International Journal of Science and Technology (STECH)
Bahir Dar- Ethiopia
Vol. 4 (2), S/No 10, May, 2015: 75-85
ISSN: 2225-8590 (Print) ISSN 2227-5452 (Online)
DOI: http://dx.doi.org/10.4314/stech.v4i2.7

Environmental Degradation in Oil Producing Areas of Niger Delta Region, Nigeria: the Need for Sustainable Development

Ugboma, Paul Peters, *Ph.D.*
Department of Geography & Regional Planning,
Delta State University, Abraka
Phone: +2348033663941
E-mail: paulpeters441@yahoo.com

Abstract

Due to oil exploration and other human activities in the Niger Delta region, there is evidence of environmental degradation all over the area (Oronto, 1998). Environmental degradation is occasioned by consistent flow of industrial waste, oil spills, gas flares, fire disaster, acid rain, flooding erosion, etc., which has led to the pollution of farmlands and fishponds. It has also led to the destruction of properties and human lives, including aquatic and bio-diversity. This paper reviewed environmental degradation in oil producing areas of Niger Delta Region, in the context of the patterns, causes and effects of such degradation. It also considered environmental issues such as soil erosion, flooding, oil spillage, gas flaring and how they affect development needs of the people in the region. Policy options for upgrading the degraded environment such as stoppage of oil spillage and gas flaring, flooding, pollution and erosion, etc, were also suggested.

Key words: Environment, Degradation, Sustainable, Development, Niger Delta.

Introduction

The Niger Delta region has suffered excruciating pains from environmental degradation occasioned by government and multinationals over years, despite its enormous contribution to the economic prosperity of the nation, over 80% of the national revenue comes from sale of oil produced in the region, yet paltry sum equivalent to 13% of oil revenue accrues to the oil bearing states (Oronto, 1998). This amount falls short of the developmental needs of the region. All the laws enacted by Federal Government to control environmental pollution caused by oil exploration are never enforced despite the fact that Nigeria is a signatory to several summits organized in respect to environmental sustainability (Adetunji, 2006).

Environmental degradation is viewed in the context of the high rate of oil exploration and other human activities in the oil rich Niger Delta without regard for the health and welfare of the inhabitants, including colossal damage to the flora and fauna. Beside poverty and deprivation, environmental abuse and degradation are the greatest threat to the survival of the people in the oil bearing region (Sagay, 2005). Oil spillage, erosion and leakage from oil pipelines, gas flaring, flood erosion and salt water incursion have taken their ugly toll on the social and economic lives of the people of the region (Adedipe, 2002).

When the World Bank carried out a comprehensive study of the region in 1995, it concluded among other things that the environment was being degraded and all indices of development were far below acceptable standard. As a consequence, the people have over the years engaged in different forms of agitations and conflicts, in order to attract the attention of government for even development and socio-economic emancipation of the region. The Stockholm Conference on the environment in 1972 and the Earth Summit in 1992 urged all nations to include environmental protection as an integral part of their developmental processes. Unfortunately rather than improve the environment, man, through his continual interaction within the environment degrade it more and more (Oronto,1998). It is in this context that this paper endeavours to identify the level of environmental degradation with a view to proffering lasting solution to the phenomenon for sustainable development.

Causes of Environmental Degradation

1. Oil Spillages:

In the cause of oil exploration, oil is transported through pipelines in the refineries. Oil leakage usually originates from corroded or rusted pipelines. The spillage spurts over a wide area destroying crops, fish ponds, economic trees, farmlands, and biodiversity (Sagay, 2005). In the Niger Delta region an average of one oil spill occurs every week causing grave damage in the environment (Federal Ministry of Environment, 2006). The director in the ministry estimated thousands of barrels of

crude oil spilled, besides the hundreds of thousands of tons of oil soaked vegetation and debris. Investigation carried out by the federal Ministry of Environment (F.M.E.) showed that Warri Refinery and Petrochemical Company (WRPC) continuously released untreated wastes (liquid, solid, gaseous and particles) into the environment of the communities around its facilities.

The Ministry of Petroleum Resources (1992) and Nigeria National Petroleum Corporation (NNPC, 2000) report that oil spillages arise due to (i) pipeline vandalism (ii) leakage from corroded pipes and valves (iii) the process of oil drilling (iv) transportation by petroleum tankers (v) oil bunkering and smuggling (vi) the process of petroleum refining (both conventionally or locally (vii) leakages at filling stations and petroleum depots (viii) government lack of effective control over the multinationals in terms of incessant soil spills (ix) the directive by the regulatory body that oil companies should clean up the impacted areas and pay adequate compensation action to the affected communities fell on deaf ears.

