CHAPTER 6

Sustainable Development, Green Growth and Sustainable Agriculture: Concepts and Issues for Nigerian Agriculture

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Abstract

Nigerian agriculture has not been able to supply a significant proportion of the food the nation needs to feed its teeming population, hence the nation keeps importing large amounts of food every year. Also, poverty in Nigeria is increasing and is currently estimated at 49.1%. This paper looks at conceptual issues on sustainable development, green growth and sustainable agriculture with a view to raising issues on sustainable agriculture that should be considered in order to move Nigeria's agriculture forward. It concludes that the main goal of sustainable agriculture which Nigeria's Agriculture must strive to attain is to meet society's food and fibre needs in the present without compromising the ability of future generations to meet their own needs. This requires that Nigeria's agricultural sector meets the standards of environmental, economic and social sustainability. In addition, if Nigeria desires to pursue the slightly higher standards of Green Growth and Green Economy, the nation must be efficient in the use of natural resources, minimize pollution and environmental impacts, and be resilient with respect to natural hazards. It must use more renewable energy sources for farm production activities. The researchers, extension workers and policy makers must work together to reconfigure the typical agricultural enterprise in Nigeria to meet these standards.

Key Words: Sustainable Development, Sustainable Agriculture, Environmental, Economic and Social Sustainability, Green Growth, Green Economy.

Introduction

Nigeria has an estimated population of about 167 million people and a land area of about 924 square km (AfDB, 2012), a large proportion of which is arable. It has large deposits of oil, gas and solid minerals. It also has a sizeable educated and skilled work force. Despite these, the country has not been able to effectively harness its endowment to develop the economy sufficiently to improve the welfare of its people. It has not been able to produce the basic goods and services required for smooth running of the economy which developed economies take for granted. Above all, it has not been able to produce a significant proportion of the food required to feed its teeming population. It has resorted into importing large amounts of food every year to fill the shortfall in supply (Koema, 2019).

Nigeria continues to experience high rate of urbanization leading to loss of virile labour force by the agricultural sector. Besides, the rate of job creation has been far less than the rate of growth of the urban labour force. This combined with an education system that is not attuned to the production of the appropriate manpower required to support robust growth has led to high levels

of unemployment and underemployment (NBS, 2018). Poverty in Nigeria is increasing and is currently estimated at 49.1% (World Bank, 2018). The economic situation rather than improve has been worsening over time. This has become a source of embarrassment for a country that is relatively so well endowed.

The weakness of the Nigerian economy in the past decades is not unrelated to its dependence on oil. Indeed, the country is a textbook example of an economy under the influence of the Dutch Disease with its deleterious impact on the development of other aspects of the real sector. Oil still dominates foreign exchange generation and government revenues although it employs only a relatively small percentage of the labour force (PWC, 2016).

Nigeria's agricultural sector has a big role to play in redeeming the nation from the economic situation it has found itself. But the sector cannot operate the way it has operated over the past years if it is to produce a different result from what it has produced in the recent times. Thus the sub-theme "Sustainable Agriculture" is timely. It is an opportunity to look at Nigeria's agricultural economy over the past years and look forward, proffering potential solutions to be tested and probably implemented to make the sector contribute appropriately to the development of Nigeria.

This paper titled "Sustainable Development, Green Growth and Sustainable Agriculture: Concepts and Issues for Nigerian Agriculture" has been prepared to look at conceptual issues with a view to setting the tone for the discussion for the sustainable agriculture in Nigeria going forward. This paper is divided into six sections. Section one is this introduction; Section two is focused at sustainable development. Section three is devoted to growth, green economy and sustainable development while section four addresses sustainable agriculture. The focus of section five is sustainable agriculture: issues for consideration in Nigeria. The conclusion is presented in section six.

Sustainable Development

Development has been defined in different ways. In fact, the definition of the term "development" has undergone several refinements over the past years. Development was initially equated with economic development while economic development was itself equated with economic growth. Over time, however, the deficiencies of these definitions were noticed, leading to more refinements. Following Akpokoje (2016) some of the concepts of development provided by foremost economists are briefly examined as follows.

