

Original Research Article

Political Economy of Greenhouse Gas Emissions and Human Security Threat: An Evidence From Niger Delta Region, Nigeria

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ABSTRACT

The paper examined the political economy of greenhouse gas emissions and human security threats in the Niger Delta Region, Nigeria. Nigeria is one of the largest producers of crude oil in Africa and flares a greater percent of her gas. The Gas Flare Track indicates that from March 2012 to February 2019, the total carbon dioxide emitted in the five Niger Delta states was estimated at an average of 239.1 million tonnes. Gas flaring by the transnational oil firms is a major contributor to global warming leading to the human security threat in the region. At present, the Niger Delta ecosystem is one of the worst-hit of the adverse effects of global warming. The effect of climate change in the Niger Delta region has pushed greater percentage of her inhabitants into abject poverty. The government is rhetorical and adamant to attending to the socio-economic challenges occasioned by climate change. The continuous neglect and deprivation of access to petrodollar benefits led to the anti-thesis between the Niger Delta inhabitants and the oil companies backed by the federal government in the Region. The aftermath of this struggle is the launching of the artisanal refining of crude oil, which became another source of greenhouse gas emission in the Niger Delta Region. The artisanal refining enterprise, however, received a morale-boost from the oil-bearing communities, but unbeknown to them of its environmental impact. The study adopted externality theory and structural conflict theory as its theoretical construct. The study relied on qualitative method of data gathering techniques, which include internet, journals, and books. The study unraveled that gas flaring has become another source of revenue to the Nigerian government, hence cannot end it. The paper recommends amongst others the amendment of the Reinjection Act of 1979 clause that allows the multinational oil companies to flare gas.

Keywords: *artisanal refining, human security, gas flaring, penalty, Niger Delta, political economy*

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1. INTRODUCTION

Climate change emanating from anthropogenic activities has remained a major challenge to the global community. It has increased the degree of poverty, death rate, sea-level rise, scarcity of water, an increase in temperature level, and heavy rainfall among others. Stern[1] noted that the "scientific evidence has shown that climate change is a serious and urgent issue" making it a topmost priority on the international agenda, not minding the ongoing debates about its sources,

imports, and solutions[2]. Nevertheless, the adverse impact of the alteration of weather conditions is enormous that tackling the phenomenon is beyond one country but requires regional/international cooperation. Hence, several conferences have been organized to address the phenomenon. Regrettably, progress in combating global warming has been relatively sluggish despite these conferences. One reason for the slowness is the problem of reaching legally binding agreements. The developed countries tend not to accept the necessary emission conditions or limits, or compel the major developing countries to limit the growth of their greenhouse gas emissions as stipulated in the Kyoto Protocol-[3,4]. The irreconcilable controversy is anchored in the international political economy perspective of the North-South dimension. The North-South is a centre-periphery global structure in the climate change dialogues, which has been driven beyond the simple bifurcation. The periphery countries with "the poorest people who contribute least to the change are the ones who suffer the most." [5].

In Nigeria, the anthropogenic activities of the oil companies operating in the Niger Delta Region contribute to greenhouse gas emissions leading to an increase in global warming. The Niger Delta Region is endowed with crude oil deposits and a considerable degree of anthropogenic activities ever since oil was discovered at Oloibiri in 1957. Afterwards, the Niger Delta communities became a hotbed for aggressive exploration and plundering of crude oil resources, leading to the disarticulation of livelihood and the ecological degradation of the region emanating from gas flares, blowouts, seismic and oil-spills occasioned deforestation.

Nigeria is one of the largest producers of crude oil in Africa and flares a greater percent of its gas. For instance, the Gas Flare Track indicates that from March 2012 to February 2022, the total carbon dioxide emitted in these five Niger Delta states (Akwa Ibom, Bayelsa, Delta, Edo, and Rivers) was estimated at an average of 135.4 million tonnes-[6]. According to the Associated Gas Re-Injection Regulations Act of 1979, the Oil Companies are given the option to stop gas flares or pay fines to the Federal Government as they continue to flare. The oil companies chose the latter.

