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HUMAN POPULATION GROWTH AND ENVIRONMENTAL RESOURCES CONSERVATION IN THE SOUTHERN SENATORIAL DISTRICT CROSS RIVER STATE, NIGERIA

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Abstract

The study investigated the impact of human population growth on environmental resources conservation in the Southern Senatorial District of Cross River State, Nigeria. Two null hypotheses were formulated to guide and direct the study. Literature was reviewed based on the sub-variables of the study. The survey research design was adopted for the study. A sample of 791 respondents was used for the study. The sample was selected through stratified and simple random sampling techniques. A Four-Point Modified Likert Scale Instrument entitled, "Impact of Human Population Growth on Environmental Resources Conservation in the Southern Senatorial District of Cross River State, Nigeria" (HPGERCSSDCRSNQ) was validated by experts who vetted the items developed. The reliability estimate of the instruments was established through the Pearson Product Moment Correlation (PPMC) statistics. The

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result of the analysis revealed that human population growth is significantly related to environmental resources conservation. It was then concluded that human population growth has severe impact on environmental resources conservation. Based on the findings, the study recommended among others things that, the government should have training programmes that would create awareness on the control of overpopulation on environmental resources conservation. Tellingly, people should be sensitized on the effect of excess population growth for the present and future generations.

Keywords: Impact of human population growth, environmental resources, conservation.

Introduction

Human population has been increasing at an extremely high rate in the last century and little has been done to reduce the high growth rate. Over population is a worldwide issue today, it is worldwide because it pertains to humanity and environmental resources. Almost all human activities impact on environmental resources. The pressure of human activities negatively affects the environment. Environmental resources problems emanating from population growth such as water, pollution, deforestation, poor water supply, soil degradation and loss of biodiversity has pose serious threat to humanity and the environment itself. The lists of environmental resources issues definitely show that the natural assets that human take for granted are in absolute decay or destruction. Most of the damage on the environmental resources caused by human expansion is long-lasting and in some cases permanent. There is no doubt that the human population will continue increasing and the condition of the environmental resources could contract the detrimental effects of over-population on the environmental resources. The conservation environmental resources are on issue of need.

Population growth is a direct determinant of increase in water demand for domestic uses. In the medium term, population and economic growth will exist even greater pressure on water resources than on land as most human activities contribute to pollute surface and ground water, either directly (by returning dissolved affluent to water bodies) or indirectly (because waste deposited on solid ground finds its way to water bodies). Fresh water is increasingly polluted by organic

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nutrients, toxic metals and agricultural and industrial chemicals carried by industrial affluent, land use runoff and domestic waste water. Secondary growing sources are teaching from mine toiling and solid waste dumps and atmospheric deposit of pollutants into water bodies.

Deforestation has contributed greatly to erosion. Soil erosion in deforested watershed increase water turbidity and accelerates the leaching of soil erosion nutrients. These effects are particularly severe in tropical regions, especially during the rainy season, but other regions are not immune. Human population growth especially when compounded by urban concentration is the source of increasing amount of sewage streams in Calabar result to amount of overloading the metropolis (Colimin, 2013). Studies have shown that the higher the population, the higher the preside on environmental resources in terms of over exploitation of forest resources, the use of fertilizers and pesticides which results to water contamination and increase in waste generation. The major variables that trigger population growth are urbanization, migration, consumption pattern and emergence of urban slumps. However, this study will focus on urbanization and consumption patterns the major variables of the study.

Statement of the problem

The Southern Senatorial District of Cross River State is presently faced with the problem of environmental resources conservation. The rate at which environmental resources are being exploited and depleted is increasing on daily basis in the study area. This exploitation and depletion of environmental resources could be attributed to increasing rate of population or population growth which is manifested through urbanization and human consumption pattern among others. There is wanton destruction of the forest as a result of urbanization and human consumption pattern in the study area.

The government through its ministries agencies and departments has attempted to solve this challenging issue to no avail. For instance the Cross River State government placed a ban on logging activities within the state in 2010 in an attempt to curtail the effect of urbanization and human consumption patter. This attempt by the state government did not yield much fruit. Non-governmental organizations have equally made concerted effort in conserving environmental resources in the study are yet the situation is deteriorating.

