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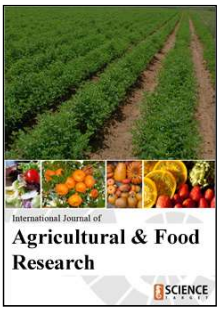

International Journal of Agricultural and Food Research [IJAFR]
ISSN 1929-0969
Vol. 5 No. 3, pp. 1-12
(2016)

Consequences of Environmental Pollution on Agricultural Productivity in Developing Countries: A Case of Nigeria

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Abstract. Environmental pollution is a widespread problem that influences both human health and agricultural productivity. One of the greatest problems facing the world today is environmental pollution, which is increasing every year and causing grave and irreparable damage to the earth and human health. It is these conditions that make environmental pollution a major concern to the developing countries of the world, especially Nigeria. Environmental pollution results from the activities of man through the use of technology to manipulate the ecosystem or environment to meet his needs. Nigeria as a developing country has lost much of her habitable environment due to environmental degradation and pollution, which destroys crops and aquaculture through the contamination of waterways, ground water, and soil and causes flaring of associated gas. There is also rampant mismanagement of the land resources. These have significant negative consequences on crop yield and land productivity, which further impoverish the already poor farmers in these areas. With the increasing soil infertility as a result of the destruction of soil micro-organisms and dwindling agricultural productivity, farmers have been forced to abandon their land to seek non-existent alternative means of livelihood. Therefore, this paper examines the nature of environmental pollution in the area and its consequences on agricultural productivity. 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. The paper recommends, among other things, that efforts be made to immediately address the environmental problems of the country if any meaningful development is to be sustained.

Keywords. *environmental pollution, environmental degradation, productivity and oil exploration.*

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1. Introduction

Before the discovery of oil in Nigeria in early 1956 at Oloibiri, agriculture was the mainstay of the Nigerian economy, contributing more than 70% to the exchange rate of the Nigerian economy. Since the discovery of oil in most other places in Nigeria, the region has become the centre of intensive and extensive oil production activities, including exploration and exploitation. These activities have been associated either directly or indirectly with a myriad of environmental problems, which have been the main source of sorrow for the people of Nigeria as a whole. This activity has polluted the water bodies and land terrestrial ecosystems. One of the biggest concerns associated with this pollution in the environment is the risk of contamination to farmland, fisheries, and potable water since most of the people's livelihood depends on farming, fishing, and usage of water for domestic purposes (Ugwuanyi et al., 2012).

Nigeria has lost more than 30% of its habitable environment due to oil spills, which destroy

crops and aquaculture through the contamination of waterways and groundwater, oil flaring of associated gas, and mismanagement of the land resources (Otunkor and Ohwovorione, 2015). Oil spills have been proven to have significant negative impacts on crop yield and land productivity, which further impoverish the already poor farmers in the study area with the increasing soil infertility as a result of the destruction of soil micro-organisms and dwindling agricultural productivity. Farmers have been forced to abandon their land to seek non-existent alternative means of livelihood. This problem of land and environmental pollution has become a global issue due to its adverse effects on both human health and crop productivity. Nigeria is one of the world's third largest wetlands after Holland and Mississippi (Omene, 2003). The area remains increasingly under threat due to rapidly deteriorating environmental conditions, especially the menace posed by oil companies. Since the discovery and subsequent exploration of crude oil in Oloibiri in 1956, the environmental pollution emanating from such exploration has led to unprecedented economic deprivation and underdevelopment of the area. The area contains the bulk of proven oil reserves in Nigeria, which makes her one of the largest oil producing areas in the world. Oil and gas resources account for over 98 percent of the country's export earnings and 83 percent of the government's total revenue, (Bayode *et al.,* 2011). This is a result of agriculture and agricultural productivity being relegated to the background due mainly to the effects of oil flaring on agriculture, which causes a lot of damage to productivity.

Initially efforts were made to diversify the Nigerian economy, but her dependency on oil money as a quick way of amassing wealth prevented such efforts from succeeding. Recently, due to the dwindling prices in oil, all stakeholders and the government of Nigeria have called for all hands to return to farming so that Nigeria may have sustainable food security for her teeming population in the future. Presently, it has become a global concern to search for measures to sustain agriculture and agricultural productivity in Nigeria in order to meet with the millennium development goals of eradicating hunger and poverty. Unfortunately, the Nigerian environment, especially the South-South and South-East part of Nigeria, is regarded as a vast reservoir of crude oil and gas resources (Raheem, 2000).

