

# Environmental health hazards and rural community development in Abia State of Nigeria

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## ABSTRACT

The study assessed the influence of environmental hazards on the development of rural communities in Abia State. Three research questions and two hypotheses guided the study. The population of the study was 1,772 executive members of 175 Community Development Associations from where a sample of five hundred and nine executive members from 70 Community Development Associations was drawn. Self-structured questionnaire was the instrument used for data collection. It was face validated by two experts in Educational Administration and Educational Measurement/Evaluation from Abia State University, Uturu. The reliability of the instrument was tested on 25 executive members of Ayamele and Ifite-Ogwari Community Development Associations, both are Local Government Areas in Anambra State. Reliability coefficient of 0.88 was obtained using Cronbach Alpha estimate. The data were analyzed by computing and comparing the mean scores and standard deviation. Also, the null hypotheses were tested using t-test statistics. The findings of the study revealed the influence of deforestation, agricultural development and industries and technology on the environment. The study therefore recommended among others that Abia State Government should organize seminars, workshop and conferences for Community Development Associations executive members and other community leaders on the issues concerning environmental protection.

**Keywords:** Environment; Health hazards; Rural community; development; Nigeria

## 1. INTRODUCTION

Environment is the surroundings of human beings; a place that they live and work comfortably. It is one of the key determinants of optimal health or well-being of individuals. Environment is the inclusion of the living and non-living things that one has to interact with and which can influence one's state of health. Therefore, land, sea, plants, animals (including man) and other creatures, both living and non-living things that one has to interact with and which can influence one's state of health. Therefore, land, sea, plants, animals (including man) and other creatures, both living and non-living things around us constitute our environment.

The environment is an all-embracing concept that is made up of physical, biological and social components. The physical components include the air, housing, weather, water, refuse, sewage, soil, etc.

Other physical factors of the environment include chemicals, heat, noise from automobiles and industrial engines, and light. The biological components include plants, pests and animals. while the social components consist of human organizations, cultures,

customs and human interaction. According to Nwana (2001), the environment, be it ecological or socio-economic, is crucial for life and survival, and by implication, health. Thus, the direct influence and role of the ecological agents of disease are concrete. However, the influence of the socio-economic environment is more subtle. The history of mankind reveals that health and survival are intrinsically dependent upon the relationship with the environmental factors so that they do not constitute hazard to health.

Mitchell (2009) reported that the earth's natural resources are interdependent and balanced. However, through human activities, this balance and harmony tend to be upset. Population explosion, lack of concern for the environment, urbanization, poor land use and management, municipal and industrial wastes etc, have resulted in overgrazing, over-fishing, over-hunting, deforestation, bad agricultural practice, all of which have combined to deplete the earth's resources, degrade the environment and cause loss of biodiversity.

In all these, the rural communities are the most hit. In Nigeria, Ayichi (2005) noted that about two-third of the population still live in an estimated 97,000 rural communities. Also, UNICEF (1990) postulated that the lives of the inhabitants of the rural communities are characterized by poverty, misery, morbidity and underdevelopment. As such, they are prone to the factors that pose serious threat to the environmental health of the people. The factors include:

- Deforestation
- Agricultural activities
- Industry and technology

Deforestation means the abysmal removal of trees in the forests. The forests are the "lungs of the planet". In all, the forest renews two-third of the oxygen on earth, grasslands and savanna and cultivated land. The forest trees form part of the protective umbrella of the environment. Among others, the need for forest trees includes the improvement of soil fertility, reduction of soil erosion and prevention of desert encroachment. It is very devastating that the Nigerian population has ignored what trees and their uses are.

According to Kulkani (2011), the total area of forests in the world is about 4, 700 million hectares (about 32 percent of the total land area), but the consequences of deforestation are becoming more and more serious. This is because the world forests are disappearing at the rate of 15 million hectares each year. Most of these losses occur in the humid parts of Africa, Asia and Latin America. Modebelu (2012) stated that deforestation has the following effects on the environment:

1. It causes a loss in biological diversity, which is important for the functioning of nature and its cycle.
2. The improvement of cultivation of plants and animal species, the development of new medicines and the study of the diversity of biological life cycles comes to an irrevocable end when there are no longer sufficient natural forest areas.
3. It leads to global warming through the green-house effect. It is one of the functions of the trees (green plants) to trap the atmospheric Carbon(IV) Oxide during photosynthesis. As a result, the green-house has only the presence of small amount of Carbon(IV) Oxide, Methane (CH<sub>4</sub>) and other green-house gases in the atmosphere. These gases are responsible for the warming of the atmosphere while oxygen causes cooling of the a atmosphere. Therefore, due to the absence of forests,

the gases in the green-house increase in about 50 percent resulting from the burning of coal, firing of the cannon, oil and natural gases from the release of Chlorofluoro Carbons (CFCs) gases used in refrigerators and in the manufacturing of foams and plastics. These would lead to major changes in the climatic pattern of different regions as solar radiation from the soil is severely reduced.