There is no political will to end gas flares in the Niger Delta region. The World Bank Report cited by Ebeku[7] revealed that "gas flaring has been the most contested [as] source of environmental damage because in many places it has been on 24 hours a day for over 35 years. There are hundreds of gas flares throughout the Niger Delta. It affects plant life, pollutes the

surface water, and as it burns, it changes to other gases, which are not very safe." Gas flare has been adjoined as a major source of high temperature in the Niger region, even when a deadline to end gas flare was issued in 1984 by General Muhammadu Buhari's regime, the oil companies did not stop. Rather, every successive administration of the Federal Government in Nigeria has continued with the rhetoric of ending gas flare.

"At present, the Niger Delta ecosystem is one of the worst-hit by the adverse effects of global warming leading to human security threats. The Niger Delta economy is mainly characterized by peasant agriculture, fishing, and forest resources, which have been their main sources of livelihood before the discovery of crude oil." [8]. The effect of climate change in the Niger Delta region has pushed a greater percentage of its inhabitants into abject poverty. The government is rhetorical and adamant about attending to the socio-economic challenges occasioned by climate change.

The continuous neglect and deprivation of access to petrodollar benefits led to anantithesis between the oil companies backed by the Federal Government in the region and the Niger Delta inhabitants. The struggle and claim of ownership by the Niger Delta inhabitants led to the establishment of artisanal refining of crude oil, which became another source of indigenous revenue generation and greenhouse gas emission in the Niger Delta Region. The artisanal refining enterprise, however, received moral support from the oil-bearing communities but unbeknown to them of its environmental impact. The Marxian Political Economy perspective explains the class struggle which is inherent in social relations of production leading to structural conflict among the social forces. Nagel ~~et al., Dietz, and Broadbent~~ [9] argued that "political economy analyses link carbon emissions and their effects on the global climate to economic and social organization in modern industrial societies." Given the above, the paper interrogates the inherent contradictions in the social relation that led to an increase in greenhouse gas emissions and its human security challenge in the Niger Delta Region.

2. CONCEPTUAL REVIEW

2.1 Political Economy

The concept of political economy has occupied a dominant platform in social sciences as a sub-discipline and research, but what political economy meant as a discipline and sub-discipline of

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the field of study has been contentious among scholars, particularly in the capitalist culture of social relations. At present, many volumes asserting to be the political economy of a subject contesting the nature of the field, sometimes outside the social sciences discipline, yet there is no generally accepted conceptual definition of political economy. The major proponents include Adam Smith (1776), David Ricardo (1852), Thomas Malthus(1820), James Mill (1817), Karl Marx(1867), and Frederic Engels(1845), among others. These proponents "explored how groups or classes in society exploited each other or were exploited, and used their conclusions to create theories of change or growth." [10]. Ilyin and Motyle [11] defined the political economy as a study that deals with "the relations of production in their complex interaction with the productive forces and the superstructure". Volkov [12] viewed the political economy as "a science which studies the social relations that evolve between people in the process of the production, distribution, exchange, and consumption of the material benefits."

Nyemutu-Roberts [13] highlighted the contribution of petroleum to the national economy and its significance in the authoritative allocation of distribution of values in Nigeria. "Oil revenue remains a pivotal topic in the national tension between the northern and southern states, due to, the extraction of the oil resource and the environmental impacts and ... violation of human rights of some minority communities in the Delta opposing the oil activities on their land-(p. 24)" [13]. [14]. In the past few years, the struggle of who controls the state has intensified by the dominant forces of the State, especially the centre because of the allocation and consumption of the oil revenue.

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2.2 Greenhouse Gas Emission

Greenhouse gas emissions have been at an increase as a result of anthropogenic activities in all parts of the globe. Harris revealed that "the sun's rays travel through a greenhouse's glass to warm the air inside, but the glass acts as a barrier to the escape of heat." [14]. "The global greenhouse effect, in which the earth's atmosphere acts like the glass in a greenhouse... Clouds, water vapour, and the natural greenhouse gases, carbon dioxide, methane, nitrous oxide, and ozone allow inbound solar radiation to pass through but serve as a barrier to outgoing infrared heat. This creates the natural greenhouse effect, which makes the planet suitable for life. Without

it, the average surface temperature of the planet would average around -18°C (0°F), instead of approximately 15°C (60°F)-"[4615].

