of income sources due to artisanal refining ($X^2 = 4.398$, $p = .221$). Respondents also demonstrated similar perceptions that land resources had become less attractive to property developers or buyers ($X^2 = 3.541$, $p = .317$) and that many traditional economies such as farming, fishing, and hunting had been lost ($X^2 = 4.871$, $p = .181$). This uniformity underscores how deeply artisanal refining activities have affected the economic landscape of the communities as a whole. Interestingly, respondents also reported consistently across communities that the operation of artisanal refineries had created a bustling business environment in some areas ($X^2 = 2.653$, $p = .448$). However, this perception of economic activity was tempered by agreement that the cost of living had increased in the community due to the artisanal refining activities ($X^2 = 3.782$, $p = .286$). Taken together, these findings show that while some short-term economic opportunities may arise from artisanal refining, its broader impacts are perceived negatively and uniformly across communities.

Table 5. Kruskal Wallis test summary for variation in the social disaster outcomes of artisanal refining activities among the communities

Social Disaster of Artisanal Refining Activities	N	df	X^2	Asymp. Sig.	Remark
Crime began and became increased with the onset of artisanal refining	398	397	4.128	0.248	Not Significant
Young people started being in possession of weapons and cultist activities also started	398	397	3.786	0.286	Not Significant
Different cult groups began to spring up and fight over control of bunkering locations	398	397	4.352	0.226	Not Significant
Drug peddling and addiction set in among the youths	398	397	3.984	0.264	Not Significant
Young ladies got involved in prostitution	398	397	4.201	0.24	Not Significant
Increased cases of kidnapping and abduction related to artisanal refining	398	397	3.765	0.289	Not Significant
Breakdown of social order and communal trust due to illegal activities	398	397	4.418	0.219	Not Significant
Rise in school dropouts among youths engaging in artisanal refining	398	397	3.982	0.264	Not Significant
Family disintegration caused by the lure of quick money from artisanal refining	398	397	4.283	0.233	Not Significant
Increased clashes between communities and security agencies over artisanal refining activities	398	397	3.894	0.273	Not Significant

Overall, the Kruskal–Wallis results show that perceptions of the economic effects of artisanal refining activities are highly consistent across the study area. In line with APA reporting standards, all test statistics are reported with their degrees of freedom and asymptotic significance values. The lack of significant differences suggests that the economic consequences of artisanal refining are not peculiar to one community but are instead widespread, requiring coordinated responses and interventions. Table 5 presents the Kruskal–Wallis H test results examining whether there were significant variations in the social disaster outcomes of artisanal refining activities among the surveyed communities. Across all ten indicators, the test statistics show that none of the outcomes recorded a statistically significant difference between communities (X^2 ranging from 3.765 to 4.418, p values between .219 and .289). This pattern indicates a high level of consistency in the way artisanal refining has disrupted social life throughout the study area. In other words, crime, cult activities, drug use, and other related social problems appear to be widespread and similarly experienced across the communities, rather than concentrated in any particular location. The data show that crime escalation coincided with the onset of artisanal refining activities ($X^2 = 4.128$, $p = .248$), while possession of weapons and involvement in cultist activities among youths also followed a similar trend ($X^2 = 3.786$, $p = .286$). Likewise, the emergence of rival cult groups fighting over control of bunkering locations ($X^2 = 4.352$, $p = .226$) and the spread of drug peddling and addiction among young people ($X^2 = 3.984$, $p = .264$) did not differ significantly among communities. These findings point to a uniform erosion of social norms and security across the area rather than localized "hotspots" of disruption. Other aspects of social dislocation such as prostitution among young women ($X^2 = 4.201$, $p = .240$), increased kidnapping and abduction ($X^2 = 3.765$, $p = .289$), and a general breakdown of communal trust and order ($X^2 = 4.418$, $p = .219$) were also similarly distributed. This suggests that artisanal refining's effects go beyond economic consequences, creating comparable social stresses across the study area. Furthermore, school dropouts among youths ($X^2 = 3.982$, $p = .264$), family disintegration tied to the lure of quick money ($X^2 = 4.283$, $p = .233$), and increased clashes between communities and security agencies ($X^2 = 3.894$, $p = .273$) also showed no significant variation, reinforcing the conclusion that these problems have become endemic and cross-cutting. Taken together, these findings imply that the social disasters linked to artisanal refining are not isolated or community-specific but rather systemic. In APA terms, the consistent lack of significant variation suggests that interventions should not be limited to a single community but should be coordinated across the region, addressing the shared drivers of crime, youth vulnerability, and social breakdown associated with illegal refining.

This also underscores the need for integrated community and policy responses, since piecemeal measures would likely fail to address the broadly distributed nature of the problem.

