

CRUDE OIL REFINING INDUSTRY: A CORRELATE TO HEALTH AND SOCIO-ECONOMIC CHALLENGES IN NIGER DELTA, NIGERIA

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ABSTRACT

Illegal refineries in communities has placed residents lives and the environment into disaster era. Humans, plants and animal habitats have been devastated by black soot. This scenario has left the public to suffer various illnesses associated with illegal refining of crude oil. The study investigated illegal crude oil refining: a correlate to health and socio-economic challenges in Niger Delta. The objective of this research is to determine the causes of youth involvement in illegal refining, and to examine the public health disaster from wastes of illegal refineries. Two questions are formulated, one of which is, what are the causes of youth involvement in illegal refining? And the second is, how does illegal refining of crude oil constitute a public health disaster? The illicit relationship theory was utilized. However, the study adopted descriptive survey design to obtain secondary data. The findings of the research revealed that unemployment and poverty are key factors to why youths involve in illegal refining. The study further revealed that activities of illegal refineries circulates black soot which has resulted to public health disaster through environmental pollution. Based on the findings, the study recommends that government should create job opportunities through establishment of manufacturing industries. Government should assist affected communities with medical supplies in terms of drugs and treatment.

Key words: illegal refineries, crude oil theft, pollution, environmental pollution

INTRODUCTION

The dependence on oil in Nigeria has been the mainstream of the country's economy. The discovery of crude oil and involvement in large scale exploration has since become the mainstay of the country's total export earnings. This has plunged the nation into diverse environmental pollution problem and oil theft in the Niger Delta region. The country continues to lose billions of dollar worth of its oil production through oil theft or illegal bunkering activities. As the demand for crude oil keep increasing, the commodity has skyrocketed in value. Consumers of oil, as in developed nations are comfortably removed from the havoc that is linked to oil exploration and oil transportation as in the case of countries involved in oil extraction. Poor countries see oil discovery as a means of economic and national development, while paying less attention to the underlining consequences surrounding oil production, such as pollution that affects the Niger Delta region (Dell, 2004). Before the escalation of crude oil pollution through illegal refineries activities, the pollution problems were previously resulting from oil spills caused by accidents, leakages and equipment failure. However, in the present era illegal bunkering and refining activities by unemployed youths has increasingly resulted to large scale pollution of the environment. This illegal bunkering and refining of crude oil in recent times seem to be a means for most youth to generate income, source for survival and has been seen to be a lucrative business or venture to amass private gain without taking cognizance of its consequences to the lives of community residents. Many people have placed their hope on oil as a resources that can lift them out of poverty. Although oil has enriched some nations, but to others, it has led to high rate of poverty, malnutrition and mortality. Oil in some nations are been exploited at the detriment of residents who do not partake in oil bunkering activities. The vandalism of oil installation and refining of crude oil has daily contributed to the low quality of air in the atmosphere and resulting to air and other environmental pollution (Okpokwasili et al, 2013). Illegal refineries are being located in different communities within the Niger Delta region. These refineries are

estimated to have access to crude oil stolen from pipeline installation of between 70,000 and 300,000 barrels of crude oil. Large amount of the stolen crude oil is sold and a quarter of it are refined locally (Onuoha, 2013).

The nomenclature "kpo-fire" is a local term used to refer to artisanal refinery process, which is carried from the explosive sound heard when there is any oil explosion, and when oil is used as the fuel for the refining purpose (UNEP, 2011). It is also a simple fractional distillation process, using locally sourced materials. The materials used are metal pipes and drums welded together in which crude oil is boiled and the resultant fumes are collected in tanks after they are cooled, condensed and the resultant products include kerosene, diesel and fuel (UNEP, 2011). After the products of interest are collected, the large quantities of residue or waste are indiscriminately dumped on land, nearest water body thereby causing environmental pollution.

Statement of the Problem

Crude oil is a complex heterogeneous substance composed of various hundreds of hydro carbon elements that has the capacity to impact pollution on the environment. The Niger Delta region is on the verge of catastrophic end, and there is the depletion of the regions biodiversity in the soil. Thus kpo-fire activities have contributed to causing several environment disasters to soil, plants, water bodies air and endangering of different species of fungi and other microorganisms (Kolwzan et al, 2006). For several decades, the Niger Delta region has been subjected constantly to ecological abuse as a result of crude oil exploration and exploitation through illegal refining, which has resulted in the reduction of habitat quality and loss of biodiversity. The health disaster of oil related pollution on human should interest the stakeholders in the sector to have a rethink. Furthermore, pollution resulting from bunkering of crude oil gives rise to poor water sediment quality and thus is a major threat to mangroves and human existence in the area (Tarn and Wong, 1995). The water quality in an aquatic environment is very important for the survival of its flora and fauna.