Meier and Baldwin defined economic development as "a process whereby an economy's real national income increases over a long period of time". This definition has three major factors:
a) Process. This refers to the operation of certain forces which bring about changes in certain variables. Various types of economic changes take place during the development process. The most important of these changes are:

i) changes in the supply of fundamental factors, and
ii) changes in the structure of demand for the products.

Changes in factor supply take place due to discovery of additional resources, capital accumulation, population growth, adoption of better techniques of production and institutional

changes. Again, changes in the structure of demand for products take place due to changes in the size and composition of the population, changes in the level and distribution of income, changes in tastes, etc. Hence economic development may be defined as development of factor supplies and product demand. These changes bring about an increase in real national income over a long period.

b) Real National Income. Other things being equal, there is a positive correlation between the real national income and economic development. Higher real national income of a country is considered an index of higher economic development and vice versa. Meier and Baldwin believed that the real national income is the measuring rod of economic development. This has however been faulted, none the less, it is still being used for global development comparisons. The emphasis is on the term "real" which means that purchasing power of national income should be taken into consideration in quantifying development. This means that the money national income is to be discounted by the price index. Thus, development will only be meaningful if an increase in money national income is not accompanied by increase in price level. It implies that price stability is an essential condition for promoting development. Thus, economic development signifies higher real national income.

c) Long Period. Economic development refers to an upward trend in real national output over a long period. Since a major business cycle covers normally 6 to 13 years, long term process here refers to a sustained increase in real output over a period of at least 25 years. Economic development is therefore a process consisting of a long chain of interconnected changes in fundamental factor supplies and in the structure of demand for products leading to a rise in real national income over a long period.

Benard Okun and Richard Richardson define economic development as a sustained secular improvement in well being, which is considered reflected in an increasing flow of goods and services. According to this definition, economic development implies continuous secular increase in national output for promoting material welfare of the society. The definition emphasizes that economic development (a) is a dynamic and long term phenomenon (b) implies improvement in material welfare (c) national output is the measuring rod of material welfare.

The perspective of Baran, Bachanan and Ellis is that economic development transcends an increase in total output. They contend that economic development should also denote a rising standard of living. They defined economic development as a process whereby the total per capita income or output of a country increases over the long period. Hence, for economic development to take place, the rate of increase real income should be higher than the rate of population growth.

Colin Clark defined economic development from the angle of economic welfare. For him, "economic progress can be defined simply as an improvement in economic welfare." Economic welfare, following Pigou, can be defined in the first instance as an abundance of all those goods and services which are customarily exchanged for money. Leisure is an element in economic welfare.

According to United Nations Expert Committee, "development concerns not only man's material needs but also the improvement of the social condition of his life. Thus, development is not only economic growth, but growth plus change – social, cultural and institutional as well as

economic". This definition encompasses economic and non-economic aspects of development. It emphasizes the expansion of development variables, and also improving the quality of those variables. The central point of this definition is that quantitative and qualitative changes in development variables are considered essential ingredients of economic development.

Development is thus a concept difficult to define to the satisfaction of everybody. It is complex and ambiguous (Thomas, 2004). It is however generally agreed that 'development' involves continuous 'positive change' in different aspects of human society. The dimensions of development are extremely diverse, including economic, social, political, legal and institutional structures, technology, environment, religion, the arts and culture (Corbridge, 1995).

It has been argued that perspectives to development could be historical and policy related. The historical perspective is long term and arguably relatively value free. It sees 'development' as a process of change. The policy perspective is evaluative or indicator led. It is based on value judgments, and has short- to medium-term time horizons. It sets targets to be met at different points in time, for example, the Sustainable Development Goals.

