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ENVIRONMENT, DEVELOPMENT AND POVERTY IN NIGERIA

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ABSTRACT

All countries, whether underdeveloped, developing, or developed are always striving to meet the basic needs of its citizenry. In the quest for development in Nigeria, human activity and technology have greatly impaired the natural ecosystem by undermining its viability to such an extent that it has become diminished in terms of biodiversity, bioactivity and biomass making it less able to withstand shocks. Such deterioration of the environment is responsible for the pervasive level of poverty in Nigeria and has had a far-reaching negative impact on the environment, upon which man depends for survival. It further suggests, that to improve the conditions of living for people in the immediate term and safeguard the standard of living for the future generations, the balance of the natural ecosystem must be enhanced and protected. There is the need to stop the degradation of land and forestry assets and restore the ecological balance.

1. Introduction

NATURAL ecosystems are viable because they are balanced and stable, and thus able to withstand shocks arising from natural and human activities since the beginning of time, man himself was part of the said viability because demands on his habitat were in a balance with the ecosystem of which he was a part. Natural ecosystems are gradually disappearing in the present world due to the influence of man's technological know-how and other innovations aimed at facilitating the process of development.

Most of the Nigerian environment is a complex of human ecosystems which make up the human biosphere, so human and natural activities which have an impact on the environment implies that these actions have an impact on the human ecosystems, and therefore, on human conditions of living. The natural ecosystems are created by the inter-relationship of relief, climate, local drainage, soils, plants and animals.

The natural ecosystems of Nigeria fall into about eight ecozones and a number of ecotones. These include the swamp forest, rain forest, oil palm bush of the

South and the Guinea zone, Jos Plateau, the Sudan zone and the Sahel zone of the north. The settlement patterns, occupations, natural resources endowment and ways of life vary with the zones.

Various soil types, animals, water resources, and minerals form the ecological indicators for specific ecozones. Mankind has had and continues to have a far reaching impact on the natural ecozones, creating human ecosystems that are manifested in the evolving human landscape. The modern impact of mankind on the environment is explained by the principles of the 'Tragedy of the Commons' as well as 'market impact'.

There are certain basic requirements that both the individual and the community must have in order to survive as human beings. These, according to Burkey (1993), include clean (unpolluted) air and water, adequate and balanced food, physical and emotional security, physical and mental rest, and cultural and climatically appropriate clothing and shelter. Others are sexual regeneration, a system of communication (language), a belief and educational system for cultural continuity, physical and cultural security, a political system defining leadership and decision-making, and systems of health and recreation for maintaining well-being among sufficient numbers to maintain a community. Thus, we can look at poverty in terms of basic needs.

Absolute poverty may be defined as the inability of an individual, a community or even an entire nation to meet its basic needs. Relative poverty is the situation whereby the basic needs are met, though the individual or the society is unable to meet its perceived needs and desires.

In order to enhance both individual and societal well-being and thereby reduce, or even completely eliminate poverty, both the public and the private sector of the Nigerian economy have been running development programmes over the past three decades. Todaro (1992) defines development as the process of improving the quality of life. It is made up of three equally important aspects viz:

- a. raising people's living standards, such as the level of their income, food consumption, medical services and education, through relevant economic growth
- b. creating conditions which are conducive to the growth of people's self-esteem through the establishment of social, political and economic systems and institutions which promote human dignity and respect
- c. increasing people's freedom of choice by increasing the range of their choice variables, e.g., increasing varieties of consumer goods and services

Unfortunately, the process of development in Nigeria has tended to have a devastating effect on the environment and has therefore resulted in defeating and

inhibiting its very purpose, which is the elimination or reduction of poverty. This paper discusses the different ways in which developmental efforts have affected the environment, thus enhancing poverty in Nigeria. There exists a vicious circle where development degrades the environment, causes poverty, which further deteriorates the environment — and that in turn results in further poverty.

2. Conceptual Issues

2.1 The environment

The biosphere is that part of the earth where living things exist. Ecosystems are self-contained units of the biosphere containing interrelated living organisms, including human beings that inhabit the same environment, and the non-living things upon which they depend for their existence. The environment is made up of land, water and the air from which man taps resources. There is a dialectical relationship between human beings and other living things and the environment in which they live. As man influences the environment, it influences man in return. Such effects can be positive, or negative. It is, therefore, imperative to make a conscious effort to promote the positive effects of socio-economic actions on the environment and minimize the negative ones.