Every country to an extent emits greenhouse gases into the atmosphere, which is considered the root cause of climate change. However, some countries emit more than others predicated on the fact that they are technologically advanced. The International Panel on Climate Change (IPCC) Report[1647]revealed that "human activities result in emissions of four long-lived greenhouse gases (GHGs) CO_2 , methane (CH_4), nitrous oxide (N_2O) and halocarbons (a group of gases containing fluorine, chlorine or bromine). Atmospheric concentrations of GHGs increase when emissions are larger than removal processes." At present, climate change emanating from greenhouse gas emission "is perhaps one of the most serious environmental issues that the present world's population is facing though the issue is not new- "[4817].

2.3 Human Ssecurity

The definition of human security by the United Nations System report in 1994 is one of the most widely cited in security studies-[4918].The 1994 report wasthe "first document to provide a comprehensive definition of human security- "[2019].Human security is people-centred security-[2420]. The conceptualization of security fundamentally "became an analytical tool with attention on the individuals, not the state- "[2221]. The "primary goal behind the concept of human security... is the need to restore the security of people- "[2322]. It is the kind of security-focused on individualrather than the state. Human security "addresses challenges that threaten human existence beyond external aggression, which used to be the core value of the traditional security- "[2423].The concept of human security is multidimensional. It includes economic security, political security, food security, environmental security, personal security, and community security-[2524].

3. THEORETICAL FRAMEWORK

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3.1 Externality Theory

The externality theory was propounded by Arthur Cecil Pigou (1877-1959), a British economist known for his work in welfare economics. In the book titled "The Economics of Welfare", Pigou

developed a concept of externalities which was anchored on the "cost imposed or benefits conferred on others that are not considered by their action-"^[26,27,25,26] The theory of externalities posits that the "costs are thrown upon people (third party) not directly concerned ..."^[28,27]. There are "two types of externalities. They include positive and negative externalities. While the positive externality involves a situation where the third party benefits from the pollution, negative externalities is a situation where the third party suffers from anthropogenic activities. The negative externality is an economic activity that imposes a negative effect on an unrelated third party."^[29,28] For instance, the carbon dioxide that emanates from the anthropogenic activities in the Niger Delta that contributes to climate change is viewed as a negative externality because it imposes an external cost on the third party that is not connected to the producers or consumers. Another instance is the emergence of energy technology that pollutes the environment such as motor vehicles. The cost of air pollution leading to climate change is uncompensated by both the producer and users of the motor vehicles. The third party bears the brunt of the consequences of air pollution.

Linking the theory of negative externality to this study is based on the social relations between the greenhouse gas emitters and rural dwellers in the Niger Delta region. The third party are the Niger Delta rural dwellers who relatively contribute nothing to the factors that contribute to climate change in the region. Yet, they do not partake in the profit emanating from a gas flare, which has been proven as a major contributor to climate change in the region nor do they engage in deforestation emanating from seismic activities, and oil spills. The inhabitants suffer the consequences of climate change in the Niger Delta region leading to human security threats.

3.2 Structural Conflict Theory

The structural conflict theory is situated within the ambit of two main orientation. First, is the Marxian political economy paradigm represented by Marxian dialectical school proponents such as Marx (1870); Lenin (1937) and among others. Second, is the liberal scholars represented by Ross (1993), Scarborough (1998), and the famous works of John Galtung (1990) on structural violence. The structural theory addresses the reactions of individuals, groups, cultures, institutions, and societies to change. Collier^[30,29]viewed the structural conflict based on incompatibility of interests anchored on the competition for resources, which in most cases are

assumed to be scarce, as being responsible for social conflicts. The thesis of historical materialism as presented by Karl Marx gave a view of conflict emanating from the economic structure and social institutions.

The structural conflict theory argued that conflict is built into the ways various societies are structured and organized. The theory viewed social problems like economic and political exclusion, injustice, exploitation, inequality, poverty, and diseases as sources of conflicts. The structural conflict buttressed that conflicts occur because of the degree of exploitation and unjust nature of human societies, the domination of one class by another, among others. Ross^[3430] noted that "in situations where economic and political discrimination and weak kinship ties are the defining characteristics of a society, the chances that the negative forms of conflict will result are higher than in situations where the conditions are the exact opposite." Scarborough^[3231] argued that conflicts emanate "in situations where existing structures are tilted in favour of one group while putting the other(s) at a disadvantage."

