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**Policy implementation in the Context of Environmental Degradation,
Insecurity and Poverty: The Case of Niger Delta Region, Nigeria**

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Abstract

Until the discovery of crude oil in Nigeria, the economy of the country relied on Agriculture for sustenance. Upon this discovery, the oil sector started an economic domination in Nigeria leading to the neglect of Agriculture. Since the extraction and production of crude oil takes place in the Niger Delta, the region is bedevilled by ills caused by reckless crude oil exploration and production activities. This led to the emergence of artisanal crude oil refining as a coping strategy. Though with its attendant socio-economic benefits, the loss to the national economy was huge. Artisanal refining also destroys the environment and traditional livelihoods. The consequent decline in revenue earnings of the country caused the government to implement existing policy to halt artisanal oil refining and oil theft. Thus, the objective of this study is to identify the environmental effects of artisanal oil refining and government's policy implementation on crude oil refining in the Niger Delta region. The study was conducted in six communities in three states namely; Oruma, Aguobiri (Bayelsa State), Ido, Bille (Rivers State), Egwa 1 and Tebujoh (Delta State). The study adopted the cross-sectional survey research design comprising 400 randomly selected respondents out of which 314 research participants responded. The findings indicate that government policies geared towards addressing the problem of artisanal refining and oil theft exacerbates the environmental, livelihood and security problems in the region leading to further pauperization, poverty and insecurity. It is thus recommended that government policies in the Niger Delta region should not only be geared towards increasing the nation's earnings but also to enhance security and the socio-economic well-being of the people.

Keywords: Environmental degradation, insecurity, Niger Delta, policy, poverty

Introduction

Oil has been the main sustenance of the nation's economy. The extraction and production of crude oil take place in the Niger Delta. This region is bedevilled

by ills caused by crude oil exploration and production, leading to socio economic and ecological crises. A good example is the problem of oil spillage. When oil is spilled into the ocean or river, the lives of animals and plants are harmed. Shorelines are washed away by oil spillage impacts. With the expansion of oil exploration and production activities, the incidence of oil spills has greatly increased (Akpofure, 2008). Spilled oil expose plants and animals to degradation in non-moving water. Flowing streams and rivers, show oil collection on plants and grasses growing on the banks, thereby affecting the organisms that are sustained by the water. The National Oil Spill Detection and Response Agency (NOSDRA) identified 9,856 oil spills and a loss of 468,803 barrels of oil in Nigeria between 2011 to 2021. The Agency identified Rivers, Bayelsa and Delta states as accounting for over 85% of the oil spills between 2019 and 2021.

Table 1: Showing Nigeria’s oil spills record between 2011 to 2021

Year	Number of Spills	Quantity Spilled (Barrels)
2011	1,059	73,132
2012	1,135	41,802
2013	1,666	32,292
2014	1,521	78,890
2015	921	47,714
2016	685	42,744
2017	595	34,887
2018	702	28,009
2019	744	41,782
2020	458	23,592
2021	370	23,958

Source: NOSDRA, 2021

Several authors assert that militancy, bunkering and sabotage are the major causes of oil spills in the Niger Delta region (Onoja, 2013). According to the Nigeria Extractive Industries Transparency Initiative report of 2019, Nigeria lost about \$42 billion to oil activities from 2009 and 2018. The report indicated that \$38.5 billion loss was on crude theft, \$1.6 billion on domestic crude, and \$1.8 billion on refined petroleum products. Also, the National Oil Spill Detection and Response Agency (NOSDRA) averred that Nigeria lost approximately 4.75 trillion naira between 2015 and 2018 on oil activities.

Babatunde (2014) averred that while the oil companies embark on indiscriminate spills, the Federal government fails to effect relevant environmental laws to halt the situation. Ebegbulem, Ekpe and Adejumo

(2013), described multinational oil companies as the main cause of environmental degradation and poverty in the in the Niger Delta region.

