



Prevention Of Environmental Degradation In Nigeria: A Strategy Towards Sustainable Development

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Abstract-*There was growing awareness that it was impossible to separate economic development issues from environmental issues; many forms of development eroded the environmental resources upon which they had to be based and environmental degradation could undermine economic development. The methodology of this study was literature review, with the sole aim of mitigating the Nigerian environmental degradation, resulting from the devastating exploitation of the natural resources occasioned by the ever rising insatiable propensity for economic and technological development. The study revealed that major contributions to the degradation of the Nigerian physical environment to include deforestation and desertification; industrial manufacturing; construction activities; solid mineral extraction; and crude oil exploration and exploitation. Some of the resultant effects of such degradation, as revealed by this study included loss of farmlands, destruction of ecosystems, flooding, landslide and global warming. The study concluded that there was the urgent need for Man to moderate the excessive devastation of the environment due to his inordinate quest for economic and technological development; if he was to protect himself from the foreseeable fatal consequences of continued devastation. Nigeria, as an integral part of the Earth-World, could not afford to be indifferent. Recommendations included creation of environmental awareness for the citizenry to understand the need to sustain the environment, for the environment to sustain Man. Tripartite collaboration, that is, government agencies, non-governmental organizations and private sectors need to work more closely to promote a sustainable Nigerian environment.*

Key words: *Economic Development, Environmental Degradation, Devastating Exploitation, Pollution, Prevention, Sustainable Development.*

1.0 Introduction

The practice of harnessing minerals and other natural resources of the Earth seems to be as old as man himself. However, with the advent of industrial revolution in Europe and astronomical advancement in science and technology, exploitation of these resources took a frightening dimension. (Odieta, 2001; Ozili, 2001 and Offodile 2001); report that in Nigeria, while mining on large scale had started during the colonial era, e.g. Coal in Enugu, Tin in Jos, it was the discovery, exploration and exploitation of crude oil in later years coupled with Middle-East Crises, Oil World Market Price; in the early 1990's that however, changed the focus and scope of mining in the country. The concern about sustainable development to a large extent stems from the universal concern about environmental degradation arising from natural resource exploitation and utilization. Ensuring sustainable utilization of environmental resources, according to Nwagbara, Abia, Uyang & Ejeje, (2012); calls for a holistic approach in tackling the problems of avoidable damage to the environment.

Bothering about the environment cannot be helped. This is because the sustenance of man's livelihood, thus according to Ewharieme & Cocodia, (2011); "protection of the environment is also seen as an essential part of development". On this premises, there arises the need for the protection of the environment. There is therefore, the need to assess the circumstances of environmental degradation and its prevention to achieve a sustainable environment.

The aim of the study is to assess the level of devastating exploitation of the natural resources for economic development of Nigerian physical environment, and the prevention thereof, with a view to mitigating the resultant degradation. The objectives include identifying the sources of degradation of the Nigerian environment, the effects of such on the environment as well as methods of its prevention.

Numerous international and local studies abound, on the topic of degradation of environment. Oladimeji (2002), Okusanya (2007), UNDESA (2008), among others. This study intends to assess the current situation in Nigeria, considering the age of some of the previous studies – five years and above; and the rate of degradation appears to be worsening. The paper would become handy for students working on this area, and even lecturers alike, as well as increasing awareness on the urgent need to protect the environment.

2.0 Nigerian Environment

2.1 Nigerian Natural Resources

According to Odiete, (2001); Ozili, (2001) and Offodile (2001); if Nigeria could be said to be richly endowed with natural resources apart from the large reserves of crude oil she possesses and the buoyant vegetation and climate, it is perhaps in the vast array and variety of solid mineral resources that she is blessed with, that the assertion can be said to be true and correct. In fact, as crude oil and its associated gas is the prevailing mineral resources of the Niger Delta region and the swampy areas of the South / Southern part, so also do the dry rocky parts of the South-West, North-West, North-East and North-Central sections of the country, have their fair shares of essential solid mineral resources of various categories ranging from precious metals such as gold, silver and platinum, to various precious stones and also industrial minerals such as barytes, gypsum, kaolin, marble, limestone, tin/columbite and granite. Many researcher have previously identified environmental degradation as one of the serious problems inhibiting sustainable development (Asiou, 2002); (UNEP 2000); (Ityavyar & Tyar 2013).