4. It also leads to the destruction of the Ozone layer. Chlorofluoro Carbons (CFCI) are part of green-house gases that have been identified as the major culprit in the depletion of the Ozone layer which protects the earth from the direct effects of the sun rays. The Ozone layer has large quantity of oxygen therein, but through deforestation, the quantity of oxygen released to the atmosphere is highly reduced. It results in the accumulation of more direct and severe scouring of the sun-rays.
5. Absence of forests leads to desert encroachment, a phenomenon known as desertification. This in turn, increases the rate of drought.
6. It leads to a rapid increase in earth's erosion through the action of both water and wind.
7. It leads to the accelerated increase in the disappearance of wild-life which man uses for game.

On the influence of agricultural activities on the environment, Neel and Neel (2008) noted that as there is continual increase in the population of people, there is also need for a rapid increase or improvement in the rate of food production. Consequently, there is an urge to mechanize farming and the same soil is cultivated or grazed year after year. This results in the over-use of the limited land. There is depletion of soil nutrients and decrease of its life-supporting abilities. Therefore, man in his usual effort to combat the problem he had created on the environment, resorts to the use of fertilizers, pesticides, herbicides, bactericides, fungicides, virucides, etc.

This system, however, compounds man's problem on the environment because most of these chemicals are toxic. Some of them contain Mercury, Arsenic, Lead, Aldrin, Dieldrin, Chlorinated Hydrocarbons and D.D.T. These chemicals are extremely difficult to breakdown as they are non-degradable. They therefore remain in the soil posing danger to the biotic factors of the environment.

Kukani (2011) stated that the agricultural wastes and chemicals washed from crops and soil find their ways into springs, streams, rivers and oceans. These chemicals cause not only death to aquatic organisms such as fish, they also cause harm to terrestrial animals including man. Also, O'Brien (1985) noted that pesticides are capable of causing cancer and liver damage in human beings. In a related development, Stewart (1986) emphasized that the continuous use of the soil for cultivation has led to the destruction of the structure of the soil as the binding force of the soil is no longer present. The soil, in turn, is left bare and exposed to the dangers of soil erosion through the action of water or wind. Also, during grazing, not only that the animals remove the grasses that protect the soils, but they drop their dung that emit bad odour, and cause the air in the environment to be polluted.

On the influence of industry and technology on the environment, Ayichi (2005) stated that industrial and technological development which leads to more use of machine to do factory work has resulted to pollution. According to him, pollution is the presence of impurities in an environment to such an extent or concentration that the environment can no longer support life. Many of the pollutions are harmful to man and other living and non-living matter on which the balance of the environment depends. Therefore, the industrial and

technological influences are categorized into air, water and land pollution.

The major sources of air pollution come from automobiles, factory chimneys and cigarettes (tobacco), etc. They lead to atmospheric fouling. Each gallon of petroleum consumed produces about three pounds of Carbon (IV) Oxide which are discharged into the atmosphere. Some of these gases are dissolved by rain droplets and fall as acid-rain which is harmful to plant and animal life. Hydrocarbons produced from incomplete combustion of petrol and engine oil and cigarette smoke (e.g. Benzopyrene) are cancer-causing agents. Nuclear fall-out also formed from atomic tests also cause air pollution. The radio-active substances are carried by rain and absorbed by plants which may be taken up by animals and man.

The general effects of air pollution on man include: headache, mental dullness, dizziness, weakness, nausea, vomiting, loss of muscular control, increased or decreased respiratory pulses, collapse, unconsciousness, often times, death (Neel & Neel, 2008). The major sources of water pollution are natural contaminants and discharges from forests and grassland as well as chemical wastes from industries that are discharged into streams and rivers. Some of these wastes such as cyanides, compounds of Mercury, acids, alkalis, salts, etc., are toxic and harmful to aquatic organisms and human. Also, oil fouls up the beaches, water and all the living things. It should be noted that these polluted water are the major sources of water supply.

