

**AGRICULTURE, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT IN NIGERIA:  
SOME ISSUES**

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**Abstract**

*Agriculture is the main occupation of the Nigerian people. However, agricultural practices whether traditional or modern degrade and pollute the environment and endanger the prospects of sustainable development. This article argues that the goals of agricultural development such as increased food and fiber production, raw materials for industries, employment generation and foreign exchange earnings are most likely to put increased pressure on the environment hence the need to manage and conserve the environment so as to avoid adverse consequences both now and in the future. Accordingly, to ensure continuous agricultural productivity and environmental sustainability in Nigeria, the paper recommended the following: the involvement and participation of farmers in government agricultural and environmental policy making; periodic survey of agricultural areas susceptible to environmental hazards; increased training and research; and the granting of incentives to farmers to enable them undertake necessary actions that will help to maintain and prevent environmental degradation.*

**Key words:** Agriculture, Environment, Sustainability, Sustainable Development and Development.

**Introduction/Statement of Problem**

Agriculture is the predominant occupation of the Nigerian people. A conservative estimate has it that about 75 percent of Nigerians are engaged in agriculture. The agricultural sector in the country has continued to provide food and fiber for the ever growing population and raw materials for industries. Also, agricultural export products constitutes significant source of Nigeria's foreign exchange earnings, which has always aided the importation of capital goods into country. The agricultural sector therefore, is very significant to the Nigerian economy. It is as a result of the importance of agriculture to the economy that successive governments have been involved directly in efforts aimed at enhancing its performance (Ogbuagu, 1995; Obi et al, 2008; Ego, 2008; Nchuchuwe and Adejuwon, 2012; Ugwu and Kanu, 2012; Oni, 2013).

It is therefore obvious giving the huge dependence on agriculture that Nigeria has pursued with determination the exploitation of her natural resources for the purposes of sustenance. However, agricultural practices, whether traditional or modern degrade and pollute the environment and endanger the prospects of environmental sustainability that would enable the country cater for the agricultural needs of its people both now and in the future. There is therefore, the need to pay adequate attention to the good management and conservation of the environment so that increased food and other resources can be produced at a minimum cost and without putting at risk the survival of future generations. For a very long time now, a lot of irreplaceable damages have been done to the environment as a result of Nigeria's agricultural practices. According to Yudelman (1987), we have always looked at the African problems mainly in the context of economic constraints. Yet, eroding soils, deteriorating rangeland, dwindling forests and falling water tables, results of environmental mismanagement, are testimonies to the related

crisis of ecological degradation. There is therefore the need to understand the interrelationship between agriculture and the environment so that we do not promote an aspect of development at the expense or detriment of another. This calls for the need to give sustainable development a high priority in our planning efforts. Sustainable development among other things requires adequate knowledge of sensitivity towards natural resources management.

This article argues that the self-sufficiency drive in food and raw materials are most likely to put increased pressure on the environment hence the need to preserve and conserve the environment so as to avoid adverse consequences both now and in the future. Basically, the objectives of this article are three fold;

1. To examine the relationship between agriculture and the environment vis-à-vis sustainable development,
2. To assess the consequences of misusing the environment, and
3. To suggest strategies and ways that will enhance proper management of agricultural environment.

### **Theoretical Framework**

The theoretical framework of this paper is based on the theory of natural resources' scarcity, which is credited to some classical economists like Malthus (1798), Ricardo (1821) and Mills (1963). This theory is of the view that scarcity of natural resources would eventually lead to diminishing social and economic returns to human efforts and ultimately to stagnation, retardation and cessation of social-economic growth.

### **Methodology**

This research work is a library-based study, which relied entirely on secondary sources of data and employed descriptive analytical techniques.

### **The Environment, Agriculture and Issues of Sustainability**

There is no universally accepted definition of sustainability environment, sustainable agriculture or even of sustainability in general. Pretty (1995:11) sees sustainability as "a complex and contested concept" which to some, implies persistence and the capacity of something to continue for a long time. To others, it implies resilience and the ability to bounce back after unexpected difficulties. Common (1995), has also reasoned similarly that sustainability is a contestable concept, i.e. one that can be interpreted in variety of particular ways, but which, at the same time is widely agreed as representing a desirable state. In terms of the environment, sustainability involves development activities directed towards the protection, maintenance and conservation of natural resources. It is against activities that damage and degrades the environment. The goal of environmental sustainability is therefore, to maximize the productivity of the environment and also ensure its continued use into the very long future.