Oil spillage has many effects which include the effect on rivers, creeks, streams and lakes. Pollution is engendered and aquatic organisms die prematurely.

Bush fire occasioned by explosion of oil tankers, oil installations, leakages from oil pipes and pipelines explosion during oil bunkering or pipeline vandalism cause destruction of plants, insects, birds and also burns the organic matter content of the soil. All these have bearing on agriculture, water supply settlement and the ecosystem or biodiversity within the region (Oronto, 1998).

Oil spillage causes untold damage to the environment and hardship to the people. Due to oil spillage, human lives have been lost. For example in 1998 more than 100 youths, women and children perished in the Jesse inferno leaving the community highly devastated and improvised. Also, the Idobo platform spillage, which occurred in 1998, affected five communities leading to ecological damages of flora and fauna. Oil spills also affect the environment (land, water, air).

Table 1: Quantity of Oil Produced and Spilled from 1991-1996.

S/No	Year	No. of spill	Quantity spilled/barrels	Quantity recovered (barrels)	Net loss to environment (barrels)	% loss to environment
1	1991	258	108,367.01	2785.96	105,561.05	97.43
2	1992	378	1,476.70	1,476.70	49711.20	97.12
3	1993	453	2937.08	2937.08	5,168.24	63.76
4	1994	495	2,3335.93	2,3335.93	32,796.78	93.38
5	1995	417	3110.02	3110.02	60567.15	95.12
6	1996	156	1,183.80	1,183.80	38,719.86	97.03
Total		2159	13,829.49	13,829.49	292,544.28	95.49

Source: Oronto, 1998.

2. Gas Flares

Gas is flared through surface flaring and high towering pipes. Gas flaring is defined as the burning of natural gas, which could have been refined into usable products (Bankoff, 2003). The average gas flare in the world is about 4%. Human Rights Watch (2004) reported that in Nigeria over 70% of associated gas is flared. Nigeria has a record 25% of all gas flared in the world. The deadline to an end to gas flares was fixed for 1985. In 2002, the Federal Ministry of Environment set a gas flare out date of 2004. Shell canvassed for 2008 as another deadline, while Exxon Mobil set a date of 2006. This is 2014 and none of the several flare sites has been discontinued. Nigeria has a gas equivalent of 29 billion barrels of crude oil, enough to last for 35 years. Nigeria produces about 5.5 billion cubic feet of gas per day. About 2.6 bef or 40% is utilized, while 2.9 bef or 60% is wasted through flares (NNPC, 2002) leading to environmental degradation.

According to Sagay (2005), the value of the wasted gas per day amounts to 86 million dollars (#780 billion). The annual value of the wasted gas is about 2 billion dollars (36 billion naira) or enough to generate electricity for the whole of West Africa region (Sagay, 2005).

The free disposal of gas through flaring constitutes a deafening bowl of raging fire at gas flare sites; the thick smoke that billow into the atmosphere falls back as acid rain which has polluted rivers and creeks in the region (Wisner and Cannor, 2004). Human Right Watch (2002) reported that about 75% of Standard Cubic Feet (SCF) of gas has been flared daily since 1970, with a value of 100 thermal units. The World Health Organization (WHO, 2002) also reported the following: that release of high

levels of sulfur, carbon and nitrogen oxide causes acid rain, which facilitates the process of rusting and also reduces oil productivity and excessive heating of the environment leading to damage in biodiversity

Flaring contributes to ozone layer depletion, which causes skin damage in the form of sunburns and "Suntans". It destroys natural ability to fight skin cancer.

Gas flaring also damages the eye and reduces visibility and in some cases causes blindness. It also affects the natural Immune System with increased potential for infection. It restricts plant growth, delay in flowering, adverse changes in plant leaf structure, adverse effects on animals (Oronto, 1998)

Finally, gas flares causes excessive heating of environment leading to climatic change, increase in temperature of human metabolism and excessive perspiration. For so many years now, farmers and fishermen have been sacked from their occupation because of gas flares. They hardly make a living out of the devastated environment (NNPC, 2002).