Environmental pollution results from the activities of man through the use of technology to manipulate the ecosystem or environment to meet his needs. The effects of man's activities on the environment have been mostly negative. These result from the use of fire and other advanced technologies such as biomass. Some of the various ways man's activities influence the environment are through land reclamation, irrigation, crop breeding, and deforestation among others. The negative results of many of these activities are soil degradation, soil erosion, air pollution, deforestation, desertification, and more, all of which affect farming and farm produce.

Soil is one of the worst sites of environmental pollution by the oil industry in Nigeria. Soil is one of the basic components that support life and agricultural productivity in the ecosystem. Flora and fauna as well as man depend on soil for support and effective functioning. This critical component of the environment is in danger due to environmental pollution, especially oil pollution. Oil production involves the release of materials and substances that are poisonous and have detrimental effects on the environment, including the cultural environment, atmosphere, hydrosphere (water bodies), and lithosphere (e.g., geo-biosphere: soil, flora, climate) (Turner *et al.,* 2000). Indeed, man's activities lead to oil spillage, air pollution, water pollution, thermal pollution, and noise pollution. Thermal pollution results from the use of fire (burning) directly on the environment. In Nigeria, bush burning is the major source of thermal pollution and gas flaring. Gas flaring and bush burning in search of game has existed for more than three decades in Nigeria. Vegetation and the health of human beings are not spared from the effects of the thermal pollution.

Gas flaring is a process that takes place during oil drilling in Nigeria. The crude oil and gas are separated at flow stations. While the gas is flared at the flow station, the crude oil is pumped to the

refineries. According to Research Initiative (2005), flaring is used to consume waste gases in a safe and reliable manner through combustion in an open flame. Therefore, gas flaring is a means of safely disposing of waste gases through the use of combustion (Evoh, 2000). This is a common practice in Nigeria where oil is exploited. Consequently, this flaring is one of the most significant sources of environmental pollution from the Nigerian oil industry, affecting not only agricultural activities and potential, especially farming, but the health of the farmers and the ecosystem generally. Despite the huge economic benefits of agriculture in this time of hunger and poverty, the government of Nigeria and the oil companies tend to downplay the devastating effects of oil production activities on the environment of Nigeria, especially on the soil component and its consequent effects on agricultural activity and production, which is the mainstay of the people. It is for this reason that this study is pertinent.

Objectives of the Study

This objective of this study is to focus attention on the consequences of environmental pollution on agricultural productivity in Nigeria. It specifically elicits information on the socio-economic characteristics of the respondents, examines the effects of pollution on crops, determines the effects of environmental pollution on soil fertility, and assesses the effects of pollution on the growth of various crops planted in Nigeria. It also suggests ways of curbing the problem of environmental pollution in Nigeria.

Before the advent of oil prospecting and production in Nigeria, the environment was friendly and viable. The soil was fertile and good for farming. The farm produce was high, adequate for the subsistence and commercial needs of the people. Presently, the environmental pollution affects not only the soil but also vegetation, agriculture, and crop production (Alakpoda, 2000; Ogidiol, 2003; and Efe, 2003). Farming has become very difficult and even drinking water has become scarce. Environmental pollution affects the agricultural productivity of the people by causing stunted growth and other adverse effects on the yield of such crops as yam, cassava, and plantains among others.

Conceptual Definitions

Productivity: According to Rogers (1998), productivity is the ratio of outputs to inputs for a specific production situation. It can also be defined as the relationship between the output of goods and services and the inputs of resources, human and non-human, used in the production process (Centre for the Study of Living Standards, 2008). This report also states that productivity is determined by a number of factors, including the quality and availability of natural resources, industrial structure and intersectional shifts, capital accumulation, the rate of technological progress, and the quality of human resources in the macroeconomic and microeconomic environments. In this study, the Centre for the Study of Living Standards (CSLS) report is adopted because the influence of environmental pollution that is to be determined is a non-human input used in the agricultural production process.