The United Nations Environmental Programme's (UNEP) report of 2011, explained that hydrocarbon emanating from activities of oil exploration are harmful to the environment and traditional livelihoods.

The devastation of the environment and the traditional livelihoods of the people such as fishing and farming led to the introduction of artisanal crude oil refining as a coping strategy (Odalonu, 2015). UNEP (2011) linked artisanal crude oil refining to severe environmental degradation and health problems. It mentioned artisanal refining as main source of contamination in the region and that if not checked, would completely destroy the entire ecosystem because large quantities of hydrocarbon are discharged into the waters and land during refining. Also, open fires being used to condense the heat during the refining stage, leads to underground pollution. The risk also includes incessant fire outbreaks that often claim lives and cause more deforestation. Balogun (2015), used remote sensing method in detecting and mapping the impacts of crude oil theft and artisanal refining in the Niger Delta region. He found out that stressed vegetation areas around artisanal refineries had low vegetation index of -0.39 while areas with healthier vegetation had higher index of 0.55. Artisanal refining activities in the Niger Delta severely affects the nation's economy. Obenade and Amangabara (2014), put the daily loss of crude oil to bunkering and artisanal refining activities to between 200,000 and 300,000 barrels leading to severe economic loss to the national economy. They also argued that though the multiplicity of artisanal crude oil refining increases oil pollution and impacts negatively on the environment and livelihoods, it has some economic and social gains in the Niger Delta region.

As enshrined in the 1999 constitution of the Federal Republic of Nigeria and the petroleum Act, Oil found in any location of the country, land, territorial waters, continental shelf is owned and to be controlled exclusively by the federal government. The petroleum Act permits only the Petroleum Product Pricing Regulatory Agency (PPPRA) to exercise monopoly to regulate. supply distribute as well as price petroleum products in the country. By this Act, the federal government has the responsibility to license oil and gas companies to engage in activities that has to do with oil exploration, production and transportation of crude oil. Specifically, on crude oil refining, Nigeria's Oil legislation, states that no person is allowed to refine hydrocarbon oil except in a refinery that is licensed under the Hydrocarbon Oil Refineries Act. The foregoing, automatically places artisanal crude oil refining and the sale and distribution of the petroleum products thereof to be illegal. As a means of policy implementation to stop the revenue loss of the country through bunkering and artisanal refining, the federal government established a special military Joint Task Force (JTF), to put an end to the activities of bunkering and artisanal refining in the Niger Delta region.

The objective of this study is to identify the environmental effects of artisanal oil refining and government's policy implementation on crude oil refining in the Niger Delta region.

Though Several studies have been conducted on the devastating effects of oil pollution in the Niger Delta region, not much has been researched on the environmental impacts of government's policy implementation on crude oil refining in the Niger Delta region. This informed the gap in knowledge for this study.

Theoretical framework

The theoretical framework adopted in this study is the Sustainable Livelihood framework. The framework espoused livelihood using a mix of Social, Human, Natural, Financial and Physical capital. These capitals form the means of survival. Households must thus adopt methods to have these capital assets for sustainability. Such livelihood coping methods are influenced by external circumstances e.g. oil pollution as in the Niger Delta region. Households get involve in livelihood activities to secure income to obtain goods and services for sustenance. The framework thus identifies these assets and explain how their combination produces desired livelihood outcomes to tackle livelihood problems. The framework analyses vulnerabilities, complexities, strategies, objectives, opportunities and constraints.