Natural ecosystems describe the dynamic relationship of living things to each other and to the biosphere, which can be understood in terms of:

- a. dependency, mutual coexistence and competition amongst species
- b. bioactivity — energy flow, productivity and resource recycling
- c. biomass — the result of productivity, the total mass of life.
- d. biodiversity — the number of species in a given area and the function of dependency, mutual coexistence, biomass and bioactivity
- e. balance, because products of decay are recycled as new life
- f. stability, because energy expenditure equals energy income

Due to these dynamics, species and ecosystems evolve both as a result of their own internal dynamics and as a result of response to external stimuli such as climatic cycles, geological processes as well as the human impact.

In reality, mankind has to be added for a balanced equation of the natural environment, and their relationship to the environment occurs in three phases both in historic and contemporary spatial terms:

- a. natural mankind — where there exists a stable balance in man's environment, depending on the demands of his habitat
- b. viable mankind — where man's activities maintain an environment that remains viable despite modification. Settled hunting and farming societies where productivity is maintained are an example of this phase

- c. modern mankind — where ecosystems are either degrading towards non-viability or are already unviable as a result of mankind's activities (Jones, 1994)

Thus, modern mankind has the technology to undermine the viability of the environment to such an extent that it is diminished in terms of biodiversity, bioactivity and biomass. Modern man has affected the environment ever since they started using tools. Most of the Nigerian landscape has been modified by man, and his contemporary activities have greatly threatened the viability of the Nigerian environment.

According to Mellor (1988), environmental problems and poverty are inseparable in developing countries. A considerable percentage of the people in these countries cannot afford sufficient food to maintain minimum activity levels for healthy productive lives. The poor as well as the rich largely depend directly or indirectly on agriculture and therefore, on the environment. As a result, environmental problems are inextricably linked with the problems of growing populations. The same view is shared by Igbozurike (1977) who sees soil exhaustion and the unregulated use of pesticides, herbicides, fertilizers and other agricultural chemicals as indicators of environmental degradation and the bane of agricultural productivity in Nigeria. The indiscriminant grazing activities of the nomadic pastoralists has led to deforestation, soil erosion and desertification. Mining and quarrying are also among the important causes of land degradation in Nigeria.

Oil spillage is a major culprit in environmental deterioration, coupled with the unnecessary and avoidable flaring of massive quantities of natural gas. Furthermore, soil and coastal erosion adversely affect over 80 per cent of Nigeria's land.

Human activities add nitrous oxide, methane gas, chlorofluorocarbons and other heat trapping gases to the atmosphere. These gases cause the earth's climate to grow warmer with the attendant devastating effect on agriculture and human, animal and aquatic life. Natural or man-made changes in the ozone layer will have an effect on both the climate and life on the earth's surface, (Cariolle, 1992). Generally, poverty and rapid population growth have a definite effect on ecological dysfunction; increased demographic pressure engenders decline in per capita agricultural output (Engel and Abdallah, 1992).

2.2 Development

One of the critical issues facing many developing societies is how to enhance the well-being of their people. Achieving a high level of development requires a multidimensional approach to ensure the reorganization and reorientation of the entire socioeconomic system. This is aimed at improving output and incomes, and to bring about radical changes in institutional, social and administrative

structures, as well as in popular attitudes and sometimes even in customs and beliefs (Todaro, 1992).

It is in recognition of this, that the Nigerian economic planners from the first National Development Plan (1962-1968) to the Fourth National Development Plan (1981-1985) designed the predominant strategy of employing all our available resources (land, labour, capital and managerial know-how) for the expansion of the productive capacity of the economy to lay a solid foundation for self-sustaining growth and development in the shortest possible time. Unfortunately, these developments do yield negative externalities (social costs) to the society. For instance, the exploitation of petroleum resources, mining, improvements in agriculture, transportation, and industrialization, have seriously degraded the environment and thereby impoverished many people.

The word *development* has its root from the French word *voloper* which means 'to wrap'. To develop therefore means to *de-wrap*, or to unfold gradually, to cause to grow gradually fuller, larger, stronger and better'. This is in line with the view of Rodney (1986), who maintains that a society develops economically as its citizens jointly increase their capacity for interaction with the environment. This capacity depends on their comprehension of the laws of nature, their application of that understanding by devising appropriate tools (technology) and their ability to make the best use of this technology.

