

Illicit Economy of Oil Bunkery and the Survival of Niger Deltans in Nigeria: The Health and Environmental Consequences of Black Soot in Port Harcourt, Rivers State, Nigeria

¹Osaji, Nsagha Nkang, ²Okon Bassey Bassey & ³Emem Udoh

¹Department of Human kinetics & Health Education,
University of Calabar Cross River State Nigeria

²Department of Political Science, University of Calabar Cross River State Nigeria.

³Legal Advisor with Resolve to Save Lives Nigeria, Abuja-FCT, Nigeria

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Abstract

The study, seeks to examine the health and environmental implications of black soot-a product of incomplete combustion of fueled carbon whereby, when carbon burns all the way through, very little residue is left. When it doesn't it leaves behind a black, flaky substance called soot. In the Nigerian case, this issue of black soot emanates from the illicit economic activities of bunkery-act of hacking into oil pipelines, to extract oil then refine or selling it on a parallel market. This particular type of illicit cum parallel economy is prevalence in, and has taken the centre-stage in the economy of many people in the oil producing Niger Delta States of Nigeria. The financial reward, not minding the huge risk involved, in terms of escalating violence as a result of stiff quest to control bunkery sites, the huge loss to Nigerian government due to oil theft, explosions that destroy lives and properties, environmental pollution, premature death from health challenges like: heart attacks, strokes, aggravating asthma among children etc. It is based on this backdrop the study looks into finding answers to such questions as: whether the illicit act of bunkery produces or causes Black soot? Whether Black soot adversely effects the health of Port Harcourt residence in Niger Delta Region of Nigeria whether Black soot affect the environment of Port Harcourt residence in Niger Delta? To arrive at such scientific prognosis, the study proceeded with content analysis methodology as data were obtained through secondary sources (textbooks, journal publications, newspapers, magazines, internet materials, etc), while the broken-window theory of corruption was explored to buttress the work. The study discovered among other things that: due to the lip service paid to illegal oil theft/refinery, it has encouraged many citizens to involve in it. Also it is seen as an easy way to make money so as to escape the pernicious problem of poverty and economic lack. The study therefore recommends, strict and uncompromising monitoring of such illegal activities, while punishing offenders and unravel the reason why people engaged in such activity-poverty, lack, complicity from the part of government officials/politicians, military and Security personnel's, be looked into seriously.

Keywords: *Illicit economy, Oil Bunkery, Niger Delta, Black Soot, Broken Window Theory*

Corresponding Author: Osaji, Nsagha Nkang

Background to the Study

The prevalence, of illicit economic activities remains a teething and worrisome challenge to domestic, regional and international Political– economy. The oxford Dictionary defines illicit as anything or an activity Forbidden by law, rules or custom. The Miriam Webster Dictionary, defines illicit as anything criminal, felonious, illegal lawless, unlawful, and wrongful, etc. Any behaviour that is immoral and unlawful. The Global Initiative Against Transitional Organized Crime informed that, illicit economy contribute to long-term enabling environments for instability by prolonging conflicts and eroding government responses to conflicts. Coke-Hamilton and Hardy (2009), opined that, illicit trade endangers the environment, the law and the achievement of sustainable development goals, while also cost a drain of about \$ 2.2 trillion-nearly 3% on the world's economy. It creates a triple threat to the financing of development by crowding out legitimate economic activity, depriving governments of revenues for investment in vital public services and development. One of the biggest oil producers in the world, losses as much as 30% of its refined petroleum products through thefts, diversion and smuggling into neighboring states.

The problematic, associated with, illicit or parallel economic activities, is disastrous in so many aspects: it remains unlawful, causing instability and conflict, degrades the environment, ridicules human dignity and worth, economic loss to the government, etc. The situation in Nigeria, a country that produces about 1,928.500 Barrel/Day of oil as of February 22, the 6th largest oil (2.5 million barrels Per day) producing country in the world. Nigeria produces only high value, low Sulphur content, light crude oils-Autoblend, Bonny light, Bonny medium, Brass Blend, Escavos light, Forcados Blend, IMA, odudu Blend, Pennington light, Qua Iboe light and Ukpokiti. The Nigerian National Petroleum Company-NNPC through its subsidiary, the Nigerian Petroleum Development Company (NPDC) is directly responsible for four oil and gas fields with a total production of 15,000 per day, (CEIC Data 2021; NNPC Group.Com). The oil in Nigeria that gives the Nation 90% of foreign exchange and 85% of budget revenue is produced from just 7.5% of the total area of the country, known as Niger Delta oil producing states. This small part of the country that produces this oil is known as the Niger Delta region and the states (9 states), namely: Akwa Ibom, Lagos, Delta, Rivers Bayelsa, Ondo, Edo, Imo and Abia. Out of these producers, Akwa Ibom, Delta, Rivers and Bayelsa accounts for 80% of the crude oil produced (Yahaya 2022). The oil beneath the soil of these states have been transmogrified into a nightmare, a curse rather than a blessing.

