



# **Agricultural Value Chain and Environmental Degradation in Nigeria (A Case Study of Akwa Ibom State)**

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## **Abstract**

This study aimed at examining agricultural value chain and environmental degradation in Akwa Ibom State. The population of the study consist of the total population of Akwa Ibom State. With the aid of Taro Yamane formulae, a sample size of 400 were generated. 400 questionnaires were strategically distributed to two local government area from each of the three (3) senatorial districts that made up Akwa Ibom State. The research questions of the study were analyzed using statistical tools of mean and standard deviation in Statistical Package for Social Sciences (SPSS) with a mean criterion of 3.0. The findings review that the impact of agricultural value chain on environmental degradation in Akwa Ibom State are: changes in climate, destruction of forest reserve, ecosystem, soil nutrient, pollution of waters, and finally destruction of inter communal road. The study concluded that agricultural value chain are the means by which citizens get the food they consumed and also industries get their raw materials from agriculture, if there is effective public policy design to reduce the problems of bad agricultural value chain system, sustainable agricultural development and environment free from degradation can be achieve in Akwa Ibom State.

## **Introduction**

Agriculture is still the main focus of national development plans of many developing countries, particularly in Nigeria. Land policies and reforms have been widely instituted in several countries in an effort to improve the performance of the agricultural sector. However, it has not always been accompanied with success. In most countries, traditional agricultural practices and low productivity still persist despite major reforms and large monetary investments to transform the sector. Where agricultural innovations have been introduced, short-term successes have often been followed by long-term problems on natural resources and the environment (Miay, 1976; Drechsel, Kunze and Vries, 2001).

Environmental degradation is the most frequently occurring and rapidly accelerating problem related to agricultural activities. In practice, most agricultural programs tend to place a heavy emphasis on increasing productivity and less attention on resource management and conservation as a result of which the social and environmental implications of increased pressure on natural resources remain overlooked until a serious degradation occurs (Makhanya, 2004). There is rising concern that much of Sub-Saharan Africa's natural resource base and ecological environment are deteriorating mainly due to high loss of vegetative cover resulting from deforestation and conversion of savannah to cropland (Bielli et al., 2001).

Perkins Marsh (1864) in his book titled *Man and Nature* "concern over human-induced soil depletion in colonial Africa, it was not until the 1960s that significant research interest was rekindled." Clearly, efforts to understand the relationship between demographic and environmental change are part of a venerable tradition.

In 1970, the Environmental Protection Agency was established in the United States to respond to what was at that time a relatively new public concern with air and water pollution. Since then growing worldwide attention has devoted to the environment.

In 1992, the United Nations Conference on Environment and Development (UNCED) focused on the major global issues including: depletion of the earth's protective ozone layer, destruction of tropical and old-growth forest and wetlands, species extinction, and the greenhouse gases causing global warming and climate change. In recent time, the United Nation Environmental Programme (UNEP) found that "environmental gains from new technology and policies are being over taking by the pace and scale of population growth and economic development". With the exception of Ozone depletion, an area in which major reduction in emission has been achieved by international agreement, UNEP report offers evidence that global environmental problems identified at UNCED in 1992 have continued to worsened. The problematic areas pointed out by UNEP are nitrogen pollution in fresh water and oceans, exposure to toxic chemicals and hazardous wastes, forest and freshwater ecosystem damage, water contamination and declining ground water supplies, urban air pollution and wastes, and over exploitation of major ocean fisheries. The global problem of food scarcity is exacerbated by the constant increase in environmental degradation as a result of man activities, with no complimenting increase in the output of agricultural produce. Over the years it has become a major focus of most governments especially Nigerian to provide enough food for her citizenry which will in-turn curb the series of social discord that could emerge if a hunger-crisis breaks out, and create an enabling atmosphere for strategic economic development by providing the working population with one of the most important physiological needs. The rapid globalization of the Agricultural markets has led to the generation of new production and distribution systems, as well as new consumption patterns. One of the objectives of modern agriculture is to reduce to the barest minimum the problems associated with agricultural loss, wastages and output underutilization by ensuring an efficient optimization of all the linkages between the producer and final consumer through the "Value-Chain" concept. The basic characteristic of a Value Chain is market-focused collaboration; different business enterprises working together to produce and market products and services effectively and efficiently by allowing businesses to respond to the marketplace through linking production, processing and marketing activities to meet market demands." Agric-food Value

