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THE IMPACTS OF ENVIRONMENTAL POLLUTION ON AGRICULTURAL PRODUCTIVITY IN THE NIGER DELTA

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ABSTRACT

Since the discovery of oil in the Niger delta, the region has become the centre of intensive and extensive oil exploration and production activities. These activities have been associated either directly or indirectly with a myriad of environmental problems which has been main source of sorrow for the people of Niger Delta region as a whole. This has polluted both the water bodies, land terrestrial ecosystems and one of the biggest concerns associated with this pollution in the environment is, the risk to farmland, fisheries and potable water contamination since most of the people's livelihood depends on farming, fishing and usage of water for domestic purpose. The Niger Delta has lost more than 20% of its habitable environment due to oil spills which extensively destroys crops and aquaculture through the contamination of waterways, ground water and soil, flaring of associated gas and mismanagement of the land resources. Oil spills have shown significant negative impact on crop yield and land productivity which further impoverish the already poor farmers in these oil producing areas. With 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 paper therefore, examines the nature of environmental pollution in the area and its impact on agricultural productivity. It also argues that the pervasive impact of oil related environmental problems are the drastic decrease in the nutrient value of the soil, the decrease in available land mass for cultivation, the destruction of food, cash crops and marine life which ultimately lead to a decline in agricultural productivity. This paper finally submits that the solution to environmental pollution lies on the policy of sustainable development and the evolution of sound environmental management principles by all stakeholders at all levels.

Keywords: *Environmental degradation, Agricultural productivity, Exploration, Niger Delta,*

BACKGROUND

One of the greatest problems facing the world today is that of environmental pollution which is increasing with every passing year, causing grave and irreparable damage to the earth. In the Niger Delta, the issue of environmental degradation is a major cause of productivity losses and poor human health (World Bank, 1995), thereby making it a topical concern to communities in the area (NDES, 1995). The Niger Delta region of Nigeria is the World's third largest wetland after Holland and Mississippi (Omene, 2003) and covers a coastline of 560 kilometers about two-third of the entire coastline of Nigeria. This area remains increasingly under threat from rapidly deteriorating environmental conditions especially the menace posed by oil companies. With the discovery and subsequent exploration of crude oil in 1956 in the Niger Delta, the environmental pollution emanating from such exploration has led to

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unprecedented economic deprivation and under development of the area. The area contains the bulk of proven oil reserves in Nigeria which makes her one of the largest producers of oil in the world. Oil and gas resources accounts for over 98 percent of the country's export earning and 83 percent of government's total revenue (Bayode et al, 2011). Even as serious efforts are being made at different quarters to diversify the Nigerian economy, her dependence on oil as a major source of revenue is bound to continue for a long period of time. According to Eteng (1997), oil exploration and exploitation has over decades, impacted disastrously on the socio-physical environment of the Niger Delta oil-bearing communities, massively threatening the peasant economy and the environment, hence the entire livelihood and basic survival of the people. Laws were made which include the Petroleum Act of 1969 and the Land Use Decree/Act of 1978 that regulates community access to communal land while at the same time making it possible for the multinational investors to have unrestricted access to explore oil unchallenged even on sacred lands (Achi, 2003). Farm land pollution as a major oil exploration problem in the Niger Delta results to decline in soil and marine resources, land degradation, regular displacement during oil spills, fall in agricultural output and intensive exploitation of other fertile lands. During drill cuttings, barites and bentonite clays when dumped on the ground prevent plant growth until natural processes develop new topsoil. Heat from gas flare kills vegetation, suppresses the growth and flowering of plants thereby diminishes agricultural production. This situation continues to attract the interest of environmental experts who call for regular evaluation of the exploration and exploitation activities in the coastal areas of the country. This paper on the impact of environmental pollution on agricultural productivity in the Niger Delta is aimed at providing an understanding of the nature and extent of impact of environmental pollution in the area. This process for determining these understanding, explores the devastation of the environment and the ecological imbalance created by oil and gas exploitation and its contribution to the disappearance of agricultural lands.