The challenges facing the Niger Delta ranges from infrastructural cum developmental neglects, poverty, loss to means of livelihood, health deterioration and 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 Niger Deltans, specifically Port Harcourt in Rivers State, which is the focus of this study. Nan (2010), informed that, the illegal activities of bunkery are the work of unpatriotic and criminally minded Nigerians and their collaborators. The oil bunkery in Nigeria, causes a lost of between 300,000 and 400,000 barrels of oil to illegal theft. The theft accounts for roughly 15 percent of Nigeria's 2.4 million barrels per day produced. Oil theft or bunkery occurs throughout the Niger Delta, where pipelines crisscross the region. Oil export revenue contributes about 70 percent of Nigeria's

total government revenue and 95 percent of Nigeria's export revenue. A loss of 300,000 barrels a day cost the Nigerian government a whopping \$1.7 billion a month. Despite the efforts of the Nigerian government to eradicate oil bunkery by boosting security, theft and pipeline vandalism continues, (Campbell 2015). Ana (2020), is of the view that, illegal bunkery connotes the syphoning of crude oil from pipelines and storage facilities. This act is usually carried out by local bandits, who often favour brute force, employing force, using chainsaws and sharp blades to cut into pipes transporting crude oil, causing both environmental problems-pollution and health challenges-coronary heart disease, asthma, cancer, bronchitis and other respiratory illness as a direct fall out of black soot.

Dovetailing from the above brief analysis, the study dedicates its efforts in unravelling the health and environmental impact of black soot emanating from the illicit economic activities of oil bunkery in Port Harcourt Rivers State, Nigeria. The study authenticates the bunkery-Black soot nexus, then delved into the health and environmental effect of Black soot in Port Harcourt Rivers State and then buttress the outcry from Port Harcourt residence to ventilate their grievances,. The study also revealed efforts made by rivers state government and the Nigerian government in responding to curb and put an end to bunkery activities and finally tender some suggested prognosis and conclude the work.

Statement of Problem

The problematic associated with bunkery, remains a disturbing issue in the Nigerian body politic as regards one of the debilitating conditions and experiences of oil producing states in Nigeria. The Niger Delta region domiciled in Nigeria is situated in the Gulf of Guinea between longitude 5oE of 8oE and latitudes 4oN to 6oN. It is the largest wetland in Africa and the third largest in the world consisting of flat low lying swampy terrain that is criss-crossed by meandering and anastomosing streams, rivers and creeks. It covers 20,000km² within wetlands of 70,000km² formed primarily by sediment deposition. It has an equatorial monsoon climate influenced by the southwest monsoonal winds (maritime tropical) MT air mass coming from the South Atlantic Ocean, it is home to 20 million people drawn from nine states namely: Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo and Rivers states. More than 70% of Nigeria's crude oil and gas production is from the area. The region produces over 90% of Nigeria's foreign earnings through crude oil exploration activities. It plays host to most of the upstream and downstream oil related industries and nonoil related industries that releases tons of pollutants into the ecosystems. The pollutant from the Niger Delta on a scale could be regarded as one of the worst among similar delta areas in the world. These environmental issues affects their agricultural practice and prospects, (Ana, 2010; Ubom, 2010; Aminu, 2021; the SND; Babatunde 2014; Ratcliffe 2019).

Dovetailing from the above, it is obvious that, the Niger Delta has been strategically placed and blessed by God, with abundance of oil wealth. Such oil wealth, if judiciously utilized is capable of transforming the area with the necessary developmental edifices such as: good roads, health, education, recreational activities, electricity, employment, etc even the engagement of the oil multinationals in corporate social responsibility in areas of scholarship skills acquisition, community development services would elevate the welfare of the people.

But the area has continuously suffer severe environmental degradation and neglect. The poverty in the area has prompted the youths to indulge in bunkery activities due to the huge economic gains and financial rewards accrued from such illegal activities, not minding the risk: health and environmental implications of such criminal acts.

According to Kalagbor, Dibofori-Orji and Ekpete, (2019), in November 2016, resident in Port Harcourt wakes up on daily basis to black soots covering cars, clothes, houses, plants, etc. This continued to increase until the first quarter of 2017, which led to a decline due to public outcry. Salaudeen (2020), is of the view that, residents have identified the continuous burning of waste and illegal oil refineries-bunkering as the cause of the particles that covers the city for long now. This is an issue of crude oil theft from pipelines, known as bunkering. This illegal bunkering involves Syphoning crude oil from pipelines and storage Facilities. It is usually carried out by Local bandits, who often favour brute force, using chainsaw and sharp blades to cut into pipes transporting crude oil, causing pollution, and sometimes, even accidents. At their most forceful engagement, they blow pipelines and gather the crude. “The stolen crude is put in drums and burnt far away in the bush over a long period of time. After the burning process, it is sieved”, explained by Mohamed Bashir oil and gas expert. The crude oil theft is pronounced in Port Harcourt City in Niger Delta and some estimates suggest that Nigeria losses \$1 billion dollar each year to bunkery. In Port Harcourt the crude is mostly burnt in the creeks, in places like Isaka, Borokiri, and Kalabari. In Borokiri traders openly Hawk the illegally refined oil. Today the black soot is the result of decades of illegally burning crude to derive Petrol and diesel; soot is the byproduct of burning oil. Four of the worst cities of air pollution in the world as listed by the World Health Organization are in Nigeria. This means Nigerians are generally exposed to hazardous air pollution, and this becomes alarming when the soot is considered. Residents of Port Harcourt, for instance, are vulnerable to higher likelihood of coronary heart disease, asthma, Flu, bronchitis and other respiratory illness because of the soot, (Salaudeen ,2022).