Chains are designed to increase competitive advantage through collaboration in a venture that links producers, processors, marketers, food service companies, retailers and supporting groups such as shippers, research groups and suppliers. One of the central ideas of the Agricultural Value Chain concept is the differentiation of the total agro system and the specialization of each element so as to optimize the entire system. The rate of environmental degradation will determine the level of agricultural value chain a community, state and nation will experience. As the rate of environmental degradation in Akwa Ibom State continue to increase and becomes more affluent, there is increased pressure on agricultural value chains to deliver sustainable food production, distribution, and consumption that simultaneously foster human wellbeing. As a result, there is renewed interest from policymakers, development institutions, civil society organizations, and private businesses in examining the role of food and agricultural markets in promoting sustainable growth that benefits people and the planet. Agricultural value chains are undergoing profound transformations and are facing multiple environmental and social challenges. Due to increase in environmental degradation in Akwa Ibom State, it exerts increased pressure on the proper functioning of the ecosystem and natural resource stocks which in returns affect the agricultural system of the state as well as poses challenges to politics, agriculture, sustainable development, environment, food security and migration not just to the State alone but Nigeria as a whole. In the present day, research in Nigeria have confirmed the persistent increase in environmental degradation such as pollution (air, water and land), deforestation, urbanization, desertification, logging/lumbering, soil degradation, floods, oil spill etc have bring about decrease in the rate of food production, congestion, unemployment resulting to social disorder. The focus now in Akwa Ibom State is how to increase agricultural productivity and value chain with minimal attention given to resource/environmental sustainability in order to carter for her residents in the state which has led to diverse environmental degradation which has become a problem in the state. Base on this background, the research problem is what are the impact of agricultural value chain on environmental degradation in Akwa Ibom State. The researcher intends to carry out this study in other to provide solutions to the identified problem above.