The quality of interstitial water has impacts on species composition, assemblages and distribution of organisms (Hart and Zabbey, 2005) crude oil yields three basic products, such as gas and gasoline, middle distillate and fuel oil and residue cuts. Once the refining plant is not concerned with the chemical changes in crude or which involves physical changes found in simple distillation, this contributes to solid, liquid and gaseous wastes in the environment (Nwankwo et al, 1998). The environment stands to suffer pollution from crude waste left on the soil surface or water bodies which are used by humans for different purposes.

The increasing rate of illegal bunkering and illegal refining of crude oil remains a social problem that has almost destroyed the environment for human existence due to deposits of petroleum waste on water bodies and lands has disrupted fishing activities and crop yields in the Niger Delta region. The environmental pollution caused by illegal oil activities has contaminated food and water with acute effects on people's health, which include respiratory problems, dizziness, headaches, vomiting, hearth disease, skin disease and death (Solomon and Jansen, 2010). The kpo-fire activity is a clear disaster begging for urgent mitigation to keep lives and the environment safe for present and unborn generation. The health problems resulting from oil pollution appear in various dimensions, like in the pollution from gas flaring, water and land oil waste dump, and pollution from oil spillage and pipeline vandalism (Nduka and Orisakwe, 2011).

Apart from the foregoing, oil pollution causes mental health. This cumulates from stress caused by trauma and stress of economic inflation that comes from residing in oil rich and polluted area (Shreve, 2010). Therefore, the study seeks to investigate the activities of illegal refining in Niger Delta region and the pollutions affecting public health of residents from Emohua in Emohua Local government area.

However, the objectives of the study are to:

1. Determine the causes of youth involvement in illegal refining in Niger Delta.
2. Examine the public health disaster from wastes of illegal refineries in Niger Delta.

Research Questions

The research questions are thus:

1. What are the causes of youth involvement in illegal refining of crude oil in Niger Delta?
2. How does illegal refining of crude oil wastes constitute public health disaster in Niger Delta?

Theoretical Framework

The illicit relationship, theory was adopted for this study. According to the dictates of this theory, the illicit relationship that existed between oil workers and idle youths in the Niger Delta who are out to make a quick living or illicit profits brought about the existence of artisanal refineries. This theory preaches that unknown oil, engineers offered the technology to these locals out of sympathy in order to provide them with a means of livelihood following the breakdown in farming activities and fishing vocations in the early beginning of oil induced environmental devastation and disasters (Gibson, et al, 2014).

Review of Literature

Illegal Bunkering

Pipeline vandalism is the main source for illegal bunkering in Niger Delta. The tapping of crude oil from flowing pipeline and drilling of holes in the pipes are the ways crude oil is being stolen for sale and use for illegal refining or artisanal refining. There are subset operators to bunkering activities. This subset includes owners of siphoned crude, buyers of the stolen crude oil to process into low quality petroleum products in the Niger Delta region. According to (Naanen and Tolani, 2014), the larger proportion of the stolen oil is linked to categories of operators where there are powerful exporters, made up of individuals as well as organized groups. These individuals are described as cartels with link to top levels of political and military elites in the country. Bunkering activities are being complimented by high level government officials in the oil and gas industry. However, in terms of economic loss through oil theft, the high ranking government official understanding is that oil bunkering results to revenue loss to the country, but uses the opportunity for personal gains. Owing to this fact, government have used the granting of oil lifting license as an incentive to encourage political associations and appease influential individuals for support.

The local operators of bunkering and refining business are also connected to local level authorities such as joint task force (JTF) and regular police and politicians as well. These uniform men provide protection for the bunkers.

Furthermore, another important group involved in illegal oil refining business is independent individuals who do not belong to any cult group. These are groups of unemployment youth between 18 to 30 ages. Their wages are on daily basis, but they normally get paid at the end of each week when the products must have been evacuated and sold to their customers. However, the wages vary from each bunkering area to another.