Awe (1986) also maintains that development must mean improvement in living conditions through industrialization, modernization and economic growth. This presupposes the absence of gross disparities within a country and the provision of the basic needs of the citizens of that country.¹ Similarly, many economists measure development mainly from the point of view of increasing the rate of savings and capital formation. The achievement of this would encourage a reduction in the unemployment rate, absolute poverty and inequality in income distribution. Meier (1989) measures development in terms of the increase in real per capita income over time, provided the number of people below the absolute poverty line does not increase, and the distribution of income does not become unequal. He sees development as a way out of persistent poverty, absorbing the surplus labour and diminishing inequality.

Akpakpan (1987) shares this view as he clearly states the indices of development to include:

- i. a reduction in the unemployment level
- ii. a reduction in the extent of personal and regional inequality
- iii. a reduction in the level of absolute poverty

¹ See also Thirlwall, 1983, Schumpeter and Kindleberger in Jhingan, 1992.

- iv. a rise in real output of goods and services and the improvement of production techniques
- v. improvement in literacy, health services, housing conditions and government services
- vi. improvement of the level of social and political consciousness of the people
- vii. greater ability to draw on local (human and material) resources to meet local needs

Despite all the efforts made by developing nations to develop, the majority of people still live in poverty. Wheeler (1992) is of the view that the development process itself has exhibited limiting factors which will require much more careful management for progress to be made. Development is damaging the natural resource base on which human life depends. As development raises incomes in a country's more productive regions, poverty concentrates in less developed environmentally fragile areas.

3. Environmental Protection in Nigeria

The discovery in 1988 that some toxic waste had been dumped by an Italian firm at the Koko port in Southern Nigeria, spurred government to give more attention to environmental issues. This led to the establishment of the Federal Environmental Protection Agency (FEPA) as well as State Environmental Protection Agencies (SEPA) in each state of the Federation.

The enabling Decree No. 58 of 1988 by which FEPA was established, vested responsibility in the agency for general environmental protection, the initiation of appropriate environment policies in Nigeria and international cooperation in environmental matters. Later on in 1992, the increasing challenges and tasks of protecting our environment for sustainable development compelled government to expand the mandate of FEPA to include the protection and conservation of Nigeria's biodiversity and natural resources, with the promulgation of the FEPA Amendment Decree No. 59 (1992).

The Federal Government further enacted the Environmental Impact Assessment (EIA) Decree 86 of 1992. These decrees make environmental impact assessment mandatory for new major industries and prescribe the process, follow-up actions and conditions. Decree 86 contains the schedule of mandatory study activities relating to 19 vital sectors of the economy — agriculture, airport, siting, drainage and irrigation, land reclamation, fisheries, forestry, housing, industry, infrastructure, mining, petroleum, power generation and transmission, quarries, railways, transportation, resort and recreational development, waste treatment and disposal as well as water supply.

The Federal Environmental Protection Agency (FEPA), with the assistance of government and in conjunction with the United Nations Development Programme (UNDP) has made efforts regarding 9 areas of environmental protection. These include:

- a. policy and legislation
- b. environmental education and awareness
- c. pollution control and waste management
- d. biodiversity conservation
- e. combating drought and desertification
- f. alternative energy
- g. flood and erosion control
- h. urban development
- i. rehabilitation of mining sites

A major effort already initiated by FEPA to tackle the problem of solid waste management in Nigeria has been the production of a blue print on *National Waste Management Strategy*. This is anchored on waste minimization, recycling and waste-to-wealth; guidelines for sorting, collection, treatment, transportation and disposal of waste; penalties for contravention of waste management laws for households, business districts, industries, government offices, hospitals, schools, etc; collection of fines, and disbursement of incentives to local governments and state governments for effective implementation.

The Federal Environmental Protection Agency has fashioned a programme to combat erosion, through conservative land-use practices. Soil erosion hazards mapping involves the creation of an environmental database with facts about erosion and the causative factors, mapping inventories, data analysis and processing. In addition, FEPA scientists are developing soil erosion simulation models for various soil hazards in different agroecological zones of Nigeria.

Through the analysis of all known variables in the erosion process, the result of the study will reflect the natural propensity of the different agro-ecological zones for erosion. The result is expected to provide an important aid to land-use planning and information about areas of the country in need of additional resources for soil conservation sustain continuous production with minimum soil degradation.