Definition and Conceptual Clarification

Environment: Traditionally the word environment is defined as the total surrounding which includes natural and biological resources but World Bank (1991) 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 natural environment of the land, water and air (Bayode et al, 2011). This also includes all layers in the atmosphere, inorganic and organic matters (both living and non-living), socio-economic components and processes of the human environment. According to Emmanuel and Alakinde (2006), land and associated resources, structures, sites, human health, nutrition and safety are also inclusive. Thus, the environment is the natural habitat of man with several components within which various levels of activities and processes take place.

Environmental Pollution: is defined as the introduction of different harmful pollutants in certain environment that make the environment unhealthy to live in. The most common pollutants are usually chemicals, garbage and waste water. Environmental pollution is happening in many parts of the world especially in form of air and water pollution. The best

example for air pollution are some of China's cities including capital Beijing and the best example for water pollution is India with its Ganges river pollution problem.

Productivity: According to Rogers (1998), productivity is the ratio of out to input for a specific production situation. It is also 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 (CSLS Report, 1998). The report also states that productivity growth is determined by a number of factors including the quality and availability of natural resources, industrial structure and intersectoral shift, capital accumulation, the rate of technological progress, quality of human resources, the macroeconomic and microeconomic environments. Here, this study adopts the CSLS report because the impact of environmental pollution which is to be determined is a non-human input used in agricultural production process.

Exploration: This refers to mining or exploitation of mineral resources from the land and sea using technological know-how. According to Mba (1995), there are three types of mineral resources namely fuel; metallic and industrial minerals and their exploration processes differ. Exploration activities for fuel mineral involve 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 while those for industrial exploration involve limestone, marble, feldspars, gypsum, gravel and sand. Fuel exploration is done to harness energy, metallic exploration for industrial and economic purposes while industrial exploration is done for construction purposes. One of the benefits of exploration is an increase in the revenue of that oil producing country and this revenue from the Nigerian oil sector has been the mainstay of her economy. However, the on-going activities in the oil sector are associated with problems that deserve serious attention.

The Place called Niger Delta

The Niger Delta area which is bordered to the South by the Atlantic Ocean and to the East by Cameroon belongs to the South-South geographical area of the country which makes up the six geographical zones of the Nigerian Federal Structure and is endowed with rich deposits of natural resources. It lies between latitude 3^{O}N and 6^{O}N and longitude 5^{O}E and 8^{O}E (Ndubuisi and Asia, 2007). This area has a composition of nine states namely Rivers, Bayelsa, Delta, Cross-River, Akwa-Ibom, Abia, Imo, Edo and Ondo states with the nation's oil installations mostly located in the creeks (Nwokolo, 1991). Imo, Edo and Ondo states were recently added to the composition of the Niger Delta due to the fact that they can also boast of substantial oil wells. This addition has subsequently expanded the land mass which have officially been defined by the Federal Government to extend to over 70,000km contributing a share of 7.5 percent of the total land mass of Nigerian state which is a home to about 31 million inhabitants of the Nigerian state including 40 different ethnic nationalities whose livelihoods are predominantly farming and fishing (Chuba, 2010). This area is also a home to the third largest low-lying land in the south-east of Nigeria having considerable deposit that flows from the River Niger and River Benue respectively. The inhabitants include the Urhobo,