The study, at this point, unravels the health and environmental implications of black soot in Port Harcourt, rivers state, Nigeria. Also the study factually showcase that black soot emanates from the illicit economic activity of bunkery. And finally, the measures and steps taken by rivers state government and the federal government to frontally tackle the menace of black soot.

Objective of Study

The general objective of the study, is to examine the extent at which Black soot affects the health and environmental condition of Port Harcourt residents in Rivers State, Nigeria. The study further look into some specific but salient issues below:

1. The nexus between oil bunkery and black soot
2. The health implications of black soot
3. The environmental implications of black soot
4. The response of rivers state government and the Nigerian state in ameliorating the plight of citizens of rivers state as regards the deadly effect of black soot.

Research Methodology

The study, which was in a content analysis methodological features, applied the secondary sources (textbooks, journal publications, internet materials, textbooks, newspapers, magazines, etc) to get facts. Thus it is a quantitative analysis that critically examined and analysed documentary facts.

Theoretical Framework

Broken Window Theory of Corruption

According to Jones (2021), the broken window theory, propounded in 1982 by criminologists James Q. Wilson and George Kelling, states that: signs of disorder will lead to more disorder. A building with a broken window that has been left unrepaired will give the appearance that no one cares and no one is in charge. This will lead to vandals breaking the rest of the windows and adding graffiti, because in their minds nobody cares.

According to Ojeifo (2015), the broken windows theory is a theory in criminology and social psychology that deals with the effect of urban disorder and vandalism on crime and anti-social behaviour. If the broken windows are not repaired, the tendency is for vandals to break on one windows. Ojeifo went further to state that, Nigeria is a country which has the attributes of the broken window theory in the management of affairs. Through complicity, acquiescence, indifference, adjustment and withdrawal into personal enclaves into primordial zones, (2015) etc.

The input of this theory to the study, as it relates to oil theft, bunkering and the resultant black soot in Nigeria, is a clear case of social disorder emanating from the days of militancy. Thus, the character of the Nigerian state towards the oil producing states in areas of compensation, and development, for the environmental degradation caused by oil spillage and gas flaring prompts the people of Niger Delta to go into militancy, kidnapping, sabotage of oil pipeline, till the current bunkering. The disorder in the form of such criminal behaviour as militancy led to bunkering. Thus, as many politicians, Security personnels, traditional rulers also engage in such criminal behavior, it emboldens the youth to glow in the act, considering the huge financial gains on the one hand and the carelessness on the part of the Government. Also the government initially paid little attention to bunkering, the result is the black soot. The behavior of the Rivers State Government and Nigeria initially display lackluster attitude, made worst by irresponsiveness of the Government to the plight of oil States who suffers the environmental, economic and health impact of oil spillage and gas flaring and complicity on the parts of some top politicians, military personnel's, etc It shows that such attitude towards a disorder like bunkering, clearly gives room to the level it has reached today.

Definition of Terms

Illicit Economy

Webster's Dictionary defines illicit as 'not permitted by law' (Merriam-Webster, 2014a) and economy as 'the process or system by which goods and services are produced, sold and bought in a country or region' (Merriam-Webster, 2014b). Thus, in an unambiguous form, illicit economy can be defined as a system or process by which goods and services are produced, sold

and/or bought in a country or region where it is forbidden by law. Illicit economy has not been subject to extensive scrutiny by academicians. Lack of authentic empirical data and direct subject research opportunities present a handicap for researchers. However, some authors like Andreas Friman and Peter H Richard have attempted to define the illegitimate economy in global terms. For Friman and Richard, 'the illicit global economy consists of a system of transnational economic activities that are criminalized by states in importing or exporting countries' (Friman, 1999, 5). Edgar L. Feige recognizes that the academics do not follow a uniform nomenclature for illicit economy and in a considerate effort to discern informal, under or unreported economies and illegal economy, he defines, illegal economy as a system that 'consists of the income produced by those economic activities pursued in violation of legal statutes defining the scope of legitimate forms of commerce. Illegal economy participants engage in the production and distribution of the prohibited goods and services, such as drug trafficking, arms trafficking and prostitution' (Feige, 1990).

Bunkery

According to Daniel (2021), bunker fuel also known as the bunkery is any fuel used for powering a ship. The term has its roots back in the days when the primary source of power for the ships was coal. The coal was stored in a container known as the bunker. As the industry changed from coal to oil for propulsion, the name remained and became synonymous with the fuel for ships. Hence, bunkering oil means fuel oil used for ships. Bunker fuel is the residual portion that remains from the process of crude oil refinement. Naturally, it is much cheaper than the latter. It is used by big land-based plants as well as large ships for their propulsion and auxiliary engines. Since it is cheap, it lowers the expenditure for companies dealing with commercial shipping. Bunker fuel in itself might be cheap. The Maritime Insight informed that, Bunkering procedure is one such operation on a ship which has been the reason for several accidents in the past. Bunkering on a ship can be of fuel oil, sludge, diesel oil, cargo etc. Bunkering of fuel or diesel oil requires utmost care and alertness to prevent any kind of fire accident or oil spill.