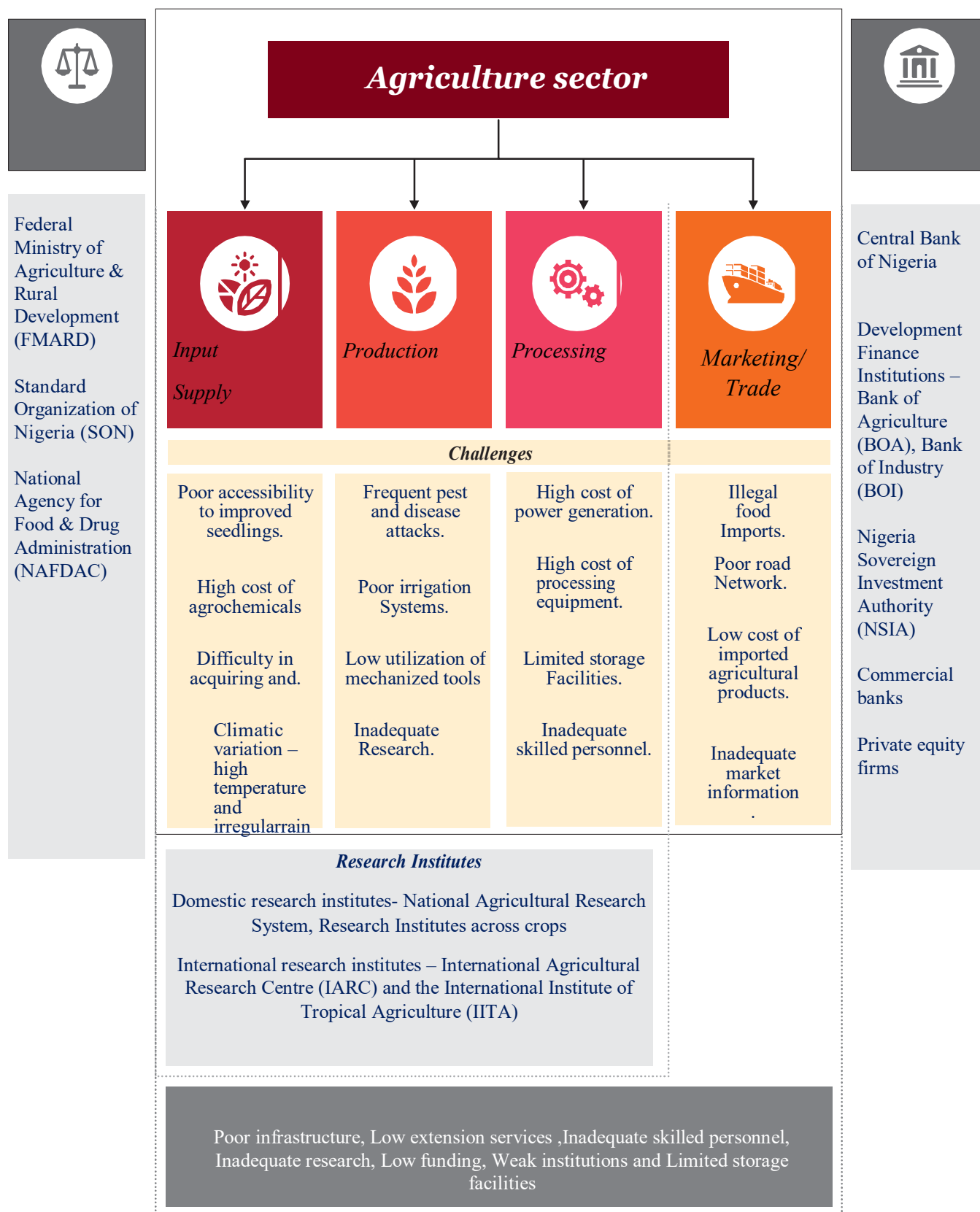
## **Conceptual Clarifications**

### **Agricultural Value Chain**

There is no commonly agreed definition of what is actually meant by agricultural value chains. Indeed, some agencies are using the term without having a workable definition or definitions and simply redefined ongoing activities as “value chain” work when the term came into vogue. Evan Tarver (2020) define value chain as the process in which business receive raw materials, add value to them through production, manufacturing, and other processes to create a finished product, and then sell the finished product to consumers. Value chain is a chain of activities by which goods and service is produced, distributed, and marketed.

Food and Agriculture Organization (FAO) of the UN, (2005) “A ‘value chain’ in agriculture identifies the set of actors and activities that bring a basic agricultural product from production in the field to final consumption, where at each stage value is added to the product.”

## A Review of Nigeria’s Agricultural value chain System



Source: PwC Analysis

## Environmental Degradation

The United Nation International strategy for Disaster reduction (UNISDR, 2001) defines environmental degradation as the reduction of the capacity of the environment to meet social ecological objectives, and needs.

Rajiv Chopra (2016) defined environmental degradation as the disintegration of the earth or deterioration of the environment through consumption of assets like, air, water and soil, the destruction of environment and the eradication of wildlife.

Jhingan (2012) noted that the causes of environmental degradation include; population growth, agricultural development, industrialization, transport development, urbanization, foreign indebtedness and market failure.

## Agricultural value chain and environmental degradation

The environmental impact of agriculture is the effect that different farming practices have on the ecosystems around them, and how those effects can be traced back to those practices. The environmental impact of agriculture varies widely based on practices employed by farmers and by the scale of practice. Farming communities that try to reduce environmental impacts through modifying their practices will adopt sustainable agriculture practices. The negative impact of agriculture is an old issue that remains a concern even as experts' design innovative means to reduce destruction and enhance eco-efficiency. Though some agricultural activities are environmental friendly while some are not.