The contaminated water can cause enteric diseases such as typhoid, guinea worm, cholera. Also, the major sources of land pollution include plastics, metal and glass containers, food wrapping, worn-out machinery, old furniture, garbage, etc. Taieba (2010) stated that most of the land pollutants are from industrial solid wastes. They include paper, packaging materials, solvents, resins, paints and sludge, glass, ceramics, rubber, leather, etc. They have a wide range of environmental toxicity. All these hazardous wastes have dominated environmental issues because of their potential to cause toxic effects on the human health and the environment.

The discussion so far has shown different factors contributing to the ugly situation of environmental hazards. The environmental health impacts of the hazards are disturbing (Waste Management Association of Nigeria, 2010). The Nigerian governments – local, state and federal having been making efforts to improve the situation. Therefore, there is need to incorporate the informal structure created by the society into waste management and environmental education. These include community-based institutions, association and organizations. The problem of this study is therefore to assess the influence of environmental health hazards on the development of the rural communities in Enugu State in terms of deforestation, agricultural activities, and industry and technology as perceived by members of Community Development Associations in Enugu State.

Specifically, the objectives of the study include:

1. to find out the extent to which deforestation influence the development of rural communities in Abia State.
2. to ascertain the extent to which agricultural activities influence the development of rural communities in Abia State.
3. to identify the extent to which industries and technology influence the development of rural communities in Abia State.

## 2. RESEARCH QUESTIONS / HYPOTHESES

The following research questions guide the study:

1. To what extent has deforestation influence the development of rural communities in Enugu State?
2. To what extent has agricultural activities influenced the development of rural communities in Enugu State?
3. To what extent have industries and technology influenced the development of rural communities in Enugu State.

The following null hypotheses were tested at 0.05 level of significance:

**HO<sub>1</sub>:** There is no significant difference ( $p < 0.05$ ) between the mean ratings of male and female executive members of community development associations on the extent to which deforestation has influenced the development of rural communities in Abia State.

## 3. METHODOLOGY

The researchers employed survey research design to provide descriptive investigation on the assessment of the influence of environmental health hazards on the development of rural communities in Abia State. The research work covered all the communities in the seventeen (28) local government areas of Abia State. The population of the study was one thousand, seven hundred and seventy-two (1,772) executives of registered community development associations in the 17 local government area of Abia State. Their characteristics vary in terms of age, sex, occupation, marital status and educational qualifications. The researchers used five hundred and nine (509) executives of community development associations as sample.

The sample was drawn by employing simple random sampling technique. Accordingly, 40 percent of the population was sample. The instrument used for data collection was a 4-point structured AHEHA questionnaire which was designed and constructed by the researchers. The instrument was face and content validated by two experts in Educational Administration and Measurement/Evaluation.

The reliability was determined by administering 25 copies the questionnaire to twenty-five (25) executive members of community development associations in Ayamele and Ifite-Ogwari Communities, both in Anambra Local Government Area of Anambra State. The communities have similar characteristics with the study area in terms of historical and cultural backgrounds. The reliability co-efficient value of 0.88 was obtained with Cronbach Alpha technique.

The researchers administered 509 copies of the questionnaire to the 509 executive members of the community development association executives with the assistance of 28 trained research assistants. At the end, only four hundred and twenty-five (504) copies of the questionnaires were returned. It gave a percentage rate of return of 99.02 percent. The collated data were analyzed using mean and standard deviation for the three research questions. The cut-off mean is 2.50. Also the one null hypothesis was tested using t-test statistic tool at 0.05 significant level.

#### 4. RESULTS

Data on Table 1 above indicates the extent to which deforestation has influenced the development of rural communities in Abia State. It shows that deforestation, to a great extent, causes lot of plants and animal species, irregular changes in climatic patterns, and direct and severe scourging of the sun-rays, desert encroachment or desertification, and exposure of soil to erosion. It was reflected in the respective mean scores of the respondents (3.00, 2.57, 2.65, 2.86, 2.75 and 2.76). The grand mean of 2.76 shows that the respondents perceived that deforestation influenced the development of rural communities to a great extent.