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To create awareness among people on the need for sustainable environmental resources management in Cross River State, researchers have conducted and published series of materials on the danger of unsustainable environmental resources management yet to no avail. The media stations have also played a major role in sensitizing the populace on the dangers of environmental resources depletion all to no avail. It is against this background that this research work seeks to examine the impact of population growth on environmental resources conservation.

Purpose of the study

The purpose of this study is to investigate the extent to which human population growth to environmental resources conservation in the Southern Senatorial District of Cross River State.

The study specifically aims at investigating the extent to which:

1. urbanization relate to environmental resource conservation in the Southern Senatorial District of Cross River State;
2. human consumption pattern research environmental resource in the Southern Senatorial District of Cross River State.

Hypotheses

The following null hypothesis guided and directed this study

1. Human consumption pattern does not significantly impact on environmental resource conservation in the Southern Senatorial District of Cross River State.
2. Urbanization does not significantly impact on environmental resource conservation in the Southern Senatorial District of Cross River State.

Literature Review

Urbanization and environmental resource conservation

In recent decades, the world has experienced unprecedented urban growth. Historically, the human population has lived a rural lifestyle, dependent on agriculture and hunting for survival. In 1800 only 3 percent were urbanites although only 13 cities had one million or more inhabitants in 2008, for the first time, the world population was evenly split between urban and rural areas. More developed nations were about 74 percent urban, while 44 percent of residents of less developed

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countries lived in urban areas. However, urbanization is occurring rapidly in many less developed countries. It is expected that 70 percent of the world population will be urbanized by 2050 and most urban growth will occur in less developed countries (Satterthwer, 2017).

Urbanization results to land use change: Land use change is a change in land cover and land use. Land cover is the physical state of the land surface which includes both natural amenities (crop lands, soil types, vegetation, biodiversity, water resources) and man-made structures (buildings, pavements (Meyer, 1995). Change in land cover may occur in two ways- land cover conversion and land modification (Lambin, Geist and Rindfuss, 2006). Land cover conversion is a change in the overa classification of land cover through replacement of one type of land cover by another type due to change in urban extent agricultural expansion and deforestation land cover modification is a change in the character of land over without undergoing its overall classification (Lambin, Geist & Lepers, 2003). Land use refers to the way human beings employ and exploits land cover for several purposes as a result of increase in population (Lambin *et al.*, 2006). Urbanization is the concentration of population due to the process of movement and redistribution in a particular environment. The process of urbanization results in dense settlement called urban settlement. Both human population and economic activities are growing rapidly. It is expected that in the next twenty years, the world will add more than two billion people in urban areas which will affect environmental resources to a greater extent. According to Sullivan (2010), the US population will hit nearly 400 million by 2050, which is more than a 50% increase from the 1990 population size (Day, 2006). Based on the current urban population trend there will be a need of more than 30 million housing units (U.S Bureau American Community survey, 2010 and 8.1 million acres (12,600 square miles) of land go accommodate the future urban population growth. If other infrastructural development such as roads and transportation recreation and business are taken into consideration the amount of require land will increase substantially.

Urbanization is a major driver of environmental change and socio-economic development shows little indication of abatement man continues sustenance on earth and the quality of his living is heavily dependent on environmental resources. The major component of the

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environment, air, water and land use are supporting pillars of man which he depends on directly or indirectly for his survival and wellbeing. Unfortunately, man seems to be at east with his environment, which is evident in his over exploitation and inadequate management of basic component of the environment. This unsustainable exploitation of the nature environment has posed serious changes and great threat to Nigeria's natural resources base. One of the major threats to the Nigerian environment is urbanization. Mobogunje (2005) stated that urbanization is the process of human agglomeration in multi-functional settlement of relatively substantial size. Urbanization process is one of the powerful and visible anthropogenic forces on earth (Zanni, 2009). The process as explained by Adesina (2003) has been responsible for transforming towns, cities and metropolitan areas, while at the same time depopulating the rural setting through a process of direct rural-urban migration.