Over the centuries, development continues to be an issue which has stayed on the front burner in economic discourse. This is because the issue under consideration is essentially the well-being of human beings. Different perspectives of the same issue have been given prominence at different times. Emphasis has shifted between focusing on mass unemployment which is usually the case in times of economic depression, to income gaps between the rich and the poor nations, income distribution within nations, poverty, hunger and socio-economic well-being, etc. Emphasis in development discourse is being tilted towards human development as the end of development interventions while economic growth is taken to be a means (Soubbotina, 2000). Additionally, emphasis is being placed on sustainable development as opposed to unqualified growth or development. Sustainable development is simply addressing the issue of equity between generations, i.e. that the well-being of current generation does not compromise the well-being of future generations (Soubbotina, 2000)

Equity is at the heart of sustainability concept. The equity is usually viewed from two perspectives namely inter-generation and intra-generation. In the strict sense, inter-generational equity is a necessary condition for sustainability. It is based on the argument that the use of the available resources by present generation should not compromise the access of the future generations to the same resources. This also implies that today's generation should be mindful of what it does with the current capital [natural] assets since tomorrow's generation also has a right to them.

Intra-generational equity is, in actual fact, the basis for development as opposed to simple economic growth. This implies equitable access to available resources and/or well being by people in all strata of the society within the same generation. Thus, the holistic perspective of sustainability among development practitioners expects development to be both sustainable and equitable.

The issues covered under sustainability can be categorized into three, namely, economic, environmental and social. Economic sustainability addresses changes in the total capital stock

over time. Thus indices to measure economic sustainability must be capable of documenting the status of the capital sock at specific points in time. Environmental sustainability is concerned with life support systems that are necessary for the survival of the present and future generations while social sustainability addresses relationships between individuals and groups in the society, particularly in regard to participation, togetherness, empathy, honesty, etc. It is important to note that without economic and environmental sustainability, social sustainability cannot be guaranteed. The concept of sustainability is depicted in Figure 1.

