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Effect of Oil Production on Socio-Economic Development in Niger Delta, Nigeria

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Oil production is the general process of manufacturing oil and natural gas from wells and turning them into the final petroleum products that consumers can use. Crude oil production is the quantities of oil extracted from the ground after the removal of inert matter or impurities. It includes crude oil, natural gas liquids (NGLs) and additives. This indicator is measured in thousand tone of oil equivalent (toe). Crude oil is a mineral oil consisting of a mixture of hydrocarbons of natural origin, yellow to black in color, and of variable density and viscosity. NGLs are the liquid or liquefied hydrocarbons produced in the manufacture, purification and stabilization of natural gas. Additives are non-hydrocarbon substances added to or blended with a product to modify its properties, for example, to improve its combustion characteristics (e.g., MTBE and tetraethyl lead). Refinery production refers to the output of secondary oil products from an oil refinery. Petroleum is a naturally occurring hydrocarbon material that is believed to have formed from animal and vegetable debris in deep sedimentary beds. The petroleum,

being less dense than the surrounding water, was expelled from the source beds and migrated upward through porous rock such as sandstone and some limestone until it was finally blocked by nonporous rock such as shale or dense limestone. In this way, petroleum deposits came to be trapped by geologic features caused by the folding, faulting, and erosion of Earth's crust. Petroleum may exist in gaseous, liquid, or near-solid phases either alone or in combination. The liquid phase is commonly called crude oil, while the more solid phase may be called bitumen, tar, pitch, or asphalt. When these phases occur together, gas usually overlies the liquid, and the liquid overlies the more solid phase. Occasionally, petroleum deposits elevated during the formation of mountain ranges have been exposed by erosion to form tar deposits. Some of these deposits have been known and exploited throughout recorded history. Other near-surface deposits of liquid petroleum seep slowly to the surface through natural fissures in the overlying rock. As part of the Corporate Social activities, the oil companies have provided for the citizens of Nigeria pipe borne water, electricity, proper roads, school buildings, scholarship programs, and job opportunities. The amenities the companies provided are not enough as compared to the environmental impact (pollution and degradation) of their activities on these communities (Niger Delta). From the most questionable act about these oil

ABSTRACT

The study examined the effect of Oil Production on Socio-Economic Development in Niger Delta, Nigeria. The adopted Oil Spillage and Gas Flaring as the independent variables while environmental degradation and social conflicts serve as dependent variables. The study adopts a survey research design where secondary data were fully in used. The data was obtained from World Bank Reports, United Nations Development Programme, United Nations Environmental Protection, Amnesty International, Nigerian National Petroleum Corporation, Niger Delta Development Commission, Department of Petroleum Resources Nigeria, National Bureau of Statistics-Nigeria. The research also adopted comparative study method, descriptive and conceptual approach to analyze all the information generated from the various sources of data. The result revealed that oil spills usually have direct contact with the land, waterbodies and some also evaporate into the atmosphere. While gas flares also affect every part of the ecosystem from the ozone layers to the microorganisms in the soil. We conclude that Oil Production on has significant negative effect on Socio-Economic Development in Niger Delta, Nigeria. we recommended that Oil companies should adopt modernized technologies to enhance fewer contacts of pollutants into the environment.

Keywords: Oil Production; Socio-Economic Development; Environmental Degradation; Niger Delta

Citation: Daku, V. F. & Okechukwu, E. U. (2023). Effect of Oil Production on Socio-Economic Development in Niger Delta, Nigeria. *European Journal of Finance and Management Sciences* 7(2), 1-10. DOI: <https://doi.org/10.5281/zenodo.7978953>

Accepted: May 22, 2023; **Published:** May 26, 2023

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companies is their agreement with the federal government to militarize the Niger Delta region to improper cleaning of oil spill site. And the state resources that were to be used to develop the Niger Delta region have been diverted to state security (Chukwuemeka & Aghara, 2010; Olorube et al., 2013). Kafada (2012) in his study noted that the oil industry has benefited the country's economy enormously but unsustainable oil exploitation activities have rendered Niger Delta region one of the five most severely petroleum damaged ecosystems in the World.