Environment: Traditionally, the word environment is defined as the total surrounding that includes natural and biological resources. The World Bank (2001) defines the environment as the natural and social conditions surrounding all mankind, including future generations. Therefore, the environment includes the biophysical components and processes of the natural environment such as the land, water, and air (Bayode et al., 2011). This also includes all layers in the atmosphere, inorganic and organic matter (both living and non-living), socioeconomic components, and processes of the human environment. According to Emmanuel and Alakinde, (2011) in Ugwuanyi et al, (2012), land and associated resources, structures, sites, human health, nutrition, and safety are also included. Thus, the environment is the natural habitat of man with several components within which various levels of activities and processes take place.

Environmental Pollution: Environmental pollution is defined as the introduction of different harmful pollutants in a certain environment that make the environment unhealthy for survival of man, flora, and fauna. The most common pollutants are chemicals, garbage, and wastewater. Environmental pollution is happening in many parts of the world, especially in the form of air

and water pollution. The best examples of air pollution are some of China's cities, including the capital Beijing; and the best example of water pollution is India with its Ganges river pollution problems (Ugwuanyi et al, 2012).

Exploration: This refers to mining or exploitation of mineral resources from the land and sea using technology. According to Mb, (2005), there are three types of mineral resources: fuel, metallic, and industrial minerals, and their exploration processes differ. Exploration activities for fuel involves exploration, extraction, processing, transportation as well as storage and consumption of petroleum, natural gas, coal, lignite, and uranium. Similar activities for metallic exploration involve iron, gold, columbite, cassiterite, and tantalite. Industrial exploration involves limestone, marble, feldspars, gypsum, gravel, and sand. Fuel exploration is conducted to harness energy, metallic exploration is conducted for industrial and economic purposes, and industrial exploration is conducted for construction purposes. One of the benefits of exploration is an increase in the revenue of the oil producing country. This revenue from the Nigerian oil sector has been the mainstay of her economy. However, the ongoing dwindling activities in the oil sector are associated with problems that deserve serious attention in Nigeria.

Land Degradation:

Land degradation generally describes the temporary or permanent decline in the productive capacity of the land. It is also seen as "the aggregate diminution of the productive potential of the land, including its major uses (rainfed, arable, irrigated, range land, forests), its farming system, (e.g., smallholder, subsistence), and its value as an economic resource". This link between degradation (which is often caused by land use practices) and the effects on land use is central to nearly all published definitions of land degradation. There are several types of soil degradation, which are forms of environmental pollution. These are:

Figure 1: Land Degradation area in Nigeria; Source: Survey data, 2015(A land degraded area)

Soil Erosion by Wind: The removal of soil particles by wind actions; usually this is sheet erosion where soil is removed in thin hollows and other features.

Soil Erosion by Water: The removal of soil particles by the action of water; this is similar to the sheet erosion by wind. It is uniform removal of the thin layer of topsoil. This can be catastrophic, resulting in volcanic eruptions.

Soil Fertility Decline: The degradation of the soil's physical, biological, and chemical properties. Erosion leads to reduced soil productivity.

Loss of Vegetable Cover: Vegetable cover is important in many ways. It protects the soil from erosion by wind and water, and it provides organic material to maintain certain levels of nutrients that are essential for healthy plant growth. Plant roots help to maintain soil structure and facilitate water infiltration.

Water Logging: This is caused by a rise in groundwater close to the soil surface or inadequate drainage of surface water, often resulting from poor irrigation management. Water saturates the root zone leading to oxygen deficiency.

There are many other forms of soil degradation, such as salinization or sodication (increase in salts in the soil), sedimentation, lowering of the water table, and any more. All of these forms of environmental pollution negatively impact agricultural productivity in Nigeria (Ugwuanyi et al, 2012).

Nature and Consequences of Environmental Pollution on Agricultural Productivity in Nigeria.

Nigeria, which is one of the most important countries in West Africa, is bedeviled with environmental pollution. The study area is one of the most important Wetlands and Coastal Marine ecosystems in the world and is home to about 31 million people (NDTC, report, 2008). It is also the location of massive oil deposits, which have generated earnings of more than an estimated $600 billion since the 1960's (Wurthmann, 2006). Despite this, the majority of the Nigerian population lives in abject poverty in contrast to the wealth generated by oil. According to the UNDP, (2006), more than 60 percent of the people of Nigeria depend on the natural environment for their livelihood. Thus, good environmental quality and sustainability are fundamental to the overall wellbeing and sustenance of the people. The environmental resources base, which is used for agriculture, fishing, and the collection of forest products, is the principal source of food. The main crops grown include yam, cassava, maize, cocoa, pumpkin, plantain, pineapple, and various other fruits and vegetables. Oil spills, waste dumping, and gas flaring are endemic in this area and have affected the area for decades, damaging the soil, air, water, and quality of life. Most of the people affected are particularly the poorest and most vulnerable rural farmers who rely mainly on traditional occupations such as fishing and agriculture. Damages from oil operations are chronic and cumulative and have severely impaired coastal ecosystems and hampered the livelihoods and health of the region's impoverished residents.

