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# Impact of Human Activities on Nature, Public Health and Environment Sustainability in Nigeria

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**Abstract:** The Nigerian community is wrestling with conflicting views about resources from human standpoint. Though, nature provides natural resources and services that keep people alive human activities have been acknowledged to affect public health and health of the ecosystem in Nigeria. The aim of this study is to interrogate the impacts of human activities on nature public health and environmental sustainability. Qualitative research technique was adopted for this study. Data were collected from secondary sources. Secondary data were collected from extant literature, textbooks, government records, journal articles, internet, United Nations reports and newspapers. Content-analysis technique was adopted to elicit key concepts, which were edited, sorted, pattern-matched, and coded into themes, such as: nature, natural resources, human activities, public health and sustainability. Thematic and Secondary data analysis techniques were adopted to analyze, interpret and answer the research questions. Findings showed that air pollution from fossil fuel emission, water, Urban sprawl and land use, biodiversity and habitat loss, fossil fuel emission, oil spills affected public health, ecosystem health and environmental sustainability in Nigeria. The study concluded that human activities on nature and its elements in the ecosystem affect public health. It recommended that mitigation of human activities on nature would protect the environment, promote agricultural gains, curb food insecurity, and sustain the environment.

**Keywords:** Nature, Natural Resources, Human Activities, Public Health and Sustainability

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## 1. Introduction

Nature is the pivot of human existence and civilizations. It provides “products and natural services such as food, water, fuel wood, fibers, biochemical and genetic resources” [7]. All the resources found on the earth with influence of human activities can be regarded as natural resources [4]. Nature can be regarded as a capital because it comprises of natural resources and natural services that keep people and other species alive and support the economy. The human connection to nature is because of its involvement with public health.

Nature provides food, water, fuel, wood, fibers, biochemical and genetic resources from the ecosystem. It also provides regulating services, such as climate change, disease, and pollution. Nature also provides “cultural services, non-material benefits from the ecosystems, such as religious, education, recreation and ecotourism” [7]. All these resources and services are managed for the current and future

needs of humans. Managing natural resources, therefore, also has consequences to the sustainable utilization of major resources [1].

The global community is wrestling with conflicting views about resources from human standpoint. Peoples’ needs are realized through natural resources. They can be classified as “renewable (such as water, land, plants, and air) and non-renewable, (such as: gas flaring, copper, fossil fuel emission, oil spills, and coal). Natural services are functions or nature, such as purification of air and water, which support life and human economies” [16].

In Nigeria, human activities on natural resources affect public health and the ecosystem. The human interaction with the environment occurs through the air, use of land and water as well as other species, plants and microbes The key ecological issues related to “air quality are the sources of air pollutants, such as: carbon monoxide, sulphur dioxide,

among others impact on the environment and public health” [5].

The purpose of this study, therefore, is to interrogate the impacts of human activities on natural resources, public health and environmental sustainability. The specific objectives include:

- 1) To evaluate the impacts of human activities on renewal of natural resources (air, water, land) and public health.
- 2) To evaluate the impacts of human activities on non-renewal of natural resources (minerals, and fossil fuel emission, coal, oil spills and natural resources) and public health.
- 3) To assess the impacts of biological diversity and habitat loss on ecosystem health.
- 4) To examine how natural resources can be managed and sustained to meet the current and future needs of the people.

In the light of this, four research questions are posited to drive this investigation:

- i). What are the impacts of human activities on renewal of natural resources (air, water, urban sprawl and land use,) on public health?
- ii). What are the impacts of human activities on non-renewal of natural resources (minerals, and fossil fuel emission, coal, oil spills and natural resources) on public health?
- iii). What are the impacts of biodiversity and habitat loss on ecosystem health?
- iv). How can the environment be sustained in the use of natural resources to meet the current and future needs of human in order to mitigate public health challenges?

In the light of this, the paper is organized into four sections. Section one examined the introduction, objectives of the study, research questions, materials and methods. Section two examined the impacts of renewal and non-renewal of natural resources on public health. Section three examined the impact of bio-diversity and habitat loss on ecosystem health and environmental sustainability. Section four discussed and concluded the study.

## 2. Material and Methods

A constructed conceptual framework was adopted as materials for the analysis of this study as presented in figure 1 (see appendix 1). The natural capital in the conceptual framework represents natural resources and natural services provided by nature to keep human being and other species alive and support the economy. These resources are often classified as renewable (such as air, water, soil, land, plants and wind) or non-renewable (such as copper, gas flaring, oil spills, and coal-fossil fuels). Natural services are functions of nature, such as purification of air and water, which support life and human economies. A critical natural service element is nutrient cycling. It circulates chemical necessary for life from the environment (mostly soil and water) through organisms and back to the environment without this service, life cannot exist [16].

