

Nigeria's Agriculture and Food Security Challenges

"Today's problems cannot be solved at the same level of consciousness that created them."

Albert Einstein

by Professor Chinedum Nwajiuba

introduction

Nigeria has the ambition of diversifying her economy from crude petroleum dependency. The country also faces a looming food security crisis with a growing population that is increasingly dependent on imported foods. The once dominant subsistence-oriented farm economy is at risk of gradual marginalisation. Insecure land tenure, scarcity of funds and credit, labour scarcity despite overall high unemployment and stagnant technology have crippled its further development. Until today, a wide range of policies, programmes and projects have had limited impact in ameliorating these problems. Given the choice, young people from the rural areas rather try their luck in urban centres. Climate change compounds the challenges confronting agriculture. The sector is dependent on the natural resource base and thus faces risks such as desertification, rising temperatures, changing rainfall patterns and sea level rise, leading to degrading agriculture and exacerbating conflict. So, what are the prospects of a Green Deal for agriculture in Nigeria?

vision for 2020

The declared aims of Nigeria's national agricultural policy are to "(i) attain food security, (ii) increase production and productivity, (iii) generate employment and income, and (iv) expand exports and reduce food imports thereby freeing resources for critical infrastructure development and delivery of social services." The current government seems to attribute the unsatisfactory state of Nigeria's agriculture to its subsistence-orientation. The efforts of previous governments are characterised as having treated agriculture purely as a development issue. Hence the focus shifts to the role of agri-business. Specifically, the Agriculture Transformation Action Plan (ATAP, launched in August 2011) seeks to develop the value chain of five key commodities, i.e. rice, cassava, sorghum, cacao and cotton. This entails reforming the input supply regime, a targeted region-specific increase in the output of the five priority commodities, post-harvest systems development, a strong orientation towards agri-business and promoting value-addition in the product chain. The success of the programme depends largely on reforming the fertiliser supply mechanism which has a history of large-scale corruption. The programme is promoted by the current Minister of Agriculture who, however, has to contend with his own officials and the states who have not bought into this vision. State-level involvement in the agricultural reforms is key because agriculture is on the concurrent legislative list and, in practice, is largely dealt with at the local and state level.

"In ten years, time I want my farming occupation to go international, be married with children. I rear Catfish and Tilapia, I will love to be exporting my farm products to countries both far and near."

C2DE, 20 – 25, Female, Lagos Semi Urban¹

problem statement

A green deal for Nigerian agriculture has to confront the following key questions:

- Will Nigeria remain a largely agrarian country in terms of the share of agriculture in aggregate Gross Domestic Production, employment generation, and income for the majority of people?
- Can agriculture be a primary driver of Nigeria's future development and provide a growing proportion of foreign exchange earnings?
- Can the transformation programme deliver sufficient production and inclusive development? Can it indeed ensure food security?

**background**

Nigeria faces huge food security challenges. About 70 percent of the population live on less than N 100 (US\$ 0.70) per day, suffering hunger and poverty. Despite its reputation as petroleum resource-dependent, Nigeria remains an agrarian economy. The sector provides over 40% of gross domestic product (GDP) with between 60 and 70% of the population productively engaged in farming. But large regional differences exist. For instance, in the southeast, 22% of the people live in rural areas with most of them engaged in non-farming activities.ⁱⁱ

Nigeria has about 79 million hectares of arable land, of which 32 million hectares are cultivated. Over 90% of agricultural production is rain-fed. Smallholders, mostly subsistence producers account for 80% of all farm holdings. Both crop and livestock production remain below potentials. Inadequate access to and low uptake of high quality seeds, low fertiliser use and inefficient production systems lead to this shortfall. Despite a seven percent growth rate in agricultural production (2006–2008), Nigeria's food import bill has risen. The growing population is dependent on imported food staples, including rice, wheat and fish.

Nigerian agriculture contributes to a small extent to global warming through bush burning and other poor land management practices, but it bears first and foremost the full brunt of climate change impacts. This matches the findings on the state of agriculture in sub-Saharan Africa, summarised in the international assessment of agricultural knowledge, science and technology (IAASTD, 2008).

trends and dynamics

Two broader trends challenge agriculture and food security: population dynamics and climate change.

population dynamics

Present and projected population dynamics carry major implications for agriculture and food security.