Statement of the Problem

Exploration and production of hydrocarbon in the form of crude oil or natural gas has been the source of revenue generation for some countries in the various continents on our planet earth. Though this commercial entity can be said to be a blessing to any nation that produces it, nonetheless it has diverse environmental challenges that can also be called a curse in disguise if proper measures are not put in place to handle them on time. The traditional economy of the Niger Delta region which is largely dependent on fishing and farming is however under constant threat by oil production activities. The continuous spillage of oil, venting and flaring of gas and discharge of drill waste into the environment pollute farmlands and coastal waters. The people are continuously being handicapped and have negatively affected their standard of living. Poverty, social conflict, occupation dislocation, ill health, unemployment, are some of the social and economic hardship identified as problems the Niger Delta Region people are facing.

Objective of the Study

The main aim of this study is to examine the effect of Oil Production on Socio-Economic Development in Niger Delta, Nigeria. The specific objectives are sought to;

- i. Examined the effect of Oil Spillage on the environmental degradation in Niger Delta, Nigeria
- ii. Evaluate the effect of Gas Flaring on the social conflicts in Niger Delta, Nigeria

Hypotheses of the Study

- i. Oil Spillage has no significant effect on the environmental degradation in Niger Delta, Nigeria
- ii. Gas Flaring has no significant effect on the social conflicts in Niger Delta, Nigeria

Review of Related Literature

Oil Production

Oil production is one of the most capital-intensive industries: It requires expensive equipment and highly skilled labors. Once a company identifies where oil or gas is located, plans begin for drilling. Many oils and gas companies' contract with specialized drilling firms and pay for the labor crew and rig dayrates. Drilling depths, rock hardness, weather conditions and distance of the site can all affect the drilling duration. Tracking data using smart technologies can help with drilling efficiency and well performance by providing real-time information and trends. While every drilling rig has the same essential components, the drilling methods vary depending on the type of oil or gas and the geology of the location (Charles 1999).

Oil Spillage

Niger Delta is known to be a major farming region in Nigeria, contributing remarkably in the agricultural sector of the country. It's said to be the third producer of oil palm in the world after Indonesia (Kadafa, 2012). Because of their rich vegetation, most of the indigenous people are engaged in farming as their means of livelihood. Some studies have been focused on how the various environmental challenges have affected the farming activities in the region (Niger Delta). That is. the productivity, fertility of the crops, access to farmlands for transportation of goods to their farms and to the market to sell their products; and others have also been focused on crop diseases. Before the production of oil, the lands in Niger Delta were used for farming and other activities but the land is now shared with oil companies for crude exploitation. Activities of the oil companies are still affecting the remaining lands left for the people to use. Their farmlands for growing crops are being reduced every day because of oil spillage and other forms of pollution. Investigations on the various environmental problems associated with oil exploration and production in specifically the Niger Delta in Nigeria have revealed that oil spillages have caused immense damage to farmlands, sources of water, mangrove forest, fishing activities, and other marine resources. This has caused

people to completely relocate from their communities, no source of proper drinking water, loss of ancestral homes, pollution of fresh water, loss of agricultural land, destruction of fishing grounds and reduction of fish population (Adejoh, 2014; Asoya, 2010; Kadafa et al., 2012). Kadafa (2012) has argued that, after all the enormous contribution of the oil companies located in the Niger Delta region of the country and their host communities, the exploration and production of crude oil has also led to the contamination of streams and rivers, forest destruction and loss of biodiversity in the area. Studies have shown that over 50 years' period of exploration and production activities in the Niger Delta at least 9-13 MMbbl of oil have been spilled. Considering the effect of oil spillage on farming activities, Ojimba and Iyagba (2012) focused on how oil pollution has affected horticultural crops in Rivers State, Nigeria. Multistage sampling procedure was used to obtain data from 17 local government areas. The results from analyzing 296 questionnaires showed that average hectare of horticultural farm cultivated was smaller in crude oil polluted farms (1.04 ha) than in unpolluted farms (1.17 ha). It revealed that output of fruits, banana, pepper, okra, leafy vegetables and melon in crude oil polluted farms (15.98 tons) were lower than in non-polluted farms (18.75 tons).