Other Forms and Effects of Environmental Degradation

(3) Deforestation

When ground is broken for purpose of farming, lumbering and contraction of oil facilities and companies' houses, vegetation is removed and the soil layer is exposed and upset by construction equipments. Runoff and storm flow increase, while land erosion is accelerated and sediment loads dramatically increase causing large sedimentation problem further down valley. This phenomenon obstructs smooth flow, increases flooding and shift in configuration of the channel bottom, blanketing of bottom dwelling flora and fauna. There is equally the alteration of species of fish due to the changes produced in the flora and fauna upon which the fish depends (Delta State Ministry of Environment, 2005).

When construction of companies or factory houses and roads has taken place, there is decrease in the natural infiltration. Ground water level may be lowered and artificial drainage lines are produced. Local interference with minor stream, creeks may cause these to flood or undermine their banks with the attendant negative implications

Untreated wastes including sewage from factories may be discharged into creeks and rivers causing pollution, which may be lethal for aquatic life and detrimental to the use of water downstream either as a source of supply or recreational purposes. Land reclamation for oil exploration and industrial activities leads to destruction of biodiversity, less rainfall, changes the drainage pattern and reduces amount of soil moisture content. Atmospheric pollution occasioned by man's generated pollutants in the form of greenhouse gases consisting of carbon dioxide and chlorofluorocarbon (CFCS) cause glass house effect allowing short solar waves to pass through the earth

surface and restricting terrestrial long waves from escaping to the space. This leads to global warming

Bush burning accounts for a quarter of carbon dioxide emission in the country and causing greenhouse gases which causes damage to plants, animals and man.

(4) Noise Pollution

Noise pollution causes health hazards like hypertension; sleep loses (which can lead to fatigue and brain fag). It deafens people who are constantly near them. Noise often distracts people. For instance, those who want to read find it difficult to concentrate. Some people sometimes leave their line of thought under noisy situations. Some people are easily distracted from their line of thought under noisy situations. Some people sometimes leave their city homes to country homes once in a while in order to have sober reflections in a boisterous-free and noiseless atmosphere.

The health effects of noise, air and water pollution and psychological stresses caused by high density and a relatively "fast-paced" environment are easily quantified. Continued exposure to inhalation of low-leveled concentration of lead, for example, may be much more serious problem.

(5) Toxic Substances

Adedeji (2002) accounted that the adverse effects of pesticides, used largely agricultural purposes, on non target organism (or victim) such as birds. Since then wide-ranging concern has developed, about the dissemination of toxic substances throughout the environment. These may be metals such as lead or mercury, organics such as DDT or PCB (Polyichlorated biphenysis), inorganic such as sulfur compounds of asbestos, or radioactive materials. The toxic effects are, lethal to humans, and other organisms, resulting in ecological changes. For example, a loss of reproductive capacity, resulting in ecological changes affecting predators-prey relationships. The energy industries handle considerable quantities of these hazardous substances, for example, uranium for nuclear fuels and sulfur compounds from the combustion of oil. Of oil particularly concern is the generation of substances that induce mutations or cancer. Example is polynuclear aromatics, such as benzopyrenes, and various heterocyclic organic compounds, which includes the elements nitrogen and sulfur. These compounds may be produced during combustion or in the synthesis of synthetic liquid from fuels from mining, exhaust from diesel engines causing adverse effects, Hydroelectric dams have caused fish kills and siltration, sulfur dioxide has health implications and has harmed forests and lakes, and uranium mine tailings have produced undesirably high levels of radioactivity.

During oil production, there is potential for damage due to contamination of local environment by drilling chemicals, muds, and bine (a salt solution), which is often

produced from the oil formation association with the crude oil. Oil is transported both by tanker and by pipeline in very large quantities, causing environmental pollution, fueling of agricultural land, leading to loss of productivity. A special problem is the construction of pipelines for transmission of oil or natural gas. A common engineering practice is to build the pipeline on piles, or in trenches with adequate insulation, thus separating it from the vulnerable ground. Such pipelines often pass through sparsely populated wideness areas where the construction activities can have severe impacts on local lifestyles, fisheries, trapping and land use generally. The use and disposal of crude oil result in emission of hydrocarbons and oxides of sulfur, nitrogen, and carbon, all of which may cause environment and health problems. Some of the hydrocarbons produced during incomplete combustion are polynuclear aromatics such as benzopyrenes, which are potential carcinogens. A final impact is the disposal of used oil, particularly lubricating oil which may be contaminated.

