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Assessment of Environmental Hazard effect on Agricultural Resources and Health Conditions of Rural Households in Imo State, Nigeria

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ABSTRACT

The assessment of the effect of environmental hazard on agricultural resources and health conditions is critical given its impact in changing livelihood patterns in the country especially among rural dwellers. Multi- staged purposive and random sampling techniques were used to choose the samples. The study described the socio-economic characteristics of the respondents and analysed for difference in the effects of environmental hazard on health conditions and agricultural production. Data analysis was carried out with the use of descriptive statistics analysis of variance. From the result, 87.92% (majority) of the respondents had a household size of below 10 persons while 12.08% of the respondents had a household size of above 10 persons. The mean household size is 6 persons. The result from the means of the perceived effect of environmental hazard on health conditions and agricultural resources shows that the mean of the perceived effect on agricultural resources was 1.954 while the mean of the perceived effect on health conditions was 1.035. This implies that the perceived effect is significantly lower in health conditions when compared to agricultural resources. It was therefore recommended that more studies that assess hazards which provide information on the probable location and severity of dangerous natural phenomena and the likelihood of their occurring within a specific time period be encouraged.

Key Words: Environment, Hazard. Agricultural Resources, Health Conditions.

INTRODUCTION

The rural environment presents many potential hazards and risks to health and well-being, particularly for those involved in the primary industries, which are either not present in urban areas, or are present on smaller or more contained scales. One of the most pressing problems facing rural areas in the developing world today is the presence of environmental hazards. Most of the tropical African countries do not have adequate facilities to achieve an ideal environmental sanitation. This predicament has significantly been contributory to the perennial high incidence of such communicable diseases as dysentery (*Bacillary* and *Amoebic*), cholera (*Vibrio*), typhoid (*Salmonella typhosii*), hepatitis (*Viral*) meningitis (*meningococcus*), malaria and tuberculosis (Odom *et al*, 2009).

Rural areas are subject to local resources of pollution, as well as secondary effects from urban areas which mean that total global health burden from pollution falls largely on rural areas (College of Environmental Health (COEH), 2011). Exposures in the rural environment tend to be less related to national ambient air quality standard criteria of pollutants. Ifenkwe and Izuogu (2015) opines that the problems of the rural environment extend well beyond natural factors such as the quality of the water and the air and also include the built environment in terms of human inputs—the buildings placed on the land, the kind of farming performed and the chemicals that are applied to the land, and the types of industries that are built in rural Nigeria.

In Imo State especially, the organic dust that arises from agricultural environments and the by-products of operations and businesses that process agricultural commodities are also of health concern to rural dwellers. Also, incidence of destruction of aquatic organisms occurs each year, and these are most often attributable to the contamination of surface waters with manure or, in some cases, ammonia (Ifenkwe and Izuogu, 2015)

Environmental studies provide an approach towards understanding the environment of our planet and the impact of human life upon the environment. Thus, environment is actually global in nature (Home and Property, 2006). It is a multi-disciplinary subject including physics, geology, geography, history, economics, physiology, biotechnology, remote sensing, geophysics, soil science and hydrology etc. It deals with the analysis of the processes in water, air, land, soil and organisms, which lead to pollution or degradation of the environment. It is useful for establishing standard, for safe, clean and healthy natural ecosystem. It also deals with important issues like safe and clean drinking water, hygienic living conditions and clean and fresh air, fertility of land, healthy food and development. Sustainable environmental law, business administration, environmental protection, management and environmental engineering are emerging as new career opportunities for environment protection and management (New Age International, 2005).

The public has the right of access to environmental information held by public authority, and making information about the environment publicly available is essential for achieving sustainable development. With access to environmental information, the people have full knowledge of the implications of their activities on the environment and are able to participate more effectively in decision making processes that affect the environment (UNESCO, 1992).

Data from the Imo State Ministry of Health on the incidence of selected environmental hazard-related disease between 2000 and 2012 showed that there were 44,491 reported cases of malaria within the study area. Twenty-one thousand, one hundred and fifty incidences of Cholera were reported within the study area, while 1,943 cases of Typhoid were officially reported (Izuogu *et al.;* 2015). The use of pesticides, intensive cropping practices, use of inappropriate technologies are all agricultural activities that contribute as sources of environmental hazard (Ifenkwe and Izuogu, 2015).