Gas Flaring

Globally, Nigeria is ranked the sixth country to flare gas. Before recently, the natural gas has been exploited as hydrocarbon reserves, all the gas after the discovery of oil in the 1900s was flared. This, in the long run, has affected the local settlers and the region in general. Gas flaring has been the highest source of air pollution in the Niger Delta. The uncontrolled gas flaring is gradually destroying the ecosystem of the Niger Delta. Gas flaring goes on for twenty-four hours and some have gone on for as long as thirty years and in the process hydrogen sulphide is released into the atmosphere. The oil companies are not only destroying Niger Delta environmentally but also immensely contributing to global warming. (Comet Newspapers, 2001 cited in Arong & Ikechukwu, 2013). The chemicals released aid in acid rain formation which corrodes the roofing sheets, causing skin diseases, etc. (Okaba, 2005). Udok, & Akpan (2017) also showed elevated levels of lead at concentrations of 0.56 mg/l in the atmosphere and argued that large concentration of oxides of nitrogen and sulphur from gas flares in the Niger Delta released into the environment contributes to acid rain experiences in the region. The quantity of carbon released per day is about 2,525,000 tons (Ubani & Onyejekwe, 2013). These flares have affected vegetation, farming, fishing and the entire community in general.

Ubani and Onyejekwe (2013) noted that there has been massive destruction of aquatic life in communities due to acid rain. Also, no vegetation can have proper growth in an area close to flare sites. The leaves of cassava, waterleaf, and pepper near flare sites have decreased in dimension and the nutrients such as starch and ascorbic acid in the cassava in flare sites are less as compared to those located farther away from flare sites (Dung et al., 2008). A study done at the Izombe flaring site indicates that there is a 100% loss in crop yield within 200 meters of the station. Cotton and oil palm among other economic plants wither away at any instance where they are located close to flares. This has brought about high socioeconomic cost on the people in terms of repairing their corroded zinc roofing sheet, treating of sicknesses (breathing difficulties and pain, asthma, headaches, nausea, chronic bronchitis), buying of fertilizers, resettlement, and farming. And eventually increase in unemployment and poverty in the region (Chijioko et al., 2018). Unfortunately, these impacts will continue for a long time if not forever because the existing law only charges companies' monies for continuous flaring but do not ban gas flaring (Udok & Akpan, 2017). Orubu (2002) stated that pollutant concentrations are highest in the Niger Delta after undertaking a comparison of concentrations of ambient air pollutants in the Niger Delta region and Lagos State. Orubu (2002) argued that the emitted greenhouse gases (such as methane and carbon dioxide) at flare sites contribute to global warming. Sadly, the highest number of the flare sites are located in the Niger Delta where the heat temperature from the flare sites could be as high as 1600 °C contributing to thermal pollution. Also, Adewale and Mustapha (2015), after their research on gas flaring at Akwa Ibom, Rivers and Bayelsa states confirmed that gas flaring has caused sicknesses, a damaged and unsustainable environment, toxic waterways, loss in productivity of fishing and farming activities. What changes have these implications brought to the life of the people of the Niger Delta?

Social Economic Development

According to the International Economic Development Council (IEDC), no single definition incorporates all of the different strands of economic development. However, economic development is can be defined as a process that impacts growth and restructuring of an economy to improve the living standard of a society. Put differently, economic development is a process that enhances an economy's real national income as well as per capital income over a long period of time (Nafziger, 2006). In recent years, development programming has been focused on the

overriding issues of equity and equality in the distribution of the gains from development efforts. A lot of concern has been expressed about the predicament of the rural poor and the imperatives of several baseline requirements for human development. These include access to land and water resources, agricultural inputs and services, including extension and research facilities, and participatory development strategies to tackle rural poverty, with social equity and civil participation viewed as essential to well-rounded socio-economic development (UNDP, 2006). This relatively new orientation has produced concepts such as 'people-oriented development', 'participatory development' and 'sustainable human development'.