## Impact of agricultural value chain on environmental degradation

The environmental impact of agricultural value chain which involves impacts on a variety of different factors such as: the soil, to water, the air, animal and soil variety, people, plants, and the food itself. Agriculture contributes to a number larger of environmental issues that cause environmental degradation which including:

- (i) **Climate change:** As agricultural practice/activities continue to increase; it brings about various actions that causes change in the natural environment which in return lead the climate changes.
- (ii) **Deforestation:** Due to increase in agricultural practice either subsistence or commercial farming, has led to the destruction of forest reserve resources in order to provide land for agriculture.
- (iii) **Biodiversity loss:** Increase in the activities of agricultural value chain in Akwa Ibom State right from the seedling to the final consumption stage has brought about loss of many biodiversity in the state mostly animals are hunt, the ecosystem is being jeopardize just for the success of agricultural value chain.
- (iv) **Irrigation problems:** During raining season some of the chemicals and fertilizers used in farming are being washed by rain into rivers and most times majority of the land where some of the crops are harvested are not properly cover thereby hindering the free movement of water which leads to irrigation problems in the state.

- (v) **Soil degradation and water pollution:** The natural soil nutrient is being destroyed and rivers are being polluted either by manual labor or machines through the use of chemicals for the benefit of man in order to boost agricultural activities in Akwa Ibom State.
- (vi) **Increase in waste:** Since most of agricultural products in Akwa Ibom State are not recycled, the end product is waste and as the activities of agricultural value chain continue to increase so as the waste in the state will also increase thereby leading to various forms of pollution in the state.
- (vii) **Destruction of inter communal roads:** Due to the processes involved in agricultural value chain, most of the trucks and vehicles that carry some of these agricultural products pass through community roads due to their heaviness lead to the damage of these communal roads.

## Theoretical Literature

### Boserupian Theory

Boserup, a Danish economist, has also developed a framework known as Boserupian theory. This theory shows the link that exists between population change and agricultural development. According to her theory, “population growth is not a hindrance for agricultural development; but the level technology used in farming, rather she argues that population growth stimulates new agricultural techniques through agricultural intensification, livelihoods diversification and stimulating out migration so as to cope up with the changing situation” (Harrison, 1992; Drechsel, Kunze and Vries, 2001; Carr, Suter and Barbieri, 2005; Demont et al., 2007; Sherbinin et al., 2007). “For example, population pressure through time transforms shifting cultivation which demands more land to practice to land saving and labour intensive type of agriculture such as annual cropping system” (Boserup, 1965).

### Empirical Literature

Ester Boserup (1965) “examine the conditions of agricultural growth.” The Economics of Agrarian Change Under Population Pressure. She investigates the process of agrarian change, cost and productivity under the main systems of primitive agriculture. She stated the problem of population explosion and concluded that technical, economic and social changes are likely to take place within primitive agriculture unless the rural community concern is exposed to the pressure of population growth. She took a very optimistic approach arguing activity. Rather, she argues the approach “there were about 1.4 million people who had been born in a province other than the province in which they were residing.” Rural to urban migration involves mainly young energetic people who move to towns to look for employment. They leave old people in the rural areas who cannot sustain agricultural development adequately.

Kilewe and Thomas (1992) “in their studies on land degradation in Kenya noted that land degradation through soil erosion is a pressing problem.” They argued that each year, hundreds of hectares undergo land use changes where forests and grasslands are continuously converted to pastoral and agricultural land. This reduces the ground cover which is a potential catalyst to soil erosion. They concluded by saying that if this degradation of land resource is left unchecked; it



would threaten the basic elements of life by decreasing the ability of Kenya's land resource to produce food supply that Kenya needs and lowers the quality of air and water. The other problem which emerges because of population pressure is migration. People will move from the densely populated areas to the sparsely populated areas or to urban centres.

Pingali, Elahi et al., (2001 and 2019) "stated that inputs such as chemical pesticides and fertilizers used in farming can lead to various environmental problems (pollution of water bodies, reduction of useful insects, declining soil fertility), and health hazards for humans, especially when not properly handled."

Agatha and Bako, (2012), "examined the impact of environmental pollutions on agricultural sector productivities in Nigeria." Relying on the descriptive expositions of the studies related to this work. The result revealed the presence of a negative relationship between environmental quality and agricultural sector performance. Also, that the solution to environmental pollution lies in the policy of sustainable development and the evolution of sound environmental management principles by all stakeholders at all levels.