2.2 Devastation of Nigerian Forest and Menace of Desert Encroachment

Asiodu (2002) reported how Nigeria has continued to lose 350,000 hectares of forest annually to combination of factors including the legal and illegal commercial harvesters of timber, increased firewood collection, agricultural expansion, accelerated urbanization and industrialization. To the north, Savannah, the extensive and the richest grasslands in the world have the most extensive ecosystem in Africa. (These grasslands cut across many countries of West Africa).

The Sahara Desert has continued to advance (southward) into Nigeria at the speed of 0.60 kilometers annually. All these have grave consequences on the quality of the environment and by implication, human life. This scenario, according to (FAO, 1997 and 1998); (UNEP, 2000) underscores the need for priority attention for forest conservation in Nigeria.

2.3 Solid Mineral Exploitation

Odiete, (2001); Ozili, (2001) and Offodile (2001) assert that approximately 33 types of solid minerals have been identified in about 450 locations nationwide and at various stages of exploration and exploitation. A number of these solid minerals are being fully explored by various prospecting and mining companies, subject to the provisions of Nigerian Mining Corporation Act, (NMC) (1990). Other are being exploited to a large extent, to satisfy the demand of local industries and for the export market.

2.4 Manufacturing / Industrial Sector's Activities

Odiete (2001), & Ityavyar, et. al (2013) opine that as human societies continue to change from traditionalism to modernism with rapid technological advancement and increasing industrial production to satisfy growing human needs and comforts to improve civilization, new life styles and increased production activities have created unexpected industrial pollution. The environment is highly polluted in the process of execution, processing and disposal of minerals. In Nigerian cities; such as Lagos, Enugu, Ibadan, Kano, Port Harcourt, Benin, Warri, Kaduna, where these activities dominate, industries inject into the air.

2.5 *Nuclear Power Risks*

Ityavyar, et. al (2013); asserts that the fact that Nigeria is not thinking along the line of Nuclear Power development, notwithstanding, we are an integral part of the “global village” which the Earth has become. We can, therefore, not avoid being interested in the global environment. The Koko Dump of 1988, has brought in its wake a renowned national consciousness in the area of environment protection. Hitherto, our attitudinal approach to environmental issues has more often than not been non-methodical and certainly, lacking in vitality and purpose.”

Although nuclear power plants avoid many of the air emissions associated with fossil fuel plants, they create unique environmental risks. A combination of human and mechanical error could result in an accident killing several thousand people, injuring several hundred thousand others, contaminating large areas of land, and costing billions of dollars. While the odds of such an accident are low, the Chernobyl accident of 1986, showed that they can occur. In addition to safety issues, nuclear power plants continue to be problematic because of their spent fuel rods and other radioactive waste. By 1995, US nuclear plants had produced almost 32,000 metric tons of high-level radioactive waste. Finding a way to keep this waste out of the environment for the thousands of years it remains radioactive has proven difficult. (Lochbaum, (1988) cited in Oladimeji, (2002).

The current author is of the opinion that even now in 2016, the industrialized nations are still contending with problem of waste disposal and the third world countries such as Nigeria become more threatened by the fear of toxic waste dumping.

2.6 *Crude Oil Exploration, Exploitation and Refinery*

Oil and Gas related operations are the most obvious industrial activities in the Niger Delta region. (wikipedia, 2006); reveals that oil and gas resources account for over Ninety-eight (98%) percent of the Nigeria’s export earnings and eighty three (83%) percent of the government’s total revenue.

Achi, (2003); report that petroleum exploration, exploitation and refinery have triggered adverse environmental impact in the region. It is worthy of mention that Nigeria, according to World Bank Report, 2004; has continued gas flaring with at least 70% of its associated gas, into the atmosphere.