Other efforts undertaken by FEPA² in conjunction with foreign agencies to protect the environment include the following:

- a. UNDP support to FEPA to conduct an awareness seminar on ozone depleting substances for 40 industrialists in 1992

² This section draws heavily from various issues of *The Nigerian Environment*, a quarterly newsletter of the Federal Environmental Protection Agency (FEPA).

- b. In 1993, UNDP approved US\$300,000 under the multilateral fund for institutional strengthening for the phase-out of ozone depleting substances
- c. UNEP approved a US\$250,171 project for the inventory of sources and sinks of Greenhouse Gases in 1993
- d. FEPA in conjunction with UNDP has the targeted communities in various states of the Federation as follows:
 - i. Agriculture and rural development for addressing the use of obnoxious fishing practices in Anambra, Benue, Kano, Plateau, Niger, Ogun and Lagos states. Inculcating environmentally sound use of more productive agricultural machinery in Abia, Kebbi, Kogi, Osun, Yobe, Akwa Ibom and Katsina states
 - ii. Village land management in Kebbi and Yobe states
 - iii. Women in development for obtaining information on environmental ethics associated with income generating activities in Abia, Anambra, Delta, Jigawa, Kebbi, Kogi, Kwara, Osun, Taraba, Yobe and Akwa Ibom states and imparting same to women groups
 - iv. Health sector support for environmental education in primary health care as it relates to water and sanitation in Kano and Katsina states
 - v. Mass literacy as a medium for developing a curriculum for environmental education during Rural Participatory Appraisal at the grass-roots level in all states

To give legal backing to the requirements of the guidelines and standards for environmental pollution control in Nigeria, the Federal Environmental Protection Agency enacted three regulations in 1991 as follows:

- a. *National environmental protection effluent limitation regulation*: makes it mandatory for industries to install anti-pollution equipment for the treatment of effluents.
- b. *Pollution abatement in industries and facilities generating wastes regulation*: stipulates restrictions on the release of toxic substances into the environment, and gives the requirements for environmental audits and penalties for contravention.
- c. *Management of solid and hazardous wastes regulation*: provides a comprehensive list of dangerous and hazardous chemicals and wastes, and the prescription for environmentally sound disposal of various categories of waste.

4. Environment, Development and Poverty in Nigeria

The number of poor people in Nigeria has increased in the past decade both absolutely and also as a percentage of the total population. Over two-thirds of these poor live in the rural areas and depend primarily on whatever natural resources (land, water, biomass and genetic) are available.

During the process of development, as people, both individually and collectively, strive to improve upon the conditions of their well-being, many wrong approaches and procedures of production are employed, which, rather than enrich the people, impoverish them through their negative impact on the environment.

4.1 Environmental impact of agricultural development

Agriculture makes use of over one-third of the Nigerian land mass. As agriculture becomes more mechanized, complex, extensive and demanding on land, there has been a striking increase in the environmental and socioeconomic problems associated with it.

There are two important principles pertaining to the impact of agriculture on the Nigerian environment: *the market impact* and *the tragedy of the commons*.

- i. *The market impact*: The trend in Nigeria is such that existing communities cultivate more land, hunt and gather more forest products than they need for their own subsistence. This is as a result of trading and the monetized nature of the economy, which creates the pressure to satisfy market demand. Presently in Nigeria, the demand for agricultural and forest products is effectively infinite. The limiting factor, therefore, is the land which is exploited to exhaustion
- ii. *The tragedy of the commons*: This explains why, once conservative traditions have broken down, resources are exploited to exhaustion very quickly where there is an infinite demand for them. A ready example is the reckless exploitation of the forests for timber and fuel wood, especially where the forest is held as common property. No one considers conserving the forest, because if an individual does not exploit it to his maximum ability then someone else will. The tragedy is that the trees are exploited to the last stand. The situation is worsened because the poor people (made poorer by environmental degradation), to whom present needs take precedence cannot afford to think of conservation

The same effect is true of the rearing of cattle, sheep and goats by nomadic pastoralists. These are associated with overgrazing, and its attendant problems of deforestation, soil erosion and desertification.

Crop agriculture also faces very serious environmental problems, such as soil exhaustion and the effects of the unregulated use of pesticides, herbicides, fertilizers and other chemicals.