According to Iniodu (1997), sustainable agriculture is primarily concerned with measures designed to protect the environment, natural resources and the entire ecosystem from degradation, while at the same time ensuring high and stable crop yields. It aims at resources improvement and at preventing long-term reduction in the productivities of resources because it makes no sense to meet the needs of people today if this leaves no tomorrow for their children. Pretty (1995:9), has similarly argued that sustainable agriculture is any system of food and fiber production that systematically pursues the following goals:

1. A more thorough incorporation of natural processes such as nutrient cycling, nitrogen fixation and pest-predator relationships into agricultural production processes.
2. A reduction in the use of those off-farm, external and non-renewable resources with the greatest potential to damage the environment or harm the health of farmers and consumers, and a more targeted use of the remaining inputs used with a view to minimizing variable costs.
3. A more equitable access to productive resources and opportunities, and progress towards more socially-just forms of agriculture.
4. A greater productive use of biological and genetic potentials of plant and animal species.
5. A greater productive use of local knowledge and practices, including innovative approaches not yet fully understood by scientists or widely adopted by farmers.

6. An increase in self-reliance among farmers and an improvement in the match between cropping patterns and the productive potential and environmental constraints of climate and landscape to ensure long-term sustainability of current production levels; and
7. Profitable and efficient production with an emphasis on integrated farm management, and the conservation of soil, water, energy and biological resources.

As observed earlier, the goals of agricultural development in Nigeria includes the provision of adequate foods, fibers and industrial raw materials, employment and foreign exchange generation. In an effort to attain these goals, several strategies have been adopted and some of them include the following: (1) Increasing the aggregate area under cultivation; (2) Using high yielding varieties of seeds (3) Increasing the productivity of cultivated land through the use of fertilizers and other forms of manures; (4) The use of irrigation (5) Mechanization of agriculture (6) The use of plant and livestock protection arrangements; (7) Adopting multiple cropping thus increasing the total area cultivated, etc. Usually, any strategy adopted most often derives its sustenance from the environment and such a strategy in turn affects the physical, chemical and socio economic structure of the environment. For example, the use of tractors and other agricultural machinery alters the physical nature of the soil, which can lead to soil erosion.

In Nigeria today, the typical forms of agricultural related environmental degradation often observed are deforestation and soil erosion. Deforestation has often been caused by the demand for new land for farming, demand for fuel wood, and timber harvesting for building needs and collection of other forest products. Soil erosion on the other hand is caused by the farming systems adopted, inappropriate road construction, overgrazing, deforestation and lack of appropriate farm maintenance, etc. The impact of agricultural environmental degradation due to agricultural activities is not limited to Nigeria alone. According to Scherr and Yadav (1995), 65.0 percent of the croplands in Africa, 51.0 percent in Latin America and 38.0 percent in Asia have become degraded since the middle of the twentieth century. According to their findings, as land deteriorates, yields decline, forcing farmers to expand into marginal/virgin lands which quickly become depleted in turn. They therefore made some policy recommendations for maintaining, protecting and improving agricultural lands as follows:

1. Improving information systems for land management.
2. Increasing research and technology development and promoting investment in land development.
3. Modifying property rights to encourage long-term land investment and development.
4. Developing flexible and participatory planning systems for sustainable land use.
5. Supporting local people and organizations to manage local resources and reducing discrimination against marginal regions on public investments.
6. Developing marketing infrastructure and correcting distorted price incentives; and
7. Encouraging rural income and diversification.

As argued earlier, agricultural production derives its existence from the use of natural resources. In order to avoid the depletion of these natural resources and its adverse consequences to Nigeria and Nigerians, there is the need to use the most efficient production techniques. Yudelman (1987), observes that the accelerating deterioration of the resource base in much of sub-Saharan African threatens to reduce production. The implication here is that natural resources must be managed in such ways as to provide a basis for sustainable development. The paper will address this later. For now, it is pertinent to examine some of the consequences of mismanaging the agricultural environment.

### **Consequences of Mismanaging the Environment**

The importance of the environment to agricultural production and productivity cannot be over-emphasized. Surely, without the environment, nobody would be talking about agriculture. However, despite the acknowledged and indispensable role of the environment in this regard, commensurate attention is most often not given to its proper use so as to ensure maximum returns. To start with, farmers often embark upon several agricultural practices and activities, which are detrimental to the environment. Activities such as bush burning, overgrazing by animals, wood fuel harvesting in a non-sustainable fashion and inappropriate farming practices are all inimical to the efficient use of the environment.

All these practices leave the soil worst off. Also, the traditional fallow system is presently proving inadequate for food and fiber production as a result of over-population. With over-population and the attendant pressure on land, the traditional fallow period required for the regeneration of the soil is shortened. A shortened fallow period can lead to overgrazing and over cropping resulting in erosion, degradation and impaired quality of the soil. The implication here is that agricultural production and

productivity are endangered. Also, the ability of the farmers to realize their socio-economic objectives is seriously impaired.