According to Oladimeji (2002), Fakpor & Omisore (2009) and Ityavyar et al (2013): most oil spills come from vessels or involves pipelines, oil terminal and bulk storage facilities which are sometimes caused by accidental or deliberate sabotage. The blow-out of offshore oil and gas wells, the dumping of drilling muds and oil soaked waste, the destruction of drilling rigs are major sources of water pollution in these areas.

2.7 *Construction Industry Activities*

According to Salami (2003), the environmental implication of construction activities are now, well known; considering the Sector to be the most wasteful and the main consumer of resources and energy. International studies have revealed that the construction industry alone is responsible for 12-16% of fresh water consumption, 25% of wood harvested, 30-40% of energy consumption, 40% of virgin material extracted, 20-30 % of greenhouse gas emission and 40% of the total waste stream, 15–30 % of which ends up in landfill and up to 15% of purchased materials at the job site ending up as waste.

Ekanayake & Ofori (2000); and Macozoma (2001); assert that it was however, identified as an issue, in *The Agenda 21: For Sustainable Construction In Developing Countries*; that new innovations and strategies are needed in the operation of the construction sector around the world, to deliver environmentally responsible construction, (Macozoma, 2002).

2.8 *General Effects Of Environmental Degradation*

Pollution: The summation of all the various negative environmental effects of human development activities amounts to pollution. Okusanya (2007); and Ityavyar et al (2013); define pollution as any introduction by man, directly or indirectly of substance or energy into the environment resulting in

deleterious effects of such nature as to endanger human health, harm living resources, ecosystems and material property and impair amenities or interfere with other legitimate uses of environment.

Effects of Deforestation and Desertification: Continuous deforestation and desertification may eventually lead to extermination of the forest resources - timber (both hard and soft) and animals. Gully erosion which renders land formation unsuitable for farming due to barrenness, hence lower yields, or unsuitable for any other development. (Asiodu, 2002).

Effects of Harnessing Solid Minerals: Earth tremors, gully erosion, land slide, land cracks and flooding causing damage to roads, services and other structures. Noise effect of blasting, and associated dust particles released into the atmosphere are certainly injurious to the neighbourhood. Odieta (2001); asserts that farmland, fishponds and other natural habitats that are even relatively far from the mining sites, may be impacted.

Effects of Manufacturing/Industrial Activities: Oladimeji, (2002) revealed that ozone depletion, pollution of water resources through effluent discharges and dumping of solid wastes are some of the effects of manufacturing or industrial activities mitigating against sustainable development.

Effects Of The Construction Activities: The biotic and abiotic factors are affected, wastes are generated. Salami, (2003); reports that erosion, flooding, landslide, deforestation, release of hydrocarbons and offensive gases are also not left out.

Effects Of Crude Oil Pollution:

- i. *Devastation of Ecosystem: Is the consequence of letting crude oil loose out of its confines without control. this can “within a twinkle of an eye” suffocates the entire ecosystem within its spread, leading to extinction of numerous species.*
- ii. *Destruction of Farmlands: consequential effects of spillage could also affect, even farmlands in places relatively far away from spillage.*
- iii. *Pollution of Water Supply: Waterways, streams and even deep wells are not free from pollution, hence the phrase “water, water everywhere but none to drink”.*
- iv. *Global Warming: Oladimeji (2002), Fakpor, et al (2009); Ityarvyar, et al (2013) extensively report on the problem resulting from gas flaring to include global warming, danger to human health and disappearance of valuable species which are all considered inimical to sustainable development.*

2.9 *Steps Towards Environmental Sustainable Development*

Sustainable Development: According to Odum, (2010); the most widely accepted definition of Sustainable Development is that of The Brundland Commission Report of 1987. “Meeting the needs of the present without compromising the ability of the future generation to meet their own needs”. It serves as the starting point for the vast majority of sustainable development policy-making by governments, citizens groups, industry and environmental organization.

According to Adogbo & Chindo (2010); Sustainable Development contains within it two key concepts: the concept of ‘needs’ and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs. Thus, the goals of economic and social development must be defined in terms of sustainability in all countries.