Igbozurike (1977) recommends polycultural agriculture as being ecologically more sound than monocultural agriculture. According to him, although the polycultural farm presents a riotous and chaotic physiognomy like a miniature forest, its environmental rationale is infinitely superior to that of the monocultural. The argument is that since many different crops are grown together, the entire microecological spectrum available per unit of tillage space is utilizable. A significant benefit from polyculture relates to soil wash and soil fertility, whereas soil erosion and wastage occur where farmers practice monoculture. In various parts of Nigeria, overcropping due to the increasing demand for farmland and overgrazing have resulted in soil impoverishment and soil erosion. Absolute nomadic pastoralism also results in water pollution and its attendant problem of water-borne disease.

Table 1. Contrasts Between Mixed Cropping and Sole Cropping

Attributes	Sole cropping	Mixed cropping
Species diversity	None at all	High
Space utilization	Poor	Excellent
Nutrient cycles	Open, very poorly developed	Tight, very well developed
Inherent systemic stability	Low	High
Net biomass production	High	Very low
Biochemical contribution to diet	Low	High
Susceptibility to mechanization	High	Low
Economic stability	Boom or burst	High and steady

Source: U.M. Igbozurike, Polyculture and Monoculture: Contrast and analysis. *Geojournal* 2(5): 443-449, 1978.

Table 3 outlines the major environmental problems of 18 selected states in Nigeria. Some of these environmental problems arise from natural causes, while others emanate from human activities. For instance, the petroleum exploration and extraction processes in Akwa Ibom, Rivers, Delta, Ondo and Cross River States has had various undesirable effects on the environment such as land surface devastation, gas leaks, oil spills, noise, as well as soil, water and air pollution. Similarly, tin mining during the past eight decades in the Jos Plateau has also left the landscape devastated and the ecosystem destabilized. An estimated 325 sq km out of 8,600 sq km of the Jos Plateau has been damaged by various mining activities, especially the open-cast mining of cassiterite and columbite. These mine ponds and lakes pose a grave danger for children. Furthermore, this open-cast mining, together with modern commercial mining has led to the loss of agricultural land in these areas which are rich in alluvial deposits.

Table 2. Environmental Impacts of Fossil Energy Resources

Mining activity	General effect	Specific impacts
Exploration	Landscape disturbance	Aesthetic deterioration of the landscape
Mineral extraction	Land degradation and ecosystem destabilization	Land surface devastation (erosion), land subsidence, disruption of drainage systems, deforestation, excessive water draw-down, lowering and contamination of water table
Processing, transportation, storage and consumption	Gas leaks, oil spills, noise and pollution of the air, soil and water	Thermal loading of waterways, increase in CO ₂ and CO, ozone layer depletion, acidification of air, soil and water, weather modification, toxicity hazardous to plants and animals, death of terrestrial and marine life, loss of crops and livestock, impairment of atmospheric visibility, vehicular accidents, damage to buildings and machinery, nervous disorders, respiratory diseases, cardiovascular illnesses, cancers and food poisoning

Source: U.M. Igbozurike, Energy Development and Energy Crises with Special Reference to Nigeria, Department of Geography, University of Nigeria Nsukka, 1983, p. 13.

Table 3. Nigeria: Major Environmental Problems in Selected States

S/N	State	Major environmental problems
1.	Akwa Ibom	Coastal erosion, gully erosion, soil erosion, land, water and air pollution
2.	Imo	Gully erosion, water pollution, urban waste management
3.	Abia	Gully erosion, water pollution, industrial pollution, waste management
4.	Rivers	Coastal erosion, industrial pollution, water pollution, land pollution, flooding
5.	Anambra	Gully erosion
6.	Delta	Gully erosion, deforestation, flooding, soil erosion, water pollution, wind storms
7.	Cross River	Coastal erosion, water pollution, gully erosion
8.	Benue	Gully erosion, air pollution
9.	Edo	Gully erosion, flooding, soil erosion, water pollution, windstorms, deforestation
10.	Lagos	Coastal erosion, industrial pollution, noise pollution, water pollution, soil erosion, municipal chemical and toxic waste management
11.	Oyo	Water pollution, waste management, industrial pollution, flooding
12.	Ogun	Industrial pollution, water pollution, municipal waste management
13.	Ondo	Gully erosion, coastal erosion
14.	Jigawa	Soil erosion, flooding, desertification, drought, pest menace, wind storms and waste management
15.	Kano	Industrial pollution, desertification, wind erosion and municipal waste disposal
16.	Borno	Drought, desertification, sandstorms, windstorms, pest invasion and flooding
17.	Plateau	Industrial pollution, radiation
18.	Kaduna	Water pollution, industrial pollution

Source: Compiled from various issues of FEPA quarterly newsletter.