The framework also helps to identify adopted coping strategies. Due to changes caused by external forces, households face risks and income loss so they adopt methods to cope (Bhattarai, 2005). The core vulnerability source in the Niger Delta region is oil pollution. Hydrocarbons from oil exploration and production activities degrade the environment and livelihoods. The affected communities suffer vulnerabilities. This gets more severe with the emergence of artisanal crude oil refining followed by the actions of the military to eradicate the activity. The key element of this framework is sustainability. Mshelia (2016), identified four dimensions of sustainability, namely; environmental sustainability achieved through the conservation of resources for the unborn. Economic sustainability, achieved through sustainable economic welfare. Social sustainability achieved through the reduction of social exclusion. Institutional sustainability achieved through institutions' capability to continue performance. The new viewpoint on environmental sustainability is woven around livelihood sustainability. According to Mohammed et al. (2020), A livelihood is sustainable if its activities does not deplete or destroy the ecosystem, leading to the destruction of other people's livelihoods. Artisanal refining is not sustainable because it destroys the environment and traditional livelihoods such as farming and fishing (Zibima, 2015). Thus, the destruction of artisanal refineries by security agencies exacerbates the destruction of the environment and traditional livelihoods, thereby worsening the unsustainability. The implication is lack of Environmental, Economic, Social and Institutional sustainability by rural households in the region.

Materials and methods

This study adopted the concurrent mixed method research design which involves the use of both quantitative and qualitative approaches concurrently in data collection and analysis. The three states identified by the National Oil Spill Detection and Response Agency (NOSDRA), as having the highest incidents of oil pollution in the Niger Delta region Rivers, Delta and Bayelsa states were purposively selected for the work. In like manner, the communities, Oruma, Aguobiri in Bayelsa State. Ido, Bille in Rivers State. Egwa 1 and Tebujoh in Delta State were purposely selected for the study. A simple random sampling technique was used to select the respondents. The Data collection instruments were structured interview schedules, focus group discussions and key interview informants. The population of the study is 15,248,118. The researcher utilized the Taro Yamane sample size formula to obtain a sample size of 400 out of which 314 respondents participated in the study. The quantitative data analysis was done with descriptive tools such as frequencies and percentages. The research participants were made to participate voluntarily. Their anonymity and strict confidentiality was ensured.

Results and discussion

This section presents the research findings and results emanating from the analysis of the data as well as the discussion on the findings and results.

Evidence of artisanal crude oil refining**Table 1: Evidence of Artisanal Refining**

Evidence	Frequency	Percent
Presence of Artisanal Refining		
Yes	298	94.9
No	16	5.1
Number of camps present		
1-5	72	22.9
6-10	90	28.7
11-15	6	1.9
>15	104	33.1
Knowledge of operational period		
Yes	204	77.3
No	60	22.7
Number of years in operation		
1-5	86	42.6
6-10	20	9.9
>10	96	47.5

Source: Fieldwork, 2019

The study revealed that 94.9% of the respondents confirmed the presence of artisanal refineries in their communities. On the number of artisanal refinery camps, 22.9% of the respondents indicated between 1 to 5. 28.7% mentioned between 6 to 10 camps while 1.9% mentioned between 11 and 15 camps.

Finally, 33.1% of the respondents indicated above 15 camps. 77.3% of the respondents claimed to have knowledge of the operational period of the refineries while 22.7% claimed lack of knowledge. 42.6% put the operational years of the refineries at 1 to 5 years while 9.9% placed it at between 6 to 10 years. Finally, 47.5% put the operational years of the artisanal refineries at above 10 years.

