IMPACT OF ENVIRONMENTAL CHANGE ON THE HEALTH AN LIVELIHOOD OF YAKURR PEOPLE IN CROSS RIVER STATE, NIGERIA

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Abstract

The research was designed to determine the impact of environmental change on the health and livelihood of Yakur People in Cross River state. In order to effectively handle the study, the three (3) research hypothesis were formulated to guide the study. The survey research design was adopted for the study. A random sampling technique was used to sample four hundred (400) participants from the ten (10) communities that make up the study area. Data collected was analyzed using the chi-square for hypotheses 1 and one sample t-test for hypothesis II and III at 0.05 significant level. The result revealed that; (i) there is a significant impact of environmental change on the people's level of awareness (ii) there is significant impact of environmental change on agriculture and livelihood. (iii) There is significant impact of environmental change on the health of the people. It was recommended that there should be multi-stakeholder investment in water harvesting and conservation solutions that will bring food stability in the study area. It was also recommended that efforts be made to sensitize households and educate them on the threats posed by environmental change.

Keyword: Health and livelihood Environment , Ecology

1.0 Introduction

According to USEPA (2016), some group of people will likely face greater challenges than others. Environmental or climate change may especially impact people who live in areas that are vulnerable to coastal storms, drought and sea level rise or people who live in poverty, older adults and immigrant communities. Similarly, some types of professions (outdoor tourism, commerce, agriculture ete) and industries may face considerable challenges from environmental or climate change. Projected environmental change will affect certain groups of people more than others, depending on where they live and their inability to cope with different climate hazards. In some cases, the impacts of environmental change are expected to worsen existing

vulnerabilities. It is therefore important to note that the location of a place influences their vulnerability to environmental or climate change (USGCRP, 2016).

People who live in poverty may have a different time coping with changes as they have limited financial resources to cope with, relocate or evacuate as well as respond to increases in the cost of food. Older adults may be among the least to cope with impacts of environmental change. The young population is also a sensitive group since their immune system and other bodily systems are still developing. The indigenous communities and tribes are diverse with their unique cultures and as such environmental change affects their ability to prepare for, respond to and cope with impact since they rely on the surrounding environmental and natural resources for food, cultural practices and income.

Melillon, Jerry and Terese (2014) said that climate change can impact the health and well-being of indigenous tribes in ways like access to good drinking water and waste treatment thus increasing health risk associated with water quality problems. USGCRP (2014) asserts that by affecting the environmental and natural resources of tribal communities, environmental change also threatens the cultural identities of indigenous people as plants and animals used in traditional practices sacred ceremonies become less available.

According to the National Climate Change Adaptation Research Facility (NCCARF, 2009), the city residents and urban infrastructure experience amplified heat waves during the day than the rural areas. The increase in population in the urban areas result in increase in heat waves, drought, violent storms and this will likely affect the cost of energy, air and water quality, and human comfort and health.

Environmental change affects air, food and water which are the key determinants of human health. It also influence the frequency of heat waves, floods and storms as well as the transmission of infectious diseases.'

Similarly, the climate and health country profile 2015 of the World Health Organization (WHO) has estimated globally over 150,000 deaths annually resulting from changes in the world's climate relative to the average from the base line climate of 1961-1970. The Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPPCC, 2007) clearly states that environmental change is contributing to the global burden of diseases and premature deaths. Thus, there is a growing need for a better understanding of the multi-faceted and complex linkages between global environmental change and human health as well as the establishment of an international research community to address the issue.

1.2 Statement of the Problem

Over the past four decades, population has grown rapidly in forest region and coastal regions of Yakurr Local Government Area. These areas are most sensitive to deforestation, coastal storms, drought, heat waves, flooding, bush burning, air pollution etc. Increase in population and changes in environmental conditions place growing demands on transportation, water and energy infrastructure.

Scientists, policy makers, and the public have become increasingly concerned about the threat that such change if it continues unabated, poses for the future. Growing numbers of scientists from a variety of disciplines have been systematically studying specific aspects of this change and attempting to identify effective strategies for preventing or mitigating potentially catastrophic effects.