Linking structural conflict theory to this study is anchored on the resource competition between the oil companies/Nigerian Government and the Niger Delta inhabitants leading to an increase in greenhouse gas emissions. The emission of greenhouse gases has deepened the existing social division between the carbon emitters and non-emitters in the Region, thereby creating straiten the societies. The inhabitants of the Niger Delta Region live in abject poverty, while the bureaucratic elites of the Nigerian state and their collaborators (Oil Companies) enjoy the petrodollar resources. This deprivation of petrodollar revenue and underdevelopment in the Region led to the emergence of resourceresistance by the inhabitants. To assert ownership of the oil resources, the Niger Delta inhabitants established artisanal refineries in most oil-bearing communities. This action has contributed to an increase in the circulation of CO₂ in the air.

4. METHODOLOGY

The study adopted a secondary method of data gathering technique. They include books, published and unpublished reports/records; newspaper articles, magazines, journals, conference papers, symposia and workshop papers, communique, seminars and theses and internet on greenhouse gas emissions and human security threats.

5. RESULTS

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5.1 Political Economy of Greenhouse Gas Emissions in the Niger Delta region

Crude oil production is associated with the gas flare. The American Association for the Advancement of Service described gas flare as "a practice in which the natural gas associated with petroleum is burned off into the atmosphere instead of deploying alternative methods of removal such as subterranean re-injection or confined to storage tanks." [3332]. Similarly, Ubani and Onyejekwe [3433] described gas flare as the "burning of natural gas and petroleum hydrocarbons in flare stacks by upstream oil companies in [the] oil fields during operations." The Annual Statistics Bulletin of the Nigerian National Petroleum Corporation (NNPCASB) of 10 years of gas flare, showed that from 2007 to 2016, oil and gas companies operating in the country flared a total of 5.031 trillion Standard Cubic Feet (SCF) of gas. [3534].

Nigeria is "one of the top countries in terms of the volume of gas flared, world" [3635] with 222 gas flare sites across the country, according to Gas Flare Tracker, and about 14.33% of gas produced is currently flared [3736] however artisanal flare is not included. The gas flare has resulted in hardship and alteration in weather conditions in the region. Despite the Reinjection Act, though option either to flare or pay penalties, the multinational oil firm chose the latter. Gas flare became another source of revenue to the detriment of Niger Delta indigenous people. The table 1 below is the Gas Flare Penalties Payable to the Federal Government between March 2012 and February 2019:

Table 1: Shows the Gas Flare Penalties Payable to the Federal Government between March 2012 and February 2022

S/N	States	Amount of Gas Flared	CO ₂ emissions	Penalties payable
1	AkwaIbom	743.0 million Mscf	39.5 million tonnes	1.5 billion USD
2	Bayelsa	333.0 million Mscf	17.7 million tonnes	665.9 million USD
3	Delta	697.6 million Mscf	37.1 million tonnes	1.4 billion USD
4	Edo	165 million Mscf	8.8 million tonnes	331.1 million USD
5	Rivers	608.9 billion Mscf	32.3 million tonnes	1.2 billion USD

Source: The table created by the author from: <https://gasflaretracker.ng/>

Overtime, the Federal Government became rhetorical to end gas flares. The procrastination strategy of the Federal Government is to ensure that the revenue accrued from the defaulter of

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gas flare laws does not cease. The Federal Government has been increasing the penalties paid by the oil companies for gas flares. For instance:

2 Kobo per one thousand standard cubic feet between 1985 to June 1992, the total of 4.085 trillion (SCF) of gas flared in this period translated to N40.85 billion Naira accrues to the Federal Account; the penalty was later increased from 2 Kobo to 50 Kobo from July 1992 to December 1997. Another increment of N10.00 was also made between January 1998 to March 2008 and \$3.50 was applicable from April 2008 till date."[\[3837\]](#).

Consequently, the environmental degradation led to the anti-thesis between the Federal Government oil firms and the indigenous people of the Niger Delta region. The relationship between the multinational oil firms and oil-bearing communities in the Niger Delta became hostile leading to restiveness in the region. This is predicated on the fact that the oil exploration and exploitation have woefully impacted the livelihood of the Niger Delta inhabitants, yet the oil-bearing communities lacked amenities such as schools, electricity, access roads, hospitals, and drinkable water. The former Governor of Rivers State, Chief Rufus Ada-George in a meeting between the secretary of the Federal Government and oil-bearing communities in 1993 noted that:

The oil company workers on-site live in comparative luxury, leisure and affluence, with the provision of electricity, potable drinking water and communication facilities, in well-laid camps or site villages. In contrast, natives of the host communities remain in strikingly deplorable conditions."[\[3938\]](#).