Prevention of pollution and devastation would consist of some or all of the followings:

Pollution Prevention And Devastation Mitigation: Pollution prevention or “Source Reduction” is any practice which prevents or reduces pollution of the source. That means using raw materials, energy, water and other resources more efficiently, thereby reducing or eliminating the creation of waste pollutants. Pollution prevention is an essential tool for decreasing public health risks, and for assuring healthy, people and healthy communities. (USEPA, 1995) cited in (Oladimeji, 2002) and this is the whole essence of Sustainable Development

Environmental Responsibility: All activities should be planned and executed to conform to international standard so as to minimize environmental impact. Concerned bodies should strive for continuous environmental improvement, and operate within identified principles and policy guidelines in health, safety and environment. According to TEF, (2001) cited in Oladimeji (2002); Environmental performance should be seen in the context of the country’s major social and economic problems and

properties. In short, environmental responsibility entails addressing environmental problems through scientific study and analysis of alternative policies and their consequences. (Oladimeji, 2002).

Environmental Awareness: Ityarvya et al (2013) report that awareness has been raised in recent time, as man began to realize that his very existence is being threatened by the reckless manner in which the resource was exploited. Man had no choice, therefore, but to protect himself from his own activities, which was fast destroying his environment. This led to the international awareness and the establishment of the various codes. Raising awareness among staff, and contractors working in all areas of the business must be made a key element in environmental programme. Courses to be developed including Community Environmental Management and Assessments. (Odieta, (2001); (Offodile, (2001); (Ozili, 2010).

The current author has no hesitation in agreeing with this proposal.

Environmental Impact Assessment (EIA): Adogbo, et al (2010) reports that Environment Geology is a relatively new science. Minerals and natural resources have been exploited over the years without due consideration for the damage done to the environment.

Environmental Impact Assessment (EIA's) should be carried out before any major project is undertaken. EIA involves carrying out of surveys to define the environment and look at potentials to minimize the impact of new development. This would be tailored according to laid down guidelines.

In Nigeria, EIA's is still at a learning process involving training staff and the Nigerian Institutions which undertake the work. (Okusanya, 2007).

Environmental Regulations: The establishment of the Federal Environmental Protection Agency (FEPA) and the State Environmental Protection Agency (SEPA) by the Environmental Impact Assessment Decree (Number 86 of 1992) now repealed and replaced by the National Environmental Standard and Regulations Enforcement Agency (NESREA, 2007) prescribed mandatory EIA requirement for the following sectors of the economy vis; agro industry, food processing, manufacturing industry, dams, drainage and mining, among others. The decree also stipulates follow-up actions and sanctions.

Nigerian Mineral and Mining Act, (NMM Act, (2007) Section 118, is equally applicable. (Okusanya, 2007) and (Adogbo et al 2010).

Sustainable Design and Construction: According to Odum, (2010): Sustainable Construction has been defined as "those materials and methods used to construct and maintain a structure that meets the needs of the present without compromising the ability of future generations to meet their own need.

Tinker and Burt (2004); and Peakstropirairies, (2005); cited in Adogbo (2010); identifying the main goals of sustainable designs and sustainable construction to include reduction in the depletion of resources including energy, water, and raw materials; minimizing environmental damage caused by buildings and facilities throughout their life; and creating better building environments.

Governments in the centre and federating states need to be more proactive in matters relating to environmental degradation and climatic change. This can be achieved through legislative re-engineering - repealing ineffective laws and replacing them with new ones; enforcing compliance of all regulations put in place to protect the environment; political will to mobilize and encourage our neighboring countries to imbibe international standards in environmental protection. (Okusanya, 2007) and (Adogbo, et al (2010).

3.0 Summary of Findings

Literature review reveals succinctly, the following sources or contributions to the Nigerian Environmental Degradation:

Devastation of forest and Menace of Desert Encroachment; Uncontrolled Exploitation of Solid Mineral Resources; Solid Waste Dumping and Effluents from Manufacturing / Industrial Sectors Activities, Disposal of Nuclear Power Waste; Oil Spillage and Gas Clearing from Crude Oil Exploitation and Refineries and Construction Industries Activities.