However, it is important to state that some changes in the environment are unavoidable. Though it is difficult to forecast the impact of environmental change, there is a certainty that the climate we are used to is no longer a reliable guide for what we expect in the future.

The emergency meeting held on Monday 19th September, 2022 by Nigeria Emergency Management Agency (NEMA) revealed that more than 300 persons have been killed and more than 100,000 people have been displaced by flooding this year 2022 due to heavy rainfall and the effects of excess water from a dam in Cameroun that will affect fourteen (14) Nigerian states.

On human factors that cause environmental changes, researchers have not focused much attention on this area in the past but enormous health implications have been recorded as a result of environmental change. It is on this premise that the study will examine the people's level of awareness of environmental change and its associated impacts on the health and livelihood of the Yakurr people in Cross River State.

1.3 Justification of the Study

It is imperative to note that the subject of detrimental environmental change has received much attention in news media for some time because environmental issues are of great concern to all and sundry. A good knowledge of the profile of basic and environmental science especially as it relates to environmental changes will provide possible ways by which individuals or the society can control the impacts of environmental change. This is achievable through formulation of policies that will help in sustaining the environment as well help in the planning for farming, job and businesses of rural-urban dwellers. The findings that will be provided by this study will be beneficial to the Environmental Protection Agency (EPA) as well as the National Environmental Standard and Regulation Enforcement Agency (NESREA).

1. 4 Objectives of the Study

The main objective of the study is to investigate the impact of environmental change on the health and livelihood of Yakurr people. Specifically, the study shall seek to determine the:

(i)   Extent of people's awareness of the impact of environmental change on health and groups that are located in vulnerable areas.
(ii)   Impact of environmental change on agriculture and towns that are uniquely sensitive to extreme weather.
(iii)   Impact of environmental change on the jobs and livelihoods of Yakurr people.

1.5 Research hypothesis

$H0_1$ There is no significant impact of environmental change on the people's level of awareness.

$H0_2$ There is no significant impact of environmental change on agriculture and livelihood.

$H0_3$ There is no significant impact of environmental change on health

Literature Review

According to the World Health Organization (2018), large scale and environmental hazards to human health include climate change, stratospheric ozone depletion, changes in ecosystem due to loss of biodiversity, changes in hydrological systems and the supplies of fresh water, land degradation, urbanization and stresses on food producing systems.

Appreciation of this scale and type of influence on human health requires a new prospective which focuses on ecosystems and on the recognition that the foundations of long term good health in population rely on great part on the continued stability of the biosphere's life supporting systems.

2.1 Global Environmental Change

Environmental change is one of the biggest crisis facing humanity. On June 1st, 2013 south of Lake Hughes, California, a wildfire ran rampart for days destroying thousands of homes overnight and spreading through brush and dry and engulfing a total stretch of 9500 hectares (Alexandria, 2018). More than ninety-seven (97%) of environmental scientists agree that changes to the global climate in the last century have been caused by anthropogenic factors. Since the industrial revolution, global emissions of carbondroxide and other greenhouse gases have been exorbitant, leading to the phenomenon that, until relatively recently, has been known by the misnormal "global warming".

According to Anijah-Obi (2001), the atmosphere is the temperature regulator and source of light for photosynthesis. It adds to the beauty, joy and happiness of life on earth, the lovely blue skies, the colours, the refreshing rain and gorgeous sunrise and sunset, even the music we enjoy is possible because the atmosphere allows sound waves to travel through it. The atmosphere fluctuates and this fluctuation is what leads to global environmental change.

Wokocha (2018) defines climate change as a change resulting directly or indirectly from human activities that alter the composition of the global atmosphere with little natural forces resulting in rise in sea level, desertification, erosion, flooding, biodiversity lost etc.

According to the United Nations Framework Convention on Climate Change (UNFCCC, 2009), human activities include the pollution that arises from industrial activity and other sources that produce greenhouse gases. These gases such as carbondioxide, methane, Nitrous oxide, fluorinated gases etc have the ability to absorb the spectrum of infrared light and contribute to the warming of our atmosphere. Once produced, these gases can remain trapped in the atmosphere for tens or hundreds of years.