In the 1990s, there was an increase in environmental consciousness among the Niger Delta inhabitants leading to various protests and the emergence of ethnic-based non-governmental organizations. One such organization was the Movement for the Emancipation of the Niger Delta (MEND). The MEND was formed by the Niger Delta inhabitants as a militia organization to protest against ecosystem degradation. MEND carried out several attacks on oil installations. Each time, the bombardment was carried out, there was thick smoke and fire that lasted for hours, possibly a few days, except the fire was quickly extinguished by the oil companies.

One significant feature in the actions of MEND during the period of the struggle was that it accelerated greenhouse gas emission into the atmosphere in the Niger Delta region through artisanal refining. That was the emergence of the artisanal refining of crude oil syphoned from

the NNPC oil pipelines. Figure 1 below is the bar chart indicating the loss of crude occasioned by oil theft.

Figure 1: Production losses in Nigeria's oil terminal (march 2022)

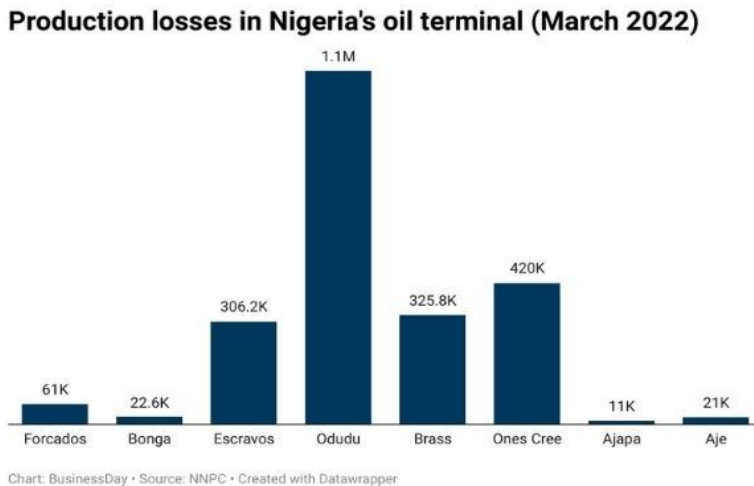


Figure 1. Production losses in Nigeria's oil terminal (march 2022)

Source: <https://businessday.ng/energy/oilandgas/article/new-report-details-shocking-scale-of-crude-theft-in-nigeria/>

Artisanal refining is the illegal cooking of crude oil through the use of local resources and skills to get various petroleum products. The artisanal refiners met the local needs of the communities cut off from commercial supplies of petroleum products in the region. The enterprise became an opportunity for the militants to raise funds to sustain the struggle against the Nigerian state. These include cheap diesel, fuel and kerosene. [4039]. The process of cooking the oil produces carbon dioxide, which circulates into the atmosphere in the creeks. At present, there are about 217 local refineries located within the coastal communities south of Port Harcourt; whose concentration of crude oil produces huge smoke and particulate matter in the atmosphere. [4140]. The artisanal refining of crude oil increases greenhouse gas emissions, thereby increasing the level of temperature leading to variation in the climatic condition. Bøås [4241] assert that "all social relations between groups and interests in the Delta region revolve around oil and oil revenue." The above assertion collaborates with Adunbi [4342] submission that:

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The transformation of oil from a mere commodity to a national treasure has generated a situation where oil, consumption, and capital mix and produce an explosive outcome... Complex actors- those who act on the impulse of the value of oil -rebellion against the state and corporation, advocacy through non-violent means, and cooperation with the state and corporations. The complex actors who act against the state and corporations contest the transformation of oil from the local property into a national treasure that benefits the state while depriving communities of their livelihood. This contestation generates violence against the state and corporations- a form of violence that is intertwined with communal ownership claims.