Black Soot

According to Opeyemi, (2021), soot is a black particulate matter made up of carbon and results from the incomplete combustion of fossil fuels. Residents of Rivers State and experts across Nigeria believe that illegal crude oil operations and the destruction of products from illegal oil refineries are responsible for the black soot. In an interview with CNN, Saatah Nubari, a state resident, says, 'one of the causes [of the black soot] is destroying products that are gotten from illegal crude refineries. When you burn them, it goes up into the atmosphere'. The Avant clean Publication informed that, black soot can best be described as a product of the incomplete combustion of fueled carbon. You see, when carbon burns all the way through, very little residue is left. When it doesn't, it leaves behind a black, flaky substance called soot. Niranjana and Thakur (2014) are of the view that, soot is a powdery mass of fine black particles. It consists of impure carbon, formed after the incomplete combustion of hydrocarbons. The main source of environmental soot is the combustion of fossil-based fuels and biomass burning at the earth's surface. The other examples of soot may include coal, charred wood, petroleum coke, cenospheres, and tars. To a smaller extent, quartz/halogen

bulbs with settled dust, cooking, oil lamps, smoking of plant matter, fireplaces, candles, house fires, furnaces, and local field burning also contribute to the soot production. Soot particles range from about 10 nm to 1 mm in size. The relative amount of elemental carbon inside soot is considered to be less than 60% of the total mass of particles.

The Nexus between Oil Bunkery and Black Soot in Port Harcourt, Rivers State

This part of the study, extrapolates scholarly articles on the nexus between illegal oil bunkery and black soot in Niger Delta region and Port Harcourt in particular. As aptly put by Daniel (2022) thus:

Resident of Port Harcourt, Rivers State cry out on daily basis to government to respond to the polluted environment caused by soot from illegal refineries and bunkers who engaged in what the local people described as “Kpo – fire”. Their activities are making the city uninhabitable for residents.

In the same wavelength, Godwin (2021), opined that, as many as 23,000 persons suffer respiratory related ailment for five years following the nefarious and incessant oil bunkering. This has caused panic in Port Harcourt for fear of soot. A review report by a 20 man team from various inter-disciplinary and relevant fields including a consultant physician and dermatologist at the University of Port Harcourt Teaching Hospital, Dr. Dasetima Altraide, Conducted an investigative studies into the airborne particulate (soot) in Port Harcourt and the report stated that: illegal bunkering and gas flaring are two major sources of soot in the state. Investigation by the Guardian at the Rivers State Ministry of Environment revealed that artisanal refining is occurring in 14 of the 23 local government areas of Rivers State. The activities of the Local refineries (bunkery) is said to be causing incomplete combustion of crude which now releases carbon monoxide, Sulphur into the air. By November 2020 the soot particles became perceptible across the state because of the surge in illegal refining in several parts of Rivers State. Some of the artisanal refiners, who pleaded anonymity, told the Guardian that, people can't bear the excruciating hunger, can't meet their unending needs. In the quest to meet needs especially during festive season, hence their involvement in the lucrative illegal refining (bunkery), activities which unleashes soot. Some even vowed to refrain from such acts if government empower them, while many insist on furthering the illegal bunkery venture due to it quick source of income.

Gilles (2015), also gives credence to the above view thus: the city of Port Harcourt usually known as “Garden City” has been basterdized by black soot when in 2015, the problem started. The cause of the soot has been something of a mystery. Although some environmental activist like Nubari attributes it to illegal oil refineries-bunkering. In a statement released to CNN, Nigeria's Ministry of environment said there is a link between the pollution and the operation of illegal oil refineries and their destruction. There is a direct correlation between the level, intensity and composition of the soot and illegal oil refinery activities, including their destruction in the Niger Delta. Ojo (2021), also affirmed that, due to the adverse and deadly effects of black soot in Port Harcourt, and the outcry by the populace, in 2016, Governor Nyesom Wike, the Rivers state governor commissioned a technical team in 2018 to investigate

the factors responsible for the surge of black soot pollution and how to tackle it. According to the report published in 2019, a copy of which was obtained by the cable, illegal bunkering and gas flaring topped the list of activities causing soot pollution in Rivers State.

Health Implication of Black Soot in Port Harcourt, Rivers State

The problematic, associated with black soot, readily presents environmental and health threats to residents of Port Harcourt on daily basis. They are greeted with soot at homes: it covers their clothes, fill their nostrils, which means the inhale it into their body without any means to stop it, causing health problems.