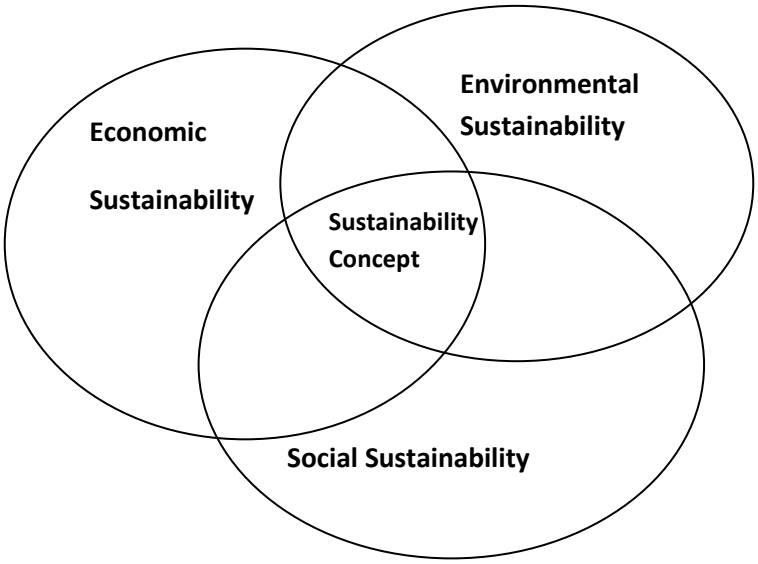

Figure 1: Sustainability Concept

Growth, Green Economy and Sustainable Development

The concept of sustainable development has been extended further in recent years into what is termed Green Growth which is expected to lead to Green Economy. The concept of Green growth attempts to combine sustainable development's economic and environmental pillars into a single intellectual and policy planning process, thereby recasting the very essence of the development model so that it is capable of producing strong and sustainable growth simultaneously (Samans, 2013). Green Growth as a concept promotes economic growth and development, while ensuring that natural assets are used sustainably, and continue to provide the resources and environmental services on which the growth and well-being rely (OECD, 2011). The World Bank (2012) defines it as growth that is efficient in its use of natural resources, clean in that it minimizes pollution and environmental impacts and resilient in that it accounts for natural hazards. The consistent achievement of Green Growth should lead to the achievement of Green Economy which, according to UNEP (2011) aims for improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. A 'green' economy can be understood as one in which environmental, economic and social policies and innovations enable society to use resources efficiently — enhancing human well-being in an inclusive manner, while maintaining the natural systems that sustain us (EEA, 2014). Economic and environmental objectives are often presented as conflicting goals and mutually exclusive. The Green Growth concept presents a contrary argument thus challenging researchers, policy

makers and the private sector to see the advantage and the possibility of achieving economic and environmental objectives simultaneously.

The belief is that income and employment growths can be driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. The Green Economy concept therefore seeks to engender growth that is compatible with sustainability while promoting social equity.

Green Cities and Sustainable Agriculture

An additional extension of the Green Growth, Green Economy and sustainability concepts is the concept of Green Cities. The Green City Concept is one of the latest responses to the diverse efforts and research conducted to address the problems caused by the dispersed model of city development and to help cities to become more sustainable (greener), less dispersed and more livable (Brilhante and Klaas, 2018).

It is ”an integrated, multi-sector process whereby a city’s environmental challenges are periodically identified, prioritized and addressed through targeted investments and services, regulations and other relevant policy instruments with the aim to enhance the city’s environmental performance in a cost-efficient and financially sustainable manner, while at the same time seeking to maximize the economic and social co-benefits” (EBRD, 2016).The concept of Green City is also a response to growing urbanization and unbridled lateral expansion of cities due to availability of cheap land, readily available and affordable automobiles and other means of transport as well as relatively cheap fossil fuels. An extensive development of transport and other infrastructures leading to the deterioration of urban environment which is manifested in the poor quality of air and water, long distance daily shuttle and traffic congestion in many cities. In addition to all these is the need to transport food to feed the city population from long distances with the attendant increase in cost and decrease in quality. The development of Green Cities contributes to Green Growth and Green Economy; it promotes climate resilience and environmental sustainability, social inclusion and poverty reduction and economic growth (GGGI, 2016)

What is relevant to Nigeria from the perspective of Green City concept is to begin to moderate the way cities are growing from urban planning perspective to reduce the pitfalls that the Green City concept seeks to address. For Nigeria’s agricultural policy makers and researchers, there is a need to mitigate the uncontrolled conversion of lands within and around the cities that are best suited for the production of fresh agricultural produce for feeding the urban population to other purposes. Such lands, especially low lying areas, that could be put to vegetable production and aquaculture in normal years but could serve as water catchment basin in years of excessive rainfall should be designated for urban agriculture thus creating avenue for producing relatively cheaper and fresher foods for the city’s population and providing job opportunities to potential urban farmers. The use of such land for agricultural purposes also helps to provide carbon sinks around the cities.

Sustainable Agriculture

The increasing world's population is putting pressure on resources for agricultural production especially in developing countries. The world's population is expected to reach 8.5 billion by 2025 and the ability of nations to produce enough food to meet the growing demand is uncertain. Thus, one of the greatest challenges facing nations of the world is being able to produce enough food in a sustainable manner so that everyone can be adequately and nutritiously fed without over-exploiting the Earth's ecosystems (UNESCO, 2010). In the light of this challenge, the sustainability of food production systems becomes a critical concern.

Systems high in sustainability can be taken as those that aim to make the best use of environmental goods and services while not damaging these assets (Pretty, 2008). The key principles for sustainability are to:

i. integrate biological and ecological processes,
ii. minimize the use of those non-renewable inputs that cause harm to the environment or to the health of farmers and consumers,
iii. make productive use of the knowledge and skills of farmers, thus improving their self-reliance and substituting human capital for costly external inputs, and
iv. make productive use of people's collective capacities to work together to solve common agricultural and natural resource problems (Pretty, 2008).

