

**Human Activity and the Loss of Biodiversity in Nigeria****Patrick, Elizabeth Odije****&****Ukpanukpong, Fidelis Ashibekong**Department of Continuing Education and Development Studies
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The way natural resources are managed is one of the most important sustainability challenges facing man in recent times. This is because, the expansion of human activities in the last 250 years have been dramatic, leading to major transformation in the biosphere. Also, changes that occurred in the past have been reduced through the use of life – support mechanisms provided through ecosystem functions, many of which have been lost or are currently under threat. Incidentally, during the 2005 Millennium Ecosystem Assessment (MEA), scientists have warned that, human activities have taken the planet to the edge of massive wave of species extinctions that threatened human well-being. The rate of loss of biodiversity in Nigeria as a result of human activity is alarming thus has resulted in issues that affect the environment such as global warming, flood, pollution, gas flaring etc. It is also resulted in problems such as epidemic outbreaks, over population to mention a few. This paper therefore, presents information on different types of human activities in Nigeria, their impacts on biodiversity in the Nigerian aquatic ecosystems, control and management of human activities to minimize damage on biodiversity.

Keywords: Human Activity, Biodiversity, Ecosystem, Environment, Habitats, Pollution.

Introduction

It became obvious that biological resources have limits and that we are exceeding those limits and thereby reducing biodiversity. This is therefore the time of extraordinary change in the relationship between people and the biological resources upon which their welfare depends. Mustapha, (2006) each year, more people are added to the human population than ever before, species are becoming extinct at the foster rate known in geological history and climate appears to be changing more rapidly than every day. Human and industrial activities result in the discharge or various pollutions into aquatic environment, threatening the health of thy population and damaging the quality of the environment by rendering water bodies unsuitable.

Werner, (2010) states that biodiversity is the term used to describe the total variety of living organisms (plants, animals, fungi and microbes) that exist on our planet. It is the totality of genes, species and ecosystems in a region. The term is also used to describe the number, variety and variability of living organisms. A massive review of our current knowledge on the broad field of biological diversity commissioned by UNEP considers human as an integral and critical important part of biodiversity. Werner (2010) says in the past, there was the tendency to treat human species as separates from the rest of nature. In recent times, biodiversity had become easy targets for human over-exploitation due to

burgeoning human populations and the quest for a “better life” through improvements in science and technology. Biodiversity, there, is being exploited at much faster rates than ever before with negative implications for sustainable human livelihood. Biodiversity is facing a doctrine of crisis proportions which could ultimately lead to mass extinctions in the very near future.

The biodiversity of the Nigerian aquatic ecosystems is increasingly being destroyed or depleted by persistent threat of aquatic pollution resulting from intense human activities such as indiscriminate use of fertilizers and pesticides in agriculture, industrialization, urbanization; pressure due to rapid population growth, mal-utilization and mismanagement of natural aquatic resources, dam, road and bridge construction, irrigation, draining and filling of wetlands. Wuver (2006) explains that, the negative environmental and social impacts of these projects are becoming evident and cannot be ignored if we are to avoid the sorts of problems which they have brought in other parts of the world.

The study therefore, presents information on different types of human activities in Nigeria, their impacts on biodiversity in the Nigerian aquatic ecosystems, control and management of human activities to minimize damage on biodiversity.

Species Diversity in Nigerian Aquatic Ecosystems

Nigeria aquatic ecosystems are characterized with diverse species of plants and animals unlike the terrestrial habitats, animals in the oceans are found at all depths, so that the total habitable space of a 4km (average) deep ocean is 1,263,804km³. It is therefore reasonable to assume that Nigeria’s aquatic flora and faunal biodiversity is higher than of the terrestrial habitats.

Wilson (2012) says the total fauna of the world is comprised of 25 phyla of which 24 phyla are in-vertebrate, the phylum chordate consists of the non-vertebrates and vertebrate chordates. Invertebrate species diversity is much higher in the aquatic ecosystem than in the terrestrial ecosystem. The significance of greater protection to the aquatic ecosystems cannot be over-emphasized, since its diverse fauna is of great economic and social importance.

Human Activities Resulting in Contamination of Aquatic Ecosystems

Almost everything produced by man or resulting from his activities can bring about contamination and eventual pollution of our diverse ecosystems. Pollution is defined as the production and or introduction by man, directly or indirectly of substances or energy into the environment, resulting in deleterious effects or harms living resources, including human beings or interferes with amenities and other uses of the environment (Ajas & Okoye, 2006).