Similarly, the desire to obtain mineral resources in order to realize adequate financial benefits for the nation has resulted in the dangerous exploitation of the environment in search of resources such as crude oil, tin, limestone, gold, etc. Mismanagement of the environment during the process of mining most often leads to soil, air and water pollution. For example, oil spillages and over flowing crude petroleum products are common occurrence in the oil producing areas of the Niger Delta. This inevitably results in air, soil and water pollution. Such pollution affects adversely the ecosystems and micro flora leading to reduced fish, crop, livestock and wildlife. Since health problems and productivity are incompatible, agricultural production and productivity is seriously impaired or hampered in the unfolding scenario.

According to Pearce (1988), the economic implications of resources degradation include: reduced wood fuel supply, increased time lost in wood fuel collection, increased prices of marketed biomass fuels, similar impact on the water supply and reduced nutritional intake via reduced cooking activities. The impact indirectly extends to national and regional economics through reduced agricultural yield, increased rural-urban migration, and depletion of natural resources assets, which are the basis of both indigenous and export industries.

In a study on the economic effects of soil erosion in Efon-Alaye, Nigeria, carried out by Titilola, et al (1996), it was established that erosion has (1) reduced the areas farmed to about one third of the original size, (2) reduced physical output to about two third, and (3) Reduced the monetary value as well. The major factors thought to be responsible for erosion on Nigeria farms according to the study include ecosystem disequilibrium; rising population pressure on land; fragile and permeable soil; farming system adopted; soil management practices and poverty. The implication of this study is that farmers who are based mostly in the rural areas are the most important actors in the prevention and management of erosion control efforts. Extension officials also known as “change agents” can also help to disseminate research and other agricultural information to the farmers on better ways of managing erosion and other environmental problems caused by farming. According to Titilola (2008:6), the measures that will adequately encourage resource management must satisfy the following conditions, (1) It must be profitable in the short-term, (2) It must include some aspects of existing farming system and practices, and (3) It must not require farmers to donate their most limiting resources.

From the foregoing, one can see that the consequences of mismanaging the environment are really grave. Titilola (2008:5), summarizes the consequences of mismanaging the environment thus:

Mismanagement of the environment leads to a fall in production and productivity, a fall in the income generating capacity of the people and the nation, impaired ability of the economy to generate increased employment, inadequate industrial material and lowered ability for investment in the economy. All these translate into lack of growth.

### **Managing Agricultural Environment for Sustainable Development**

The now famous Brunt land report entitled “our common future” published in 1987 defines sustainable development as development aimed at meeting the needs of the present generation without compromising the ability of future generations to meet their own needs. However, the idea of sustainable development was first floated during the Earth summit held in Stockholm in 1972. The Stockholm summit had expressed a serious concern at the rapid depletion of the exhaustible natural resources. The concept of sustainable development therefore, focuses attention in finding strategies to promote economic and social development without causing environmental degradation, pollution and over-exploitation. According to Ress (1989:3), “sustainable development is positive socio-economic change that does not undermine the ecological and social systems upon which communities and social systems are dependent”.

Agricultural development demands higher production, which involves the exploitation of natural resources. This exploitation sometimes comes with some adverse consequences for the environment as observed earlier. Considering the fact that natural resources are not inexhaustible, there is every need to understand the inter-relationship between agriculture and the environment so that we do not promote one aspect of development at the detriment of another. Agriculture and the environment must be mutually managed for persistent and continuous food and fiber production, employment generation, foreign exchange earnings, etc, both now and for future generations. This is the essence of sustainable development.

The implementation of sustainable development therefore, requires planning, integrated policy and social learning process. Its potency and viability depends on the full support of the people, their social institutions and the government. Since agricultural development has conventionally been based on the use

of natural resources, it becomes necessary that these resources especially land must be maintained and properly managed. The government through such organizations like the Federal and State Environmental Protection Agencies and some Non-governmental Organizations like the Nigeria Conservation Society has been involved in creating awareness of the need to use carefully, and thus preserve the environment. Although preservation and other management measures taken so far are step in the right direction, they do not appear to be enough, especially in ensuring widespread knowledge among farmers on the relationship between agricultural productivity and environmental sustainability.