According to the Wikivoyage (2019), Port Harcourt is a gulf city with a population of 1.8 million inhabitants, the capital of Rivers State in the Niger Delta area of Southern geopolitical zone in Nigeria and is the center for the oil industry. English is generally spoken, but Ikwerre (the indigenous language) is also spoken and Pidgin English is widely spoken across all demography as found in most part of the country. The Dentons Publication informed that, the city of Port Harcourt was founded in 1912. It is Nigeria's primary oil-refining city and has two main oil refineries located in Eleme. Both refineries processes approximately 210,00 barrels of oil per day and are operated by Port Harcourt Refining Company. Rivers State is one of the wealthiest states in Nigeria by GDP, largely due to foreign exchange revenue from oil industry, with crude oil being its principal export earner. In addition, Port Harcourt's deep-water facilities are responsible for the export of palm oil, palm kernels and timber from the surrounding area, coal from Anambra State, tin and columbite from Jos plateau, and since 1958, petroleum from fields in the eastern Niger Delta river. Port Harcourt has bulk storage facilities for both palm oil and petroleum.

The Port Harcourt City, in Rivers State, remains strategic to the survival of the Nigerian economy as other oil producing states. Oil in Port Harcourt, Rivers State, like other states have become a curse rather than a blessing. Thus the theory of the “Paradox of plenty” and “Dutch disease”-a situation common in many oil-rich and resources endowed Nations mostly, where the abundance of oil and other mineral resources have not been able to engender any meaningful development in terms of good roads, electricity, modern health and education, reasonable per capita income, security, etc but rather the prevalence of violent-conflict, poverty, oil cum resource war, corruption, high poverty and infant mortality rate, huge gap between the rich and the poor, environmental pollution, inequality, poor and deteriorating infrastructure etc.(see Duke, Ediege and Bassey 2022, conference paper on "mirroring the developmental challenges of oil-rich Nigeria within the context of Resource curse/Dutch Disease and paradox of plenty" presented at the faculty of management sciences, University of Calabar Cross River State Nigeria).As aptly put by scholars whom are concern about the developmental challenges of the Niger Delta people. The huge gains from oil to the Nigerian economy, which is gotten from the Niger Delta area has not benefited the area. Apart from environmental pollution as a result of oil spills putting millions of the inhabitants at risk. The undending pains of black soot emanating from the activities of oil bunkery-breaking pipelines and channeling illegal oil to bushes has increased in the oil-rich Niger Delta region. The problem of black soot is at the doorsteps of those in all states suffering it, thus: as you walk

with your bare foot in your home, the sole of your foot becomes black, wash your clothes outside, they are stained with black particles, you clean your face with handkerchief and it becomes black. Also to be considered is the setting ablaze of crude oil impacted site in the states by some contractors in the name of cleanup, as well as the burning of seized and stolen crude by security operatives is not environmentally – friendly, (saint 2022; Oja Dongha, 2021).

The problem of black soot, and its concomitant health challenges, emanating from the illicit economic ventures of bunkery remains a disturbing threat to man's existence and dignity. The Background Briefing informed that the bunkery in Port Harcourt, is an activities carried out by conglomerates of oil bunkerers made up of expatriate and local businessmen, high-level politicians and military personnel and even employees of the oil companies themselves, who most times recruit youth leaders to help provide security for such criminal endeavors. Although the revenue from oil bunkering fluctuates greatly, it accounts for about ten percent of Nigeria's daily production, earning those in the business between US\$1.5billion and US\$4 billion per year. Illegal bunkering has fueled violence between armed groups and exacerbated human rights abuses. However this part of the work is not on the violence associated with bunkery, rather the health implication of soot. This Day Newspaper of January 24 2022, informed that soot particle, according to experts is 2.5 micron in size and can only be seen through a high-powered microscopic lens. These particles can penetrate any closed space that absorbs air, including homes, classrooms, worship places and offices. The soot is inhaled easily by humans without masks. Since the last quarter of 2016, the black soot has become a terrible environmental problem faced by Port Harcourt residents. Black soot gets into the respiratory system triggering or aggravating asthma, bronchitis, Pneumonia, heart disease, birth defects and even cancer.

Iheamnchor (2017), posit that, about six million residents in Port Harcourt City face the risk of developing cancer of the lung and other respiratory problems as a result of incessant spread of soot caused by bunkery. This was informed by Dr Furo Green, a specialist and consultant surgeon at the Braithwaite memorial specialist Hospital, Port Harcourt, who raised the alarm of black soot. Dr Green further asserted that, currently in Rivers State, many people were at the risk of developing cancer of the lung and other respiratory problems following prolong exposure to the black soot caused by hydrocarbon, urging the Federal Government to monitor the activities of multinational companies that are into hydrocarbon processing. Dr. Green advised, washing of hands as often as possible because even when you wash your hands you will see that the lather of the soap itself is black.

The Tribune Newspaper of January 13, 2022, informed that in year 2020, two years to 2022, it has been difficult to breath clean air in the city of Port Harcourt. While handkerchiefs turn black very quickly and homes are full of soot even when doors and windows are shut. Soot has the ability to penetrate the lungs and bloodstream easily and is in fact listed by the United States Environmental Protection Agency (EPA) as one of the deadliest forms of air pollution. Beginning from 2010 when residents of Port Harcourt began experiencing the strange scourge of soot, the situation is not getting better: soot is everywhere and there is death in the air as breathing, wiping one's face with handkerchiefs and even cooking are now risky endeavours.