Human activities such as deforestation, channelization, filling and construction of canals, levees, dams, roads and bridges, agricultural, industrial and domestic activities, introduction of exotic species, over-exploitation of plant and animal species upset the hydrological regime, sediment characteristics and several biotic components.

Mustapha (2012) opined that, the most important aquatic pollution forms resulting from pollutions due to human’s activities and which impact the biodiversity of aquatic ecosystems are; sediment pollution, organic pollution, eutrophication, acidification, heavy

metals and organ chlorines, thermal pollution, unclear pollution, human introductions (voluntary or accidental) and oil pollution.

Organic Pollution: Organic pollutions such as domestic sewage, urban run-off, farm wastes and effluents from food processing industries, brewing industries, dairies, abattoirs, tanneries textiles and paper making factories have diverse adverse effects. Ekubo (2011) says pollution is biodegradable and are easily oxidized by making use of the dissolved oxygen in water. As dissolved oxygen drops, fish and other aquatic life are threatened or killed in the extreme case. Number of algae and bacteria is increased. Macrophytes are also adversely affected due to light reduction and solids rendering the bed of the river unstable for plants. The surest confirmation of serious and widespread water pollution in Nigeria is, in fact, the level of incidence of water related disease

Eutrophication: Concern over eutrophication is a relatively recent development in the scientific literature, with the earliest recollection dating back to the 1950s. Furthermore, a working definition of what this phenomenon entails was only provided in the mid-1990s, where Nixon (1995) described it as “an increase in the rate of supply of organic matter to an ecosystem.” This was a crucial step as it recognized eutrophication as a process rather than confusing it with cause or consequence (i.e., a tropic state). Despite this, however, the definition leaves considerable room for interpretation, particularly from a management standpoint. With this in mind, subsequent re-workings of what constitutes eutrophication were required to meet both scientific and legal requirements. As a result, eutrophication has been defined as “the enrichment of water by nutrients causing an accelerated growth of algae and higher forms of plant life to produce an undesirable disturbance to the balance of organisms present in the water and to the quality of the water concerned” (OSPAR, 2003).

The key feature of this definition is founded in the prerequisite for deleterious consequences to occur as an explicit response to anthropogenic nutrient loading for it to be considered eutrophication. This is an important distinction to make, as symptoms generally associated with eutrophication can also occur in pristine ecosystems, with little or no human impacts, due to natural features such as increased water temperature and residence times (Human, 2018).

Pesticides: Pesticides such as insecticides and herbicides get washed into aquatic ecosystems where they may kill aquatic life or be absorbed by them and passed up the food chain until they become toxic to man. DDT for example is an insecticide, which was once widely used but the use of which had now been banned or severely restricted in many countries with Nigeria being a notable and unfortunate exception.

Egborge (2003) indicates that, Agrochemicals such as Gammalin 20 (for spray of cocoa tree), Aldrin dust (for seed preservation) and DDT (for tsetse fly and samarium fly control), have been ignorantly by some of people, in fishing and hunting. This is a very dangerous habit, which has adversely affected biota of any kind of the ecosystem, either directly or indirectly.

Oil Pollution: The inextricable adverse effects of petroleum exploration, prospecting and marketing on plants, animals, man and his environment, has until very recently received no attention. Steiner (2008), these adverse effects are alarming in the Niger Delta where there is predominance of oil wells. Petroleum exploration, exploitation and refining as well as the transportation, storage, marketing and use of petroleum products have all created problems in several biodiversity of the country. The formation of a film of oil on water bodies effectively presents natural aeration, leading to the death of organisms trapped below. Fish may also ingest spilled oil directly or indirectly, becoming unpalatable or even poisonous.

Gas Flaring: The energetic solution conference (2004) estimates that, the Niger Delta region has about 123 gas flaring sites. Agbola & Olurin (2003) stated that about 45.8 billion kilo watts of heat are discharged into the atmosphere from 1.8 billion cubic feet of gas daily in the Niger Delta region, leading to temperatures that render large areas inhabitable. Complete utilization of produced associated gas, reduction of flaring and production greenhouse gas is one of the policies that oil companies are expected to comply, with the stoppage of gas flaring completely by 2004 or 2008. Still 84.60% of total gas produced is still flared with 14.86% only being used locally (Okoli, 2005). From 1970-1986 a total of 125.5 cubic meters approximately of gas was produced in the Niger Delta region, 102.3 (81.75) million cubic meters was flared causing biodiversity, 2.6 million cubic meters was used as fuel by oil producing companies and about 14.6 million cubic meters was domestically consumed (Awosika, 1995). In 2004 Nigeria Liquefied.