ENVIRONMENTAL IMPACTS OF ARTISANAL CRUDE OIL REFINING

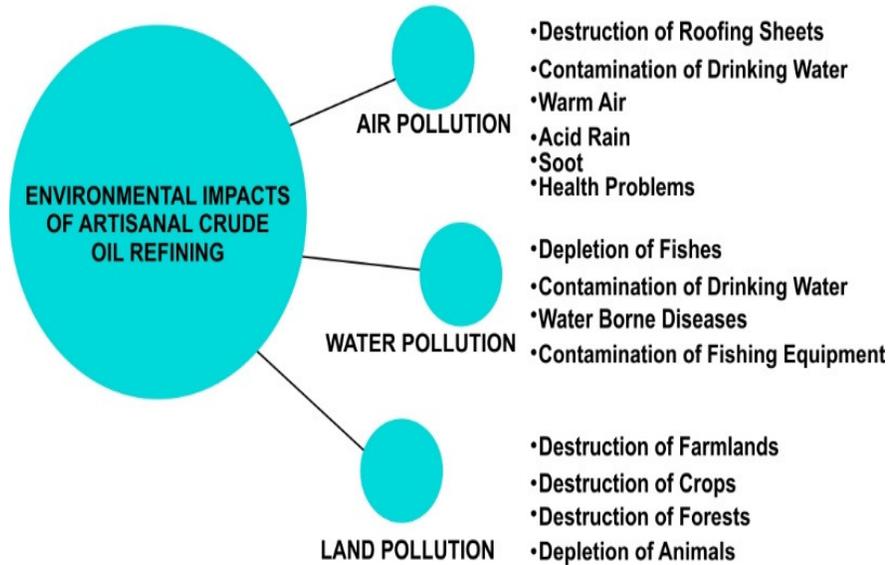


Figure 1: Conceptual framework showing the impact of artisanal refining
Source: Fieldwork, 2019

Figure 1 is a conceptual framework drawn from FGDs and KII Interviews, showing the environmental impacts of artisanal oil refining at a glance. The environmental impacts are informed by factors such as open fires, spills during crude oil siphoning, ferrying of crude and petroleum products, hydrocarbons etc. These key factors degrade the environment of the Niger Delta area. This is seen in the form of poor air quality, warm air, acid rain, destruction of roofing sheets and household items, black soot, destruction of crops, several health problems, pollution of rivers, creeks and underground waters. It also showed contamination of the soil through land pollution, causing the destruction of farmlands and crops, forest resources and biodiversity, deforestation and loss of aesthetic and vegetation cover. However, artisanal crude oil refining has socio-economic gains that drives its sustenance. So far, the government is yet to take concrete steps to address these drivers of artisanal crude oil refining in all the studied communities in the Niger Delta region. From the findings, the government decided to implement existing policy to stop the activities of

artisanal crude oil refining by establishing a special military Joint Task Force (JTF), to put an end to the activities of bunkering and artisanal oil refining in the Niger Delta region through the burning of artisanal refining camps and petroleum products thereof. As enshrined in the 1999 constitution of the Federal Republic of Nigeria and the petroleum Act, Oil found in any location of the country, land, territorial waters, continental shelf is owned and to be controlled exclusively by the federal government. Nigeria's Oil legislation, states that no person is allowed to refine hydrocarbon oil except in a refinery that is licensed under the Hydrocarbon Oil Refineries Act. This automatically places artisanal crude oil refining and the sale and distribution of the petroleum products thereof to be illegal.

Environmental impacts of government's policy implementation on crude oil refining in the Niger Delta region - FGD and KII extracts from rural households in relation to the burning of artisanal refineries by security agents

i. Environmental Degradation

From the findings, the burning of artisanal crude oil refineries and the discharge of crude oil and petroleum products into rivers and land by security agents have same environmental impact as artisanal oil refining and as such, exacerbates the environmental and livelihood problems of the region. As in artisanal refining, the environmental impact is seen in the form of poor air quality, warm air, acid rain, destruction of roofing sheets and household items, black soot, destruction of crops, several health problems, pollution of rivers, creeks and underground waters. It also showed contamination of the soil through land pollution, causing the destruction of farmlands and crops, forest resources and biodiversity, deforestation and loss of aesthetic and vegetation cover. It also affects the health of people in the communities. Government's response to the activities of artisanal crude oil refining had rather exacerbated the environmental situation in the Niger Delta region. The study revealed that in order to stop the revenue loss of the country through bunkering and artisanal refining, the federal government established a special military Joint Task Force (JTF) to put an end to the activities of oil theft and artisanal refining in the Niger Delta region. The duty of the task force is to burn or destroy artisanal refineries and arrest culprits. As shown in table 1, artisanal refineries are yet to be eradicated over the years. The refined products are discreetly moved across the region in bags to evade security agents.