The authorities have been unable to stop the illegal refiners of oil in their tracks as unscrupulous security agencies reportedly abet such activities. Many factors are making it hard to stop such illegal bunkery: the military ignoring the cost to the environment, constantly sets illegally refined petroleum products ablaze, residents burn refuse and roast meat with tyres and gas flaring is continuing in an alarming rate, putting residents of the metropolis at risk of various cancers. Port Harcourt in 2018 was rated as the worst polluted city in the world by an air index of 188. The city also runs the risk of becoming Nigeria's capital of adverse respiratory diseases, heart problems and cancer.

Victor (2022), is of the view that, black soot have continuously threatened the health and economic lives of Rivers State people. Despite Rivers State government, Federal Ministry of Petroleum Resources and the ministry of environment promises in addressing the environmental effects of the black soot. On the health front, environmental experts have warned that soot in Rivers State is capable of leading to respiratory diseases, skin cancer, and kidney and liver damages. It could also damage the human eyes and nostrils. On the economic fronts, soot also poses a threat to animals and aquatic life, especially fishing, which is a major occupation for most communities in Rivers State. Soot causes premature rusting and damages over time, leading to loss to human lives. On the health front, it could lead to full blown health crisis and reduce life expectancy. Economically, according to Nigerian Extractive Industries Transparency Initiative (NEITI), Nigeria has lost \$42 billion to activities of oil theft (bunkery) within nine years. In the same vein, Godwin (2021) averred that, about 23,000 persons in Port Harcourt suffers respiratory related ailment in recent years.

Environmental Consequences of Black Soot in Port Harcourt

One of the devastating and deplorable experiences, of the oil producing cities in Nigeria, like Port Harcourt in Rivers State, is the problem of environmental pollution and degradation. This emanates from factors such as gas flaring, oil spillage, local refining of oil called bunkery or Kpo-fire. Salaudeen (2022), succinctly put the environmental impact as follows below:

Four of the worst cities for air pollution in the world as listed by the world Health Organization are in Nigeria. This means that Nigerians are generally exposed to hazardous air pollution, and this becomes alarming when the soot is considered.

According to Salami (2022), the city of Port Harcourt, which is the capital city of Rivers State as popularly known as Garden city due to its green and open space, with its serene environment is now a cynosure of environmental pollution. Environmental assessment of soot as informed revealed that soot has been found to contain Sulphur dioxide and, which caused acid rain when combined with moisture. That the air pollutants emanating from black soot can trigger an immune response in mothers, which produces antibodies that reduce the amount of folic acid that travels through their placentas to their fuses. In February 2017, the Rivers State Ministry of Environment declared the soot an "emergency" situation. In the same month, Nyesom Wike, the Governor of Rivers State, established a committee to probe the cause of the soot and suggest ways forward in curbing such deadly menace. The committee's

report suggested that, the soot emerged as a result of the destruction of illegal refineries by security agencies. Their findings were hinged on the narrative that the police identify and demolished illegal refineries in the region, with resulting fume, forming dark cloud over the city. The Vanguard editorial of January 5 2022, informed that, recently people in Rivers State and neighboring Bayelsa State lament that they experience severe difficulty in breathing due to exposure to emissions of soot, a hazardous black amorphous carbon that has almost completely polluted the air in the areas. The findings of Professor Precious Ede-led Technical Committee set up by the Rivers State Government which carried out a comparative investigation on the impact of soot pollution over a three-year period would suffice. The findings revealed that an estimate of 500,000 persons have had their immune systems compromised and exposed to the extreme and the prevalent viral infections, and other unverified number of persons are suffering from severe kidney, liver, and mental problems.

The Daily post News Magazine informed that, for years now after the devastating impacts of soot was felt by Port Harcourt residents, the poisonous emission otherwise known as black soot has continued to pose a threat, especially to residents in Port Harcourt, Oyigbo, Obio Akpor, Ahoada, Degema, Bonny, Okirika and Eleme Local Government Areas of the State. The soot, usually observed early in the morning appears to have defied solution. The soot comes in the form of black dust-like particles, noticeable on ground surfaces, cars, houses and any other items that are exposed. The substance also get stucked in nostrils, causing breathing problems to humans, with residents having complained they cough out dark phlegm. The soot also cover roof tops to the extent that rain water turns black, with experts declaring it acidic.

Kalagbor, Dibofori and Ekpete (2019), are of the views that, about 22,077 persons have suffered from respiratory related ailments in the last five years. The Guardian Newspaper gathered that top politicians in Rivers state have started using Mas, a nose mask that filters the air. This mask, it was gathered is very expensive and has a lifespan of 30 days. It is, however, not ascertained whether the mask is worn to curb covid-19 or to protect them from air pollution. Also an air quality assessment conducted by Extractive industries and Society, from April 22, 2022 indicated that some areas in Port Harcourt, Borokiri had 24 honean, being the highest PM_{2.5} (304 ug/m³) while Nkporlu had the highest PM₁₀ (575ug/m³) and when compared with world Health Organizations (WHO) 24 hours mean standards, the results across the assessed locations indicated that citizens within Port Harcourt are exposed to potential respiratory and cardiovascular health risk due to poor quality air. Air visual ranking of Port Harcourt on December 23, ranked Port Harcourt very unhealthy for sensitive groups with an air index of 207.817, hence urging the sensitive groups to wear mask outdoors. Findings revealed that this was higher than April 2018 ranking, when Port Harcourt was rated the worst polluted city in the world with an air index of 188, followed by Beijing, China, which ranked 182, and Delhi, India at 181, (Kalagbor 2019).