Natural Gas pipeline transversing through Kala-Akama, Okrika mangrove forest leaked and set ablaze and burnt for three days. The local plants and animals within the areas where engulfed (Nenibarini, 2004). Apart from this fire incidence over several decades they have been many well documented cases of fire incidence that have resulted in a large number of human fatalities

Acid rain is another problem within the region caused by gas flaring which has led to loss in biodiversity, with forest and economic crops being destroyed. The dominance of gasses and shrubs in some parts of the region indication of loss of natural forest, this may be due to acid rain but other factors may be the cause such as agricultural activities and the exploration and exploitation of oil companies (Uyigüe & Agho, 2007).

The heat generated from gas flaring kills vegetation around flaring area, destroys mangrove swamps and suppressed the growth and flowing of some plants, induces soil degradation and diminishes agricultural productivity (Mba, 2000). A study by Adeyemo (2002) about the impact of gas flaring on agriculture showed that, direct relationship between gas flaring and productivity decline in agriculture. Apart from the above issues the toxicity to humans causing respiratory illness, leading to kidney disease, neurological disease and potential death (Ndubisi & Asia 2007).

Control and Management of Human Activities to Minimize Damages on Biodiversity

Measures to curb the damage on biodiversity by human activities, which impact aquatic ecosystems in Nigeria, are the most intricate and expensive and have attracted

insignificant attention from both the public and government (Adams & Jenkins, 2009). Biodiversity of aquatic ecosystems in Nigeria is threatened by various human activities, which culminate in diverse forms of pollution Okoli (2005) stated that, there is need for proper control and management of the various negative effect resulting from diverse cultural and social economically important human activities in order to attain sustainable development.

Abowei & Sikoki (2005) opined that there is an obvious need for an integrated approach to the control and management of human activities that impact biodiversity. This integrated approach should be an activity that will provide the framework for decision-making on how biodiversity can be conserved. The success of management depends on the level of awareness and co-operation of the public, decision-makers in government and managers. Control and management can further be enhanced by having national and regional coordination mechanisms. This is because marine waters and some of the marine living resources do not recognize national boundaries and therefore planning and management of marine resources and pollution prevention require a regional approach. The regional approach has an additional approach in terms of the national utilization of financial resources and manpower.

The key problems associated with human activities, UNESCO (1992) with report to biodiversity of aquatic ecosystem are related to inadequate planning for sustainable environmentally-sound, socio-economic development and the rational utilization of natural resources. These problems can only be overcome by adopting the following control management options: Proper Management of hydrological cycle, Environmental Impact Assessment (EIA), Environmental Auditing (EA), Monitoring and research related to the sources, levels and effects of pollutions, legislating technical methods of waste management which include non waste (zero waste) option, Waste minimization and waste treatment; multiagency projects; population control and environmental education.

Conclusion

The decline in biodiversity of aquatic ecosystems is largely caused by human activities and poses a serious threat to sustainable development. There is the need for urgent and decisive action to conserve and maintain genes, species and ecosystems. Technological developments, coupled with the growing sources needs of rapid population growth has increased the environmental hazards to biodiversity of all natural ecosystems. However, the rapid decline in biodiversity of aquatic ecosystems in Nigeria could be reversed, if there are sound engineering solutions based on ecological awareness. This should be determined on the basis of sound scientific evaluations of the existing resources and the carrying capacity of the ecosystem. In areas with rapid population growth, it may be necessary to invest in major carbon and nutrient-absorbing systems to avoid further degradation and to preserve the biological productivity of existing systems.

Suggestions

There is an obvious need for an integrated approach to the control and management of human activities that impact biodiversity. This integrated approach should be an activity that will provide the framework for decision-making on how biodiversity can be conserved.

- i. Control and management can further be enhanced by having national and regional coordination mechanisms. This is because marine waters and some of the marine living resources do not recognize national boundaries and therefore planning and management of marine resources and pollution prevention require a regional approach.
- ii. Proper Management of hydrological cycle
- iii. Regular Environmental Impact Assessment should be carried out by government at all levels
- iv. Environmental auditing, monitoring and research related to the sources, levels and effects of pollutions

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