Human activities, processes and consumptions such as fuel combustion, energy and manufacturing industries, vehicle transport and automobiles, burning of solid fuels, solid waste disposal on land, agricultural soils, metal production, consumption of halocarbons and sulphur hexafluoride etc also produce gases that are harmful to the environment.

In 2013, carbon dioxide levels surpassed 400 parts per million (ppm) for the first time in recorded history. This has been directly linked to anthropogenic activity with the largest sources of greenhouse gas emissions stemming from electricity and heat production, industry and agricultural land use. As the balance of gases in the atmosphere changes from human pollution, these emissions directly contribute to the warming of the environment, with far reaching consequences across continents and cultures.

The effects of this climate change are already felt on our planet, human life, plants and animals worldwide through desertification, flooding, food scarcity, drought, wildfires (Paris Accord 12th December, 2015).

Adaptation, Vulnerability, Livelihood and Environmental Change

The task force meeting organized in November, 2001 by IUCN - the world conservation union, the International Institute for Sustainable Development (IISD), and the Stockholm Environment Institute (SEI) on global climate seeks to inform and challenge conventional wisdom in these fields, and in particular, to bring together the different perspectives needed for successful adaptation.

Holling (2001) introduces the idea of the adaptive cycle that links different time and spatial frameworks within which adaptation should take place. Kasperson (1995) and Folke (2002) stressed that vulnerability usually describes a condition of susceptibility shaped by exposure, sensitivity and resilience. For poor people vulnerability is the inability to avoid, cope with or recover from the harmful impacts of factors that disrupt their lives and that are beyond their immediate control.

The Department for International Development (DFID), United Nations Development Programme (UNDP) and World Bank in 2002 focused on livelihoods, health and vulnerability as three dimensions of poverty reduction.

The Intergovernmental Panel on Climate Change (IPCC, 2001) reports on impacts, adaptation and vulnerability asserts that populations are highly variable in their endowments (of different capitals) and the developing countries, particularly the least developed countries which have lesser capacity to adapt are more vulnerable to environmental change impacts.

Ecological/Implication of Environmental Change

Increasing temperature and decreasing precipitation in most parts of the world are the greatest impacts of environmental change. The thawing of the Arctic, cool and temperate ice has already started impacting on the sea level rise, coastal inundation and erosion. Coastal settlements like Bonny, Forcados, Lagos, Port Harcourt, Warri, Oron, Eket, Calabar and Ekori that are less than 10m above sea level will be seriously threatened by a metre rise in sea level.

The sea incursion due to sea level rise means salt water intrusion into the fresh water, invasion and destruction of mangrove ecosystems, coastal wetlands and coastal beaches. This results to population displacement which may eventually lead to communal crisis as it is the situation between Yakurr and Obubra local government areas.

Odjugo (2008) noted that the frequency and magnitude of wind and rainstorms did not only increase but also killed 199 people and damaged property worth N83.03 billion in Nigeria between 1992 and 2007. Buadi and Ahmed (2006) had similar result when they reported that rainstorms claimed fourty two (42) lives in southern Cameroun between 2000 and 2005.

In Odjugo (2008), it was clearly shown that environmental change has led to a shift in crops cultivation in southern Nigeria. Odjugo and Ikhuoria (2003) and Ayuba (2007) also noted that there is ecological destabilization in the semi-arid region of Northern Nigeria due to the frequent droughts and lesser rains.

Conclusion

The review focused on global environmental change, causes and effects; adaptation, vulnerability livelihood and environmental change, and ecological implications of environmental change. From the submission, fresh insights have been garnered on the areas reviewed above. The report of the findings of this study will provide information on what is being done on environmental change impact that will be of greater support to environmentalists and the society at large.

STUDY METHODOLOGY

Research Design

The survey research design is adopted for the study as it involve direct contact with the respondents, thus enabling for easy collection and interpretation of data. Secondary data sources from clinical reports from hospital admission may also provide ancillary case reports.