Godson-Ibeji, and Ubochioma, (2016), "examined the consequences of environmental pollution on agricultural productivity in developing countries environmental. pollution is a widespread problem that influences both human health and agricultural productivity." To ascertain the aim and objectives of the study, questionnaires were administered to elicit information on soil fertility, crop growth, and crop productivity. A total of 360 questionnaires were administered using a multistage sampling technique and analyzed using frequency tables and percentages. Results show that environmental pollution reduces the level of soil nutrients and fertility (82%). Crop growth and crop yield are negatively affected by pollution (80%); therefore, agricultural productivity is negatively affected in Nigeria. Thus. It was recommended, that efforts be made to immediately address the environmental problems of the country if any meaningful development is to be sustained.

## Methodology

### Sample Size

The population of this study consist of all the 31 local government areas that made up Akwa Ibom State. In 1991 National population census, the state population was 2,409,613, census 2006 it rose to 3,902,051, since then no other population census has been done in Nigeria to give the actual population size of Akwa Ibom state. The sample size for this study was determined with the aid of Taro Yamane formula.

The formula of Yamane (1979) is presented as follows:

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

Where :

N = population of study

$e$  = degree of freedom/significance at 5% (0.05)

$l$  = constant

Substituting numbers in to the formula we have:

$$n = \frac{3,902,051}{1+3,902,051(0.05)^2}$$

$$n = 399.9 = 400.$$

## Sampling Techniques

Both primary and secondary sources of data was used for this study. A closed-ended questionnaires was strategically distributed to a sample of 400 residents which cut across the 3 senatorial district in Akwa Ibom State of which 362 returned. Purposive sampling techniques were adopted for the study. For the purpose of clarity, six (6) local government out of the thirty-one (31) Local Government Area in Akwa Ibom State were purposively selected as the sample of this study. The choice of using Purposive sampling techniques in this research work is that it provides non-probability samples which receive selection based on the characteristics which are present within a specific population group and the overall study. The research instrument adopted for this study was a self-structured questionnaire titled: Agricultural value chain and Environmental Degradation (A.V.C.E.D). It enabled the researcher obtained relevant data for the research. The questionnaire was designed to get information from the respondents, and to suit the need and purpose of the study. Descriptive statistics and non-parametric statistical tools were used as the instruments of data analysis to analyze responses from the respondents. The descriptive statistical tools of: tables, percentages, averages and more were also used for data presentation. On the other hand, 5 Linkert scale with the use of Mean Deviation in Statistical Package for Social Science (SPSS) were used in analyzing the three research questions. The research questions were analyzed using a mean criterion of 3.0 for the research questions, an aggregate mean below 3.0 means the respondents disagree with the stated research question while an aggregate mean of 3.0 and above means the respondents agree with the stated research questions.

## Presentation of Data

**Table 1: Breakdown of Questionnaires Administered and Returned**

State of Resident	Numbers Distribute	Numbers Returned	Percentage
Ukanafun	66	63	15.75
Ika	70	62	15.5
Eastern Obolo	66	57	14.25
Mbo	66	55	13.75
Nsit Atai	66	63	15.75
Nsit Ubium	66	62	15.5
Total	400	362	90.5

Source: Researcher's Fieldwork, 2023.



**Table 2: Sex of the Respondents**

Sex	Frequency	Percentage (%)
Male	200	50
Female	200	50
Total	400	100

Source: Field Work, 2023.

**Table 3: Age of the Respondents**

Age	Frequency	Percentage (%)
18-30yrs	75	18.75
31-45yrs	85	21.25
46-60yrs	120	30
61 and above	120	30
Total	400	100

Source: Field Work, 2023.

**Table 4: Occupation of the Respondents**

Occupation	No of Respondents	Percentage (%)
Retired Civil servants	75	18.75
Farmers	250	62.5
Traders	75	18.75
Total	400	100

Source: Field work 2023.

**Table 5: Area of Residents of the Respondents**

Residential Area	Frequency	Percentage (%)
Semi-Urban	150	37.5
Rural	250	62.5
Total	400	100

Source: Field Work, 2023.

**Table 6: Academic Level of the Respondents**

Academic level	Frequency	Percentage (%)
FSLC	170	42.5
WAEC	195	48.75
B.SC	27	6.75
Postgraduate	8	2
Total	400	100

Source: Field Work, 2023.