Salaudeen (2022), opined that, four of the worst cities for air pollution in the world as listed by the World Health Organizations are in Nigeria. This means that Nigerians are generally exposed to hazardous air pollution, and this becomes mind boggling when the soot is considered. Resident of Port Harcourt, for instance are vulnerable to tremendous effect of

coronary heart disease, asthma, flu, bronchitis and other respiratory illness as a result of soot. The Deadly environmental impact of soots remains a serious nightmare. This is so, as the Nigerian Health watch informed that, the soot affects the environment to a point that even at 8:am early morning the atmosphere is usually dark, which further makes visibility difficult. In Hotels, as you check in you see black powdered substance called 'black soot' on the bed sheets.

Citizens and Government Response to Soot

A serious catastrophe as soot, which causes sever health, environmental and social inconveniences is sure to meet public outcry and outburst so as to drag the attention of the governments towards redress. Local activist, like Eugene Abels, the coordinator of 'stop the soot', a group campaigning for a pollution-free Port Harcourt said the government seemed lackluster in curbing the menace of black soot emanating from illegal refineries and gas flaring by oil multinationals operating in Port Harcourt and other oil states. In April 2018, "stop the soot" led over 5,000 residents in a protest march in Port Harcourt, demanding prompt and effective action to end illegal refining. About 420 activists signed and sent a petition to the World Health Organization (WHO) and the United Nations (UN) requesting for their intervention. Abels also took the Federal and state government to court, demanding the Federal High Court in Port Harcourt to order governments to utilize its powers in putting an end to pollution. Even though these bold steps did not seem productive at the onset, hope rose in Port Harcourt as a result of the “stop the soot conference” organized on December, 9 2021, by the Rotary club of Port Harcourt. This prompted the government on January 1, 2022 to decisively take action against illegal artisanal refining by working with local government chairmen, traditional rulers and whistle blowers to fetch out and destroy dozens of illegal refining facilities across some local government areas.

According to Salaudeen (2022), in February 2017, the Rivers State Ministry of Environment declared publicly the danger of Black soot, calling it an “emergency situation”. This led to the shutting down of Asphalt processing plant engaged in producing thick smoke contributing to the soot. In the same month the Governor of Rivers State, Governor Wike set up a committee to investigate the cause of the soot and suggested possible ways to curb it. The committee's report revealed that soot emanates from the destruction of illegal refineries by security agencies. The proposed action was for the police and military to spot and destroy illegal refineries in the region, and the resulting smoke has eventually formed a dark cloud over the city. Sequel upon the committee's findings, Governor Nyeson Wike averred that, there is nothing his administration can do regarding the soot, as tackling security agencies is not within the purview of the state government. The Cable News informed and decried about the insensitivity of the governments and its relevant agencies and ministries (National Oil spill Detection and Response Agency – NOSDRA), Nigeria upstream petroleum Regulatory commission – NRC, as well as the National Environmental Agency saddled with the responsibility to tackle air pollution in Nigeria. These agencies are yet to respond to these teething challenges which is within their area of National assignment as regards illegal mining and refining oil in Rivers State. The abdication of responsibility of combating this environmental menace of black soot, by both the respective environmental and security agencies can be equated to ecological terrorism.

Naku, (2022), post that, due to the unbearable health implication of the black soot, resident, led by Kenneth Green, sent petition to president Buhari and, the Governor of Rivers State- Governor Nyesom Wike so as to spur them into action. This was followed by 10,000 signatories which among others included online volunteers. As of 2020 the rivers state Government expressed its readiness to implement the report that emerged from the above petition by recommending inter alia- ministerial committee set up to investigate the cause of the soot, which ravaged Port Harcourt. Governor Nyesom Wike had on several occasion blamed the federal government on it insensitivity towards the menace of soot and grievance of the rivers people. He further accused the military and police of complicity in the legal oil refining, which he tagged “worst economic sabotage”. The governor mandated the 23 local government chairmen of rivers state to provide a comprehensive list of illegal refineries and their operators within their jurisdiction. The Governor lamented the involvement of security agencies in illegal bunkery.

Chinedu (2022), noted that, in recent times, the Governor of Rivers State, Mr Nyesom Wike have been resolute in tackling the illegal act of oil theft/bunkery. The Governor affirmed that those behind the illegal acts are not poor people but a cartel and vowed to fight them until his tenure expires. Governor Wike made it feasible when he led some officials of his cabinet including the commissioner of police and other security chiefs to the forest of Ogbodo Community in Ikwerre Local Government Area and the forest of Ibaa Community in Emohua Local government Area, to unravel some crude oil illegal refining sites.