The industrial states like Lagos, Rivers, Delta, Abia, Ogun and Kaduna suffer a lot of noise and industrial waste pollution. Despite FEPA regulations regarding industrial waste management, most industrial concerns still have not

found solutions to the problems of industrial waste management. As such, air pollution, water pollution and soil pollution are still prevalent, are leading to toxicity hazards to plants, and animals, death of terrestrial and marine life, loss of crops and livestock, food poisoning, etc.

Most of the gully and soil erosion in various states of Nigeria is aggravated by activities pertaining to rural and urban development. These activities include road construction and mineral exploration, which change the drainage network of the affected areas, rendering them more susceptible to various forms of erosion.

Furthermore, the process of agricultural, industrial and social development sometimes make deforestation inevitable. This leads to erosion, desertification, windstorms and sandstorms, especially in Kano, Borno, Jigawa and other northern states. Coastal and gully erosion as well as flooding in most states also result from excessive exploitation of streams and rivers for fine sand and gravel. These activities, which are fundamentally undertaken with a view to alleviating poverty, end up creating greater problems which exacerbate it.

4.2 Environmental impact of industrial development

Industrialization and the exploitation and development of our resources have had far reaching effects on the environment and this has greatly affected agricultural output and the other aspects of the well-being of individuals and communities in Nigeria. Oil exploration has always carried with it the following environmental problems especially in the Niger Delta region (Rivers, Bayelsa, Akwa Ibom, Edo, Delta and Imo states):

a. Oil spillage

Oil spills in Nigeria average 1373 tons per year. The impact of oil spills on the environment includes loss of fish and other aquatic animals, eutrophication of water bodies, abandonment of fishing grounds and associated livelihood pursuits, devegetation, and other forms of ecological damage. Other effects include emigration of wildlife and consequent decline of hunting, loss of drinking and industrial water and its importation or derivation at extra cost, destruction or reduction of agricultural and related activities, increased economic and other burdens entailed in environmental clean-ups after pollution, impairment of human health, forced population migration, worsened rural underdevelopment, and the embitterment of the affected individuals and communities.

b. Air pollution

- i. *Gas flaring*: The environmental and socioeconomic impacts of gas flaring in Nigeria include atmospheric pollution by combustion contaminants, thermal pollution of the air, land and water;

destruction of vegetation and associated wildlife, damage of buildings and other structures by acid rain, soil and crop damage by heat, photogenic pollution which causes a nuisance and the loss of a source of livelihood. These effects sum up to severe discomfort, illness and misery, as well as poverty among the people.

Gas flaring is a wasteful emission of greenhouse gases that increase global warming. Nigeria flares more gas than any other country in the world. In 1989, Nigeria flared off 617 million cubic feet of associated gas and in the process released about 30 millions tons of CO₂ into the atmosphere. In 1994, the total emission of CO₂ from gas flaring in Nigeria amounted to an estimated 35 million tons (The World Bank, 1995).

Table 4. Flaring of Natural Gas in Major Producing Countries
(% of Gross Production in 1991)

USA	0.6
Holland	0.0
Britain	4.3
Ex-USSR	1.5
Mexico	5.0
OPEC Countries	
Nigeria	76.0
Libya	21.0
Saudi Arabia	20.0
Iran	19.0
Algeria	4.0
OPEC total	18.0
World total	4.8

Source: Escravos Staff Appraisal Report, 1993.

Gas flaring causes noise in the immediate environment like Ibeno in Akwa Ibom state, Escravos in Delta state and Port Harcourt in the Rivers states. It also causes soil acidification and corrosion of metal roofs as is the occurrence in Iko in Akwa Ibom state and Ogoniland in Rivers state.

- ii. *Industrial emissions*: Localized pollution of the air in Nigeria results from various industries. For instance, cement industries in Calabar in Cross River state, Warri in Delta state, Port Harcourt in Rivers state, Gboko in Benue state, etc., emit cement dust into the air; the fertilizer plant in Port Harcourt emits nitrogen compounds, NNPC refineries in Port Harcourt and Kaduna emit multiple pollutants, while steel works in Aladja, Asaba and Sapele emit sulphur dioxide.