illegal Refining

On defining illegal refining, it will be necessary to include the under lining meaning of kpo fire inclusively. illegal refining is a unit describing the simple form of petroleum distillation which is conceptualized like a crude oil school science project. It is similar to the production of local dry gin known as ogogoro. During the field work, the aim is to boil barrels of crude oil with naked fire in a metal constructed sealed tank. The crude oil evaporates and passes two parallel pipes connected to the tank through a wooden constructed cooling water bath, the refined products then drips out slowly into a container at the other end with different products emerging at different intervals (Naamen and Talani, 2011). Furthermore, kpo fire is a familiar word used to described artisanal refinery process. The slang was coined from the explosive sound usually heard when crude oil is used as the fuel for refining activity (UNEP, 2011). This process involves fractional distillation using locally sourced materials like metal pipes and wielded drums. The process also involves the boiling of crude oil of which fumes are collected into tanks. After collection of the fumes, the substance is

cooled, condensed, and the products produced are kerosene, diesel and fuel (UNEP, 2011). To this end, large quantities of waste are also produced which they dump on land and in any nearest water body. This waste substance causes environmental pollution. Kpo fire also refers to make shift refinery involves the processing of crude oil for sale in the black market.

It employs indigenous technology to distill locally made petroleum products adopting the processes involved in producing local gin called ogogoro. However, kpo fire has been on limelight since 2011. This activity is carried out around river areas, the consequences affect aquatic life by resulting to unabated pollution and damages to the flora and the fauna, and considerably makes the area to suffer environmental degradation (Gijo et al, 2016).

Socio-Economic Causes and Consequences of Illegal Refining

Beyond doubt, crude oil theft and illegal refining activities are basically linked to social, political and economic conditions of the country. There are fundamental actors driven by economic aspirations into involving in illegal refining or artisanal refining of stolen crude oil. The first among the actors are individuals infested with poverty and unemployment. They are the ones who steal crude oil and refine it for sale in the internal or local market. These actors are littered in almost all communities in Niger Delta region. The second actors are those who are primarily motivated by capital accumulation. They are described as big operators involved in the expert of stolen crude oil to international buyers in the international black market. Using their high political links, they muster the high financial capital requirement of the high risk illegal international business through political connection to protect their business. (Naanen and Tolani, 2014).

Describing the causes of artisanal refining activities, the socio-economic status of the Niger Delta region is a crucial aspect to blame for illegal bunkering and illegal refining activities. Economic growth within Niger Delta region is weak, slow, and it makes it difficult for youth to gain useful employment. There is high rate of unemployment and poverty in Niger Delta region, despite being the source of the country's oil exploration and exportation activities. It is very hard for youths to get employed because the economic condition makes it hard for job creation in the region. Meanwhile, the country's petro-economy is unable to create jobs the way other sectors like agriculture and manufacturing does. Overtimes, oil wind falls have not been invested judiciously to diversify the economy, create jobs, generate development and improve living condition of people in Nigeria, particularly in Niger Delta region. The failure of prudence, and governance of the socio-economy has brought crisis in Niger Delta region. The crisis situations include criminality, oil theft, insurrection and sabotage of oil facilities within the region (Naanen and Tolani, 2014). It is believed that the people feel that their lives have not been improved by the rich endowment of oil wealth taken from Niger Delta, and that the government and oil companies demonstrate careless abandon to the region. Unemployment is one of the identified root causes of illegal bunkering and kpo fire activities in Niger Delta region. As identified, large numbers of youth are unemployed within the Niger Delta region, to buttress further, the National bureau of statistics 2005 revealed that millions were unemployed and many had never worked before. The youth claims that oil companies do not hire their workers from the oil producing communities. Most of them are not opportuned in skill acquisition programmes. Further, due to environmental degradation, most individuals cannot practice their indigenous occupation of fishing and farming (Naanen and Tolani, 2014).

Consequences of Illegal Refining on Environment

The environmental degradation caused by oil spill is similar to that of illegal bunkering and kpo fire activities in Niger Delta region. The oil companies contribute to the pollution of the environment through gas flaring and equipment failures that result to oil spillage. The environmental devastation caused by kpo fire have rendered the Niger Delta region to become a polluted area with all kinds of risks to humans, plants and animal species. The environmental devastation caused by the oil companies and illegal bunkering and artisanal refineries has been documented. (UNEP, 2011). The environmental condition of Ogoni is similar to other communities in the Niger Delta. However, the

activities of kpo fire peddlers have significantly aggravated the situation due to increase of oil theft and artisanal refineries.