The health status of the rural dwellers is of utmost concern because rural dwellers' active involvement in agriculture ensures adequate supply of food, labour and raw material for the industrial sector, and these activities are influenced by

their health status. A study of their environmental health hazard and its impact on health will therefore be useful in guaranteeing food availability and security (Izuogu *et al.;* 2015). Agriculture is the main non - oil sector of the Nigerian economy. Crop production, fisheries and animal husbandry are the dominant activities. Agriculture is an important sector contributing 42 percent to the national Gross Domestic Product (GPD). It provides employment for 56 percent of the population out of which 70 percent reside in rural areas. Nigeria's agriculture is practiced in three major types of agricultural land namely upland or rainfed (94%), lowland or swamp (8.3%) and irrigation (1.5%). It is largely rain-fed and vulnerable to climate variabilities. Total area planted to various commodities is on the increase in response to growing demand for food. Similarly, national production of exportable agricultural commodities is on the increase (Izuogu and Ekumankama, 2015)

It is difficult to leave a liveable world to future generations if governmental organizations; non-governmental organizations established at local, regional, national and the international levels; the private sector, and people do not pay enough attention to environmental issues. Therefore, the ideas of rural inhabitants on environmental issues should be taken into consideration when deciding agro-environmental policies (Ifenkwe and Izuogu, 2015)

OBJECTIVES OF THE STUDY

The broad objective of the study was to evaluate environmental hazard effects as a critical issue relating to agricultural production of rural households in Imo State, Nigeria. Specifically, the study described the socio-economic characteristics of the respondents analysed for difference in the effects of environmental hazard on health conditions and agricultural production

METHODOLOGY

This study was carried out in Imo State. Imo state has a population of 3,934,899. With a total area of 5,530km^2, the State has a population density of 710 persons per square kilometre (National Population Commission (NPC), 2007) and the population is predominantly rural.

The population for this study comprised of all rural households in Imo State. The sampling frame comprised of rural households in some selected rural communities within the three agricultural zones of the state. A multistage sampling procedure involving purposive and random sampling techniques were used for the study. A sample size of 116 respondents selected from across the three (3) geo-political zones of the state was used for the study.

CONCEPTUAL FRAMEWORK

In conceptual framework, a researcher articulates the nature of relationship which exists between the dependent (response) and the independent (explanatory) variables of the study (Ogolo, 1996). These relationships are often represented diagrammatically.

To examine the impact of environment on health and agricultural productivity, this paper adapts the conceptual framework used by Izuogu C.U et *al.;* (2015).

