

**IMPACT OF HUMAN ACTIVITIES ON ECOSYSTEM IN RIVERS STATE, NIGERIA**

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**ABSTRACT**

*This study was to assess the percent sample population size of people involved in selected human economic activities and the impact on ecosystem in Rivers State. The data for this study was obtained from a sample size of 1000 respondents who were purposively selected from the study area. Purposive sample was used to ensure that the questionnaires which were the materials for collection of data, were directed at 8 human economic activities in Rivers State. The 8 human economic activities were: farming, fishing, logging, charcoal/fuelwood collection, construction/urban development, industrialization/manufacturing, transportation and soil excavation. The state was divided into 10 strata and assessment was carried out using 100 questionnaires per stratum. Descriptive statistics involving frequencies and percentages were used to analyze the data. Result showed that 40.8% of the sample population was involved in transport business. 19.9% and 11.9% were involved in industrialization/ manufacturing and construction/ urbanization respectively. Other economic activities were farming 2.6 %, fishing 1.5%, logging 2.3%, fuel wood collection 6% and soil excavation 5.6% respectively.*

**INTRODUCTION**

Ecosystem is a community of organisms and its physical environment (Chapman and Reiss, 1995). It is a functional unit of nature that combines biotic communities and abiotic environment with which they interact. As human population grow, so do the resource demand and its impact on ecosystems. The natural system which sustain mankind are degenerating at a fast rate while human population is rising rapidly (Asthana and Asthana, 2003). Ecosystems are ware house of tangible and intangible products and services needed by mankind. They provide food, medicine, wood and water directly to man. On the other hand, ecosystem also stabilizes climate, control erosion and flooding, accelerates biogeochemical cycles and maintains biodiversity. Farming, logging, fishing, fuel wood /charcoal collection, soil excavation, transportation, industrialization/manufacturing and construction/ urbanization are the major human economic activities that have been influencing the structure, composition, function and survival of the ecosystems in Port Harcourt.

The impact of human economic activities on the ecosystem has become more apparent. Firstly, the air and water quality are increasing being compromised. Secondly, mineral resources are being overexploited. Thirdly, deforestation continues unabated in and around the city. Fourthly, wildlife habitats are disappearing at an alarming rate. Consequently, ecosystem resource and services are not only threatened and limited, but there is urgent need to evaluate human economic development and its attendant ecosystem destruction. These factors create the need for this study in order to find the way forward.

The objective of this study was to evaluate the effect of human economic activities on ecosystem in Rivers State, Nigeria.

**MATERIAL AND METHODS**

**Study Area**

The study was carried in Rivers State, South-south, Nigeria. It is located on Latitude 4<sup>0</sup> 50<sup>1</sup>N and Longitude 7<sup>0</sup> 01<sup>1</sup>E. The rainfall pattern is bimodal with July and October as peak periods. The ecosystem is made up of 3 types of vegetation. These are: the tropical lowland rain forest the fresh water and mangrove swamp forests. The area has a mean annual rainfall of more than 2000mm and average temperature range of 25<sup>0</sup> to 35<sup>0</sup>C

**Data Collection and Analysis.**

The stratified method of population sampling, in which the entire Rivers State was divided into 10 strata based on observed human economic activities was used. The strata were: Choba, Rumuolumeni, Aba Road, Trans Amadi Industrial Estate, Rumuokoro, Rumuokwursi, Elelenwo, Rumuomasi, Mile 3 and Port Harcourt Town.

The data for this study was obtained from a sample size of 1000 respondents who were purposively selected from the study area. Purposive sample was used to ensure that the questionnaires which were the materials for collection of data, were directed at 8 human economic activities in Rivers State. The persons were interviewed on: type of economic activities, input, output, mode and area of operation, type and state of waste generated, byproduct of activity, means and area of waste disposal, and nature of damage done to ecosystem. One hundred questionnaires were distributed and retrieved per stratum. The observed human economic activities which were used as treatments include: fishing, farming, logging, soil excavation, fuelwood collection/charcoal production, construction/urban development, industrial/ manufacturing, transportation and others.