**Table 1.** The extent to which deforestation influenced the development of rural community.

S/NO	Influence of Deforestation	T.S	$\bar{X}$	S.D	Decision
1	It leads to loss of plants and animals species.	1277	3.00	0.91	High
2	It leads to irregular changes in climatic patterns.	1094	2.57	1.01	High
3	It causes direct and severe scourging of the sun-rays	1128	2.65	1.10	High
4	It leads to desert encroachment or desertification.	1197	2.85	0.94	High
5	It exposes the soil to both water and wind erosion.	1170	2.75	0.97	High
Grand mean			2.76		High

**Table 2.** The extent to which agricultural activities influenced the development of rural communities.

S/NO	Influence of Agricultural Activities	T.S	$\bar{X}$	S.D	Decision
1	Chemicals used as fertilizers are toxic and poisonous to both plants and animals.	1069	2.51	1.05	High
2	Pesticides can cause cancer and liver damage.	1076	2.53	1.00	High
3	Continuous use of the land for cultivation destroys the soil structure.	1212	2.85	0.92	High
4	The soil is exposed to agents of erosion	1174	2.76	1.10	High
5	Animal droppings cause environmental pollution.	1000	2.35	1.16	High
Grand mean			2.60		High

Data on Table 2 above reveals the extent to which agricultural activities have influenced the development of rural communities in Abia State. From the data, the respondents agreed that fertilizers are toxic and poisonous to plants and animals.

They scored 2.51 as the mean. Others are that pesticides cause cancer and liver damage (2.53); continuous use of land or cultivation destroys the soil structure (2.85).

Soil is exposed to erosion agents (2.76) and animal dropping cause environmental pollution (2.35). However, the grand mean of 2.60 shows that agricultural activities influenced the development of rural communities to an extent.

**Table 3.** The extent to which industries and technology influenced the development of rural communities.

S/NO	Influence of Industries and Technology	T.S	$\bar{X}$	S.D	Decision
1	Vehicles, factory chimneys and cigarettes cause air pollution	1182	2.78	0.92	High
2	Gases discharged into the atmosphere can form acid-rain which is harmful to plants and animals.	1160	2.73	0.94	High
3	Hydrocarbon from vehicles and cigarettes can cause cancer.	808	1.90	0.99	High
4	Some wastes discharged into streams and rivers are toxic and harmful to sea animals and man.	1244	2.93	1.03	High
5	Contaminated water causes enteritic diseases such as typhoid, cholera, etc.	1444	3.39	1.10	High
6	Land pollutants such as garbage, food wrappings, plastics, metal and glass containers, and wornout machinery cause environment toxicity.	1569	3.69	0.96	High
Grand mean			2.90		High

Data on Table 3 above shows the extent to which industries and technology have influenced the development of rural communities in Abia State. The respondents who agreed that vehicles, factory chimneys and cigarettes cause air pollution has a mean score of 2.78.

Others are gases discharged into the atmosphere form acid-rain (2.73), Hydrocarbons from vehicles and cigarettes cause cancer (1.90), wastes discharged into water are toxic and harmful to sea animals and man (2.93), contaminated water causes enteritic disease (3.39) and land pollutants cause environmental toxicity (3.69). However, the grand mean of 2.90 is indicative that respondents perceived that industries and technology influenced the development of rural communities to a great extent.

**HO<sub>1</sub>:** There is no significant difference ( $p < 0.05$ ) between the mean ratings of male and female executive members of community development associations on the extent to which deforestation has influenced the development of rural communities in Abia State.

**Table 4.** t-test of difference between the mean ratings of male and female community development association executive members on the influence of deforestation.

Sex Variables	N	$\bar{X}$	SD	df	Level of significance	t. Cal	t. Critical	Decision
Male	228	2.98	0.98	423	0.05	0.946	1.960	Not Rejected
Female	197	2.54	1.03					

Data on Table 4 above shows that the t-calculated value of 0.946 is less than the t-critical value of 1.960 at 0.05 level of significance, and at the degree of freedom of 423. This means that the null hypothesis is not rejected showing that there is no significant difference between the mean ratings of the male and female executive members of community development associations on the extent to which deforestation has influenced the development of rural communities in Abia State.

## 5. DISCUSSION

The findings of the study revealed that the respondents accepted that deforestation has great influence on the development of rural communities in Abia State. It is manifested in the great loss of plants and animal species, desert encroachment or desertification, exposure of soil to both water and wind erosion, direct and severe scouring of the sun-rays on the land and irregular changes in climatic patterns. The findings are in line with the assertion of Nwana (2001) that deforestation causes a loss in biological diversity. According to him, biological diversity is important for the proper functioning of nature and its cycle. According to United Nations' Environmental protection (UNEP) (1992), conference was held at Rio de Janeiro, Brazil in 1992 with the theme Earth Summit. The conference centered on the world's biodiversity, environment and sustainable development. Consequently, 5<sup>th</sup> June of every year was declared as World Environmental Day while 16<sup>th</sup> September is regarded as International Day of Preservation of the Ozone layer.