As the pipes are regularly tampered to siphon or tap crude oil, the peddlers are careless about the control of force of oil not the spillage it causes. Furthermore, kpo fire refining process generates more volume of oil wastes than normal oil refining companies. The waste is in sludge form and is discharged into the environment. The oil waste is found covering large area, and do often catch fire, scorching vegetation, destroying microorganisms and everything that stands its way (Naanen and Tolani, 2014). More so, the mangrove and rain forest swamps of the Niger Delta are the places bunkering and kpo fire activities take places. The flares from kpo fire create the same heat as in gas flaring from the oil wells, which causes global warming. Also, the kpo fire causes pollution in the atmosphere by generating black soots inhaled by residents of the community. This has compounded the contamination of rain water that has been the source of drinking water in various communities in Niger Delta region. The effect of black soot on the human respiratory system is resulting to lung, heart and breathing malfunction on people. The water bodies are highly contaminated by the black soot, and the mangrove vegetation as well as the fishing industry in area deeply affected are total devastated. Environmental pollution from kpo fire activities has endangered many lives in various communities. This is because the health of youths directly involved in artisanal refining and the surrounding residents of the community are in danger. The inhaling of toxic elements from crude oil fumes is highly detrimental to everyone's health. However, studies have shown that ailments like cough and rashes are linked to smoke and hydrocarbon elements from crude oil (Naanena and Tolani, 2014).

Consequences of Illegal Refining on Public Health

The contaminants from petroleum waste are harmful to the environment. These pollutants are mostly connected to resident within areas of illegal refining activities, which causes diseases to human and plants. Some of these diseases include organs malfunction, cancer and infectious diseases. The environment pollution caused by operations of illegal refineries in the Creeks of Niger Delta region (Umeh, 2009), is similar to that of gas flaring by oil companies with health and environmental consequences. Every emission of hydrocarbon waste contains over 250 toxic substances which include sulfur dioxide, carbon dioxide, lead, formaldehyde, benzene, and hydrogen sulfide (Canadian Public Health Association, 2004). Illegal refineries and gas flaring has a lot of negative effects on the environment and the society at large. These activities allow widespread airborne pollutants, such as nitric acid and sulfuric acid. In addition, it attracts rain acid that is detrimental to humans, plants, animals and infrastructures (Ekpoh and Obia, 2010).

The emission from oil explosions, pipeline fire, gas flaring and illegal refineries circulates black soot and dangerous particles in the air, lands, water space, and on the skin of residents. The aftermath of oil explosion and pipeline leakage can be devastating on the environment and on peoples' health by causing ailments like cancer, genetic disorders, dermatitis, breathing difficulty and organ failure (Aroh et al, 2010). Because of oil pollution, people in Niger Delta regions consume unsafe water and contaminated food that black soot has infested (Jemelov, 2010). Several researchers have observed that environmental pollution is responsible for carcinogenic disease, traceable to exposure to the radioactive substances of hydrocarbon emission among residents in Niger Delta regions. The presence of heavy metals in oil explosion causes genetic mutilations as well as cardiovascular disease, autoimmune disease and neurological disorders (Bezek et al, 2008). Furthermore, in countries like Nigeria, the consequence of oil pollution is significantly high compared to developed nations (McCaskill, 2013). This suggest that for people to survive, there is need to take precautionary measures, such as in wearing gloves, coveralls, face mask, goggles and to stay always hydrated to minimize the acute effects of soot.

The menace of black soot in Niger Delta region has polluted different communities leaving the atmosphere, infrastructures and people with black substances on the surface. Black soot is a

devastating pollutant with harmful chemicals, metals, and acidic dusty particulates. It has obscured visibility while gazing the air space. Black soot has turned Port Harcourt city from what was known as garden city to soot city. Black soot originates from activities of illegal refiners of stolen barrels of crude oil in host communities harbouring flowing oil pipelines. Furthermore, this menace has generated variety of ailment on people's health. As a threat to public health, black soot contains toxics and the toxicity causes cancer, respiratory malfunction, skin infection and leukemia. The constant emission of hydrocarbon waste called black soot is caused by illegal refineries and gas flaring. This has caused the death of some residents and has inflicted diseases on some residents. The danger of black soot is enormous and complex in the environment. Farmlands, vegetation and water bodies and consumable food are directly and indirectly contaminated by black soot (Jemelov, 2010). The consequences of black soot can have long term and short term effects on the health of people constantly exposed to inhaling the polluted air infested with much of the soot. According to (Solomon and Jansen, 2010), the effects include dizziness, nausea, headaches, vomiting and respiratory problems.

Scholars have known that the health consequence of black soot is detrimental to humans. Therefore, long-term exposure to crude oil waste is much more dangerous than those who stay indoor often. (Woodward, 2010). The health effects of crude oil emission involve acute phases of outcomes on public health. However, many researchers have conducted studies on long-term soot exposure in developing nations with many challenges to reliable data on developing trends in recent times (McCaskill, 2013). This lack of data is a tragedy for underdeveloped nations, such as Nigeria. (Ana et al, 2009) conducted a study in two Rivers State communities of the Niger Delta region to assess the prevalence of health outcomes that can be linked with the health disaster caused by black soot and other environmental risk factors from exposure to oil pollutants from hydrocarbon emission The communities under study were Eleme and Ahoada East (Ana et al, 2009).