Population dynamics

Population in 2011: 162 million people

Population in 2050: between 230 and 430 million people

Urban population in 2011: 51% and growing

Population earning less than US\$ 2 per day 84% in 2009

Nigeria in 2011: the world's 7th most populated country

Nigeria in 2050: the world's 3rd most populated country (after India and China, outstripping the USA)

- Nigeria's food security challenges will grow with its population. At current food production growth rates, Nigeria remains unable to feed its population. Production will have to expand at a higher rate.
- Nigeria's urban population has outstripped the rural population. This shift to urban centres will become even more pronounced. Despite its rural roots, the urban population is disconnected from food production and relies on the market for food supplies, whether domestically produced or imported.
- Youth make up a growing share of the population and are the bulk of urban migrants. The challenge is to retain them, educating and employing the next generation of farmers.

"Instead of marrying a farmer I will pray to God to give me the right husband."

ABC1, 20- 25, Female, Abuja Urban

Agriculture provides an opportunity to turn rural poverty and stagnation into development. At least in theory, the rural youth could produce the food that the urban youth consume. However, this would assume that the urban youth have the required purchasing power. A different scenario may play out in which rural youth do not benefit and agribusiness produces the bulk of food for urban centres. Can there be agricultural jobs without consumers? Can there be high demand for agricultural products without jobs for youth?

Agriculture as a development issue will remain a core challenge for Nigeria for the coming decades. To address the challenge, Nigeria's should adopt a twin-track approach, both encouraging agribusiness and supporting the large population of smallholders. This is critical to rural food security, social cohesion and poverty alleviation.

As agricultural technology development and diffusion has stagnated, the sector continues to rely on labour for farm power. This stagnation is due to a lack of domestic innovation, especially in mechanisation that is appropriate to the ecology. Farmers cannot afford the available equipment, and in turn there is a lack of local maintenance capacity.

Government policy should, more than in the past, consider environmental challenges and remediate poor past and present agricultural management practices, which hinge on input support, and land resource utilization, management and conservation. The central role of women in the agricultural economy needs to finally be recognized and reflected in the policies and measures that purport to buttress smallholders.

climate change

Nigeria's climate is changing. The country's current and future climate challenges are summarised in the National Adaptation Strategy and Plan of Action on Climate Change (NASPA-CCN):

climate variables	mangrove zone	rain forest	tall grass (savanna)	short grass (sahel)
temperature	Up	up	up	up
rainfall amount	Up	up	down	down
rainfall variability	Up	up	up	up
extreme rainfall events: droughts	Likely	likely	up	up
extreme rainfall events: storms & floods	Up	up	likely	likely
sea level rise	Up	n/a	n/a	n/a

The Nigerian Meteorological Agency (NIMET) has demonstrated dramatic changes in weather patterns over the period from 1941 to 2000: Irregular rainfall pattern give rise to fewer rainy days.ⁱⁱⁱ The combination of late onset and early cessation of rains led to a shorter rainy season in most of the country from 1971 to 2000 compared to the period 1941 to 1970. Between 1941 and 2000, annual rainfall decreased by 2-8 mm across most of the country, with the exception of Port Harcourt where it increased by 2-4 mm. Long-term records show that over the past 105 years, the amount of rainfall per year dropped by 81 mm. The trend of declining rainfall worsened after 1970 and continues to this date. This coincides with a period of sharp temperature increases. This general trend of a decrease in rainfall does, however, not apply to the coastal areas, where places like Warri, Brass and Calabar have experienced a slight increase in rainfall.^{iv} Between 1941 and 2000, average temperatures increased by an alarming 1.4-1.9 degrees Celsius. Scientists project a further temperature increase of between 2 and 5 degrees Celsius this century unless drastic action is taken. One might wonder what kind of agriculture will still be possible in the extreme north-east, north-west and south-west of Nigeria?^v



Maize plants after flooding

Climatic changes already have varying, mostly adverse effects on agriculture and, therefore, food security. Higher

temperatures result in decreased agricultural productivity and production, high evaporation rates and reduced soil moisture, lowering of the groundwater table and shrinking of surface water. Heat stress reduces human labour use on farms, lowers labour productivity and leads to rapid deterioration and wastage of farm produce.