Studies have shown that rapid urbanization has greatly accelerated economic and social development and global cities are engines of economic growth and centers of innovation for the global economy and the hinterlands of their respective nations. Hence, the world continues to experience high rate of urbanization especially in developing country like Nigeria, which has an estimated 5.3 percent growth rate. This in turn affects environmental resources negatively. The United Nations noted that 30 percent of the global population lived in urban areas in 1957 while the figure reached 50 percent in 2008 and estimated 70 percent is projected for the year 2050. It is stated further that in the foreseeable future, virtually all of the world's population growth will be absorbed by the urban areas of the less developed regions while population is projected to increase from 2.4 billion in 2007 to 5.3 billion in 2050, today there are over 400 cities in the world with population of over 1 million people (United Nation Population, 2007). In Nigeria human development report (2004) cited in Anderson 2003 observed that of the 2002 estimated population of 120.9 million, 45.9 percent of the population resides in urban centers. According to Awosus and Jegede (2013) residents of urban centers in Nigeria in 1950 were less than 15 percent of the population, while it rose to 2.4 percent and 43.3 per cent in 1975 and 2000 respectively with annual urban population growth rate of 4.8 per cent. This urbanization process has affected environmental resources to greater extent. This is so in the

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sense that, the higher the population, the higher the demand for environmental resources and the higher the level of environmental resources exploitation. It also noted that Nigeria has 359 urban settlements of at least 20,000 people according to the 1991 national population census. According to Awosus and Jegede (2013), the high influx of people into the urban centers from the rural areas to take advantage of the perceived opportunities offered by this urban centers without adequate planning, effective management strategies to accommodate this influx by the government, results to serious pressure on both socio-economic supporting infrastructure and environment. For instance, urbanization has been identified as the cause of numerous environmental problems, which include and not limited to air, water, land and noise pollution, deforestation, local climate alteration and traffic congestions which ranges from local to global state (Mba, Ume and Uchegbu, 2004).

According to Mba, Ume, Uchegbu (2004) cited in Daramola and Ibem, (2010) identified several types of environmental problems in Nigeria classified as ecological, poaching and habitat loss, increasing desertification and soil erosion. These are further subdivided into pollution, global warming, slump development, deforestation etc. Nigeria's coastal regions are currently experiencing widespread contamination from petroleum exploration (gas flaring, oil spillage) while the general poor living conditions in urban areas in the country constitutes an effort of human dignity, the higher the urbanization, the higher the environmental problems (Daramola and Ibem, 2010).

The National Population Commission (1991) observed that most urban areas in Nigeria have grown beyond their environmental carrying capacities and existing infrastructure. For instance, data from the national population census (2006) revealed that most of the urban areas in Nigeria with small landmass have already exhausted or have extremely limited capacities to accommodate further increase in population (FRN official gazette, 2006) with a population figure of more than 140 million and landmass of about 924,000Km^2 current estimates indicated that 10 per cent of the land area accommodated 28 per cent of the country's total population (Taylor, 2000). This imply that there is disequilibrium between the population and the environment and this has adversely affected the carrying capacity of the urban areas in the

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country; the increasing poor quality of the living conditions and the low liability index of urban areas in Nigeria (Daramola and Ibem, 2010).

Consumption pattern and environmental resources conservation

Human consumption pattern is the root cause of environmental resources depletion and degradation. The impact of consumption pattern is amplified by human population increase and growth in per capita spending (Meyer, 1997). According to Sullince (2010) their impact are often masked by increasing telecoupling process, meaning distant human-nature interaction such as trade. Traditionally, consumption needs were met locally so biodiversity conservation measures have largely focused on specific places separately. However, in recent decades, not only has consumption risen drastically but production of goods and services has also been steadily separated geographically from consumption (Sullince, 2010). Consumption increase with spending capacity and human population. From 1970-2018, global spending jumped 25 fold while the global population size nearly doubled and average global per capita spending increase 13 fold (from $1600 by 1970 to $7,810 in 2018) Sulwan, 2010. Furthermore, global household numbers increased much faster than global population, especially in countries with biodiversity hotspots, for reasons such as rising divorce rate and more single living (Andesina, 2003). He further noted that as household are basic unit of consumption, household proliferation amplifies resource consumption. According to Millers (2010), the pattern of human consumption has changed drastically overtime. For instance, the average amount of calories increased 31% from 1,196 to 2,884 kcal/capita/ day from 1961-2013. The composition of food has become progressively more meat-based with global meat consumption doubling 23kg to 43kg/capital/year during 1961-2013 (Meyer, 1997).