The major air pollutants emitted by refineries and petrochemical facilities in Nigeria are sulphur oxides, nitrogen oxides, particulates, carbon monoxide and hydrocarbons. Table 5 indicates that in 1993, 96,513 metric tons of CO₂ was emitted from industrial processes in Nigeria, giving per capita CO₂ emissions of 0.8 metric tons.

Other industries also emit fumes and gases which are hazardous to human health. Vehicles emit pollutants like nitrogen-oxides, non-methane volatile organic components, carbon monoxide, sulphur dioxide, polyaromatic hydrocarbons and lead. People who work in crowded urban centres like motor parks and roads are more susceptible to the harmful effects of vehicular emissions. Particulates like sulphur bring about respiratory illnesses, while lead can cause mental dysfunction and poisoning.

c. Erosion

Erosion has resulted in the loss of cultivable land and the decline in agricultural production. It also results in the siltation of inland and coastal waterways, thereby impeding transportation, endangering or dislocating sources of water supply and leading to the eutrophication of water bodies, as well as the fouling up of aquacultural and related production. This problem is most pronounced along the coastal wetland of the country (e.g., Akwa Ibom, Imo, Abia, Rivers, Delta, Bayelsa, Cross River, Lagos, Ogun, Oyo states). A ready example of the undesirable effect of erosion is the gully erosion menace in Afaha Offiong in Akwa Ibom state, where the access road between the Local Government headquarters and Etinan has been totally impaired and Afaha stream, which is the only source of water for the people has been dislocated.

Generally there is a prevalence of soil degradation which induces a low level of agricultural output in the coastal and southeastern regions. Other impacts of erosion include damage to residential buildings, schools, water pipelines, electricity installations, industrial layouts, forests, and wild life habitats as is the case in Uyo in Akwa Ibom state.

Given the foregoing analysis of the impact of environmental problems in terms of reducing the value and potential of the environment, and given the fact that most environmental degradation is induced in the process of development, it can be said that some development processes devastate the environment and thereby induce poverty in Nigeria. Credence to this, is given by the fact that between 1981-1990, the total forest area in Nigeria was depleted by 7 per cent annually, while the natural forest was depleted by 0.7 per cent (see table 6).

Table 5. Nigeria: CO₂ Emissions from Industrial Processes, 1993

Solid	Liquid	Gas	Gas flaring	Cement manufacture	Total	Per capita carbon dioxide emissions (metric tons)
180	37,285	9,405	47,896	1,744	96,513	0.8

Source: For (a) and (b) see Nigeria's threatened environment, a national profile, by Nigerian Environmental Study/Action Team (NEST) 1991. For (c) see Erosion and Desertification *European Environmental Bureau Bulletin*, No. 2, 1986.

Table 6. Nigeria: Forest Resources, 1981-1990

Table 6. Nigeria: Forest Resources, 1981-1990														
Forest and other wood land	Forest area								Other wooded land				Annual logging (000 ha)	
	Total forest		Natural forest		Plantation									
	Extent (000 ha) 1990	Annual % change 1981-90	Extent (000 ha) 1990	Annual % change 1981-90	Extent (000 ha) 1990	Annual % change 1981-90	Extent (000 ha) 1990	Annual % change 1981-90	Extent (000 ha) 1990	Annual % change 1981-90	Extent (000 ha) 1990	% of closed forest	% that is primary forest	
65 654	15 785	-7	15 634	-0.7	151	3.2	49 869		127	2.3	31			

Source: The World Bank, African Development Indicators 1996.

Table 7. Estimated and Projected Volume of Solid Waste Generation in Some Nigerian Cities

Urban areas	1982	1985	1990	2000
Lagos	625,399	681,394	786,079	998,081
Ibadan	350,823	382,224	440,956	559,882
Kano	319,935	348,580	402,133	535,186
Kaduna	257,837	280,925	324,084	431,314
Onitsha	242,240	263,929	304,477	386,593
Port Harcourt	210,934	229,821	265,129	352,853
Oshogbo	131,903	143,712	173,720	253,841
Aba	131,903	143,712	169,719	236,703
Jos	99,871	111,905	135,272	197,660
Warri	67,871	75,607	91,396	133,531
Gusau	44,488	48,471	57,243	79,835
Potiskum	15,434	16,816	19,399	28,347
Uyo	12,508	13,628	15,721	20,923
Suleja	9,383	10,514	13,311	21,336
New Bussa	5,690	6,200	7,152	9,518

Source: Federal Ministry of Housing and Environment, *The State of the Environment in Nigeria*, Monograph Series, No. 2, Lagos (no date).