Theoretical Framework

Resource Curse' Theory

The theory was propounded by geographer Norton Ginsburg (1950). The theory posits that developing countries that are rich in natural mineral resources and are dependent on the export of their natural resources, experience slower economic growth rate than developing countries that are resource-poor (Badeeb et al., 2017; Soremi, 2013). The term 'resource curse' was first introduced by Auty (1994) and may have gained acclaim as a result of a 1995 paper by Sachs and Warner titled 'Natural resource abundance and economic growth'. Resource curse has also been applied to specific natural resources like oil in published works of other scholars such as 'The Paradox of Plenty: Oil Booms and Petro-States' by Karl (2005) and 'The Oil Curse: How Petroleum Wealth Shapes the Development of Nations oil curse' by Ross (2012). The expectation of economic growth and the subsequent disappointing performance of many developing countries rich in oil can serve as a good example to illustrate the resource curse theory. In the 1950s and 1960s, there was an expectation that returns from oil exports will lead to prosperity in less developed countries oil producing countries (Ross, 2012). A 1979 quote credited to the president of one of such countries, Venezuela, in his comment on what the country could achieve as an oil-rich state also signify the anticipation of economic growth - "One day.....Americans will be driving cars with bumpers made from bauxite, our aluminum, and our labor. And we will be a developed country like you" (Karl, 2005). Unfortunately, Venezuela alongside some of the other oil-rich developing countries like, Iran, Angola and Nigeria, after years of exporting their oil are today characterized by 'poor economic growth, vulnerability to price shocks, poverty, and high inequality, as well as high levels of corruption, authoritarianism, and poor governance' (Kennedy, 2014). Weighing the words in the quote above against the current realities in these countries helps in a way to give evidence to the resource curse theory. Beyond economic implication, resource curse has also been associated with greater incidence of violence and civil conflict that are often inflamed by struggle for control of the resources and citizens' outrage at the economic and institutional outlooks of the states (Watts 2004; Ross 2012). There are varying explanations for the paradox in which resource-rich countries experience slow growth rate and the prominent ones are i) the rentier state structure of the countries and ii) the Dutch disease (Badeeb et al., 2017).

Empirical Review

Kretzmann and Wright (1997) examined the impact of oil spillage in Nigeria by obtaining soil samples from Luawii Ogoni and Ukpelleide Ikwerre. They found that the sample from Luawii "contained 18 ppm of hydrocarbons in the water" which is "360 times higher than the level allowed in drinking water in the European Union" and the sample from "Ukpelleide, Ikwerre, contained 34 ppm" which is 680 times more than the 0.05 ppm permitted by the European Union. Amadi and Tamuno (1999) examined the socio-economic impact of oil exploration and production in Nigeria with special focus on the Niger Delta region. Nine (9) multinational oil companies and their host communities formed the sample. Their findings revealed that host communities have a wrong perception of the socio-economic responsibilities and development initiatives of the multinational oil companies operating in their areas. They also found a negative relationship between the scale of production / exploitation activities and the level of development of the oil-bearing communities. Ofuoku, Emuh, and Agbogidi (2008) studied the social impact of oil production on small holder farmers in oil-producing communities of the Central zone of Delta State, Nigeria. However, they were rather interested in environmental problems experienced in the communities. Using data collected from a sample of 120 respondents with the use of questionnaires, they identified soil erosion, noise pollution, bush burning, land degradation/pollution, water pollution, air pollution, massive deforestation and acid rain as the major environmental problems experienced in the study area. Descriptive statistics such as frequency distribution and percentages were used to analyze the variables of the study while Chi-square was employed to test the hypothesis. Aghalino and Eyinla (2009) examined two cases of oil spillages and their concomitant impact on the flora and fauna of the Niger Delta region of Nigeria. They studied the responses of the oil firms and the federal government to the despoliation of the environment occasioned by the Texaco/Funiwa oil blow out and the Qua Iboe

oil spillage. They made use of both primary and secondary sources of information and data for the analyses. The findings of the study show that neither Texaco nor Mobil made genuine efforts to combat the oil spilled from their various platforms until much harm had been done to the environment. Also, the study revealed that Nigerian environmental laws are lax and inadequate.