According to USDA (2007), sustainable agriculture is defined as an integrated system of plant and animal production practices having a site-specific application that will, over the long term:

i) satisfy human food and fiber needs;
ii) enhance environmental quality and the natural resource base upon which the agricultural economy depends;
iii) make the most efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls;
iv) sustain the economic viability of farm operations; and
v) enhance the quality of life for farmers and society as a whole."

The goal of sustainable agriculture is to meet society's food and fibre needs in the present without compromising the ability of future generations to meet their own needs. This is the concept of inter-generational equity. Sustainable agriculture seeks to integrate the objectives of: a healthy environment, economic profitability, and social and economic equity (Agricultural Sustainability Institute, 2020)

The benefits of sustainable agriculture include:

(a) Production practices that offer yields that match or surpass those achieved from conventional approaches,
(b) Incomes and food security arising from better yields from farmer's fields,
(c) Soil and water conservation,
(d) Resilience to natural disasters and climate change,
(e) Lower greenhouse gas emissions; and
(f) Community empowerment (Christian Aid, 2011)

The subject matter areas involved in sustainable agriculture include: food insecurity, energy efficiency and conservation, organic farming, food labeling/certifications, agro-forestry, food waste and postharvest loss management, soil nutrient management, urban agriculture and cooperative (Agricultural Sustainability Institute, 2020).

Sustainability Issues for Consideration in Nigeria

The main goal of sustainable agriculture which Nigeria's agriculture must strive to attain is to meet society's food and fibre needs in the present without compromising the ability of future generations to meet their own needs. This requires that the sector meets the standards of environmental, economic and social sustainability; that is, it would need to meet most, if not all, the conditions specified for sustainable agriculture in Section four above. Going by USDA's definition of sustainable agriculture, researchers, extension workers and policy makers need to work together to reconfigure the typical agricultural enterprise in Nigeria. Most of Nigeria's agricultural enterprises can hardly satisfy three out of the five conditions stated.

It is also possible that Nigeria will set its eyes on the slightly higher standard of Green Growth and Green Economy as prescribed in Section three above. This will require the sector to be efficient in the use of natural resources, clean in that it minimizes pollution and environmental impacts and resilient in that it accounts for natural hazards. It will turn more to renewable energy sources for the energy it requires for farm production activities, and participate in carbon trading and sequestration, among others.

The critical questions are: (a) what do we need to do to meet Nigeria's food needs in the present? and (b) how do we produce enough food in the present without depleting the natural assets base needed to produce foods for future generations? The answers to these twin questions lie in our ability to re-organize our Agricultural Production Systems. The numbers of issues involved are highlighted below:

i) Production Location and Farm Size

The production of fresh fruits and vegetables should be localized as much as possible such that there will be no need to transport such food items over long distances with the attendant deterioration of quality, higher cost due to long distance transportation and the negative impact of the fossil fuel being expended for transportation on the environment. To achieve this, it will be necessary to develop land use plans that coordinate the growth of cities with the provision of suitable land for urban and peri-urban food production purposes. The prelude to this will be a major exercise on land titling and registration coupled with land use designation. This will prevent the indiscriminate land filling of low lying areas and conversion of such for non-agricultural purposes, gradual elimination of water catchment basins that will hold water in the years of excessive rainfall. It will also play a major role in creating the land management system that provides incentives to agricultural investments (Adeniyi, 2011; Ghebru, Edeh, Ali, Deininger, Okumo and Woldeyohannes, 2014).