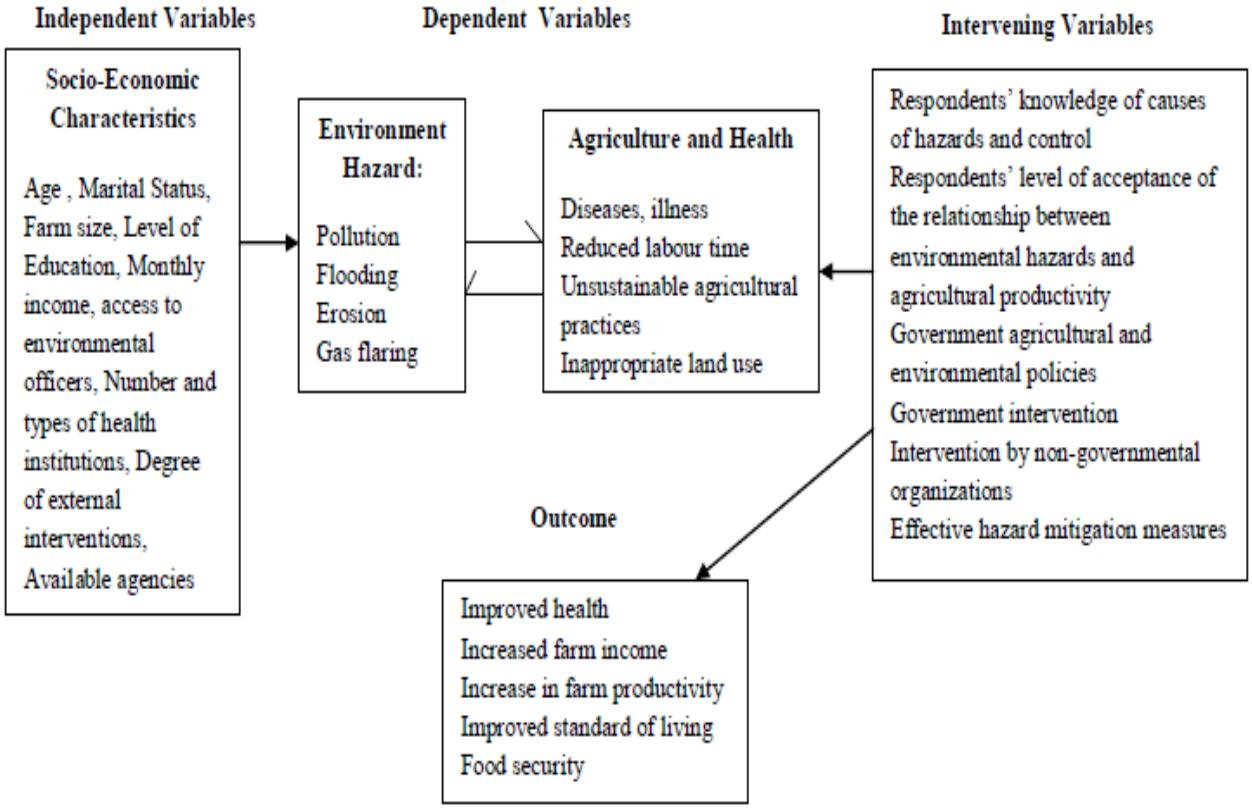

Figure 1. Conceptual framework for Assessment of Environmental Hazard effect on Agricultural Resources and Health Conditions of Rural Households in Imo State, Nigeria by Izuogu, C.U

The interactions between environment and agriculture are bidirectional: environment affects agriculture and agriculture affects the environment. In both cases there are negative or positive effects that contribute to good or bad outcomes. Agriculture is essential for good environment management through the production of tree crop, and other raw materials for shelter and medicine. Farming has contributed over the centuries to creating and maintaining a unique rural area. Yet, the target of Nigeria in achieving a degree of food sufficiency is still far from been reached. This no doubt, could be traced to the widespread use of traditional farming methods and implements. Other major problems that has contributed to this include, the absence of storage facilities, insufficient rural infrastructure development, low level of farm mechanization among others. Also, regions where agriculture is the major source of employment have the higher incidence of poverty. One of the suggested ways of reducing poverty is utilizing of the poor factor endowment for improved income earnings and in living standards (Izuogu and Ekumankama, 2015). Agricultural land management has been a positive force for the development of the rich variety of landscapes and habitats, including a mosaic of woodlands, wetlands, and extensive tracts of rural areas (Microsoft, 2012) The ecological integrity and the scenic value of landscapes make rural areas attractive for the establishment of enterprises, for places to live, and for the tourist and recreation businesses (EEC, 2012). However, agriculture also contributes to major environmental problems. Unsustainable agricultural and aquaculture practices present the greatest immediate threat to species and ecosystems around the world (EEC, 2012). Inappropriate agricultural practices and land use can also have an adverse impact on natural resources, like pollution of soil, water and air, fragmentation of habitats and loss of wildlife.

There are direct and indirect costs of hazard on agricultural productivity as follows:

1. Environmental hazards results in reduction in size of cultivable land leading to low productivity.
2. It may also result in illness and sometimes mortality, loss of labour, loss of time allocated to agricultural activities. The sick may stay back from farm activities and the farm resorts to hired labour which was paid for invariably increasing cost of production.
3. A productive member may be absent from farm to take care of the sick member of the household
4. Loss of asset when costs of controlling hazards or seeking for alternatives drive many to extra spending. They may resort to selling tools, draught animals and land to reduce debts. (Slater and Wiggins, 2005) These are indirect costs.