River Benue drying up, Taraba State

Changes in the amount of rain, increased rainfall intensity and changes in rainfall patterns lead to decreased resource productivity and production. Changing and erratic rainfall patterns make it difficult for farmers to plan their operations, may reduce the cropping season and can lead to low germination, reduced yield and crop failure. Erratic weather interferes with processing of produce (such as sun-drying of crops and smoking of fish). Increased frequency of major storms causes damage to farm land, crops and livestock. Major storms can also cause road wash-outs, which make it difficult to access farms and to market products.

To address these challenges the National Adaptation Strategy and Plan of Action (NASPA, 2011) adopted by the Ministry of Environment and awaiting approval by the Federal Executive Council, has two overarching approaches, which we endorse:

- **Adopt improved agricultural systems for both crops and livestock**
For example, diversify livestock and improve range management; increase access to drought resistant crops and livestock feeds; adopt better soil management practices; and provide early warning / meteorological forecasts and related information.
- **Implement strategies for improved resource management**
For example, promote irrigation systems that use small amounts of water; increase rainwater and groundwater harvesting for use in agriculture; increase planting of native vegetation cover and promote re-greening efforts; and intensify crop and livestock production in place of slash-and-burn practices.

green agriculture and food security

Before Nigeria can address the underlying problems articulated above, three issues need to be resolved that directly determine the success of a transformation of the agricultural economy and improving food security in the face of a changing climate.

1. Nigeria's economy is sensitive and vulnerable to the often unstable international crude oil market.
The economy is for over 80% dependent on the petroleum sector as the source of public finance. Despite this significance, the oil sector has not spurred economic growth, has created very few jobs and its wealth has been distributed amongst a small elite. A national policy framework is needed to diversify Nigeria's economy (see the other chapters in this report). The agricultural sector will be a key sector in this pursuit.
2. The preferred pathway for agricultural development in Nigeria.
The rural economy is heavily dependent on smallholders, whose primary need is household subsistence. Despite being the target group of the National Accelerated Food Production Programme (NAFPP) and successor programmes, since 1972, they produce little marketable surplus. These programmes aimed to raise output, productivity, income and thus break the cycle of poverty. The failure of this approach has a significant social impact. The contemporary policy thrust seeks to promote agri-business along the value chain. As noted above this risks creating a dichotomy.
3. A "green" agricultural sector to assure food security for the growing population.
There is controversy around what constitutes a green agricultural economy. The current crisis provides an opportunity to refocus policies and refine strategies towards an agricultural sector that is resource efficient, socially inclusive and low carbon. This requires sustainable agricultural practices that protect the soil and use fewer external inputs (especially agro-chemicals, such as mineral fertiliser, pesticides and herbicides).

Understanding this we can proceed and address the underlying problems that a green deal for Nigeria's agriculture and food security needs to contend with.

Nigeria remaining a largely agrarian country

The experiences of other countries are that, even where aggregate output and value of production increases, the share of agriculture in GDP declines over time. Nigeria's goal should still be to raise aggregate output and value of production through value addition along the production / supply chain. A comparable trend can be observed in agricultural employment, where less labour is engaged in agriculture yet output increases. In Nigeria's case, however, the drop in the number of people engaged in agriculture is not the outcome of structural economic change but the abandonment of rural life. In contrast, a higher-yielding, more intensive agriculture in developed countries has emerged from technological development, especially mechanisation, which raises total factor productivity (land, labour and capital). With stagnant technology in Nigeria, maintaining agricultural production will be difficult.



When projected into the future, Nigeria's young, growing urban population is alienated from rural life and the farming vocation. This shows the urgent need for two national policy interventions. The first is developing local technology, especially mechanisation capacity. The second is developing a successor generation of farmers. Incentives and subsidies are needed to achieve this.

agriculture a key driver of Nigeria's future development

Prior to the era of petroleum dependence, agriculture was the driver of the economy and main source of foreign exchange earnings. For decades now, government expenditure of the oil revenues has favoured the urban non-agricultural sectors. This has sapped labour and investment from agriculture. There is little reason to expect this to change, but lessons can be learnt.