A respondent in Aguobiri community, narrated that;

Some of our crops no longer grow well, some like mama coco (a brand of cocoyam) have disappeared. This has affected the income of farmers and a direct outcome of the impact of pollution. This burning of artisanal refineries by government has worsened the pollution situation. (*KII/Youth Leader/Aguobiri*)

In Oruma community, the FGD participants asserted thus:

One major problem in our community is the burning of oil refining camps by the military. The black smoke from the burning camps pollutes the air. We see sooth all over the place. The military people do not care. They pour our fuel, diesel and kerosine in our communities and rivers. Our crops and fishes are destroyed (FGD/Oruma).

Similarly, a respondent at Bille averred that:

Our fishes are reducing in the river every day. The amount of pollutants that are directly discharged into the waters are coming from many sources. The JTF has worsened the situation. Fishers hardly catch fish these days. (*KII/CBO rep./Bille*)



Artisanal oil refineries on fire along Gbaramatu river, Warri South-West LGA.
Source: Fieldwork, 2019

(ii) Disruption of Employment Opportunities

The study revealed that artisanal crude oil refining emanated as a livelihood coping strategy for people to survive the effect of environmental degradation caused by oil exploration and production activities in the Niger Delta region. The chain of business activities involved crude oil refiners, refined petroleum products distributors, sellers of the refined products, etc. Incidentally, the burning of artisanal crude oil refineries, crude oil and the refined products by the military Joint Task Force, exacerbates the environmental and livelihood problems of the region. The action of the Joint Task Force results to more unemployment due to the destruction of traditional livelihoods (i.e. farming and fishing), disruption of the sale of artisanal refined petroleum products and

other businesses that are associated with the use of petrol, diesel and kerosine. The refined products are often burnt at the refining camps or confiscated from the homes of people in the communities and discharged into the rivers or on land.

It was opined in the FGD held in Oruma community that;

The military people are destroying our farms and rivers. We do not know why they are doing this to us when we are already suffering pollution problems. They come to burn artisanal refining camps, destroy crude oil and petroleum products in camp reservoir or refined products inside the communities and along the river (FGD/ Oruma).

Similarly, the FGD participants in Egwa 1 said that;

Government don't care about our lives. Why are they seizing and burning our fuel, kerosine and diesel? I sell kerosine to feed and cater for my family. They should stop searching our houses to destroy diesel, petrol and kerosine. They destroy containers and pour the products all around our community not minding that the whole place can catch fire and kill people. Will they provide work for us? (FGD/ Egwa 1)



A burnt artisanal oil refining camp at Oruma

Source: Fieldwork, 2019

(iii) Disruption of sale of cheaper and available petroleum products

The study revealed a disruption of sale of cheaper and available petroleum products, emanating from artisanal crude oil refining. The destruction or burning of artisanal refining by security agents disrupts the sale of these

cheaper and available artisanal refined products. The research participants complained of hardship in procuring petroleum products for domestic energy needs hence their involvement in the sale of the artisanal refined products which are cheaper and available for use. Most communities in the region are without electricity because they are not connected to the national grid and as such rely on these petroleum products for energy source i.e. kerosene for cooking, fuel and diesel to power generators, boats and grinding machines.

The FGD participants in Ido community indicated that;

Fuel, Kerosene and diesel from government are scarce and expensive here. They don't supply enough to us. However, the ones from our local refiners are cheaper and always available for us to buy and use in our homes and businesses (FGD/Ido).

In Tebujoh community, the FGD participants said that;

We don't have government electricity light in our community. The government failed to provide us with electricity. We rely mostly on kerosene lamps and also, generators, without which, no economic activity will take place. We get kerosene, petrol and diesel from artisanal refining to survive. The petroleum products from government are scarce (FGD/Tebujoh).