Oil spills occur both on land and offshore. On land, oil spills destroy crops and damage the quality and productivity of soil that communities use for farming. On water, they kill fish and contaminate water used for drinking and other domestic purposes (Amnesty International, 2009). Oil spills happen frequently in the Niger Delta area of Nigeria because of the corrosion of oil pipes, poor maintenance of infrastructure, spills or leakages during refinery processes (World Bank, 2005), human errors, and vandalization or theft of oil and oil pipelines (Steiner, 2008). When oil is pumped out of the ground, the gas produced is separated, and most of it is burned as waste in massive flares in Nigeria. This practice, which has gone on for decades, is acknowledged as extremely wasteful and environmentally damaging. The flares, which continue for 24 hours a day for many days in these areas, cause serious discomfort to people living near the flare sites. When gas is flared, the combustion is often incomplete, and the oil droplets fall on waterways, crops, houses, and even people. They create air and noise pollution that communities have to live with, sometimes permanently.

Various harmful and toxic compounds are introduced into the natural environment during oil extradition. Seismic work, oil spills, gas flares, and several other forms of environmental pollution change the geo-chemical composition of the soil, river, and other components of the environment (Achi, 2003). This leads to a drastic decline in production output in both farming and fishing activities. Oil pipelines sometimes run through farmlands. Other oil infrastructure, such as oil well heads and flow stations, are often close to agricultural lands. Studies by Ukegbu and Okeke (2007) noted the effects of gas flares on the growth, productivity, and yield of selected farm crops in the Izombe flow station located in Izombe Ohaji/Egbema/Oguta Local Government area of Imo state. They experience a 100% loss in crop yield in all crops cultivated about 200 meters away from the flare, a 45% loss for those about 600 meters away, and a 10% loss in yield for crops about 1000 meters away from the flare. The effects were reduced with increased distance from the flare. Obioma, (2005) conducted a similar study that investigated agricultural production decline in the Ogba-Egbem area of Rivers state. The results of his investigation showed that insects gathered to enjoy the warmth and light of the gas flare from the forest at night. The rapid increase in the insect population and their attendant destruction of the crops was a new phenomenon that had come with the oil production in the area. Farmers in the area have confirmed that these insects have inflicted heavy losses on them by eating and destroying their crops. Farmers find that their crops are no longer abundant and that the crops are stunted in growth as a result of acid rain (Gbadegesin, 2007). According to Olumide, (2002), when gas

is being flared, the surrounding air is polluted by oxides such as nitrogen, carbon, sulphur, particle matter, sulphide, and soot from the flare. All these are capable of retarding the growth of cash and food crops tremendously.

2. Materials and Methodology

The Study Area: Nigeria is located in West Africa on the Gulf of Guinea and has a total of 923,768,000 sq. kilometers (NPC, 2006). It lies between latitude 40 and 140 north of the equator and longitude 30 and 140 east of the Greenwich meridian. It is bounded on the west by the Republic of Benin, on the north by the republic of Niger, on the east by Cameroon, on the northeast by Chad, and to the south by the by the Atlantic Ocean. Nigeria is entirely within the tropical zone. The major rivers are the rivers Niger and Benue. The outlets of these rivers and their tributaries are masked by walls of mangrove. At the Delta, where these rivers break into a network of creeks and water ways, they provide valuable means of navigation through the marshy parts of the country. In this area, oil palm, which prior to the Petronaira era as the main foreign exchange earners abound. Nigeria's two rivers empty into the Niger- Delta, which is the world's largest delta (FRN report, 2013). Nigeria is made up of 36 states and Abuja, which is the federal capital. It is divided into six geopolitical zones of South-South, South-East, South-West, North-East, North-Central, and North-West. Nigeria is made up of about 400 ethnic groups and 450 languages. Such zoning is for easy control and administration and is also according to ethnic similarities and cultures.