Trade in Agricultural commodities is increasing hindering consumers and producers worldwide. Consumption pattern have numerous implication on environmental resources. For instance, a more meat-base diet requires more resources (land, water, energy) than a plant-based diet, thus affecting more habitat area and emitting more CO_2 (FAO, 2010). Shorter lives and faster replacement of consumer products also require more resources to manufacture and generate more pollutants and waste.

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Ehrlich and Holdren (1971) in Asuquo (2020) decomposed the anthropogenic driving forces of natural capital appropriation into three variables; population, affluence and technology. This model came to be known as IPAT model. Environmental impact= population x affluence x technology. It remains a useful framework for examining environmental impact. Diet can have a direct impact on consumption per person or affluence that is to say calories per person and also type of products and food that are consumed to meet needs. Moreover, diets can have an indirect impact on footprints since consumer preferences and consumption behaviour, via demand and market pull can influence production methods, technologies and system (e.g. organic, conventional, intensive, industrialized agriculture, fishing, aquaculture) and transportation and distribution patterns therefore natural resources use, waste products and pollution intensity. According to Environmental Impact refer to ecological footprint (EF) carbon footprint (CF) and water footprint (WF)

According to Schafer, Luskch, Stainbich, Cabeca and Hanauers (2008), the ecological footprint is one of the renewable resources accounting tool that is used to address the underlying issue of sustainable consumption, then further stressed that of has emerged as the world's premier measure of humanity's demand on nature, the ecological footprint is a method to answer the following research question: how much of the regenerative capacity biosphere is occupied by human activities Schafer et al (2006). Biocapacity refers to the capacity of ecosystems to produce useful biological materials and absorb waste materials generated by humans, using current management schemes and extraction technologies (Global Footprint Nation, 2011). The dining force behind changes in the CF can be derived from the IPAT model. According to Ewing, Moore, Goldfinger, Oursler and Reed (2010), EF=population x consumption per person x resource and waste intensity.

The calculated methodology of the CF on a national scale was fully explained by Ewing et al (2010). The EF measures appropriate biocapacity, expressed in global average bioproductive hectares across six major land use types (i.e. cropland, grazing land, fishing grounds, forest land, carbon footprint and built up land according to Wiedman and Minx (2008), the carbon footprint is a measure of the total amount

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of CO_2 emission that directly and indirectly caused by an activity or is accumulated over the life stages of a product.

The water footprint is the demand of fresh water resources required to produce goods and services and its represents a measure of human appropriation of fresh water resources: fresh water appropriation is measured in terms of water volumes consumed (evaporated or incorporated into a product) or polluted per unit of time Dodds and Walter 2008). The water footprint concept is closely linked to the virtual water concept (Hoekstra and Chapagain, 2008). The water footprint product is similar to what has been called alternatively the virtual-water-content" of product or products embedded, embodied exogenous or shadow water (Hoakstra & Chapgain, 2008). The water footprint include the use of blue water (ground and surface water), green water (rain water or moisture stored in soil strata) and grey water. The grey water footprint refers to pollution and is defined as the volume of fresh water that is required to assimilate the load of concentration and existing water quality standards (Dodds, 2011). The water footprint is geographically explicit indicator, showing not only volumes of water consumption and pollution, but also locations. The framework for national water footprint accounting was presented by Dodds *et al.,* (2008).

The methodology of the global standard of water footprint assessment developed by water footprint network is set out in the water footprint assessment named by Hoekstra et al (2011). The study quantified and mapped the water footprint of nations from both a production and consumption perspective and estimates international virtual water flows, national and global water savings as a result of trade. The entire estimate includes a breakdown of water footprints, virtual water flows and water saving into green, blue and grey components.

Methodology

The study area was Cross River State, Nigeria. The research designed adopted was Correlation research designed for the study because it deals with a general method to research that focuses on "assessing the variation among naturally occurring variables". It plays a major role in "exploring quantitative research in terms of exploring the nature of the relationship among a collection of variables. The study was carried out in the Southern Senatorial District of Cross River State, Nigeria. The

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area of the study is comprised of five local government area are Akpamkpa, Akpabuyo, Bakassi, Biase and Calabar South. A sample of 347 respondents was drawn from the population of 2617 using stratified sampling technique. The questionnaire entitled Impact of Human Population Growth and Environment Resources Conservation Questionnaire (HPGERCSSDCRSNQ) were used to obtain information from respondents. The Cronbach Alpha reliability method was used to determine the reliability of the instrument. The questionnaire was administered by researcher with the help of two trained assistants. The data obtained was analyzed using Pearson Product Moment Correlation (PPMC) statistics and the results presented as follows:

Results

Hypothesis one

The first hypothesis states that, urbanization do not significantly relate with environmental resource conservation in the Southern Senatorial District of Cross River State. The independent variable in this hypothesis is urbanization while dependent variable is environmental resource conservation. To test this hypothesis impact of human population growth and biodiversity conservation were compared using Pearson Product Moment analysis. The result of the analysis is presented in table 1.