Direct cost may include money spent in reclaiming lost land, buying drugs for treatment. The extent environmental hazard will affect the farmers would depend on

1. The socio-economic characteristics of the farmer
2. Number and types of health institutions for environmental management
3. The degree of external intervention from governmental and non-governmental organizations
4. Availability of agencies to monitor and control environmental hazards

For the intervening variables, the following was included:

1. Farmers knowledge of causes of environmental hazards and control measures
2. Farmers attitude towards existing environmental hazard control methods
3. Farmers level of acceptance between the relationship between environmental hazard and agricultural practices
4. Effectiveness of hazard mitigation measures
5. Government agricultural and environmental policies.

In the long term, the impact of these was disease prevalence, reduction in the farm productivity; reduction in farm income which will lead to food insecurity and reduction in income from wage labour.

DATA COLLECTION AND ANALYSIS

Data were generated from both primary and secondary sources. The primary data were collected with questionnaire, and interview schedule administered on the 120 respondents. Field observation was also employed. Secondary data were obtained from literature in form of textbooks, journal, annual reviews, internet, and electronic libraries. Data were analysed using descriptive and inferential statistics such as frequency distribution, percentage, mean, analysis of variance and regression.

RESULTS AND DISCUSSION

1. Socio-economic characteristics of respondents

Socio-economic characteristics are expected to affect the perceived effect of environmental hazard on the respondents. This is because these variables play major roles in enhancing the level of awareness, agricultural production and health conditions of respondents, as well as the functional analysis employed. The socio-economic variables considered in this study include: age, sex, marital status, household size, level of education and income.

Data presented in Table 4.1 show that 51.73% of the respondents were males and 48.27% females. These results are dissimilar to those of Okonkwo *et al* (2010) who in a previous study opined that there are more females in the rural areas. This indicates that majority of the respondents were males. It, therefore, implies that there are more male heads of households than their female counterparts in the study area. Agricultural production is usually a family affair involving father, mother and children.

Entries in Table 4.1 also reveal that about 27.58% of the respondents were between the ages of 36 to 45years and 1.74 % were between 15-25 years respectively. The mean age of the rural farmers was 46 years. It can be seen from the study that a predominant number of the farmers are middle aged. This is wholesome for agricultural development as most of them will be receptive and venturesome to adopting new technologies.

Table 4.1: Socio economic characteristics of respondents

Variables	Frequency	Percentage
Sex		
Male	60	51.73
Female	56	48.27
Total	116	100.00
Age		
15-25	2	1.74
26-35	19	16.38
36-45	32	27.58
46-55	28	24.13
56-65	30	25.86
65-Above	5	4.31
Total	116	100.00
Marital Status		
Single	17	14.65
Married	87	75.00
Divorced	4	3.46
Widowed	8	6.89
Total	116	100.00
Household Size		
1-5	54	46.55
6-10	48	41.37
11-15	10	8.64
16-20	4	3.44
Total	116	100.00
Years of Formal Education		
0	50	43.11
1-6	29	25.00
7-12	29	25.00
13 and Above	8	6.89
Total	116	100.00
Monthly income		
Less than 4500	16	13.79
4501-9000	5	4.31
9001-18000	10	8.64
18001-22500	61	52.58
22501-26000	18	15.51
Above 26501	6	5.17
Total	116	100.00
Membership of Co-operative		
Yes	79	68.10
No	37	31.90
Total	116	100.00

Source: Field Survey, 2013

The middle aged farmers are usually more productive than the older ones and their high number will lead to increased productivity. Okwoche and Obinne (2010) has in a previous study shown majority of the rural dwellers as being within 36 to 45 years, while Bategeka and Okurut (2005) described this age as the 'working age' and that when the head of household is of the working age, there is likelihood of moving out of poverty and becoming financially independent.

The result also reveals that 75% of the respondents were married. 14.65% were single, 16.89% were widowed and 3.46% were divorced. The low percentage of divorce is attributed to the fact that though Nigeria has adopted more liberal divorce laws in the last two decades, many households in Imo State still value the sanctity of marriage.

The issue of family size generally is important in every aspect of farming production. This is because it affects the labour force, as well as per capita output (Olawoye, 2010). From the result, 87.92% (majority) of the respondents had a household size of below 10 persons while 12.08% of the respondents had a household size of above 10 persons. The mean household size is 6 persons. Rural inhabitants of Imo State, Nigeria maintain a relatively sizeable household which could serve as insurance against shortfalls in labour supply (Obi-Ifeanyi and Njoku, 2014).