4.3 Domestic and Other Wastes

Apart from agriculture and industrialization, the Nigerian environment is further degraded through the personal attitudes of individuals and communities to waste disposal. The volume of solid waste generated in Nigerian cities in 1983 amounted to 9 million tonnes; this was projected to rise to 15 million tonnes by the year 2000 (see table 7). The unsanitary condition in which solid waste is collected, processed, and disposed of, contributes greatly to urban environmental degradation. Waste collected from households, business premises, markets and even factories is recklessly dumped in the streets. This leads to air pollution and also facilitates the spread of air and water borne diseases. The table above shows the estimated and projected volumes of solid waste generated in some Nigerian cities. The impact of the inadequate disposal of domestic and industrial wastes, is the degradation of the environment with its attendant negative effect on societal as well as individual well-being.

5. Summary and Recommendations

Essentially, this paper focused on the impact of development on the environment and the environmental dimension of poverty in Nigeria. Various administrations have strived to formulate and implement policies aimed at improving the well-being of the citizenry. Financial resources have been expended at various times towards the exploitation, processing and utilization of our natural resources. Furthermore, industrial plants have been set up by the private sector for the production of consumer goods. Government and individual researchers have also made a tremendous impact on the modernization of agriculture production and

improved yields. Unfortunately, just as these efforts have had positive benefits to the economy, negative costs have arisen in the form of environmental devastation. The extraction and processing of natural resources and other industrial processes produce poisonous gases, oil spills, noise, and chemical substances which degrade the land, pollute the air and water and hinder to human and animal survival. The misuse of agricultural tools and chemicals results in soil pollution, water pollution and erosion. The deterioration of the landscape, devastation of the land surface, and destabilization of the ecosystem impair their uses and productivity and lower their potential as source(s) of livelihood. The resulting environmental deterioration constitutes a serious cause of poverty in Nigeria.

In the light of the consequences of environmental degradation on the economy and the well-being of the average Nigerian citizen, the following recommendations are made to stem the increase in poverty levels caused by environmental influences.

- Ecology, climatology, geography, ecophysiology, soil science and other resource-based disciplines must play greater roles in sustainable agricultural research and development. There is a need for a conceptual framework to integrate these different disciplines and to enable them to interact effectively and achieve sustainable agricultural production.
- To improve the living conditions for people in the immediate term and safeguard living standards for future generations, the environment and natural resources must be practically protected and enhanced by putting a stop to the degradation of land and forestry assets, restoring the ecological balance and making sensible use of natural resources.
Considerable financial resources need to be devoted to the protection of nature and the environment. Such resources must also be honestly and diligently managed to achieve the desired results.
- There is a need for government to formulate stricter policies aimed at making production and processing plants internalise their waste products. This can be done by imposing tax per unit of the waste product, e.g., gas flaring, chemical and other dangerous and environment degrading products. The enforcement of the existing environmental regulations calls for the establishment of effective environmental protection courts at all levels of government to convict and penalize offenders.
- The establishment of environmental monitoring units by all tiers of government is overdue. There is also an urgent need for government to engage in the monitoring of the environment to protect it from damage. A change of attitude towards environmental protection could be enhanced

through the integration of environmental concepts into our popular culture.

- f. Environmental education should go beyond commemorations, celebrations and fanfare. It should also incorporate people in all segments of the society, like peasant farmers, fishermen, hunters, herbalists, labourers, artisans, traders, students as well as other small-scale users of natural resources. Our cultural expression in music, poetry, dance, literature, painting, drama, and carvings must incorporate environmental issues.
- g. There is a need for full commercialization of waste management by all states of the Nigerian federation, bearing in mind the full application of the 'polluter-pays-principle'.

This paper considers poverty as it relates to development and the environment. The initial expectation was that as the economy grew, the number of people living below the poverty line would decrease. The Nigerian experience shows that conventional economic growth and development is not synonymous with reduction in poverty. Rather, as the economy was developing over time through technological and social change, the environment was suffering and this has exacerbated poverty, which is a problem that development seeks to eliminate. In order for development efforts to achieve the goal of enhancing the socio-economic well-being of the citizenry, we conclude that environmental protection should be made an integral part of the development process.

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