The Need for Sustainable Development

The United Nations defines Sustainable Development as "one that meet the needs of the present without compromising the ability of future generation to meet their own need. The key principal of Earth Summit is that of the effective use, renewal and preservation of earth resources. Also in response to these challenges, Nigeria made an important submission at the Conference which formed the foundation for the National Strategies for Sustainable Development. The key consideration among other things is preservation of the environment for human habitation. One of the characteristics of Sustainable Development is that it must be developed within a particular context recognizing the unique attributes and characteristics of that particular environment.

The 1992 Earth Summit called on countries to adopt National Strategies for Sustainable Development (NSSD) that should build upon and harmonize among other things social and environmental policies that would upgrade the environment and improve the living condition of her people. Ten years later in 2002, the World Summit for Sustainable Development (NSSD) in Johannesburg urged countries not only to take immediate steps to make progress in the formulation and elaboration of national strategies for national development but also "to begin implementation by 2005".

Right from pre-colonial era, Nigeria has grown increasingly dependent on oil and gas resources from the Niger Delta region without consequently replenishing the damaged or degraded environment caused by oil exploration, oil spill and gas flares. Right from Willink's Commission of 1958, many suggestions have been made on how best to develop the oil bearing communities and improve the living condition of the people. Yet for so long, the region was consistently ranked as the least developed in Nigeria. A tragic paradox indeed!

Policy Evaluation

In a bid to combat environmental degradation, government has instituted various strategies, such as:-

(a) Environmental Impact Assessment Process In Nigeria:

The first step in the process of institutionalization ELA in Nigeria dates back to 1975 with the creation of a Division of Urban Development within the Federal Ministry of Economic Development. The driving force was the influence of the 1972 Stockholm Conference. This conference and the Nairobi conference of 1982 addressed the connection between the environment and development, with special reference to sustainable environment through environmental protection and the conservation of natural resources. This led to the creation in 1975 of a division of Urban Development and Environment with the Federal ministry of Economic Development. This unit was later moved to the Federal ministry of Housing, Urban Development and Environment. With a further reorganization of ministries between 1979 and 1983, the environmental unit, renamed Division of Environmental Planning and Protection, was moved to the Federal Ministry of Works and Housing.

In 1982, during the second Republic civilian administration of President Shehu Aliyu Shagari (1979-1983), a bill came before the Federal House of Representatives for the establishment of a Federal Environmental Protection Agency. By 1982 Nigeria reported at the Nairobi conference that a bill was before the country's National Assembly to create a Federal Environmental Protection Agency (FEPA) to cater for the nation's needs. The first attempt at environmental legislation in Nigeria was provided by the illegal dumping of 3,880 tons of toxic and hazardous wastes of Italian origin, which was transported to the shores of Nigeria in shiploads. The wastes were loaded at the small town of Koko in the former Bendel state, now Delta state.

The incident created great environmental awareness among the population. The response of the Federal Military Government of General Ibrahim Babangida was swift and decisive. The outcomes was the enactment of the harmful (toxic) Wastes Criminal Provision Acts of 1988 (Federal Republic of Nigeria, 1988a), a year later, at the 1989 Basel Convention, the United Nations Environment Programme (UNPE) passed the resolution of Trans Boundary Movement of Toxic and hazardous wastes. The major objective was to stem the tide of the "toxic waste trade involving the illegal dumping of toxic wastes in poor, debt strapped developing countries. Nigeria is a signatory to that Basel Convention. Further to this development the Federal Environmental Protection Agency (FEPA) was created by Act 58 of 1988 as a Parastatal of Ministry of Works and Housing (Federal Republic of Nigeria, 1988b).