The result also depicts that 68.11% (majority) of the respondents spent below 6 years in school while 31.89% spent above 6 years in school. The mean number of years spent schooling by the respondents was 6 years. This implies that

most of the respondents finished primary school. The increase in formal education attainment could be attributed to the Federal Government Universal Basic Education programme in the state which has prompted many households to seek formal education, as well as the on-going adult education programme. The moderate level of literacy is an asset in agricultural development especially for extension services. This implies that farmers will be fast to adopt new technologies given to them to prevent the occurrence of natural disasters. According to the extension guide on Strategies against Risk and Uncertainty, education is a vital strategy against uncertainty in farming. The farmers will have analytical minds; they will also be fast in seeing the advantages of various technologies, always seek up-date information about production technologies and will able to read extension journals and newsletters for more information (David, 2008). Imbur, *et al* (2008) also noted that the literacy level of the farmers is a very important variable as it influences the ability to properly comprehend new techniques and methods required to bring positive changes in knowledge, attitudes, skills and aspirations of the farmers.

Entries in the Table also reveal that 64.8% of the respondents earned above N18, 000 per month, while 35.2% of the respondents earned below N18, 000 per month. Income generally is low from agricultural production as a result of low capital input into production, low level of education, low price level of farm produce, and poor accessibility to credit facilities among others.(Olawepo, 2010).The mean monthly income of the respondents was ₦19, 500. Obi-Ifeanyi and Njoku (2014) had in a similar study identified the mean monthly income of rural dwellers in South-Eastern Nigeria to be ₦21, 000. From the result, one could say that the rural dwellers of this zone are still struggling to have the basic necessity of life since they live on barely five dollars per day.

2. Test of difference between the perceived effect of environmental hazard

Result on Table 4.9 shows that there is a significant difference between the effect of hazard on health and on agricultural resources at P>0.05

3. ANOVA on test of difference between the perceived effect of environmental hazard on Agricultural Resources and Health Condition

	Sum of Squares	df	Mean Square	F	Sig.
Environmental Hazard	.370	1	.370	9.757	.002*
Error	8.539	225	.038		
Total	8.909	226			

Source: Field Survey, 2013

* 0.05 Level of significance.

4.10 MEANS OF PERCEIVED EFFECTS OF HAZARD

The result from the means of the perceived effect of environmental hazard on health conditions and agricultural resources shows that the mean of the perceived effect on agricultural resources was 1.954 while the mean of the perceived effect on health conditions was 1.035. This implies that the perceived effect is significantly lower in health conditions when compared to agricultural resources.

Abegunde *et al* (2011) in a previous research finding reported that soil erosion in the South-eastern part of Nigeria has been identified as the most threatening environmental hazard in the country. Also, Omofonmwan and Odia (2009) stated that crude oil exploration activities had adverse environmental effects on soils, forest and water bodies in the host communities in the Niger-Delta.

Table 3. Table of Means for effects of environmental hazard on health conditions and agricultural resources

	Means
Health Conditions	1.035
Agricultural Resources	1.954

Source: Field Survey, 2013

CONCLUSION

An accurate and timely prediction of a hazardous event can save human lives but does little to reduce economic losses or social disruption; that can only be accomplished by measures taken longer in advance. Included in the concept of disaster mitigation is the basic assumption that the impact of disasters can be avoided or reduced when they have been anticipated during development planning. Mitigation of disasters usually entails reducing the vulnerability of the elements at risk, modifying the hazard-proneness of the site, or changing its function

The findings of this research show that environmental hazard exists in the rural areas of Imo State. These hazards affect the farm household who constitute the majority of the rural dwellers. It is therefore recommended that studies that assess hazards which provide information on the probable location and severity of dangerous natural phenomena and the likelihood of their occurring within a specific time period be encouraged. Also, Vulnerability studies estimate the degree of loss or damage that would result from the occurrence of a natural phenomenon of given severity should carried out as the need arises.

REFERENCE

Abdullahi A.A and Amzat Jimoh (2011): Knowledge of hypertension among the staff of University of Ibadan. *European Journal of Social Sciences – Volume 22,Number 2*

Bategeka L., and Okurut N., (2005): Universal Primary Education: Uganda. Policy Brief 10.London: Overseas Development Institute.