Area of Study

The study is conducted in Yakurr Local Government Area of Cross River State. Yakurr local government area is located in the Cross River State Basin in Cross River State. The local government area lies approximately between latitude 5^0.07N and 5^0.04N of the equator and between longitude 8.04E and 8.3E of the Greenwich Meridian with a total land mass of 670sqkm, density of 391.5sqkm with an undercount of the 2006 population estimated at 262,300 using a change of +2.94% per year from 2006 – 2016 (source: National Bureau of Statistics (web). Its latitudinal and longitudinal locations make it a subequatorial belt and thus a zone of intensive insolation and precipitation.

Population of the Study

This consists of two hundred and sixty two thousand, three hundred (262,300) inhabitants in the rural and urban communities in Yakurr local government area. According to National Population Commission (NPC) 2006, there are 141,156 women and 121,144 men.

Sample and Sampling Technique

A stratified random sampling were used to sample a total of four hundred (400) persons from the ten (10) communities that make up Yakurr Local Government Area. This is because the sampling technique will allow each item in the population the equal chance of inclusion in the sample.

Criteria considered for inclusion in the population are:

    i.   must be a community in Yakurr Local Government Area
    ii.   must have the young and aged
    iii. must have the working class and the non-working class
    iv.   must have educated ones and uneducated ones
    v.   must be in the same geographical setting.

Instruments

The environmental change, health, livelihood (ECHL) questionnaire developed by the researcher were used to gather the data for the study. The instrument will be divided into two parts. Part A solicits for the respondents demographic information and part B contains twenty items to be answered by the respondents based on the three sub variables: vulnerability, agriculture and health using the 4 - point modified likert scale option of Strongly Agreed (SA) = 4, Agreed (A) = 3, Disagreed (D) = 2 and Strongly Disagreed (SD) = 1 for all positively worded statements while the reverse is the case for all negatively worded statements.

Method of Data Collection

The data were gathered through personal contact with all the respondents in the various communities. Before the completion of the instrument, the researcher emphasized on the instructions in the instrument to the respondents. At the end of filling the questionnaire, the researcher with the help of the research assistants will collect all the completed forms on the same spot.

Method Date Analysis

The data gathered shall be analysed using the chi-square test and the one sample t-test at 0.05 significant level.

Dada presentation and analysis
Presentation
Table 1; Field data presentation on respondents information on Impact of environmental change on the health and livelihood of yakurr people in cross river state, Nigeria. The data were now tested statistically using the x^2 technique the one sample t-test at 0.05 significant level as reflected in the analysis procedure that followed

Table I below shows the total number of persons and communities sampled for the study.

S/N	NAMES OF COMMUNITY	NO OF PERSONS SAMPLED
1	Ugep	40
2	Ekori	40
3	Nko	40
4	Mkpani	40
5	Idomi	40
6	Assiga	40
7	AgoiEkpo	40
8	AgoiIbami	40
9	Inyima	40
10	Kekpoti	40
	Total	**400**

The above table is gotten from the population of two hundred and sixty two thousand, three hundred (262,300) inhabitants using the YaroYuman formula since it is a finite population

Thus:

$$n = \frac{N}{1+N\,(e)2}$$

where:

n = sample size

N = population of the study

e = level of significance at 0.05

Sub variables of the study are described as shown in table 3 below.

Table 3

Sub-variables	N	x ⁻	SD
Awareness	400	3.1900	1.00570
Agriculture	400	3.1950	0.91601
Health	400	3.2975	0.84900
Job livelihood	400	3.0250	0.96265
SES	400	2.9925	1.06314
Adaptation	400	2.2850	1.15200
Vulnerability	400	3.1475	1.04569

Hypothesis:

The presentation of findings is done hypothesis by hypothesis.
$H0_1$ There is no significant impact of environmental change on the people's level of awareness.
The independent variable environmental change is categorized and the dependent
variable (level of awareness) is continuous. To test this null hypothesis, a chi-square test was used as shown
in table 4 below.

Table 4
Summary Data of Chi-square test of no significant impact of environmental change on the people's level of
awareness.