The agricultural sector needs sustainable growth: production that is socially inclusive, with the benefits equitably distributed to reduce rural poverty and food insecurity and environmentally sound. Contrary to common beliefs, according to the International Institute of Tropical Agriculture (IITA) and government statistics, cassava and maize yields per hectare have risen. The rate of increase has, however, not kept up with the increase in consumption.

A supplementary policy tailored for high-value commodities, such as horticultural products, and developing a high-value (international) market for organic products could be initiated. A few state governments in Nigeria, such as Kwara State, appear to be working in this direction. The challenge here will be ensuring the social inclusiveness of the development and the distribution of the accruing benefits.

a green agricultural economy as an opportunity for ordinary Nigerians

Government policy is aimed at the agri-business sector producing surpluses for domestic consumption and reducing import dependency and foreign exchange expenditure. But a rapidly growing poor urban population may not be in a position to constitute effective demand for locally produced food. Importantly, there is still a large rural population in need of agricultural policy support with a development focus. In designing that policy, consideration should be given to the twin challenge of population growth and climate change. Further policy reform on inputs supply, technology improvements, credits and subsidies is needed.

The transformation programme supports improved seeds and seedlings, which cannot be diverted from agricultural into non-farm use. The National Agricultural Seeds Council (NASC) is the responsible government agency. In some countries genetically modified (GM) seeds have been introduced. Whether these have entered Nigeria is not known, but the government has not promoted or distributed them. Many Nigerians including major NGOs, oppose the use of GM seeds out of concern for health and ecology, as well as the anticipated socio-economic impacts. Farmers have a limited ability to pay and local markets are not reliable when it comes to supplying inputs. Suspicion remains about the use of so called terminator genes in GM seeds. Were Nigeria to grow GM crops this would potentially harm its ability to export food to Europe.

challenges to a green deal for agriculture and food security

A vibrant sustainable agricultural economy with equitable distribution of the benefits is attainable. The following issues, however, need further examination:

- What is the potential of organic / low external input sustainable agriculture to feed a growing population?
- What is the potential for improved resource efficiency without adverse consequences for soil and water?
- What are the critical low carbon issues in Nigeria's agriculture?

The adaptation measures used by smallholders might provide insights. The traditional response to resource problems is to seek new land. This only works where land use is extensive, allowing for migration of people and livestock. At present, farmers are not simply searching for new land and water sources. As soil fertility declines and the limits of the traditional fallow cycles are exceeded, they seek external inputs to raise output per hectare. In addition, farmers and herders seek non-agricultural livelihood means. It is, however, clear that farmers will need to abandon generations-old practices. Improved farm management practices are likely more effectively introduced by educating future farmers. The current policy preference is to promote external inputs like inorganic fertiliser and bio-tech seeds. This is, however, done in the absence of a comparative analysis of the sustainability and true costs and benefits of high-input versus organic farming in Nigeria. This makes it impossible to confront concerns that a transition to low external input or organic farming may raise the cost of food. The experiences in more advanced economies with this are mixed.



Nanpan Guyit, farmer in Plateau State: "I got into farming first of all as a passion, and also because I was able to relate the value of farming, right from the planting stage to the harvesting stage, with values in life generally. We try to improve the lives of the workers on the farm. There is a need for them to understand that as a farmer, you can be proud of yourself and you can have a status in society. I do strictly organic farming; we try not to get altered crops or seeds or engineered produce. We want to keep it natural, which is the whole philosophy behind what we are doing. It's linked to your lifestyle and your health, which is also the kind of values behind what I'm trying to do. Yes, I hope that eventually, being organic will improve my sales. Because definitely, there are a lot of illnesses that are now being treated with natural foods, and I believe that with enough awareness, enough push, I will see an improvement in sales in favour of organic foods. I think we have more than what it takes to have enough good food here in Nigeria, and even to share with the world."