The natural capital is also supported by “solar capital energy from the sun that warms the planet and supports photosynthesis – a complex chemical process that plants use to provide food for themselves and for human and other animals”[16].

This direct input of solar energy also produces indirect forms of renewable solar energy, such as wind, flowing water and biofuels made from plants and plant residues. Thus, human lives and economies depend on energy from the sun (solar capital) and natural resources and natural services (natural capital) provided by the earth [16]. This constructed conceptual framework is relevant and justified for this study because it enables the assessment of the impacts of human activities on natural resources or natural capital (renewal and non-renewal natural resources) on public health, ecosystem health and environmental sustainability.

The study adopted qualitative research as its method of investigation. Data were collected from secondary sources, such as: extant literature, textbooks, journal articles, government archival records and reports, internet and newspapers. Content-analysis technique was adopted to collect and analyze data simultaneously. Content-analysis technique was adopted to elicit key concepts which were edited, sorted, pattern-matched and categorized into themes for further as analysis, such as: natural resources, renewal natural resources, non-renewable natural resources, public health, ecosystem health and environmental sustainability, using the constructed conceptual framework. Thematic and documentary analyses methods utilized. These methods used to analyze, interpret and answer research questions are consistent with previous studies in qualitative research inquiry and analysis [9, 13, 23; 15].

## 3. Ethical Considerations

In this study, a set of ethical principles were observed. The participants’ consents were obtained willingly. Participants were also assured of confidentiality and anonymity in respect to their responses to issues being investigated.

## 4. Results

### 4.1. Impacts of Human Activities on Renewable Natural Resources (Air, Water, Urban Sprawl and Land Use) and Public Health

In Nigeria, particularly in Niger Delta Region, petroleum industries are involved in greenhouse gases emission traced to the combustion of fossil fuels to generate power which resulted in air pollution leading to global warming and climate change. Other major contributing causes are the production and use of volatile organic compounds (VOCs), such as solvents in chemical plants, refineries in the region, and commercial establishments. These evidences are consistent with previous studies on the subject [14; 18]. Apart from the fact that air pollution causes poor visibility and mild irritation, it affects public health, and cause

premature deaths every year, with an estimate of 2 to 3 million worldwide [2, 6]. Indigenous of oil producing communities in Nigeria have suffered environmental degradation, pollution and suffer health challenges.

In Niger Delta Region, drinking water is recently becoming environmental concern. Most household wastes packaged in cellophane, plastic, paper, styro-foam and other materials are disposed to canals, drainage facilities and cause flooding that contaminate sources of drinking water in Nigeria. The “negligent dumping of contaminants into surface and ground waters eventually follows a circle of causality, delivering a reminder that all ecosystems are intricately inter-related” [18].

Besides, climate change also give rise to heavy rainfall resulting in flooding and compounding challenges of drinking water in oil producing communities in Niger Delta Region. Furthermore, acid precipitation resulting from industry, utilities and automobile contribute to harmful effects to humans and the environment. The most common chemical precursors of acid precipitation are sulfur and nitrogen oxides emission from fossil fuel combustion and mental smelling. These gases can be captured by high-altitude winds and transported hundreds of miles from their origin. These fossil emissions affect the health of indigenous of oil producing communities in Nigeria. Evidences such as these are supported by global water problem. Globally, the following facts give some idea of water as a global problem to public health and environment:

- 1) “97.5 percent of earth’s water is saltwater and undrinkable;
- 2) polar snow and ice hold most of the fresh water;
- 3) less than 1 percent of fresh water is usable, amounting to only 0.01 percent of the earth’s total heater;
- 4) 70 percent of water goes to agriculture use; 22 percent to industrial use; 8 percent to domestic use;
- 5) across the world, 1.1 billion people have no access to clean drinking water. More than 2.6 billion people lack basic sanitation;
- 6) each year diseases related to inadequate water and sanitation kill between 2 and 5 million people and cause an estimated 80 percent of all sicknesses in the developing world;
- 7) Water is wasted through misuse inefficiency, leakage, evaporation, and allocation of pure water to tasks that don’t need it;
- 8) it is projected that in twenty years, the demand for water will increase by 50 percent and two-thirds of the world population will be water-stressed” [19].