(iv) Disruption of Socio-Economic Activities

The findings showed that since artisanal refining ensures the availability of petroleum products to operate engine boats, electricity generators, cassava and corn grinding machines and other businesses, due to shortage of mainstream petroleum products in the communities, the activities of the Joint Task Force undermine the social and economic lives of the people. Shortage of petroleum products hampers economic growth in the communities, thereby increasing poverty.



Sale of fuel at Egwa 1, Warri South-West LGA, Delta State
Source: Fieldwork, 2019

(v) Insecurity

The findings showed that the activities of the JTF, in its bid to eradicate oil theft and artisanal crude oil refining leads to various forms of abuses, displacements and more insecurity that affects people and livelihoods in the Niger Delta region. The findings also showed that the inability of government to empower the people through developmental activities like infrastructure and employment is a source of insecurity. The burning of artisanal oil refining camps by security agents and the consequent arrest of the refiners and sellers of refined petroleum products also constitute insecurity.

A participant in Oruma community also mentioned that;

The burning of artisanal oil refining camps is creating insecurity and hunger. How will those selling the petrol products survive? That is why they are hiding them in bags. Moving along the river is now a problem. Check points here and there. (*Kii/opinion leader/Oruma*)

In Egwa community, the FGD participants said that;

People now move fuel, diesel and kerosine around in bags to beat the JTF. The sellers are not relenting also, despite the difficulties. Though the challenges are not easy. Some persons cannot meet the challenges. (*FGD, Egwa1*)

(vi) Disruption of Social Networking

The findings showed that the activities of security agents in the Niger Delta region in relation to artisanal crude oil refining disrupts social networking. Environmental degradation and insecurity, exacerbated by actions of the military joint task force, affects the social network operations of rural households due to dwindling income and instability.

The FGD participants in Oruma opined that;

People use to take advantage of established relationships to seek financial help to boost their livelihoods. They use the money to invest in petty trading or other ventures to add to their livelihoods. Now it is difficult because of money and security problem. *(FGD/Oruma)*

Also, a participant in Aguobiri said that;

I can no longer borrow money from my women association to add to my fish selling business because the association don't have enough money. *(KII/Women Leader/Aguobiri)*

(vii) Deforestation and impact on Human Health

The study revealed that security agents often locate and destroy artisanal oil refining camps hidden in the creeks. The burning or destruction of the camps exacerbates deforestation and health issues in the region.

The FGD participants of Ido community explained that;

Kpo fire (oil refining), in our community leads to cases of breathing problems like asthma, skin infections and tuberculosis. Acid rain pollutes our drinking water such as rain water and river water. Acid rain also causes skin rashes. It is now worse with the JTF actions *(FGD/Ido)*.

Discussion of Findings

Findings from the study, corroborates previous studies on the impact of oil spill on the environment and livelihood. The findings are in line with the findings of Agliardi et al. (2017) that the damage caused by oil spills to the environment and livelihood persists even after the spills have been mopped up from the land and water. From the findings, oil spills emanating from oil activities are harmful to the environment and livelihoods. This is in line with the UNEP report of 2011 that hydrocarbon emanating from oil activities are harmful to the environment and traditional livelihoods. It also supports the findings of Howard, Azuotola and Abiodun (2017), that hydrocarbon from artisanal refining affected PH, Phosphate, Sulphate and Nitrate of the study area. The findings also corroborate the findings of Zhang et al. (2019), that mangroves are drastically affected by spilled crude oil in the environment.