Materials and Methods

The study adopts a survey research design. The study relied mainly on secondary data obtained from past and present studies, governmental and non-governmental institutions and existing literature. The data was obtained from World Bank Reports, United Nations Development Programme, United Nations Environmental Protection, Amnesty International, Nigerian National Petroleum Corporation, Niger Delta Development Commission, Department of Petroleum Resources Nigeria, National Bureau of Statistics-Nigeria, published and unpublished materials, conference and seminar papers, journals, books and the internet. This research is based mainly on secondary data. The research also adopted comparative study method, descriptive and conceptual approach to analyze all the information generated from the various sources of data. The work is not focused on a peculiar sample size in one community because analyzing the socioeconomic implication of oil and gas on one community and generalizing it for the entire region will be more biased. The statistical information used was extracted from: Official statistics from Nigeria: this comprises of information obtained from government institutions, departments, bureaus and agencies in Nigeria. Such government institution consulted for data during this thesis were Nation Bureau of Statistics, Central Bank of Nigeria, Nigeria National Petroleum Corporation, Annual Statistical reports, Niger Delta Development Commission. Data from other Organization: World Bank Report, Amnesty International, UNEP Reports, UNDP Report, WHO, Friends of the Earth Nigeria.

Analyzed of Data and Interpretation

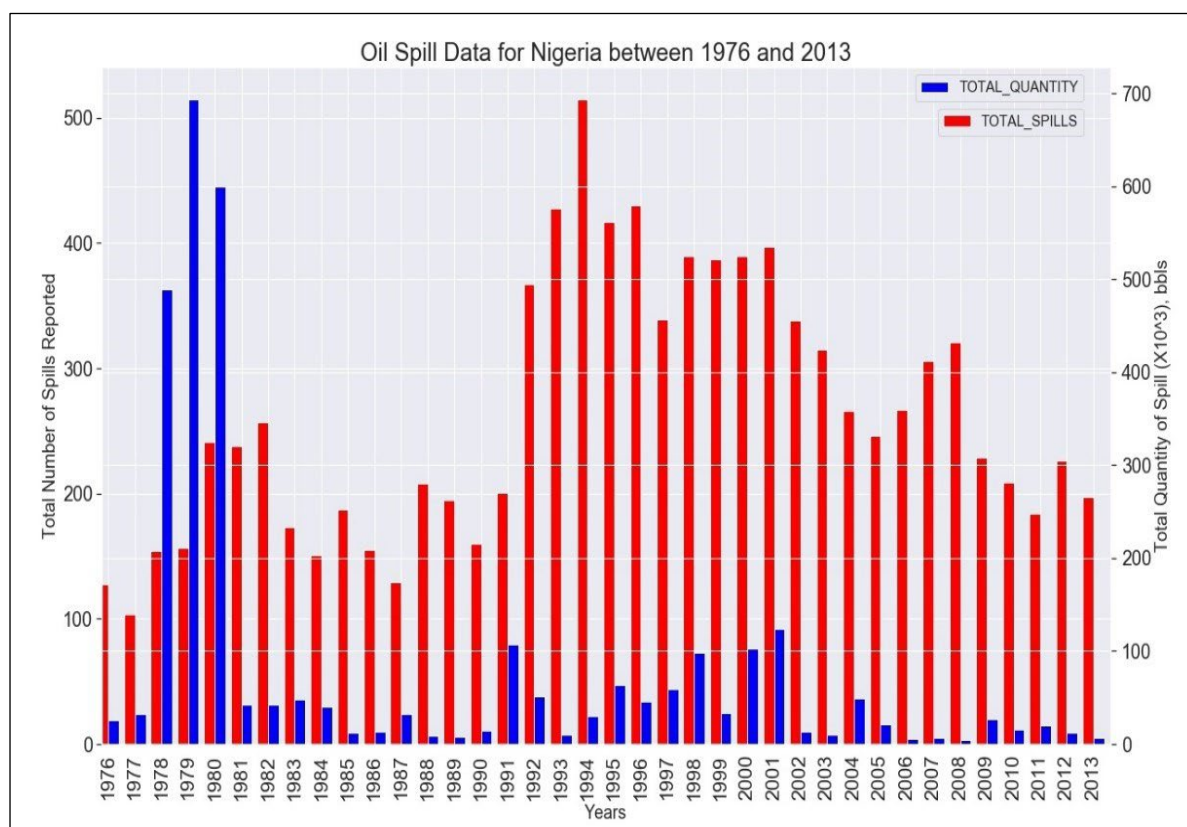


Figure 1: Total Number of Oil Spill Incidence and Total Quantity of Oil Spill recorded from 1976 to 2013.