This study was purposely carried out in the South-South and South-East part of Nigeria where environmental pollution is heavily felt due to oil exploration and exploitation. The states that are mainly affected are Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo, and Rivers. These states are known as MPP9, which stands for the nine oil producing states of Nigeria. The communities in these states are known as the Niger Delta. They are rich in oil wells, oil deposits, and gas. The people are mainly farmers and fishermen with a few traders and civil servants. The crops that are usually grown by the people are cassava, yam, maize, plantain, cocoyam, pineapple, and many others.

Figure 2: Map of oil producing states in Nigeria; Source: Survey data, 2015 (Oil producing states of Nigeria)

Sample and Sampling Technique: A multi-stage sampling technique was applied to select the 360 respondents used for the study. The first stage involved the choice of nine states out of the 36 states of Nigeria. The states are Abia, Akwa Ibom, Bayelsa, Delta, Cross River, Edo, Imo, Ondo, and Rivers. The second stage involved randomly selecting two local government areas from each of the states. The local government areas are from Abia-Ukwa West and Ukwa East, from Akwa Ibom; Eket and Oron, from Bayelsa, Oleibiriin in Ogbia and Brass, from Cross River, Akamkpa and Akpabuyo, from Delta, Isoko and Uzere East, from Edo, Orionmwon and Ikpobia-Okha, from Imo, Ohaji/Egbema and Izombe, from Ondo, Ilaje and Araromi and from Rivers, Ogoni and Andoni. This brings it to a total of 18 local government areas. The third stage involved selecting two communities from each of the local government areas, making a total of 36 communities. The final stage was randomly selecting 10 farmers from each of the communities. This was done with the help of the community leaders who presented the names of their notable farmers in the communities. The sample size was 360 respondents.

Data Collection: Data for the study was collected from secondary and primary sources. The primary sources of data collection included

questionnaires, oral interviews, and personal observation. The secondary data collection sources included books, journals, newspapers, and Internet searches. State ministries of environment, land, and urban development; the National population commission; and meteorology were also used.

Data Analysis: Data generated for this study was analysed using frequency tables, means, and percentages. Data was analysed based on the objectives of the study: the influence of environmental pollution on soil fertility, the influence of the environmental degradation on the vegetation of the study area, and the effects of environmental pollution on the growth of various crops planted in the study area. Finally, various ways of overcoming the challenges of environmental pollution on agricultural productivity in Nigeria are recommended.

3. Results and Discussion

Socioeconomic Characteristic of the Respondents

The results presented in Table 1 indicate that both men (61%) and women (38.9%) engage in agriculture in the study area. It also revealed that 55.6% of them fell within the age range of 31- 40 years old. This suggests that this age bracket was productive and able to engage in more than one livelihood activity. It can also be inferred that the majority of the respondents are in their active years and if the challenges of environmental pollution are addressed, these people can help boost the food availability and food security of the country. This is in agreement with Zhang and Flick (2001) who suggest that the level of involvement affirming activities is determined by age. The findings show that the majority of respondents (778%) were married, suggesting that there is respect for family as a social institution.

Furthermore, Table 1 revealed that a small portion of the respondents (1.4%) had no formal education and that the majority (41.7%) were literate. The implication of this is that it may likely give the respondents the opportunity to face their challenges the maturity and expose them to use available farm lands to fend for themselves.

Table 1

Socioeconomic Characteristics Of The Respondents (N = 360)

Socio-economic Characteristics	Frequency	%
Age Gender		
Male	220	61.1
Female	140	38.9
Age (years)		
20-30	80	22.2
31- 40	200	55.6
41-50	46	12.8
50 and above	34	9.4
Level of education		
Primary	70	19.4
Secondary	90	25,00
Adult education	150	41.7
Tertiary	45	12.5
No formal education	5	1.4
Marital status		
Married	280	77.8
Single	60	16.7
Divorced	4	1.1
Widowed	16	4.4
Occupation		
Farming	250	69.4
Fishing	90	25.0
Trading	6	1.7
Civil service	10	2.8
Other	4	1.1
Income Per Annum (₦)		
<100.000.00	60	16.7
101,000-2000.00	75	20.8
201,000 -300,000	205	56.9
301,000- 400,000	10	2.8
401,000 – 500,000	8	2.2
7500,000.00	2	0.6
Religion		
Christianity	320	88.9
Moslem	40	11.0
Traditional	0	0.0
Household size		
1-4	78	21.7
5-8	300	55.5
9-12	76	21.1
13 and above	6	1.7
Membership of social organization		
Yes	340	94.4
No	20	5.6

Regarding religion, the majority (88.9%) were Christians and Muslims (11%). This shows that both Muslims and Christians co-inhabit the area

and farm together. From the data on primary occupation, the majority (69. 4%) were farmers. Other primary occupations are fishing (25%), trading (17%), and civil service (2.8%). This implies that the respondents engage in both on-farm and off-farm activities, which will help them fend for their families in the face of the challenges of environmental pollution that reduce their agricultural productivity.