Variables	Value	df	Asymp.Sig(2-sided)
Pearson Chi-square	324.468	1	0.000
Continuity Correction	321.665	1	0.000
Awareness Ratio	401.800	1	0.000
Fisher's Exact Test			
Linear-by-Linear	324.176	1	0.000
Association			
N of Valid Cases	1111		

- 0 cells (0.0%) have expected count less than 5. The minimum expected count is 89.49. Computed only
for a 2x2 table.

From table 4 above chi-square test statistics was 324.468 with a probability P = 0.000 and a degree of freedom of 1. This is less than the alpha level of significance of 0.05. Therefore, the null hypothesis of "no significant impact" is rejected while the alternative hypothesis is retained.

H0$_2$ There is no significant impact of environmental change on agriculture and livelihood.

To test this null hypothesis, a one-sample t-test was used as shown in table 5 below.

Table 5

Summary Data of One-Sample t-test of no significant impact of environmental change on agriculture and livelihood.

Variable	N	x	SD	df	tcal	sig.
Awareness	400	3.190	1.005	399	62.444	0.000
Agriculture	400	3.195	0.916	399	68.667	0.000

From the table above the calculated (t-cal) value for extreme weather is 62.444 and agriculture is 68.667 for the 2-tailed test, with degree of freedom of 399 greater than the t-critical value of 0.000 at 0.05 significance level. This implies that the null hypothesis of no significant impact is rejected.

H0$_3$ There is no significant impact of environmental change on health.

The independent variable is environmental change and the dependent variable is health. To test this null hypothesis, a one-sample t-test was used as shown in table 6 below.

Table 6

Summary Data for One-Sample t-test of no significant impact of environmental change on jobs and livelihood.

Variable	N	x	SD	df	tcal	sig.
Health and livelihood	400	3.045	1.005	399	59.588	0.000

Table 6 above shows the calculated t-value of 59.588 for the two tailed test and a degree of freedom of 399 at 0.05 level of significant. This is greater than the t-critical of 0.000. It therefore shows that the null hypothesis of no significant impact is rejected.

Discussion/ Findings

The result of the third hypothesis for the study shows that there is a significant impact of environmental change on the people's level of awareness. This means that the capabilities, assets (including both material and social resources) and activities required for a means of living are affected. This makes the people not to cope with and recover from stresses and shocks both now and in the future. This result is in support of some popular authors like United Nations Development Program, UNDP; Carney (1998); Bojo and Reddy (2002); and the International Program for Climate Change, IPCC (2001) which stressed on the likely impact of environmental change on financial and insurance systems.

The result of the second hypothesis shows that there is significant impact of environmental change on agriculture and livelihood. This result is in line with some popular literature like Obulor (2018); World Health Organization, WHO (2016); United Nations Framework Convention on Climate Change, UNFCCC (2015);

Lambian and Medfroidt (2011); Camilo Mora (2013) and Libby Plummer and Cara McGoogan (2017). They asserted that pressure is mounting on water and food resources as ecosystems change and global populations continue to increase. This makes everybody immune to environmental change and environmental change becoming a truly global problem. The Nigerian agricultural activities are rain-fed and the farmers are engaged in crop production, livestock rearing, fisheries and post-harvest activities (Idowu, Ayoola, Opele and Ikenweiwe, 2011). In Odjugo (2008), it was clearly shown that environmental change has led to a shift in crops cultivation in southern Nigeria. This is evident on the fact that as at 1978 crops produced by farmers were guinea corn, groundnut and maize. But as at today due to environmental changes, it has shifted to maize, millet and beans.

The result of the first hypothesis shows that there is a significant impact of environmental change on health. This implies that environmental change always affect the health, the age, the poor as well as the area of the people. The result is in agreement with the United States Environmental Protection Agency, USEPA (2016) that stated that some groups of people will likely face greater challenges than others especially those who live in areas that are vulnerable to coastal storms, drought and sea level rise or people who live in poverty, older adults and immigrants communities. Melilo and Terese (2014) are also in support of this result. They postulated that climate change can impact the health and wellbeing of indigenous tribes by making it harder for them to access safe and nutritious food. The United State Global Change Research Program, USGCRP (2016) is also in strong support of this finding. They are of the opinion that the location of a place influences their vulnerability to environmental change.

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