Itsekiri, Ijo, Isoko, Ibibio, Igbo, Andoni, Ikwwere, Efik, Etche, Ogoni, Edo and Kwale-Igbo (Okonta and Douglas, 2003). The Niger Delta area consists of saline mangrove swamps which stretches through the coastal states with 504, 800 hectares in the Niger Delta and 95,000 hectares in Cross River state (NDDC, 1999; FOS, 2004) with a mangrove forest size that ranks the largest in Africa and third largest in the world (FOS, 2004; NDHDR, 2006). This mangrove area is declining due to climate change and the fragility of the ecosystem makes the area vulnerable to destruction by unsustainable human interventions such as oil exploration, exploitation and transportation process. Across the Niger Delta, 65 percent of the population depends on the natural environment while the other 35 percent dependence on remittance (Daniel Omoweh, 2005; Onakuse and Eamon, 2007). Agriculture remains the most economic activity in the Niger Delta with crop farming and fishing activities accounting for about 90 percent of all forms of activities in the area while about 50-68 percent of the active labour force is engaged in one form of agricultural activity or the other including fishing and farming (FOS, 2004). The use of land rotation or bush fallow system remains the agricultural pattern in the area which is characterized by land and labour as the principal inputs of production. Settlement pattern in the Niger Delta area is largely determined by the availability of dry land and the nature of the terrain together with navigable limits of the coastal rivers or estuaries with small and scattered hamlets (Daniel Omoweh, 2005; FOS, 2004; NPC 2006). Politically, the area has 185 Local Government Areas (LGAs) that is divided into more than 2,000 communities (Chinwese and Abiola-Olako, 2009). The area which accounts for more than 23 percent of Nigeria's total population (NPC, 2006), has several minority ethnic groups with a population of over 40 million people. Two broad categories of environmental problems in the area are oil and non-oil related environmental problems. The most common oil-related environmental problem include oil spills, gas flaring, dredging of canals and land for the construction of facilities while the non-oil related environmental challenges include coastal/river back erosion, flooding, spread of exotic species, agricultural land degradation, fisheries depletion, inadequate sanitary and waste management and emission discharges from industries (Ibaba, 2010). According to UNDP (2006), the lack of infrastructure, basic amenities and high level of poverty (about 70 percent) impacts negatively on the Niger Delta environment. Hence, poverty promotes an unsustainable exploitation of natural resources that leads to the over-exploitation of farmlands. Over 80 percent of rural people use fuel wood as energy for domestic use and thus, contribute to the problem of deforestation. The provision of social infrastructure promotes environmental degradation. Willinks (1957) described the area as "poor, backward and neglected' despite its privileged endowments, is still largely a rural area.

Oil Exploration in Nigeria

Nigeria had previously been a major producer of cocoa, groundnut and other agricultural items which were exported principally to the West and represents the country's major source of external revenue. With the discovery and production of oil at Oloibiri a village in the Niger Delta by Shell British Petroleum (now Royal Dutch Shell), Nigeria's relationship have change to the global capitalist order (Olawale et al, 2009). Nigeria became increasingly reliant on this oil as the exploitation continued in the post-colonial era and its reputation as an agricultural

producer disappeared. The then Obasanjo military government promulgated the Land Use Act decree to have total influence over the oil resources and the revenue thus; the ownership of the land and its resources was invested on the Federal government. Oil revenue now accounts for 90 percent of Nigeria's export earning and today, there are 606 oil fields in the Niger Delta out of which 360 are on-shore and 246 off-shores (Olawale et al, 2009). All these have been parceled out to the multinationals for extraction that in turn pay the Federal Government royalties due to the Joint-Venture Agreement between the Federal Government and the Multinationals. Oil exploration introduced entirely a new element into the structure of the Nigerian state because the elites saw the new commodity as God-sent; therefore, they are unaccountable to the communities that produce the oil. The Nigerian state and the multinational oil companies believed that what they own the oil-yielding communities is minimal with regards to the wealth derived from the oil exploration and will give that at their own pleasure. The communities receive revenue from on-shore oil deposits despite the fact that the Nigerian's revenue allocation formula legally provides that the country injects part of the revenue from the royalties into the oil-producing communities. (Off-shore deposits are much larger than on-shore deposits and exploration is more limited to off-shore). In 1983, the Inspectorate Division of the state-owned Nigeria National Petroleum Corporation (NNPC) noted the environmental problems caused by the activities of the oil companies in the area and described it as "the slow poisoning of the waters of the country and the destruction of vegetation and agricultural land by oil spills which occur during petroleum operations". These environmental problems which are devastating on the oil-producing communities have continued and there are no concerted efforts by the government to control these problems let alone the oil operators.