Data on the household size of the respondents shows that 55.5% of the respondents have between five and eight family members. This is an indication that the respondents have large households to feed. This implies that if the environmental pollution is not addressed properly, these families will remain impoverished for decades to come. Data on belonging to social organizations indicated that the majority of the respondents (94.4%) belonged to social organizations. The implication of this is that they will have to speak with one voice to address their agricultural and social challenges.

Influence of Environmental Pollution on Soil Fertility

The data shown in Table 2 indicates that 80.2% of the respondents attested to the fact that environmental pollution affects the fertility of the soil in a highly negative way, while 83.3% reveal that it does not have any positive influence on soil fertility. The implication of this is that all the useful micro-organisms in the soil are destroyed by the oil deposits, rendering their land ineffective for farming activities and leading to poor agricultural productivity.

Table 2

Influence of Environmental Pollution on Soil and Soil Fertility

	Negative Influence		Positive Influence	
Responses	Frequency	%	Frequency	%
Very high	289	80.2	0	0.0
High	86	23.9	0	0.0
Low	2	0.6	60	16.7
Very low	4	1.1	300	83.3
Total	360	100	360	100

Sources: Survey data; 2015

Influence of Environmental Pollution on Stunting Growth of Plants

The data in Table 3 reveals that the farmers in the study area attested to the fact that environmental pollution has stunted the growth of their crops. The majority (69.4%) of them agreed that gas flaring usually causes stunted growth of their crops. This implies that gas flaring has no positive influence on their plants as revealed by 94.4% of the respondents.

Table 3

Influence of Environmental Pollution on Stunting of Crop Growth = 360

	Negative Influence		Positive Influence	
Responses	Frequency	%	Frequency	%
Very high	250	69.4	0	
High	88	24.4	0	
Low	20	5.6	20	5.6
Very low	2	0.6	340	94.4
Total	360	100	360	100

Sources: Survey data; 2015

Influence of Environmental Degradation on Vegetation and Crop Yield

The results presented in Table 4 revealed that environmental degradation has a negative influence on crop yield and vegetation in the study area. It indicated that the majority of the respondents (80.5%) responded negatively about land degradation, while 82.2% of them indicated that it does not have any positive effect. The implication is that land degradation can render them homeless and render their farmlands and their crops useless. All of the vegetation in the study area had been rendered useless due to environmental degradation.

Influence of Environmental Pollution on Fishing

Data in Table 5 revealed that 82.2% of the respondents attested to the fact that environmental pollution has dealt ruthlessly with their aquaculture activities. Pollution has extremely negative effects on their aquatic animals.

Table 4

Influence of Environmental Degradation on Vegetation/Crop Yield N = 360

Responses	Negative Influence Frequency	%	Positive Influence Frequency	%
Very high	290	80.5	0	0
High	40	11.1	0	0
Low	26	74.2	64	17.8
Very low	4	1.1	296	82.2
Total	360	100	360	100

Sources: Survey data; 2015

Table 5

Influence of Environmental Pollution on Fishing

Responses	Negative Influence Frequency	%	Positive Influence Frequency	%
Very high	296	82.2	0	0
High	56	15.6	16	4.4
Low	5	1.4	24	6.7
Very low	3	0.8	320	88.9
Total	360	100	360	100

Sources: Survey data; 2015

Fishing, which is one of the primary occupations, has been affected adversely by oil flows into the rivers that change the color of the water and result in the death of the fish. It is even hard to get water for other domestic activities. The majority (88.9%) of the respondents agreed that environmental pollution has little to no positive influence on their aquatic activities.