## Data Analysis and Presentation of Data

The data for this study is hereby presented and analyzed below using simple percentage and Statistical Package for Social Sciences (SPSS) software to test the level of significance of the research question.

**Table 7: Respondents Perceptions on the impact of agricultural value chain on environmental degradation in Akwa Ibom State**

S/N	Factors	Mean	Standard Deviation	Decision
1	Increase in agricultural practice brings about climate changes as the natural environment is been interrupted by those who carried out such practice.	3.44	0.68	Agreed
2	Forest reserve are being destroy to provide more land for farming/agriculture in order to meet up the demand for agricultural product in Akwa Ibom State.	3.14	0.85	Agreed
3	Bush animals and the entire ecosystem is being jeopardize in Akwa Ibom State for the success of agricultural value chain right from the seedling stage to the final consumer.	3.31	0.68	Agreed
4	The natural soil nutrient is being destroy and waters are being polluted by the activities of those who are engage in agriculture either manually or by machines through the use of chemical and other substance that affect the soil texture.	3.46	0.61	Agreed
5	Most of the bye product of agriculture that are not recycle in Akwa Ibom State end up becoming waste product thereby increasing the rate/level of waste in the state.	3.10	0.81	Agreed
6	Increase in agricultural value chain activities brings about destruction of intercommunal roads in Akwa Ibom State.	3.44	0.67	Agreed
	Aggregate mean	3.32	0.72	Agreed

Source: Field Work, 2023

## Discussion of Findings

The findings of table 9 research question above revealed the impact of impact of agricultural value chain on environmental degradation in Akwa Ibom State are; increase in agricultural practice brings about climate changes in Akwa Ibom State, destruction of forest reserve to provide more land for farming/agriculture in order to meet up the demand for agricultural product in Akwa Ibom State, the entire ecosystem and bush animals are being jeopardize in Rivers State for the success of agricultural value chain right from the seedling stage to the final consumer, the natural soil nutrient are being destroy by the activities of those who are engage in agriculture either manually or by machines through the use of chemical and other substance which have affect the soil texture, bye product of agriculture that are not recycle in Akwa State end up becoming a waste product thereby increasing the rate/level of waste in the state, and finally increase in agricultural value chain activities brings about destruction of intra communal roads in Akwa Ibom State. The findings of research question are in-line with the findings of the findings of this research question agree with the findings of Pingali (2001) and Elahi, (2019) that the use of inputs such as chemical pesticides and fertilizers to boost agricultural input can lead to

various environmental problems (pollution of water bodies, reduction of useful insects, declining soil fertility), and health hazards for humans, especially when not properly handled. Consequently, through the findings of the research question, this study has been able to highlight the impact of agricultural value chain on environmental degradation in Akwa Ibom State which is the purpose of this study.

## Conclusion

The rate of agricultural practice that are environmental friendly couple with good government policies will determine the level of development a nation will undergo. The rural residence is busy clearing forest and burning bushes in the name of fetching fuel wood for domestic energy purpose as such in return cause flooding, erosion, degradation, loss of habitats and desertification. Conclusively, agricultural value chain are the means by which citizens get the food they consumed and also industries get their raw materials from agriculture, if there is effective public policy design to reduce the problems of bad agricultural value chain system, sustainable agricultural development and environment free from degradation can be achieve in Akwa Ibom State.

## Recommendations

The following are recommended to the state government of Akwa Ibom to adopt in order to achieve sustainable development in agricultural value chain system that will be environmental friendly:

- i) Akwa Ibom State government should adopt the use of PIGOVIAN TAX which prevent farmers, traders, private individuals, business and industries in the state from engaging in activities that create adverse side effects for the environment. In a nut shell, tax per unit of the activities of farmers, traders, private individuals, business men and industries that causes any form of environmental degradation should be implemented.
- ii) Government and NGOs should encourage farmers, traders, private individuals, industries etc in the state to use modern technology and techniques when carrying out their activities so as to reduce environmental degradation to it minimum.
- iii) Accessible and quality intra communal/LGA's roads should be created in the rural areas of the state in order to enable farmers in these communities and LGA's to have easy flow of value chain system.

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