Source: Department of Petroleum Resources

The spills effect on the environment varied in many ways and oil spills usually have direct contact with the land, waterbodies and some also evaporate into the atmosphere. Every chemical component has its own implication on the environment. The accumulated spills, the improper cleanups, delay in the cleanup, unattended spills,

unrecorded spills, and other forms of environmental negligence on the part of oil companies and regulatory bodies in the country have led to the alarming negative effects of oil spillage in the communities. People have lost their land because of the spill; farmers have recorded low productivity over some period and people have migrated from very prominent spill locations to neighboring communities and the urban centers. Many socioeconomic implications have resulted from this incidence. In 2008 people of Bodo community experienced an oil spill that went on for about 72 days and between 103,000 and 311,000 barrels of oil were spilled. In June 2012, they experienced another oil spill in the Bodo creek area. Also, there are about 2000 oil spill sites that need rehabilitation in Niger Delta (Amnesty International, 2012). The oil spill in the region occurs both on land and in water bodies as a result of human errors or sometimes deliberate acts. The occurrence of oil spillage in the host communities is attributed to many activities on the part of both the oil companies and the local inhabitants. These spills have gone on from the early years when oil production began till date, even though not all occurrences of spills have been recorded by the authorities in charge and the oil companies. There have been a number of recorded cases of oil spillage in the region which were caused by both oil companies and some militant activities. The main sources of the oil spill in the Niger Delta have been attributed to militancy, bunkering, oil theft operations, sabotage of pipelines, equipment failure, poor infrastructure maintenance, human error, vandalism, spills or leaks during processing at refineries and corroded pipelines (Ugochukwu & Ertel, 2012).

Table 1: Area of crop farms affected by crude oil spillages in varying degrees in Rivers State in 2003

<i>Degree of oil spill</i>	<i>Total crop farm affected by the spill, hectares (ha)</i>	<i>Average farm size affected by oil spillage, hectares (ha)</i>
<i>Heavy Oil Spillage (all crops destroyed)</i>	272.9	3.37
<i>Medium Oil Spillage (almost all crops destroyed)</i>	164.5	2.79
<i>Light Oil Spillage (SOME crops destroyed)</i>	110.69	2.09
<i>Total</i>	548.09	8.25

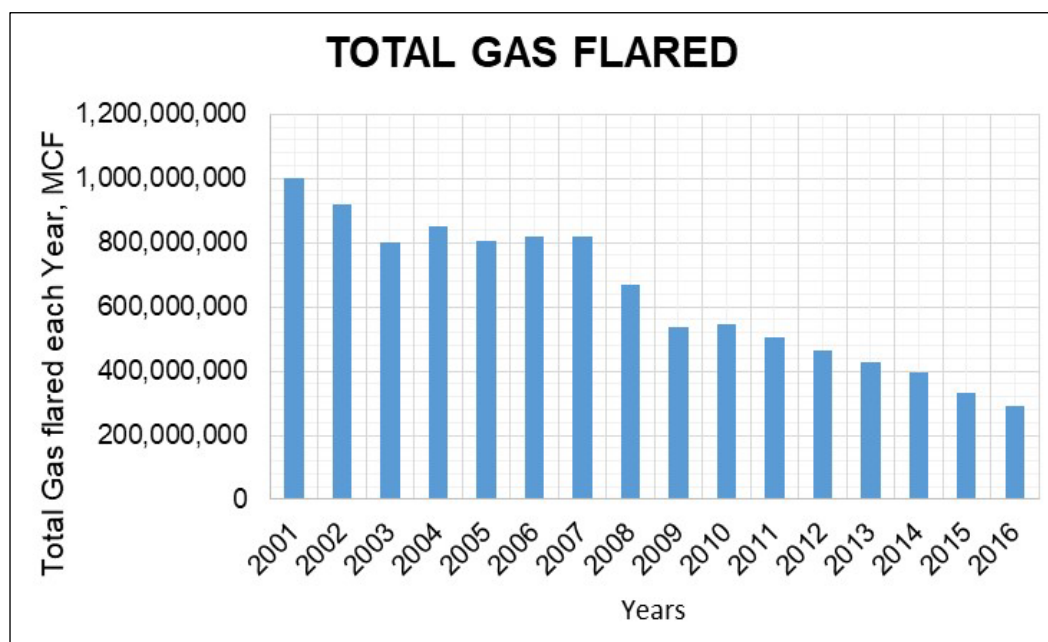


Figure 2: Gas flared in Niger Delta from 2001 to 2016. Source: DPR 2016 Oil and Gas Annual Report