Accordingly, the challenge today is how to increase agricultural productivity while enhancing the productive capacity of the natural resources base. This incidentally is the goal of sustainable development, which aims at approaches that reduce environmental degradation, conserve resources, and provide an adequate and dependable farm income through reducing poverty and associated problems. If Nigeria is to meet her food and other agricultural needs, it will be necessary to marshal and utilize natural and human potentials in an effective and efficient manner. Several attempts have been made in the past to provide policies, programmes and projects dealing with such agricultural issues. These attempts among others include, the National Accelerated Food Production Programme (NAFPP), Operation Feed the Nation (OFN), Green Revolution (GR), Operation Grow More Food (OGMF), and the Land Use Decree. Others include the River Basin Development Authorities (RBDAs), Agricultural Development Projects (ADPs), Directorate for Food, Road and Rural Infrastructure (DERRI), National Agricultural Land Development Authority (NALDA), and the 1988 Agricultural Policy for Nigeria, etc. Despite the above and many other efforts, agricultural productivity and environmental quality have remained low (Ogbuagu, 1995; Obi et al, 2008). Accordingly, one critical issue for the future is how best to achieve the equilibrium goal of agricultural productivity with that of environmental sustainability. Efforts must therefore, be made to ensure that agricultural policies, programmes and projects in vogue and the food security needs of the country are achieved simultaneously with environmental consciousness and considerations.

Some agricultural policies and programmes in the country have been growth oriented and their consequences have been environmentally blind. All forms of agricultural production affect the environment. The negative effects must therefore, be identified as failure to do this may allow it to appear in the form of several damages including damages to human health, to land, to water, to air, and to livestock. In the interest of sustainable development and national welfare, Nigeria must always account and deal with environmental and resource costs. If the country fails to do this, the development objectives of agriculture, which cannot be divorced from the resource management goals, will not be achieved. Rational use of natural resources is the only means to maintain and improve agricultural productivity and by extension human conditions. However, in the use of natural resources, one needs to appreciate the impact of one action on the resources and the society. What has been advocated worldwide is the concept of integrated resources management. This means that in altering one element in the system for the purpose of deriving advantages; one should understand the impact of the alteration upon the remaining components of the system (United Nations, 1972). Also, one should carefully calculate what should be done to make the system as a whole, as productive as possible or to prevent the benefits that the modification makes possible from collapsing because crucial natural links have been interfered with or terminated (Titilola, 2008).

All these calls for a series of concerted sustainable development efforts and reorientation embodied in appropriate policies and programmes. Sustainable development should therefore, be the overriding issue in our future agricultural and environmental planning endeavours. Sustainable development more than any other efforts recognizes the inter-relationship between agriculture and the environment and the limits imposed on achieving a given set of development objectives.

### **Conclusion and Recommendations**

This paper argued that the goals of agricultural development such as increased food, raw materials, employment generation and foreign exchange earnings are most likely to put increased pressure on the environment. Accordingly, to ensure continuous agricultural production, there is the need to manage agriculture and the environment mutually in a sustainable manner.

Several agricultural practices such as bush burning, overgrazing, deforestation without adequate reforestation and other human activities such as overpopulation, transhumance, and use of inappropriate technologies and profligate exploitation of mineral resources most times are detrimental to the environment. The obvious implication of these activities is the increasing inability of the environment to provide the necessary sustenance to agricultural development in the country because of erosion, desertification, pollution and other related environmental problems. In order to avoid the adverse

consequences of misusing and mismanaging the environment for agricultural productivity, this paper recommends the following:

1. Since agriculture is an activity of national interest, the formulation of agricultural development policies and programmes should take into consideration the peculiarities of farmers and the environment so that all concerned can make appropriate and necessary contributions in maintaining environmental quality. At the policy or programme planning state, an environmental impact assessment must be carried out in order to prevent harmful environmental effect in such areas as dam construction, use of mechanization, irrigation of farmland, and large-scale agricultural farming.
2. Periodic survey of agricultural areas susceptible to environmental hazards should be undertaken from time to time. Such surveys should be able to identify specific sources of environmental hazards and trends such as loss of soil productivity, depletion of grazing lands, rate of deforestation, rate of erosion and the magnitude of the decimation of livestock and farm crops by pest and diseases.
3. More training and research should be undertaken in relation to the understanding, functioning and productivity of agricultural systems and the important function of maintaining environmental quality in order to provide a basis for achieving sustainable development.
4. Government should urgently enact a policy compelling exploring, extracting and mining industries to reinvest and repair the soil. The absence of adequate policies in this regard has continued to have adverse consequences on the environment and the performance of the agricultural sector.
5. Lastly, since agricultural production and environmental maintenance are predominantly the responsibility of rural small farmers, government should consider granting incentives and assistance to them. Such measures will help recipients to undertake necessary actions to maintain or prevent environmental degradation caused by their agricultural activities.

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