5.2 The Adverse Impact of Greenhouse Gas Emissions on Human Security in the Niger Delta Region-

5.2.1 Increase in Weather Temperature

An increase in weather temperature has been a global phenomenon. The variation in the weather condition in the Niger Delta region has been attributed to the degree of anthropogenic activities by oil companies. The water temperature has risen over the last few decades.[443] The increase in the temperature was attributed to urbanization and anthropogenic practices in the Region. Elliott[454] argued that the multinational oil companies “have been and continue to be major direct and indirect causes of environmental decline, their substantial control of decisions over resource use, through pollution and land degradation, through what is often continued resistance to the strengthening of environmental standards and through their control of global wealth and, therefore, their influential role in the world.” For instance, the Obirikom flow station has more than three poles that flare simultaneously sited within the community. The community suffered from ailments emanating from the hotness of the weather temperature. The temperature of the Obunagha Community, which is close to the LNG flow station in Yenagoa LGA, Bayelsa State was similar to the Obirikom community experience.[465]. The cassava, banana, and plantains are stunted and their bunches are relatively small. The noise and heat emanating from the flow station affect the inhabitants of the community and their sources of livelihood. Most communities that have flow stations suffered from various health challenges emanating from high temperatures.

5.2.2 Sea Level Rise

The Niger Delta region is a coastal region. The “barrier islands, approximately 20,000 km² in area, are cut by tidal channels through which oceanic waters and tides gain access to an extensive mangrove swamp (7,000 km²)-”[4746]. The region has an area of 450 km coastline. The topography of the Niger Delta area is lower. The sea-level rise threatens coastal communities in the Region. These threats include submergence of the islands, frequent, intense coastal flooding, erosion, ground and surface water loss/change of coastal ecosystems, and impeded drainage. The Niger Delta region is “relatively made up of low-lying islands, coasts and communities that are exposed to substantial risks from coastal hazards, irrespective of the location whether urban or rural, continental or island-”[4847]. Many coastal communities in the Niger Delta region are victims of the sea-level rise catastrophe. For instance, the ItakAbasi settlement community in Ibeno Local Government, Akwa Ibom State was submerged in 2010 by Qua Iboe high sea. The inhabitants were forced into migration to Okoroutip and upenekang settlements. Though no life was lost, however public and private properties worth millions of dollars were destroyed. Besides the loss of properties, the majority of Iwuokpom inhabitants are fishermen-[4948]. The occupation or local economy of the coastal inhabitants of the region is being threatened by an increase in sea-level rise. Seafood constitutes a significant food component of the rural dwellers, especially those in the coastal communities. The sea-level rise affects the mangroves that harbor different kinds of seafood such as crabs, shrimps, fishes, periwinkles, oysters, mullets, and mudskippers, among others. These effects are more on the local communities, especially those whose major occupation is fishing. Most of this seafood is going into extinction. These kinds of seafood serve as sources of livelihood and income for those whose vocation is marine based.

5.2.3 Erosion and Flooding

Erosion and flooding are some of the features of climate change emanating from greenhouse gas emissions. This phenomenon has become common in most Niger Delta communities. Heavy rainfall emanating from climate change contributes to the degree of flooding in the region. According to the International Federation of Red Cross (IFRC), “sea-level rise and flooding are already affecting millions of people worldwide... an estimated 10 million people are at constant risk of coastal flood-”[5049]. Flooding is an experience common during the rainy season.

The Niger Delta is surrounded by the Atlantic Ocean, the topography is flat and settlements are along with the river systems-[5150]. For instance, most communities in the Orashi region in

Rivers State, Ibeno in AkwaIbom state, among others, are examples of communities along coastal areas that have experienced heavy flooding in recent times.

Most affected communities experience similar catastrophe emanating from flooding. Flooding destroys livelihoods and renders victims homeless. Gobo and Abam[5251] noted that:

Floods in the Niger Delta have had a devastating impact on the quality of life. An estimated 13,500 km² of the land area is inundated by floods annually in the region. Floods affect rural and urban residents, farmlands, infrastructure, residential/industrial buildings, roads, bridges, and power plants, commercial and socio-economic activities. Aftermath flooding results in submergence of farmlands which in most cases leads to premature harvesting of crops with resultant poor yields and poor market values.

It is empirical in the region that flooding has become a reoccurring incidence since 2012. The flood brings out dangerous reptiles such as crocodiles, snakes, and sea animals. The flooding also affects family bonding. For instance, there are several cases where family members are scattered and distributed among their relatives. In most cases, the camps for the flood victims are not hygienic for habitation.