Influence of Environmental Pollution on Cassava, Yam, and Plantain Yields

Data in Tables 6, 7, and 8 reveal the influences of environmental pollution on various crops such as cassava, yam, and plantain grown in the study area. On cassava yield, yam yield, and plantain yield, the majority of the respondents (75%) believed that environmental pollution negatively affects them. It is clear that environmental pollution has highly negative effects on crop yield, especially the main food crops produced in the area. Negative influences are evident on yam (82.2%) and plantain (83.3%) production.

Table 6

Influence of Environmental Pollution on Cassava Yield

Responses	Negative Influence Frequency	%	Positive Influence Frequency	%
Very high	270	75.0	4	
High	70	19.4	60	1.1
Low	12	3.3	60	16.7
Very low	8	2.3	296	82.2
Total	360	100	360	100

Sources: Survey data; 2015

Table 7

Influence of Environmental Pollution on Yam Yield

Responses	Negative Influence Frequency	%	Positive Influence Frequency	%
Very high	296	82.2	10	2.8
High	42	11.7	22	6.1
Low	12	3.3	30	8.3
Very low	10	2.8	298	82.8
Total	360	100	360	100

Sources: Data survey data

Table 8

Influence of Environmental Pollution on Plantain Yield

Responses	Negative Influence Frequency	%	Positive Influence Frequency	%
Very high	300	83.3	0.1	0.3
High	40	11.1	10	2.8
Low	18	5.0	29	8.0
Very low	2	0.6	320	88.9
Total	360	100	360	100

On the general agricultural productivity in Nigeria in Table 9, farmers believe that environmental pollution has done more harm than good for crop yields and agricultural productivity as a whole. Environmental pollution has negatively influenced soil fertility (80.3%); general crop yield and vegetation (80.6%); stunted the growth of crops (69.4%); negatively impacted the crop yield of cassava (75%), yam (82.2%), and plantain (82.2%); and harmed fishing (82.2%) and other crops (83.3%). From this

evidence, it is obvious that environmental pollution has done more harm than good for agricultural productivity in Nigeria, especially the MPP9 where the environmental pollution has the most adverse influence on agricultural productivity.

Table 9

Influence of Environmental Pollution on General Agricultural Productivity in Nigeria

Responses	Negative Influences Agricultural Productivity	Frequency	%
Very high	Soil and soil fertility	289	80.3
Very low		71	19.7
Very high	General crop yield/vegetation	290	80.6
Very Low		70	19.4
Very high	Stunting crop growth	250	69.4
Very low		110	30.6
Very high	Cassava yield	270	75.0
Very Low		90	25.0
Very high	Yam yield	296	82.2
Very Low		64	17.8
Very High	Plantain yield	296	82.2
Very Low		64	17.8
Very high	Fishing	296	82.2
Very Low		64	17.8
Very high	Others	300	83.3
Very Low		60	16.7

Multiple responses are recorded. Source: survey data, 2015

4. Conclusion and Recommendations

There is no doubt that the oil activities carried out by man have generally impacted the environment, thus the quality of our environment has been on the decline over the years. The level of pollution and the extent of environmental damage in the south and southeast have never been properly assessed, and the impact on the area has raised questions of great concern to stakeholders, particularly the oil producing communities who have suffered polluted air, water, degraded forest resources and farmlands. The destruction of the ecosystem by oil producing companies is aggravated by the lack of will by the federal government of Nigeria to enact and enforce stringent environmental laws to regulate the environmental consequences of crude oil exploration and exploitation. While the environment and means of livelihood of the people are undermined, little effort is made to recompense the people of this area with basic infrastructure of electricity, good roads, schools, portable water, cottage industry, and employment.

This study has determined that the net effect of oil extraction on agriculture, the basis of sustenance of a significant number of the communities in Nigeria, has an overbearing influence on the environment. Therefore, the recommendation is that efforts be made to control and mitigate the environmental problems of the area. This is imperative if meaningful development of the area in terms of agricultural productivity, infrastructure, and other forms of socio-economic development will be achieved.

The paper also recommends that laws and regulations to strictly protect the environment of Nigeria and ecology from further degradation be made and enforced on oil companies operating in Nigeria. The Land Use Act of 1978, which tends to deny the people their rights of control over the resources that pertain to their land, should be revoked. An impact assessment of environmental pollution on agriculture should be carried out by the government rather than individuals to ascertain the level of damage done to agricultural productivity in the study area. Since the oil industry in Nigeria involves the government of Nigeria and subsidiaries of multinational oil companies, the success of all these strategies will be based on principled political leadership that is committed to program implementation.

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