The Nature and Impact of Environmental Pollution on Agricultural Productivity in the Niger Delta

The Niger Delta which is one of the most important wetland and coastal marine ecosystems in the world, a home to some 31 million people (NDTC Report, 2008) is also the location of massive oil deposits which has generated an estimated $600 billion since 1960s (Wurthmann, 2006). Despite this, the majority of the Niger Delta's populations live in poverty in contrast with the wealth generated by oil. According to the UNDP, more than 60 percent of the people in the Niger Delta depend on the natural environment for their livelihood (UNDP, 2006) thus, environmental quality and sustainability are fundamental to their overall wellbeing and development. The environmental resources base which many of them use for agriculture, fishing and collection of forest product, is their principal source of food. The main crops grown include yam, cassava, cocoa, pumpkin and various fruits. Oil spills, waste dumping and gas flaring endemic in this area have affected the area for decades damaging the soil, water and quality. Most of the people affected are particularly the poorest and those who rely on traditional livelihoods such as fishing and agriculture. Damages from oil operations are chronic and cumulative and have acted in a severely impaired coastal ecosystem and compromised 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, while on water, damages fisheries and

contaminate water use for drinking and other domestic purposes (Amnesty International, 2009). Oil spills happen frequently in the Niger Delta area as a result of the following reasons- corrosion of oil pipes, poor maintenance of infrastructure, spills or leaks during processing at refineries (World Bank, 1995), human error and vandalism or theft of oil (Steiner, 2008). When oil is pumped out of the ground, the gas produced is separated and most of it is burnt as waste in massive flares in Nigeria which have been ongoing for many decades. This has long been acknowledged as extremely wasteful and environmentally damaging. This flares which continue for twenty-four hours a day in many areas, cause serious discomfort to people living near the flare sites. When this associated gas is flared, the combustion is often incomplete thus oil droplets fall on waterways, crops, house and people and also creates noise pollution in which communities may have to live with permanent light. Various harmful and toxic organic compounds introduced into the natural environment during oil extraction such as during seismic work, oil spill, gas flares and several other forms of pollution, changes the geo-chemical composition of the soil, river and other components of the environment (Achi, 2003), This, however, affects agriculture and leads to a drastic decline in production output in both farming and fishing activities. Oil pipelines sometimes running through farmland, other oil infrastructures such as well heads and flow stations are often close to agricultural land. Without oil spills, the existence of such infrastructures within a relatively densely populated rural setting can cause difficulties for farmers. For example, communities in Ohaji/Egbema Local Government in Imo state cover a great deal of farmland in the area thus reducing farm activity (Amnesty International, 2009). When oil spills occur on agricultural land, crops in the ground rarely survive and any crop that comes in contact with it is destroyed. According to Amnesty International (2009), lack of data makes it difficult to properly assess the level of impact of environmental pollution on agriculture.

CONCLUSION

Exploitation activities carried out by man have generally impacted on the environment and 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 Niger Delta have never been properly assessed and the impact on the area has raise questions of great concern to stakeholders particularly the oil producing communities who have suffered polluted air and water, degraded forests resources and farm lands, and very high atmospheric temperatures for decades. The continuous destruction of the ecosystem by oil producing companies is aggravated by the lack of political will by the Federal Government to enact and enforce stringent environmental laws to regulate the environmental consequences of crude oil exploration and exploitation in the Niger Delta. While their environment and means of livelihood are undermined, little effort is made to recompense the people of the Niger Delta with basic infrastructure of electricity, roads, schools, potable water, cottage industry and employment. This paper notes that the effect of oil extraction on agriculture, the basis of sustenance of a significant number of the people in the Niger Delta communities has an over bearing influence on the environment. Therefore, this paper recommends that Laws and Regulations to strictly protect the Niger Delta environment and ecology from further degradation should be made and enforced on oil companies operating in the Niger Delta to

make them more compliant to the Nigerian Environmental regulations. The Land Use Act of 1978 which tends to deny the people their rights to make claims to their land should be revoked. This Act also tends to deny the people their right of control over the resources that pertain to the land. An impact assessment of environmental pollution on agriculture should be carried out to ascertain the level of damage. Since the oil industry in the Niger Delta involves the Government of Nigeria and subsidiaries of Multinational Companies, the success of all these strategies will be based on a principle-oriented political leadership that is committed to programme implementation.

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