The study further revealed that the burning of artisanal oil refining by security agents, creates unemployment in the rural communities. This is in line with the findings of Obenade and Amangabara (2014), that artisanal oil refining has economic and social gains in the Niger Delta region. It also supports the findings of Odalonu and Eronmhonsele (2015), that corruption, unemployment and poverty were the fundamental factors engendering artisanal oil refining. It further corroborates the findings of Odubo and Odubo (2019) that employment opportunities, availability of labour, availability of cheaper/accessible petroleum products, improved community economy and availability of local technology are the drivers of artisanal crude oil refining. Imperatively, apart from the negative environmental and livelihood impacts of artisanal refining, it is also a source of economic gains as shown by the stated driving forces.

Furthermore, this study revealed that the burning of artisanal refining by the military disrupts the sale of cheaper and available artisanal refined products. The study revealed that communities in the Niger Delta region have limited supply of mainstream petroleum products and as such, experience shortages. This is in line with the findings of Zibima (2015), that the centralized monopoly distribution system has failed to meet the petroleum and local energy needs of the inhabitants of rural areas of the region, whose communities suffer the effect of pipeline installation and oil production and exploration activities. This occasioned a favourable operational environment for artisanal crude oil refining. The Petroleum Product Pricing Regulatory Agency (PPPRA) which exercise a monopoly to regulate supply, distribute and price petroleum products do not distribute enough petroleum products to rural households in the region.

The study also indicated that the activities of the Joint Task Force of government, do undermine the social and economic lives of the people. The destruction of artisanal refineries leads to shortage of petroleum products and more poverty in the region. The findings support the findings of Odalonu and Eronmhonsele (2015), that corruption, unemployment and poverty are the fundamental factors engendering artisanal oil refining. It also supports the findings of Odubo and Odubo (2019) that employment opportunities, availability of cheaper petroleum products etc are the drivers of artisanal oil refining. The disruption of these economic benefits, leads to more insecurity. The findings is further in line with the findings of Ejovi and Ebie (2013), that the crisis in the Niger Delta region was due to lack of attention by government and that what seemed like a harmless agitation snowballed into major insurgency.

Additionally, findings of the study that revealed that the activities of security agents in relation to artisanal oil refining disrupts social networking are in line with the findings of Jack (2017), that environmental sustainability problems are made worse by social capital deficit among rural households in the Niger Delta region. People find it difficult to mobilise social capital to

actualize their livelihood targets such as difficulty to access institutions for financial and non-financial assistance.

Finally, findings from the study on the exacerbation of deforestation and health crisis resulting from the burning of artisanal refining the camps by security agents in the region are consistent with the work of Oghenetega et al. (2021), that oil pollution induced health challenges was high in the study locale due to the discharge of hydrocarbons into the environment. It also corroborates the findings of Zhang et al. (2019) that mangroves are drastically affected by spilled crude oil in the environment.

Conclusion and recommendations

Based on this study, it can be concluded that artisanal crude oil refining destroys the environment and traditional rural livelihoods in the Niger Delta region. It is apparent that every aspect of the refining activity centres around environmental pollution, from the stage of siphoning of crude oil to the stage of refining. However, artisanal crude oil refining also has socio-economic gains that drives its sustenance within the context of employment, availability of cheaper petroleum products, improved community economy etc. All these are disrupted by the government, in the discharge of its statutory responsibility to regulate oil refining and petroleum products distribution in the country, The burning of artisanal oil refineries by security agencies of government is counterproductive. Each burning exercise exacerbates the environmental and socio-economic conditions of rural households in the Niger Delta region. Based on this conclusion, the study recommended that government policy actions in the Niger Delta region should not only be geared towards increasing the nation's earnings but also to enhance security and the socio-economic well-being of the people through the provision of basic developmental facilities that will enhance the capital assets of rural households for sustainability. Also, environmental friendly techniques should be adopted to destroy artisanal refining camps to avoid the degradation of the environment and traditional livelihoods. The government should ensure timely compensation and remediation of pollution sites, no matter the cause of the spill, to minimize the effects on the environment and livelihoods of rural households. Environmental awareness campaign should be carried to educate the people to preserve the natural environment from continuous damage.

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