David K. (2008): Farm Management Extension Guide. Managing Risk in Farming:Food and Agriculture Organization of the United Nations. Rome

Home and Property.(2006). World's Big Polluters to Fund Clear Energy Projects.The Guardian, Lagos, 22 (No. 9915). P.29

Ifenkwe, G. E. and Izuogu, C. U. (2015). Rural Household's Perception of Environmental Hazards in Imo State, Nigeria. *International Journal of Applied Research and Technology. 4(6):* 32 – 38.

Imbur, E. N., Agwu, A. E. and Akinnagbe, O. M. (2008): Adoption of citrus production technologies among farmers in Katsina-ala Local Government Area of Benue State, Nigeria. *Journal of Agricultural Extension*, Vol. 11, pp. 14

Izuogu C.U, Atasie Chikerenma and Ifenkwe G.E (2015): Perceived Effects of Environmental Hazard on Health Conditions of Rural Farm Households in Imo State, Nigeria. *International Journal Of Advanced Research in Engineering & Management (IJAREM).* Vol. 01 Issue 04 July 2015, 26.

Izuogu C.U and Ekumankama O.O (2015): Assessment of Rural Infrastructures and Productive Assets Provided by Fadama 11 Development Project in Okigwe Agricultural Zone of Imo State, Nigeria. *International Journal of Academic Research in Business and Social Sciences June 2015, Vol. 5, No. 6 ISSN: 2222-6990.*

New Age International (2005).Introduction to Environmental Pollution.3rd edition. New Delhi. www.newagepublishers.com/servlet/nagetbiblio

Obi- Ifeanyi, C.C and Njoku, E.C (2014): Socio-Economic Factors Affecting Choice of Livelihood Activities Among Rural Dwellers In Southeast Nigeria. IOSR *Journal of Agriculture and Veterinary Science* (IOSR-JAVS) e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 7, Issue 4 Ver. I (Apr. 2014), PP 52-56 www.iosrjournals.org

Odom U, Oguejiofor N,Anunonwu C,Nnadozie J,Amadi A, and Nwankwo B,(2009).Evaluation of Environmental Sanitation in Owerri Municipal Council of Imo State. *Research journal of medical sciences.* Vol. 3.Issue 4. Pg 137-140

Ogolo, M.B (1996): Student Guide to Writing research and Project Proposals. Port Harcourt City Cycle Press.

Okonkwo, E.C Emehute, V.C and Nwosu A.C (2010): The Okada phenomenon: effect on agricultural and rural development. Proceeding of the 44th Annual conference of Agricultural society of Nigeria pp. 278-279

Okwoche V. A. and Obinne C.P.O (2010): Comparative Analysis of Socio-economic Characteristic of Rural Women Co-operators in Nigeria: Evidence from Benue State. J Hum Ecol, 32(2): 119-125 (2010)

Okyere, K. Asante, F. Tarekegen. J, Andam, K. (2009): The Linkages between 1Agriculture and Malaria: Issues for Policy, research and Capacity Strengthening: IFRN Discussion Paper 00861

Olawepo R.A (2010) : Determining Rural Farmers' Income: A Rural Nigeria Experience. *Journal of African Studies and Development* Vol. 2 (2) pp. 015-026. Available online http://www.academicjournlas.org/JASD. Retrieved 0n 2/12/2014

Olawoye J.A (2010): Assessing the effect of Agbara industrial estate on agricultural production of rural dwellers in Ogun state. *International Journal for Agricultural Production*. Vol. 6 (2)

Omofonmwan and Odia (2009): Oil Exploitation and Conflict in the Niger-Delta Region of Nigeria. *Kamla-Raj. J Hum Ecol, 26(1): 25-30 (2009)*

UNESCO (1992): Report of the United Nations Conference on Environment and Development (UNCED) Rio de Janeiro, 3-14 June. http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm

Slater, R. and Wiggins, S. (2005). Responding to HIV/AIDS in Agriculture and Related Articles.National Resource perspective 98. Overseas Development Institute

Zanoli, R. Ganbelli, D. Vitulano, S. (2007). Conceptual Framework on the Assessment of the Impact of Organic Agriculture on the economy of developing countries.Mache, Ancona-Italy.