Mean percentage of sample population size per human economic activity was calculated for each stratum. The means were separated by LSD (Least significant different).

Table 1: Mean percent of sample population size per human economic activity in Port Harecourt.(%)

<b>Human economic activities</b>									
<b>Stratum</b>	<b>se</b>	<b>fm</b>	<b>fh</b>	<b>lg</b>	<b>fc</b>	<b>tr</b>	<b>in</b>	<b>co</b>	<b>ot</b>
Choba	24	17	4	2	2	4	39	5	3
Rumuomasi	14	6	—	—	—	—	52	10	18
Aba Road	20	4	—	—	—	—	42	18	16
Port Harcourt Town	30	—	—	3	—	—	28	26	13
Rumuolumeni	20	10	2	1	1	6	22	23	15
Trans Amadi Estate	24	—	—	—	—	—	24	40	10
Mile 3	18	1	—	—	4	8	41	21	7
Elelenwo	15	2	—	—	—	—	62	10	11
Rumuokwursi	12	—	—	—	—	—	48	30	10
Rumuokoro	13	3	2	—	—	—	50	16	16
Mean (%)	19 <sub>d</sub>	5.6 <sub>b</sub>	2.6 <sub>a</sub>	1.5 <sub>a</sub>	2.3 <sub>a</sub>	6 <sub>b</sub>	40.8 <sub>e</sub>	19.9 <sub>d</sub>	11.9 <sub>c</sub>

Means with same letter do not differ at 5% level of probability.

se: soil excavation, fm: faming, fh: fishing, lg:logging

fc: fuelwood/charcoal, tr: transportation

in : industrial/manufacturing, co: construction/urban development

ot: others

**RESULTS**

The percent sample population size per human economic activity is shown in Table 1. The transport sector consistently had higher number of human beings directly involved in the

sector. The result showed that many people are involved in the transport business through motor cycle, private cars, company vehicle, public motors, trawlers and shipping vessels. There were significant differences between the transport sector which had a mean of 40.8% and other activities at 5% level of probability. The construction/urban development sector and the manufacturing/industrial sector had a mean of 19.99% and 11.9% respectively which were significantly different from each other. Similarly, there were significant differences between the fuelwood/charcoal collection, soil excavation, farming, fishing, logging and other activities with a mean of 69%, 5.6%, 2.6%, 1.5%, 2.3% and 19% respectively, at 5% level of probability.

## **DISCUSSION**

The impact of human activities on the ecosystems has been the genesis of a running battle between the communities in Nigeria's Niger Delta and the oil exploration and exploitation companies (Phil –Eze, 2003; Douglas, 2003; Gbadegesin and Owolabi 2004). In Nigeria, forest management is non-existent and because of this the forest, even in the reserves are degrading (World Bank 2003). Rivers State is located in the heavily exploited and highly fragmented ecosystems of the Niger Delta. Human activities end up over simplifying the ecosystems in terms of reduction of the structural composition of the living things. There is reduction in biodiversity of such areas as against the natural setting (Phi-Eze and Umeriduji 2004). Ade jumu (2003) stated that the increasing imprint of human activities on nature and the expanding reach of dominant nationals, growing human population and planetary dynamics operating at global scales is increasingly governing and transforming the component of the earth system. Similarly, Akachukwu, (1998) observed that in Nigeria mangrove forest has been lost to urbanization and exploitation.

In this study, farming has been revealed an important primary human activity which has a strong potential to effect drastic alteration in both terrestrial and aquatic ecosystems. Farming involves the removal of the original vegetation by clearing, burning and tillage. This investigation has shown that some of the natural land forms in Rivers State have been transformed into farms dominated by yam, maize, cassava and vegetables. In some areas, the mangrove ecosystems made up of *Rhizophora* and *Avicennia* species have been replaced by *Nypa fruticans*. Consequently, the structure and functions of the natural forest types in Rivers State have been altered by land cultivation. The activities of man, such as farming has a serious negative impact on wildlife habitat. For instance the mangrove monkeys are rarely seen because they keep off the vicinity of areas of activities for their safety. Pollutants such as herbicides, fertilizers, fungicides and pesticides used by farmers are washed into rivers, streams and ocean, thereby causing ecosystem degradation.