Previous “studies found a variety of dangerous compounds, including disease-causing microorganisms, lead and chlorofoam (ironically from the chlorine) used to disinfect water supplies [18; 19]. Another study corroborated by saying that “such problems with city (and private) water supplies are not uncommon, particularly when groundwater is used” [14].

Urban sprawl and land use also affect public health and environmental sustainability. The term sprawl means

“dispersed auto-dependent development outside of compact urban and village centers, along highways, and in rural country-side” [8].

Figure 2 (see appendix 2) demonstrates the implications of human activities on urban sprawling cities and land use in Nigeria, especially, Abuja, Kano, Ibadan, Warri, Port-Harcourt and Lagos states. In urban cities, the transportation networks are created to accommodate many driving cases. This increases air pollution that threatens public health. At the top of the figures, two kinds of pollutant sources are depicted – anthropogenic (human made) and biogenic (natural). Anthropogenic emissions come from mobile, stationary and area sources, such as: automobiles and trucks, bulldozers, locomotives, boats and aeroplane. Air pollution also result from stationary sources, such as: power plants and factories even though, they are subject to state and federal regulations. Air pollution also come from areas sources, such as: airports, unpaved roads, agricultural feedlots, forest fires and lawn mowers. These evidences are consistent with previous studies [8]. The demographics of the community in terms of ages of its residents, their incomes, their family structures – also affect the amount of driving due to vehicle ownership.

Sprawling cities, such as Kano, Abuja, Lagos, Ibadan and Port Harcourt in Nigeria face threats to quality of drinking water sources. These cities also lack the availability of green spaces for sprawling mega cities because of land use. Members of the public also suffer mental health as the network of social interactions and trust may be affected. The people living close to airports are also exposed to air pollution and noise. [8].

Land use patterns in the form agriculture and building of residential houses contribute to overpopulation and deforestation. Land use and transportation interact to affect many aspects of human activity, well-being and health. Megacities such as Lagos, Abuja, Warri, Port-Harcourt, among others, suffer from land use activities of people migrating from rural to urban areas. Heavy reliance on the automobile for transportation results in “more air pollution, which contributes to respiratory and cardiovascular disease” [8]. This is because many people will be able to own vehicle. More driving of these vehicles can lead to more accidents with other vehicles or pedestrians, as being witnessed in many cities in Nigeria.

In sum, air quality is very essential to public health. Poor air quality threatens mortality and respiratory health. In addition, air pollution arising from human activities in urban sprawl and land use have the implication to “damage cardiovascular function and increase cancer risk” [8].

#### ***4.2. Impacts of Non-renewal Resources (Gas Flaring, Fossil Fuels and the Threat of Climate Change) on Public Health***

Nigeria is known to be “the largest producer of gas in Africa and one of the highest emitters of fossil fuels globally along with Russia and Iran” [22]. Nigeria is also the worst offenders of gas flaring after Russia [10]. In the Niger Delta

Region, the lifestyles of Ogoni people are: farming, fishing, bathing, drinking water, cooking, among others. This is because they were exposed to toxic chemicals, such as: gas flaring and oil spills, caused by exploration and exploitation activities of multi-national oil companies.

#### **4.3. Impacts of Biological Diversity and Habitat Loss on Ecosystem Health**

Furthermore, nature affects ecosystem health. Fragmentation, pollution and contamination “contribute up to 29 percent of all greenhouse gas emission; livestock contributes 14.5 percent of all anthropogenic GHG emissions, of which 44 percent is in the form of methane” [21]. Human activities in the form of over exploitation of species and habitats, introduction of exotic and competitive species, and the interactive effects of these activities affect habitat loss [3]. In addition, climate change affects destruction of habitat and biodiversity loss [14]. The effect of such species loss is particularly acute in tropical rain forests regions of Lagos and Niger Delta communities in Nigeria.

Moreover, climate change has affected the ecosystem through flash flood in many parts of Niger Delta Region and other parts of Nigeria. This has affected agricultural activities leading to food insecurity and public health challenges. Climate change is a major risk to ecosystem integrity and biodiversity as well as to human health, particularly in developing countries [12]. Human beings risk the destruction of critical habitats and ecosystem health, as well as the biogeochemical cycles, on which life depends, if biodiversity is preserved. [14].

#### **4.4. Impact of Human Activities on Environmental Sustainability**

Sustainable development is “the principle that meeting human development goals is possible, while sustaining or restoring the ability of natural systems to provide natural resources and ecosystem services” [16]. An environmental scientists studying nature revealed four scientific principles of environmental sustainability [16].