DISCUSSION OF RESULTS

Social disaster outcomes of artisanal refining activities among the communities in the study area

The results presented in Table 2 show a striking consensus among respondents that artisanal refining activities have generated deep social disruptions in their communities. With weighted means between 3.15 and 3.21, these findings signal that residents view artisanal refining not only as an environmental hazard but as a source of profound social crises. This aligns with earlier studies in the Niger Delta which argue that illegal oil-related activities operate as parallel economies that erode social order, empower violent actors, and destabilize community structures (Agbiboa, 2022; Obi & Rustad, 2019). The perception that crime escalated alongside artisanal refining, with 84% of respondents agreeing or strongly agreeing, reflects a widespread belief that illegal oil economies create fertile ground for theft, extortion, and violent competition. This corresponds to research showing that oil theft and refining generate informal patronage networks and fuel armed criminality, particularly among unemployed youth (Ajayi *et al*., 2021; Nwajiaku-Dahou, 2020). The high proportion linking youth cultism and weapons acquisition to artisanal refining (81%) also mirrors findings that criminal groups and cult societies increasingly act as "security" for illegal refining sites, often using violence to control access and territory (Ikelegbe & Umukoro, 2022).Respondents' observations about the proliferation of rival cult groups and turf wars over bunkering locations point to a reconfiguration of local power dynamics. This matches studies noting that artisanal refining undermines traditional authorities and empowers violent entrepreneurs who impose their own rules on communities (Agbiboa, 2022). Such rivalries destabilize local governance, heighten intergroup mistrust, and divert young men from legitimate employment or education into militarized forms of economic activity.

Drug peddling and addiction were also widely linked to the artisanal refining economy, echoing research on resource-dependent informal economies and substance abuse among marginalized youth (Onoyase & Oyemike, 2023). When illegal profits flow into communities, they can fuel not only weapons acquisition but also narcotics trade, reinforcing cycles of addiction and health vulnerabilities. The link between artisanal refining and prostitution (83% combined agreement) highlights gendered effects of the illicit oil economy. Studies in Rivers and Bayelsa States have documented how young women are

drawn into transactional sex linked to artisanal refining hubs, exposing them to exploitation, gender-based violence, and sexually transmitted infections (Ekanem & Ekong, 2021).The perception of increased kidnapping and abduction adds another layer to this social crisis. This resonates with documented patterns of hostage-taking and abduction in oil-producing regions, where criminal groups use violence to extract ransoms or retaliate against state crackdowns (Okafor & Chukwu, 2022). Such insecurity can cripple local businesses, reduce school attendance, and push communities into a defensive, mistrustful posture.

The breakdown of social cohesion identified by respondents also matches broader findings about the social costs of illicit oil activities. Research has shown that artisanal refining erodes communal trust and weakens the authority of elders, chiefs, and civic institutions (Ikelegbe & Umukoro, 2022). High proportions agreeing that school dropout rates are rising due to artisanal refining also confirm the pull of quick, illicit earnings for youth in a context of limited employment options (Ajayi *et al*., 2021). This has long-term implications for human capital development, perpetuating cycles of poverty and insecurity. Family disintegration, noted by 83% of respondents, highlights the intimate level at which artisanal refining disrupts lives. Sudden illicit income can cause intra-household conflicts over resource control, morality, and risk-taking behaviour. Over time, this destabilizes family structures that traditionally provide support and discipline (Ekanem & Ekong, 2021).Finally, the widespread agreement that clashes between communities and security agencies have increased reflects a tense, adversarial relationship between residents and the state. As noted by Agbiboa (2022), the militarized policing of oil theft often leads to raids, destruction of livelihoods, and violent confrontations, reinforcing cycles of resentment and alienation from state institutions. Taken together, these findings depict artisanal refining as more than an environmental or economic issue. It represents a multifaceted social disaster reshaping crime pattern, youth culture, gender relations, family life, and community-state relations. This corresponds with broader analyses of the Niger Delta's oil conflict which emphasize how illicit economies produce hybrid governance systems where criminality, informal business, and state violence intertwine (Obi & Rustad, 2019). Addressing artisanal refining therefore requires more than environmental clean-up or technical regulation. It demands holistic interventions that combine youth employment schemes, community-led security and conflict resolution, gender-sensitive social programmes, and educational retention policies. Without such multi-pronged responses, the cycle of environmental damage, social disruption, and criminalization is likely to deepen.

The economic impacts of the artisanal refining activities among the communities in the study area