Fuelwood collection and charcoal production which was about 6% of sample population contributes much to the depletion of all vegetation types in Rivers State. The fuelwood is used for cooking food and smoking fish. Similarly, charcoal provides alternative source of energy for households in the city. Human activities pollute the entire environment of living things. Many plant and animal species get suffocated when oil spillage occurs. And some loss their food sources and lives due to pollution of air, land and water habitats. Improper waste disposal from industries pollutes the environment and increases its toxicity, which can lead to death of flora and fauna. In Rivers State, the situation is becoming more dangerous to living things since many oil companies and construction firms produce a lot of effluents causing ecosystem degradation. Deep sea oil exploration has negative impact on both terrestrial and aquatic ecosystems.

In Rivers State, loss of sea bed habitats and their frequent disturbance is a common phenomenon in creeks and coastlines. Extensive atmospheric pollution from industrial complexes results in the precipitation of acid rain. Acid rain is a silent scourge and lethal to all vegetation types. The precipitation can breakdown macroelements such as calcium and potassium which are absorbed into the soil, resulting in leaching of these soil minerals. Thus the

ecosystem is degraded. In a similar vein, gas flaring affects the ecosystem in one way or the other. Leaves find it difficult to manufacture food in polluted air and when there is too much chemical content in the water absorbed by roots, the plant can die (Obafemi, 2004). Rivers State, the farmers interviewed complained of poor yield from yam, cassava, maize and vegetable and fruit trees.

This study has revealed that both the terrestrial and aquatic ecosystems in Rivers State are continuously excavated for river sand and laterite, with 5.6% of the sample population size involved in the business. This is done mainly by road construction firms and building contractors. This activity tends to modify the ecosystem especially in Choba and Rumuolemeni areas of the city. In Rivers State, there is heavy movement of people, goods and services through land, air and sea. In this study, the percentage of human beings involved in transportation direct or indirectly was about 41%. This suggests that Rivers State is highly polluted. Vehicles of all sorts release various gaseous emissions such as carbonmonoxide, sulphur and nitrogen oxides into the atmosphere which can cause ecosystem degradation. Traffic pollution has been reported to be a major killer across Europe with about 6% of deaths per year in France, Austria and Switzerland (Obafemi 2004).

Most of the breeding sites of Anopheles Mosquitoes which transmits plasmodium are created by human activities. This is done through the bad habit of littering, the environment with polythene bags and assorted containers from private business, logging sites, industrial zones and construction firms. Hence, a threat to any ecosystem through indiscriminate waste could be a threat to human health. Industrial waste are growing in quantity and becoming more varied, more toxic and more difficult to dispose so the number of people exposed to pollutants is much greater

Massive deforestation in both terrestrial and aquatic ecosystems is ongoing and is shaping the climate and geography of the area. Deforestation affects the amount of soil and ground water. Shrinking forest cover reduces the landscape's ability to intercept, retain and transport precipitation. It also contributes to decrease evapotranspiration which lessens atmospheric moisture that is sometimes responsible for local drought in the city. Ecological problem such flooding, coastal erosion and habitat fragmentation are caused by deforestation in Rivers State.

## **CONCLUSION**

Human economic activities, whether primary, secondary or tertiary, are commonly found in urban centres like Rivers State. The quest to reverse the negative impact of human activities on the ecosystems will only be realistic, if stakeholders acknowledge the enormity of degradation inflicted on terrestrial and aquatic ecosystems. These activities will most probably not only strangle the local economy, but will consequently have a disastrous effect on the environment which supports human life. The following control and conservation measures are recommended:

- (i) afforestation programmes for all vegetation types.
- (ii) reforestation to improve biodiversity and recharge ground water
- (iii) soil and surface water treatment.
- (iv) control of unregulated logging and fuelwood collection.
- (v) environmental monitoring of air, soil and water quality by stakeholders.
- (vi) control of sewage and industrial effluents disposal.
- (vii) ecosystem conservation policy should be implemented.
- (viii) gas flaring should be stopped by refining industries.

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