On the extent to which agricultural activities influence the development of rural communities in Abia State, the findings showed that the respondents accepted that agricultural activities has great influence on the environment as a result of agricultural development. The activities are made manifest on the continuous use of land for cultivation leading to the destruction of soil structure, exposure of soil to agents of erosion, use of pesticides which cause cancer and liver damage, and use of fertilizers which are toxic and poisonous to plants and animals. In support of the findings, Kukani (2011) asserted that pesticides can remain for a long time on the environment. Some can accumulate over the years on earth and at the bottom of water.

Later, they are absorbed by plants or released by organisms on earth and thus, contribute to a continuous poisoning of the environment. Also Modebelu (2012) affirmed that practically, every agricultural practice or activity employed by the farmer to increase his produce has its negative effect on the environment. According to him, the continuous use of the soil for cultivation has led to the destruction of the structure of the soil as the binding force of the soil is no longer present. The soil in turn, is left bare and exposed to the dangers of soil

erosion through the action of water or wind. However, the respondents did not find animal droppings as major threat to the environment.

Furthermore, the findings of the study indicated that industries and technology influence the development of rural communities in Abia State. They cause environmental toxicity through land pollutants, enteric diseases through contaminated water, destruction of sea animals through wastes discharged into streams and rivers, air pollution through vehicles, factory chimneys and cigarettes, and acid-rains through gases discharged into the atmosphere. On these, Miller (1984) identified automobiles (vehicles), factory chimneys and cigarettes as the major sources of air pollution. According to him, they lead to atmospheric fouling while Hydrocarbons are capable of causing cancer in animals and man even though the respondents did not accept that it threatens the environment. Also, Ayichu (2005) noted that most of the land pollutants are from industrial solid wastes. They are packaging materials, papers, solvents, resins, paints and sludge, glass, ceramics, rubber, leather, etc. They have a wide range of environmental toxicity.

Finally, the test of hypothesis on table 4 revealed that there was no significant difference in the mean ratings of male and female executive members of community development associations in Abia State on the extent to which deforestation influenced the development of rural communities. The result of the findings shows that both sexes accepted that deforestation influenced greatly the development of rural communities through loss in plants and animal species, desert encroachment or desertification, exposure of soil to both water and wind erosion, direct and severe scourging of the sun-rays on the land and irregular changes in climatic patterns.

## 6. CONCLUSION

This study assessed the extent to which environmental health hazards influenced the development of rural communities in Abia State. It was discovered that the influence of environmental hazards are very devastating to the environment. This was shown clearly on the influences of deforestation, agricultural activities, and industries and technology on the environment. The study showed that there cannot be any sustainable community development with the high rate of biodiversity losses, global warming, depletion of the Ozone layer, desert encroachment, soil erosion menace, destruction of soil structure, toxicity of plants and animals resulting from use of fertilizers and pesticides; and incessant air, water and land pollution. The implication therefore, is that adequate measure should be meted out to address the teething environmental problems.

### Recommendations

The following recommendations were proffered:

- Abia State Government should organize workshops, seminars and conferences on regular basis for the members of community development associations, social clubs, age grades, religious groups, town unions and community leaders. It would enlighten the people more on the issues concerning environmental protection.
- Abia State Agency for Mass literacy, Adult and Non-Formal Education (SAME) should establish community education centres in the various rural communities. It would be an avenue for facilitating the adults on the issues relating to ecological agriculture,

afforestation practice, reaction of the use of pesticides in the farms, practicing of zero tillage system and the purification of water through boiling and/or filtering processes.

- The Federal Environmental Protection Agency (FEPA), in collaboration with Abia State Waste Management Authority (ESWAMA) should install and improve the environmental sanitary systems of the rural communities so as to improve the living conditions of the rural dwellers. As such, refuse bins should be extended to the rural areas for the dumping and evacuation of wastes.
- Abia State Government should re-introduce the each-one-plant-one-tree campaign. It would go a long way arresting the problems of desertification and global warming threatening our environment. Also, alley cropping and taungya system of farming should be encouraged.
- Abia State Curriculum Development Centre (CDC) should incorporate environmental education in the curriculum of primary and post-primary institutions. It should be made separate from Health Education. Also, it should be vital issues as eco-crisis, desertification, drought and destruction of wild-life and their effects.

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