5.2.4 Health Challenges

The citizen's health is central to economic growth and development. Hence, every society strives hard to ensure the healthy lives of its citizens. Change in the weather variation has become a global threat, not to countries alone, but also to international organizations. Costello et al. [5352] considered climate change as "the biggest global health threat of the 21st century." The Niger Delta atmosphere is very hot. There is extreme rainfall in the Niger Delta region. Both high temperature and extreme rainfall have severe consequences for health outcomes. The oil-bearing communities of the flow stations are more vulnerable to the hotness of weather emanating from gas flares. The hotness of the weather contributes to severe health crises such as deformities in children, pneumonia, and lung damage-[5453]. The gas flare produces "toxins such as benzene, which pollute the air. Local people complain of respiratory problems, such as asthma and bronchitis" [5554]. There are also cases of cataracts (eye disease), malaria and typhoid, weakness of the body, heat rash, cholera, and dysentery, among others in the region.

5.2.5 Local economy

The local economy of the Niger Delta inhabitants is threatened by climate change. The IPCC 2007 Report projected that “by 2020, in some countries, yields from rain-fed agriculture could be reduced by up to 50%. Agricultural production, including access to food, in many African countries is projected to be severely compromised. This would further adversely affect food security and exacerbate malnutrition. By 2080, an increase of 5 to 8% of arid and semi-arid land in Africa is projected under a range of climate scenarios (high confidence).”[5655].

Farming and fishing accounted for over 90 percent of the traditional economy of the region. Nevertheless, “the vocational percentage declined tremendously after the discovery of crude oil in the region. Some of the inhabitants embraced the white and blue collar jobs to earn their living. A greater percentage remained in the traditional occupation of peasant fishing and crop cultivation.”[5756]. The farmers cultivate subsistence crops such as cassava, yam, peppers, cocoyam, beans, sweet potato, banana, plantain, sugar cane, maize, melon, and spices. The Niger Delta region cultivates cash crops which predate colonial rule in Nigeria such as palm oil. The region was referred to as the Oil Rivers Protectorate (1884 - 1893). There are economic trees such as raffia palm trees, paw paw, mango, cashew nuts, citrus fruits, cocoa, guava, ogbono, among others produced in the region. The forest resources such as honey, mushroom, animals, snail, and herbs are also found in the region. The region is also gifted with several kinds of seafood such as crustaceans, mollusks, sardine, croaker, catfish, sharks and barracuda, dolphin, among others. Other traditional occupations in the Niger Delta region include forest Craftworks, among others.

The rupee tree is a major source of revenue for the rural dwellers. The tree is the source of palm wine used in ceremonies in the traditional ceremonies in the region. The palm wine is fermented for days. Thereafter, it undergoes cooking for hours. This process leads to the production of local gin. The local gin is consumed by the local inhabitants and are also transported to other parts of Nigeria for profit. The alteration in weather condition has adversely impacted the production of local gin.

6. CONCLUSION

The study examined the political economy of carbon emission and climate change in the Niger Delta, Nigeria. The study argued that the inherent contradiction between the social forces has

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increased greenhouse gas emissions in the region through a gas flare and artisanal refining. The financial benefits emanating from carbon emission leading to human security threats have made it difficult to tackle or impede the process. The Federal Government lacked the political will to end the gas flare, which has been proven and admitted by the Shell Petroleum Development Company in a 1988 report that her activities have contributed to an increase in the alteration of climatic conditions in the region. It is difficult to deal with the artisanal refining of crude oil in the Niger Delta region because of years of neglect coupled with the level of corruption in the oil sector.

7. RECOMMENDATIONS

1. The Reinjection Act of 1979 should be amended and the clause that allows the multinational oil companies to flare gas and pay penalty options should be repealed.
2. The equitable distribution of petrodollar, which is considered as the major reason for social conflict in the region. The Federal Government should implement fiscal federalism as was enshrined in the 1960/1963 Constitution of the Federal Republic of Nigeria
3. To reduce and possibly eliminate artisanal refining in the Niger Delta region, the Federal Government should award modular refining operational licenses to indigenes, thereby reducing the degree of greenhouse gas emission emanating from the local refining of crude oil.
4. To reduce the socioeconomic challenge emanating climate change in the Niger Delta region, research should be encouraged on climate change adaptation and mitigation. There should be synergy in the policy framework and studies between the State, Industry and the Academia that are geared toward reducing socioeconomic challenges emanating from climate change, particularly the farmers whose occupations are threatened.

Competing Interests

Author has declared that no competing interest exist.

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