Figure 2 gives the account of the volume of the gas flared for a period of fifteen years from 2001 to 2016 by the accredited oil companies without the flares from the unauthorized producers or refineries. In 2001 74.5% of the total gas produced was flared but reduced to 14.33% in 2016. The volume of gas produced within the period under consideration increased by 91.13% whereas the volume flared reduced by only 38.06% (BudgIT, 2018). These gas flares just like the oil spillage affect every part of the ecosystem from the ozone layers to the microorganisms in the

soil. From the study conducted at Izombe flare site, farmlands close by the site have recorded loss of productivity in plants such as cotton and oil palm. In an area such as Ijaw, gas flaring started as early as 1970 with 7957 mm³ and eventually increased to 2,5934 mm³ in 1994 (Raji & Abejide, 2013).

Table 2: Ranking of Major Environmental Problems in the Niger Delta

<i>Problem Type</i>	<i>Problem Subset</i>	<i>Problem Ranking</i>
<i>Natural Environment</i>	Coastal/River bank erosion	Moderate
	Flooding	High
	Sedimentation	Moderate
	Substance	Low
<i>Development Related</i>	Exotic (water hyacinth)	Low
	Land degradation/Soil fertility Loss	High
	Agricultural decline/shortened fallow	High
	Delta forest loss (Mangrove)	High
	Biodiversity depletion	High
	Fishery Decline	High
	Oil Spillage	High
	Gas Flaring	Moderate
	Sewage and wastewater	High
	Other Chemical	Moderate

Source: Eregha and Irughe (2009)

Conclusion

Based on the research discussion, the following conclusions were made. Before commercial oil production in Niger Delta, the people in the region lived a special life that was predicted on the healthy environment surrounding them. Most of their life style, from social to economic, was linked to one or more objects in the environment. However, after oil production began, life continues, but this socioeconomic life seems to differ from what it used to be before oil production. From the research, it has been noted that there is a clear difference between the pre-oil socioeconomic life and the post-oil socioeconomic life of the Niger Delta people. It has been noted that some activities arising from the oil production operations of crude oil in the region has caused immense environmental damage to the region, most especially to the oil-producing communities. These environmental challenges included oil spillage, gas flaring, canalization, inappropriate waste management and leakages from oil pipelines, depletion of forest reserve, among others. However, these environmental challenges come about by the action of the oil companies and other times by local militants. The extent to which the environmental pollution has degraded the environment include contamination of aquatic habitats leading to the death of aquatic life, pollution of drinking water, pollution of air by flares and other chemicals, deforestation and destruction of farmlands, depletion of the Niger Delta mangrove forest, etc. We conclude that Oil Production on has significant negative effect on Socio-Economic Development in Niger Delta, Nigeria.

Implication of the Study

The post-oil socioeconomic life of the people in terms of their standard of living and health, and occupation as analyzed in the study show that environmental damage from oil production to an extent have negatively impacted the socioeconomic life of the Niger Delta people. Due to the environmental challenges, farmers, fishermen, hunters and others have lost their jobs. This has increased the unemployment rate in the region. Some people abandoned their farming and fishing to move to urban centers for greener pastures as they could not continue to suffer in such hardship. Some farmers and fishermen lost their jobs because an oil spill polluted their lands, polluted the waterbodies they fish from or even destroyed the equipment they use for their work. As these continue, the poverty rate also continues to increase in the region.

Recommendation

Oil companies should adopt modernized technologies to enhance fewer contacts of pollutants into the environment. The following recommendations are proposed in line with the research findings;

1. There should be Greenhouse Emission Regulations that monitors the gas being flared by the oil companies.
2. To avoid prolonged spill before noticed, low-pressure sensors should be placed on pipelines to give signals of pipeline rupture by corrosion or vandalism.

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