The data presented in Table 3 indicates a strong and consistent perception among respondents regarding the negative economic impacts of artisanal refining. Approximately 81–85% of participants agreed or strongly agreed with nine out of ten statements assessing economic harm, with weighted means ranging from 3.13 to 3.21 on a 4-point scale. This consensus reflects a broad recognition of the economic consequences of these activities. Kerosene explosions destroying homes and property (83% agreement) highlights immediate economic shocks that push vulnerable households into debt, force emergency spending, and can erase accumulated wealth (Bebeteidoh *et al*., 2020; PIND Foundation, 2022). Similarly, destruction of farmlands, cash crops (81% agreement), and aquatic livelihoods (83% agreement) underscore recurrent losses in agricultural and aquaculture productivity, leading to reduced incomes, lower market bargaining power, and dependence on risky coping strategies (Ikezam *et al*., 2021; Omodu, 2025). The perception that artisanal refining reduces income generated from agriculture (81% agreement) reflects contamination, market avoidance, and productivity losses, which in turn discourage investment and may prompt occupational shifts and migration (Ayodele, 2025; Nwozor *et al*., 2023). Low demand for agricultural products (81% agreement) illustrates market failures arising from reputational effects, lowering prices and compressing the local agri-value chain (Bebeteidoh *et al*., 2020). The strongest perception is that many people have lost their sources of income due to artisanal refining (85% agreement), which captures cumulative effects across farming, fishing, trading, and small manufacturing sectors (Ikezam *et al*., 2021; Omodu, 2025). Land resources are perceived as less attractive to developers (81% agreement), indicating declines in asset values and reduced investment prospects, while the loss of traditional economies (83% agreement) points to cultural and economic erosion that increases vulnerability and reduces community resilience (PIND Foundation, 2022; Ayodele, 2025). The statement that artisanal refineries have created a bustling business environment was more ambivalent (72% agreement), suggesting short-term informal economic activity that rarely translates into sustainable employment or long-term investment (Nwozor *et al*., 2023). Finally, the perception that the cost of living has increased (81% agreement) highlights inflationary pressures and higher household expenditures associated with pollution, production loss, and reconstruction costs (Bebeteidoh *et al*., 2020; Omodu, 2025). Kruskal–Wallis test results showed no significant differences across communities for any of the ten economic impact variables (all $p > 0.05$), indicating uniformity in perceptions regardless of location. This consistency underscores that the economic consequences of artisanal refining are widespread and require coordinated interventions, including environmental remediation, compensation for losses, social protection programs, livelihood diversification, and measures to restore land and property values (Ikezam *et al*., 2021; PIND Foundation, 2022).

The variation in the social disaster outcomes of artisanal refining activities across the study area

The Kruskal–Wallis H test results presented in Table 5 indicate that there were no statistically significant differences in social disaster outcomes associated with artisanal refining across the surveyed communities, with X^2 values ranging from 3.765 to 4.418 and p-values between .219 and .289. This consistency suggests that the social disruptions caused by artisanal refining are widespread and similarly experienced across the study area rather than being concentrated in specific "hotspots" (Oriji, Agwanwo, & Eze, 2025; Bebeteidoh *et al*., 2020).The findings show that crime escalation coincides with the onset of artisanal refining activities ($X^2 = 4.128$, $p = .248$), while possession of weapons and youth involvement in cultist activities follow a comparable trend ($X^2 = 3.786$, $p = .286$). Rival cult groups contesting control of bunkering locations ($X^2 = 4.352$, $p = .226$) and the spread of drug peddling and addiction among youths ($X^2 = 3.984$, $p = .264$) similarly showed no significant variation among communities. These observations align with

studies documenting how illegal oil activities in the Niger Delta have fueled criminality, youth militancy, and social instability across multiple localities (Ikezam, Elenwo, & Oyegun, 2021; PIND Foundation, 2022).Other social consequences, including prostitution among young women ($X^2 = 4.201$, $p = .240$), increased kidnapping and abduction ($X^2 = 3.765$, $p = .289$), breakdown of communal trust ($X^2 = 4.418$, $p = .219$), school dropouts ($X^2 = 3.982$, $p = .264$), family disintegration ($X^2 = 4.283$, $p = .233$), and clashes between communities and security agencies ($X^2 = 3.894$, $p = .273$), were also uniformly distributed. This suggests that the effects of artisanal refining extend beyond economic losses to encompass broader social dislocation and erosion of communal norms (Ayodele, 2025; Omodu, 2025). Similar patterns have been reported in other studies where illegal refining catalyzed youth delinquency, family fragmentation, and community insecurity across multiple communities in the Niger Delta (Suku, Ugwoha, & Orikpete, 2023).Taken together, these results indicate that social disasters linked to artisanal refining are systemic rather than community-specific. The uniformity in social outcomes underscores the need for coordinated interventions across affected areas, integrating community-based strategies, youth engagement programmes, policing reforms, and policy measures to address the structural drivers of crime, substance abuse, and social breakdown associated with illegal oil activities (Elisha & Ipregha, 2022; Bebeteidoh *et al*., 2020). Piecemeal approaches targeting individual communities would likely fail to mitigate the broadly distributed nature of these social disruptions.

CONCLUSION AND RECOMMENDATIONS

Social crises linked to artisanal refining are systemic and cross-cutting, affecting all communities similarly. Artisanal refining in the study area is deeply rooted in socio-economic and structural factors, including poverty, unemployment, and limited development. Community awareness and mixed responses highlight its normalization as a livelihood strategy. Artisanal refining has precipitated systemic social crises, including crime, substance abuse, prostitution, and breakdowns in communal trust and family stability. These issues are widespread and consistent across the study area, underscoring the necessity of integrated social policies, educational programmes, and security strategies to restore social cohesion and protect vulnerable populations. Economic losses from artisanal refining are extensive affecting agriculture, fisheries, livelihoods, land value, and household income. While localized informal trade exists, the broader impacts are overwhelmingly negative and uniformly recognized. Efforts to address these challenges require comprehensive interventions, including environmental remediation, social protection, livelihood diversification, and market restoration to sustain community resilience. Consequent upon the above, social rehabilitation, education, youth engagement, livelihood diversification and social protection are recommended for immediate action.

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