Cyril (2022), maintained that Governor Wike blamed the continuous bunkering on the refusal on the part of the Federal Government of Nigeria, to show commitment and steadfastness on issues of National concern. This was said during the visit of the participants of the strategic and policy studies course 4/2021 of the Nigerian Army Resource Centre Abuja led by major General James, and G.K. Myam paid him (Governor Wike) a courtesy call at the Rivers State Government House in February 2022. Nwisi (2022), affirmed that the Nigerian Security and Civil Defence Corps (NSCDC), Rivers State Command, paraded 17 suspected illegal oil bunkers in the state. The suspects were reportedly apprehended by the NSCDC Commandant General's Special Intelligence Squad (CGIS) and some personnel of the state Command. The suspects used six trucks and a bus to convey the illegal refined products. Also on 25th January 2022 at about 13:05 hours close to Olu Obasanjo area in Port Harcourt metropolis, two suspected oil thieves were arrested and a truck with registration number RNG 18LX yellow and white colour were arrested alongside the suspects. Nwezeh, Orizu and Onabu (2022), informed that as the battle against crude oil theft increase, the Nigeria military have shown bravery and commitment destroying networks of bunkery. The Defence Headquarters on 7th April, 2022, disclosed that, it launched a special operation code named “Operation Dakata Da-Barawo” in order to curb crude oil theft and illegal bunkering in the Niger Delta region. It revealed that 30 illegal oil refineries had been demolished in the region by the Naval troops in the last two weeks. Speaking at a briefing in Abuja, the Director Defence Media Operations (DDMO), Major General Benard Onyeuko, said the new operation in the Niger Delta region was aimed at reinvigorating the already existing operation Delta Safe with a view to containing economic sabotage in the region.

The adverse effects of black soot, to human health, it's devastating. As shown in the study above, we can ignore the disastrous impact certain behavior old man has caused to the existence of his fello man. So many occurrence that hinders man's existence on planet Earth is man-made that has caused unbearable twist all over the world. Scientific, technological, breakthrough that we enjoy today in the form of computer literacy, ease in Communication, finding solutions to myriads of health, Security, environmental challenges through scientific breakthrough as also indirectly affect us. The case of black soot, which is a result of man's quest for survival through illegal means, has become a major disaster to our lives. Thus just like other illicit economic activities (arms proliferation, drug trafficking and human trafficking, sales of counterfeit drugs, etc) Bunkery has sever health, environmental, economic, social challenges.

Conclusion

The study, was to extrapolates the adverse effects of black soot with reference to health and health. The study was able to authenticate the basic assumptions Nexus between oil bunkery and black soot; black soot and health challenges like asthma, bronchitis, cancer, etc. and the efforts of the government in curbing the menace of black soot. The broken window theory was explored to buttress the work, which shows that bunkery is a social disorder that lingered because of the quest for economic survival and the huge economic gains associated on the one hand while the initial lackluster attitude by the government and complicity on the part of military and security personnels. However, the government and military beef up their search light and clamp down on defaulters. The study showed that the problem associated with black soot explains the level at which oil in the Niger Delta area of Nigeria, remains a jinx and problem to the survival of the Niger Deltans. An area so rich with oil, supposed to be flourishing in all facet of development, like good roads, electricity, health center, portable water, adequate compensation from multinational corporations, etc. but unfortunately, he reverses has been the case. Oil has seen the Niger Delta area in resource war, militancy, environmental degradation, etc. The current issue of black soot, present a case of quest for survival on the one hand, while the lackluster attitude of the Nigerian State in terms of unwillingness to fight bunkery activities, as some politicians, traditional rulers, security personnels are accomplice, remains an issue of concern. Thus, such behavioral pattern, which gives room for disorder, ends up making such Illegal act of bunkery to wax and difficult to curb.

Recommendations

The study recommends some prognosis as follows:

Punishing offenders. The usual lip service and nonchalant attitude of the government and other agencies towards culprits should be changed. Government should be uncompromising and strict in apprehending defaulters and punishing them. There is no gainsaying the fact that, many issues of societal deformities and malaise like: arm robbery, kidnapping, militancy, rape, terrorism, thuggery, etc are treated with kid gloves. Many criminals and crime syndicates are most times release by virtue of their connection with men and women in high places in the society, financial reward to the criminal Justice system. So there is need for such ignoble narrative to be changed. Sincerity and strictness without double-standard measures be employed to deal with culprits.

Uncompromisingly enacting and enforcing laws that strictly prohibit Bunkery. As pointed out in the study, oil bunker and black soot was initially handled with kid gloves, thus government's attitude allowed those involved in the illicit act of bunkery was not enough to deter defaulters. As citizens began to be voiceferous calling on the government, civil society, non-governmental organizations, etc the matter of Bunkery and its concomitant black soot was taken serious. This was also due to the many research and findings from experts that exposed the danger associated with bunkery and black soot. At this juncture it is pertinent or rivers state government and the Senate to enact laws prohibiting bunkery. Compensation, mostly in health care for Niger Delta area and its inhabitants. Thus medical care that is focused on checking their organs by multinational corporations and government sponsoring certain health scheme mostly for the aged and expectant mothers.

Adequate attention, to issues of poverty and environmental degradation by way of empowerment and employment of the youths in the area. Although some persons are not into Bunkery because of poverty or lack. But tackling poverty and joblessness will go a long way .Many of the social disorders and social malaise in Nigeria is not unconnected with the challenge of economic deprivation, lack, neglect, underdevelopment, etc. which prompts those facing such to sort for other means of survival not minding the repercussions and gravity of their illegality.

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