The re-organization will also require the consolidation of small agricultural holdings into bigger one to ensure economies of size and generation of adequate income to sustain families that venture into agriculture. The innovation required to achieve this

is the creation of agricultural land bank. The land bank, backed by enabling Act of Parliament, could be empowered to hold vacant agricultural lands in trust, after due titling and registration of such lands in the names of the owners and to lease out such lands for agricultural purposes for and on behalf of the owners. Under this arrangement, the owners will be assured of their continuing interests due to the titling and registration of the land; and the leasehold agreement facilitated by the land bank. In this arrangement, the land bank will be the intermediary between the property rights owner and the farming enterprises to whom the use rights have been assigned. Users of land obtained from land bank will have secured tenure and in return they will pay an equitable annual land use charge which will be shared at an agreed rate between the owners of the land and the government. Of course, the land bank will deduct an agreed applicable cost of transaction from the land use charge paid.

ii) Agricultural Technology

Agricultural technology issues cover mechanical, biological and chemical technologies. Sustainability and Green Growth standards require that special attention by paid to the technologies to be promoted. Mechanization technology currently being promoted encourages moving away from the use cutlasses and hoes to the deployment of tractors and ancillary equipments. In the middle to northern parts of Nigeria where the daily mean rainfall is not very high for most months of the year, the deployment of tractors may not cause major environmental problems (loss of top soil and micro-biodiversity due to erosion). In the southern parts of the country which usually experience very high rainfall in some months of the year, care must be taken in the deployment of tractors to minimize erosion and loss of top soil with its micro-biodiversity. It is necessary to start looking at options that deploys light mechanization equipment in such areas.

The hazards of deployment of chemical technology (herbicides and pesticides) to biodiversity and to human health are well documented. Appropriate education of farmers on the appropriate use of these chemicals is necessary. In addition regular monitoring through sampling and laboratory testing of agricultural products will inform policy actions to mitigate the hazards on time. The overall objective is to reduce the use of these agro-chemicals to the barest minimum. If this is achieved, it will not only contribute to environmental sustainability but will also protect human health as well as reduce production costs probably leading to higher net returns to farmers.

Biological technology in the form of genetically modified seeds are not being deployed, thus the controversies around its use in farming is not yet a major issue in Nigeria. Above all, the National Seed Council has the mandate to regulate the production and distribution of certified seeds in Nigeria and such genetically modified seeds will come under its approval authority.

iii) Post Harvest Loss and Food Waste

Food losses and waste occur along the entire food/value chain and vary depending on the product and region (FAO 2011). Post-harvest losses are highly variable from 5 up to 30% (Oguntade, 2013). Minimizing post harvest losses and food waste requires the development and deployment of appropriate technologies that are affordable cost-wise at the farm gate and household level. The re-organization of farm products

aggregation and distribution to introduce standardization, quality certification, better packaging, cooling during transportation, among others, will help to minimize these losses. The minimization of post harvest losses and food wastes will minimize the quantum of resources that will be deployed in agricultural production thereby minimizing the impact of agriculture on the ecosystem (Oguntade, Thylmann and Deimling, 2015).

iv) Conflicts

Violent conflicts in Nigeria have been on the increase in recent times and are in different forms and scales. In some locations, the conflict will be one-off, while in others conflicts are sporadic. The conflicts are beginning to look intractable. Over the years and even currently, there have been conflicts between pastoralists and crop farmers in different parts of Nigeria. These conflicts are sporadic in the sense that they occur intermittently in different locations. These violent conflicts tend to disrupt food production by local farming communities thus increases the risk of food insecurity (Ajayi and Oguntade, 2018). The solution lies in Government's commitment to the principle of property rights and designation of resource ownership to the extent that the different parties to these conflicts know their limits.

Conclusion

The world's population is on the increase and the available natural assets to produce the food required to feed the humans remain largely limited. Thus, there is a great challenge in producing enough food in a sustainable manner that guarantees food security for everyone. In the light of this challenge, the sustainability of food production systems becomes a critical concern.

Nigeria is one of the countries in which the food security challenge is significant. The nation hence needs to review its current agricultural production system and institute a system that is sustainable on a long term basis. The objectives that Nigeria needs to keep in view in pursuing sustainable agriculture are: increase yield per hectare, incomes and food security, soil and water conservation, resilience to natural disasters, lower greenhouse gas emissions; and community empowerment.

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