Among the notable effects of environmental degradation are:

Deforestation and desertification; arising from forest harvest for construction, clearing for farmland, and for fire wood; loss of farmlands and destruction of ecosystems; gully erosion, land slide and flooding; among others, arising from solid mineral extraction.

Ozone depletion/Global warming; Pollution of water resources and dumping of solid wastes, which may sometimes be toxic, arising from manufacturing industrial activities.

Monumental wastes, noise pollution, flooding and impact on the ecosystems; arising from construction sector activities.

The risk of problematic waste disposal of spent fuel rods and other radioactive matters; likelihood of accident that could kill hundreds of thousands of people and contaminating large areas of land, that may arise from the future use of nuclear power station.

Devastation of ecosystems, destruction of farmlands, pollution of water resources, ozone depletion/global warming; arising from oil blow-outs, spillage and gas flaring associated with crude oil exploration and exploitation and refinery.

Apparent lack of political will of the succeeding federal and state governments to reform existing laws and make new legislation; strict monitoring and enforcement of existing regulations and policies to protect the Nigerian environment.

4.0 Conclusion

It is apparent from the foregoing, that unbridled developmental activities of Man, have led to unquantifiable environmental devastation. Virtually, almost all activities of Man, if not moderated, could lead to environmental degradation – solid mineral extraction, crude petroleum exploitation, forest harvest, industrial manufacturing, even building and other engineering construction. Continued degradation of the Earth environment portends grievous danger to future human existence.

There is the urgent need, therefore, for Man to protect himself from the foreseeable fatal consequences of continued devastation of the environment. Nigeria, as an integral part of the Earth-world, cannot afford to be indifferent. Nigerian governments need to be more proactive in matters relating to environmental degradation and climatic change.

Possible steps or solutions towards mitigation of environmental degradation would be for all stakeholders to imbibe, impact and enforce meaningful policies in respect of - environmental responsibility; environmental awareness; environmental impact assessment; environmental regulation; and sustainable design and construction.

Recommendations:

In view of the foregoing review, the following suggestions do not only become imminent but also eminent towards possible elimination or at least minimization of Nigeria environmental degradation:

Nigerian government should make bold to append her signature to those environmental related treaties and conventions which are capable of giving the nation a clearer focus and the required international support in the fight against unsustainable practices and degradation of the ecology.

There is the need for a greater political will and commitment on the part of our decision/policy makers, to the cause of sustainable development.

Creation of environmental awareness; this is to enable the individuals understand how to relate and apply the knowledge of environment to their actions and to the world around them. The citizens should be made to understand that we need to sustain the environment for the environment to sustain us. Indeed, all the citizenry should be active in the cause, if they could be mobilized.

The issue of environmental protection and sustainable development, should no more be regarded as the business of one particular player or sector, rather, it calls for tripartite collaboration, that is, between government agencies, non-governmental organizations and private sectors. All these need to work more closely to promote a sustainable Nigerian environment.

Towards prevention of deforestation and desertification in Nigeria, the approach should be strategic and multi-dimensional. It should take into consideration the complex situation, as regard forest resource use and management, in Nigeria. Intervention measures should focus on policy reforms, protected area management, environmental education, training and capacity building, community participation, and international cooperation, field research and inventory work.

Production and use of alternative (non-petroleum) fuel such as solar, anemo-electric, hydro-electric and geo-thermal energy, to be encouraged in the country. These alternative power sources do not only have the advantage of being renewable, but they are also economically attractive and have minimal adverse environmental impact, such as the waste emission of SO₂, HO_x or greenhouse gases.

To enhance innovations in the construction industry, waste reduction strategies, deconstruction and ability to turn waste generated into raw materials ready to be incorporated into a new building, will not only reduce cost of raw materials purchased and the disposal cost of waste, but more importantly, deliver environmentally responsible construction.

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