They include:

- a) “Reliance on Solar Energy – The sun warms the planet and supports photosynthesis used by plants to provide food for themselves and for us and their animals.
- b) Biodiversity or biology diversity: The astounding variety of life forms, the genes they contain, the ecosystems in which they exist and the natural services they provide have yielded countless ways for life to adapt to changing environmental conditions throughout the earth’s history.
- c) Population control: Competition for limited resources among different life forms places a limit on how much their populations can grow.
- d) nutrient cycling: Natural processes recycle chemicals that plants and animals need to stay alive and reproduce” [16].

Using these scientific principles of sustainability to guide

lifestyles of human activities would help to satisfy the current need of people and future generation. However, for environmental sustainability, current natural environmental emphasis should be linked to sustainability in Nigeria as discussed below:

- 1) “Current emphasis of pollution clean-up should shift to sustainability emphasis of pollution prevention;
- 2) Current emphasis of waste disposal (bury or burn) should shift to sustainability emphasis of waste prevention;
- 3) Current emphasis of protecting species should shift to sustainability emphasis of protecting habitat;
- 4) Current emphasis of environmental degradation should shift to sustainability emphasis of environmental restoration;
- 5) Current of increasing resources use should shift to sustainability emphasis on less resources waste;
- 6) Current emphasis of population growth should shift to sustainability emphasis to population stabilization;
- 7) Current emphasis of depleting and degrading of natural capital should shift to sustainability emphasis on protecting natural capital” [16].

In other words, shifting emphasis from human activities on natural resources to environmental sustainability emphasis should be the focus in Nigeria in the drive for environmental sustainability.

## **5. Discussion**

The impact of human activities has radically altered the earth’s surface. It’s effects on nature and public health have affected the environment giving birth to overpopulation, climate change, pollution, deforestation and ozone layer depletion.

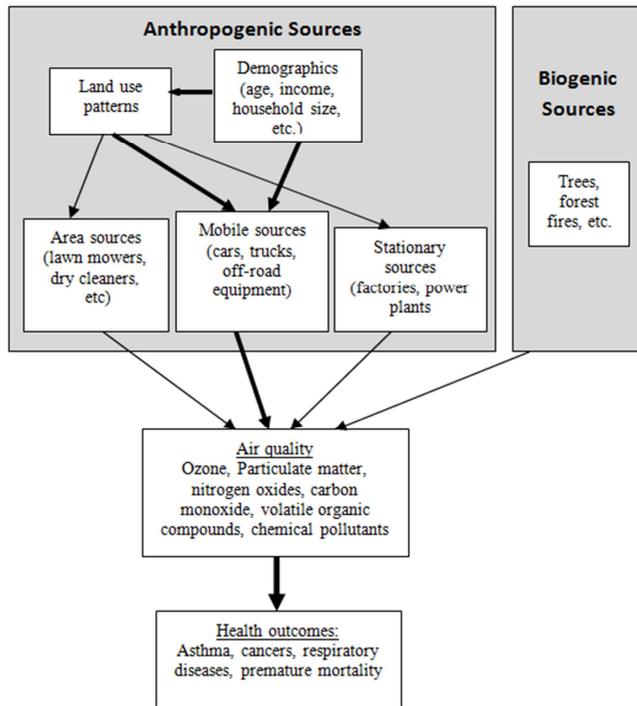
To meet the food requirements to cope with the rising population requires human activities in agriculture. To grow food, more forests are cleared. The permanent destruction of standing forests by purposeful, natural or unintentional causes result in the loss of habitat for a wide range of species, jeopardizing the survival of habitat [3]. Global warming is seen as a consequence of an increase in Earth’s temperature due to greenhouse effected and connected to human actions. It occurs due to greenhouse gases released by petroleum industries’ activities burning fossil fuels necessary for industrialization, as being witnessed in Niger Delta Region of Nigeria.

Besides, increasing population in urban areas requires a large tract of land to be deforested and then used for building cities. Human activities arising from urbanization increase pressure on the capacity of natural ecosystem leading to water and land pollution. Water pollution and deforestation are the main reasons for habitat loss. Moreover, there is tons of plastics and wastes thrown into drainage channels and river. As these wastes and plastics cannot be recycled, they are dumped into landfills. This is one of the causes of global warming and climate change.

Many raw resources whether renewable or non-renewable



## Appendix 2: Urban Sprawl, Land Use and Public Health



Source: Adapted from Frumkin, Frank and Jackson, 2004: 66

**Figure 2.** A conceptual model linking sprawl, travel, air pollution and public health.

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