Control Measures on Illegal Refining Effects

Eliminating or minimizing the health problems caused by black soot is a major aspect that require urgent inquiry to arrive at panacea. On this stance, people in society and government have the capacity to utilize useful measures to control the effects of black soot or avert respiratory diseases, malfunction of organs, cancer and even untimely death that is associated with emission of hydrocarbon waste into the air, on the land and in river bodies. On the part of people residing in Niger Delta region, adopting wearing of face or nose mask brand known as M95 is believed to have the capacity to filter the air with a lifespan of thirty (30) days. This typified nose mask is appropriate, its accessibility and cost raises question in mind of residents in the region. However, individuals can reduce the impact of soot by visiting medical doctors to do diagnosis on their respiratory organs to ascertain its functionality state. In addition, residents are also advised to take regular fluids like water, and consume lots of fruits to minimize the effects on the body organs (The Guardian, 2022). In recent times, the government have initiated political measures to track down perpetrators of illegal refineries. This measure seems to have yielded little impact, due to government position on non-tolerance with suspects at large. Some of the locations where oil thieves use in refining stolen crude oil have been racked down by the efforts the Army, Police, Navy and NSCDC officers who were accused of conniving with the illegal refining peddlers.

METHODOLOGY

The study adopted descriptive survey design. This method allows thorough collection of secondary data from books and internet sources, and were presented on tables in percentage. However, the data collected were a representative of the trending issues inflicting black soot on the common peoples of Niger Delta Region.

RESULTS

Table 1: Poverty in Niger Delta region

Crude oil earnings in Nigeria	(1960-2012)	& 932.5 billion
Derivation for Niger Delta region	(2007-2012)	& 9.4 billion
Human Development index in Niger Delta		0.564

Source: (Naanen and Tolani, 2014).

Table 1 shows level of poverty in Nigeria, which reflects in the Niger Delta region. Oil earnings in Nigeria between 1960 – 2012 stood at 932.5 billion dollars, while 13 percent derivation for nine States of Niger Delta between 2007 – 2012 was 9, 4 billion dollars. But the human development index of Nigeria was 0.564%. This shows that poverty is seen to be responsible to why youth do kpo fire is high Niger Delta region despite the high rate of crude oil earnings.

Table 1.1: Unemployment in Nigeria

	Year	Percent
Increase of Unemployment	2005	11.9%
	2009	19.7%

Source: (Naanen and Tolani, 2014).

Table 1.1 revealed the unemployment rate of the Niger Delta region. As at 2005, the unemployment rate was at 11.9%, whereas in 2009, the unemployment rate increased to 19.7%. This shows that unemployment is a factor to why youths got involved in kpo fire activities.

Discussion of findings

The findings of the study showed that poverty has deepen youth into involving in kpo fire or artisanal refining process. However, unemployment is another factor causing youths in Greeks to engage in illegal bunkering and kpo fire refining activities of stolen crude oil.

The findings of the study further revealed that kpo fire has caused environmental pollution that has endangered human lives, plant and animal habitats. Therefore, there is the perception that is nothing is done to put to an end to this illegal refining, the environment will remain in disaster condition.

CONCLUSION

Crude oil theft and kpo fire or illegal refining activities in the Niger Delta region is therefore linked to the high rate of poverty and unemployment in Nigeria, particularly in the region. The socio-economic condition of Niger Delta has enabled youth who cannot afford the means for survival to participate in kpo fire activities to derive personal profits without considering the danger it has placed on the environment and the human lives in surrounding communities. However, illegal bunkering and pipeline vandalization constitute a criminal offence in Nigeria. But the need to get money for livelihood by dire grievied youth has made them to neglect the consequences of their unpatriotic actives.

Further, to tackle such menace and to have good sense of reasoning, there is need to address the socio-economic fundamentals of creating jobs and providing useful skills to the teeming youths of the Niger Delta region.

RECOMMENDATIONS

1. Government should create employment through the establishment of modular refineries in the Niger Delta region.

- 2 Government should give amnesty to all youths who surrender materials of illegal refineries in the Niger Delta region and place them on allowances for pipeline security and sensitization of youths against oil theft.
3. Government should assist affected communities with drugs and treatment that will remedy the health problems caused by illegal refining activities in the Niger Delta region.
- 4 Government should implement the planned modular refineries in strategic communities in the Niger Delta Region to engage able bodied youths without gainful employment.

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