(b) Creation of the Federal Ministry of Environment

The creation of the Federal Ministry of Environment (FMENV) in 1999 was done by the government of President Olusegun Obasanjo. This action brought together various stakeholders in the environment sector for effective co-ordination and better management of the environment and its resources. The primary mandate of the Federal Ministry of Environment is to achieve environmental objective as enunciated in section 20 of the Constitution of the Federal Republic of Nigeria. The immediate policy thrust of the FMENV is guided by the environmental agenda of the administration of President Obasanjo known as the Environmental Renewal and Development Initiative (ERDI). The primary objective of ERDI are to take full inventory of our natural resources, assess the level of environmental damage, design and implement additional restoration and rejuvenation measures, and to evolve and implement additional measures to half further degradation of our environment. The broad responsibility of the ministry, as elaborated in the National policy on environment, is to coordinate environmental protection and natural resources and conservation for sustainable development (FEPA, 1989). Secure a quality of environment adequate for the good health and well being, conserve and use the environment and natural resources for the benefit of present and future generations, restore, maintain and enhance the ecosystems and ecological processes, raise public awareness, promote understanding of the essential linkages between the environment and development and encourage individual and community participation in the environmental improvement effects and cooperate in good faith with other countries, international organizations and agencies to achieve optimal use of trans-boundary natural resources and effective prevention or abatement of trans-boundary environmental degradation.

As part of the policy implementation strategy, the new FEDA was instructed to focus on the following areas: environmental sanitization and pollution abatement, marine and coastal management, environmental information management, include remote sensing and geographic information system (GIS), and environmental assessment and natural resources management.

Other measures to check environmental despoliation include: (i) Social dimension should be addressed forcefully. (ii) A better approach to achieve a realistic standard in the environment should be enforced. (iii) There is need to reinforce environmental screening especially to detect impacts of projects. (iv) Credible professionals should be engaged in EIA preparation and implementation. (v) Reform of National Environmental Law and Legislation.

Conclusion

It is quite obvious as exemplified above that the communities in the Niger Delta region have become the recipient of environmental degradation. Government failure to implement appropriate policies to ameliorate the devastated region has exacerbated the phenomenon. Therefore a comprehensive or holistic approach is necessary to address the, social and economic predicaments of the people living in the Niger Delta region. In this context the following measures are recommended.

Recommendations

Policy options recommended for sustainable development include:

(i) revisiting the 1958 Willinks Commission report and that of 1961 Niger Delta Development Board (NDDB). According to the provisions of NDDB Act of 1961, its functions were: to carry out feasibility study of the Niger Delta in order to promote physical, human and infrastructural development in the form of provision of transportation including, roads, jetties and water ways, health, education, employment, industrialization, agriculture, fisheries, housing, urban development, water supply, electricity and telecommunication.

(ii) It also focused on investigation of agricultural potentials of Delta- forestry, fisheries, soil etc.

(iii) Proffer solutions to ecological problems occasioned by oil exploration, oil spills, gas flares etc.

(iv) Identify pollution control measures which could aid and sustain development.

(v) We also recommend implementation of the 2006 UNDP report which include among other things, to promote environmental sustainability, build sustainable partnership for the advancement of human development etc.

(vi) The biodiversity, including flora and fauna need to be cared for and protected, because the degradation of the environmental resources through human interaction affects the quality and quantity of the services produced by ecosystem.

(vii) The way oil companies respond to environmental damages and pollution in other parts of the world especially in the developed countries should be extended to the oil bearing communities in Nigeria.

(viii) The laying of surface pipes should be abolished. Underground pipes are more preferable.

(ix) Federal Government should abrogate the Land Use Act of 1978 because the Act has destroyed the use of land as a factor of production.

References

Adedipe B.O. (2002) *Firt Foundation of Regional Planning, Ibadan,* IBDI. Educational Publishers.

Adetunji, A.M. (2006) ESM 102: *The Nigerian Environment* Lagos: National Open University of Nigeria.

Bankoff, O. and Frekers, G. (2003) *Mapping Vulnerability: Disasters, Development and People.* ISBN ISBN 1-85383-964-7.

David, K. (1996) "The Coming Anarchy", Atlantic Monthly, April 1994. Delta State Ministry of Environment, 2005.

Federal Ministry of Environment (1999) *National Policy on Environment (FMENB)*

Federal Environmental Protection Agency (FEPA, 1999). *National Guidelines on Waste Disposal through Underground Injection.*

Federal Republic of Nigeria (1998) *Harmful Wastes. (Special Criminal Provisions Act 165 LFN 1990).*

Oronto, D. (1998) Geography and the Nigerian Environment. *Geographical Perspective of Physical Environment.*

Ministry of Petroleum Resources (1992) and NNPC Annual Report (2000).

Nigerian Environmental Study Action Train: (1991).

Nigerian National Petroleum Corporation (2002)

Sagay, I. (2005) Report at the National Political Conference.