Table 1

Pearson product moment Correlation analysis of the relationship between urbanization environmental resource conservation in Cross River State (N=347).

Variables	X	SD	$\sum x$ $\sum y$	$\sum x^2$ $\sum xy$	$\sum xy$	R
Urbanization	18.06	1.17	6267	16342		
Environmental resources conservation	16.3	2.19	5597	15461	158135	0.67*

*Significant at .05 level, critical r= 1.33, df=N=345

The result in table 1 reveals that the calculated r-value of 0.67 is higher than the critical r-value of .133 at .05 level of significance with N=345 degrees of freedom. With the result the null hypothesis was

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rejected. This results therefore means that there is a relationship between urbanization and environmental resource conservation in the Southern Senatorial District of Cross River State.

Hypothesis two

The second hypothesis states that human consumption pattern does not significantly relate with environmental resource conservation the Southern Senatorial District of Cross River State. The independent variable in this hypothesis is human conservation pattern while the dependent variable is environmental resource conservation relationship between human consumption pattern and environmental resource conservation growth and water resources were compared using Pearson Product Moment Correlation statistics. The result of the analysis is presented in Table 2.

Table 2

Pearson product correlation analysis of the relationship between human consumption pattern and environmental resource conservation in Cross River State (N=347).

Variables	X	SD	∑x ∑y	$\sum x^2$ ∑xy	∑xy	R
Consumption pattern	17.48	1.75	6066	16246		
Environmental resource conservation	16.13	2.19	5597	15461	145562	0.58*

The result in table 8 reveals that the calculated r-value of 0.58 is higher than the critical r-value of .133 at .05 level of significance with N=345 degrees of freedom. With this result, the null hypothesis was rejected. This result therefore means that there is a significant relationship between human consumption pattern and environmental resource conservation has a significant relationship with the impact of population growth.

Discussion of findings

The result of the first hypothesis revealed that the impact of human population growth significantly related with environmental resources in

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the Southern Senatorial District of Cross River State, Nigeria. The findings is in line with the view of Austin (2000) who posits that population is an indirect driver of biodiversity loss, as human demands for resources like water, food, and fuel play a key role in driving resources extinction. Supporting this assertion, Wolf (2001), states that "the rate of tropical forests loss is so rapid that about 30 percent of all the plants and animals are likely to become extinct by the year, 2030, whatever is the rate of extinction, there is no doubt that any disturbances of natural forests whether man made or natural will depend on the number big species present in particular areas of forests, the distribution of deforestation and the extent of disturbance of degradation of those areas which remain forested.

Hummel (2009) stressed that human population growth is considered as an important source of development, yet it is also a major source of environmental resources degradation when it exceeds the threshold limits of the support system. Population growth has an impact on the environment primarily through the consumption of natural resources and production of wastes.

This paper focuses on human population growth and environmental resources conservation which we believed to be of crucial and growing importance, human population growth influence environmental resource conservation to a great extent, especially in the Southern Senatorial District of Cross River State, Nigeria.

Conclusion

From the result of the findings, it was concluded that human population growth has serve impact on environmental resources conservation and human population explosion remains an issue in Cross River State. Due to poverty and illiteracy level which remains the root causes of environmental degradation on environmental resources we faced with environmental problems in the Southern Senatorial District in Cross River State.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Government should provide universal access to family planning and increase access to free education and intensify their efforts to

increase Environmental awareness on birth control measures by using indispensable tool formal and informal approaches.

2. To educate all young people on population matters, sexual relationship, fertility regulations and family planning before entering parenthood.
3. Awareness creation campaign should be embarked upon to sensitize the young men and women on the importance of birth control measures.
4. Government should embark on massive awareness creation campaign on environmental resources management.

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