It is noted that Nigerian farmers make a marginal contribution to global warming through deforestation. This can be addressed by the extension services advising on agro-forestry, alternative land preparation and weed control measures. Nigerian farmers still believe that bush burning prevents weed infestations that will require more labour to combat. Labour scarcity has become more prevalent. But interventions will have to factor in gender roles. In most Nigerian farming systems both women and men provide farm labour, but there is gender stereotyping of roles. For example, weeding and post-harvest handling, where harvest losses accrue, are commonly the role of women.

recommendations

The following package of measures towards a green deal for Nigeria's agriculture is recommended for implementation in the context of a two-track approach, on the one hand fostering agri-business to increase production for the growing urban population, on the other hand offering continued support to smallholders with the aim of alleviating poverty. Both need incentives and subsidies. To improve the basis for decision-making, a comprehensive mapping of agricultural potentials is needed taking the following factors into account:

- The agricultural sector is highly impacted by the changing climate;
- The environmental footprint of agriculture needs to be reassessed in order to be reduced, including deforestation and bush burning as source of GHG emissions;
- Resources one could once take for granted are or will soon be less available and cost more. Water, for example, is increasingly scarce due to changing rainfall patterns and from drying aquifers and rivers;
- Appropriate technological and management innovations exist that improve productivity and efficiency while reducing GHG emissions, including utilising livestock waste in biogas silos and reducing post-harvest losses through local processing;
- The promotion of high-value and organic agricultural products, notwithstanding the fact that it serves a niche market, can boost farmers' earnings and potentially foreign exchange.

Policies should be designed to reduce the environmental footprint by encouraging waste conversion, use energy-efficient means of production and employ renewable energy from wind farms, solar, small-scale hydro and biomass. A reduction in non-biodegradable waste and storage materials can also be achieved.

Nigeria needs a programme devoted to a new generation of farmers that trains young educated people interested in agricultural entrepreneurship and provides financial and technological support. They should be enabled to use improved technologies and modern management approaches that help ensure farm profitability and sustainable resource use.

Urbanisation has led to large-scale acquisitions of land by the government - land that has often been allocated to a small elite. As competition for land increases, the government needs to provide secure tenure and access to land. At present, access to land is restricted for cultural reasons, by the existence of communal holdings with unclear use rights, as well as misappropriation and large-scale acquisitions.

Agriculture is mostly rain-fed. Increased investment and extension for irrigation facilities, including water harvesting and precision drip systems, is to be targeted at market-oriented, younger and educated farmers.

A regulatory environment may be required aimed at reducing sectoral GHG emissions. For now, consistent enforcement of existing regulations on land use and management, including bush burning and land degrading practices can accomplish this.

A reduction in chemical use in crop and livestock production, including fishing should be promoted. This has immediate health benefits and provides some additional farm employment.

Maintenance of soil fertility and protecting ecological diversity is crucial to the future of farming. To this end, bush burning should be stopped by training and raising public awareness, moral and community-driven persuasion and consistent enforcement of the existing regulations.

Material-flow analysis and application of such lessons should become mandatory in the education of a new generation of Nigerian farmers. Integrated soil and pest management and integrated crop and livestock systems that operate as close loops linking waste, by-products and inputs are examples of innovation.

There is a need for holistic climate change governance. To this end, a national Climate Change Commission is expected to bring stakeholders across the narrow confines of ministries, departments and agencies together. For now, the adaptation measures recommended in the NASPA should be adopted.

In conclusion, strong economic performance is not in conflict with great environmental performance. Through innovation Nigeria can achieve agricultural sustainability and food security.



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Footnotes

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- i 2020 - *Young Nigeria's Perceptions*, research commissioned by hbs, May 2012
 - ii Akinsanmi, A. (2005). *Gender Relations and Food Security of Rural Families in Imo State, Southeast Nigeria*. Farming and Rural Systems Economics, Vol. 68. Margraf Verlag, Weikersheim, Germany; and: Nwajiuba, C. (2012). *Does agriculture have a future in southeast Nigeria?* Inaugural lecture, No. 5. Imo State University Owerri, Nigeria.
 - iii Adelekan, I.O. (2009). Vulnerability of Poor Urban Coastal Communities to Climate Change in Lagos, Nigeria. *Fifth Urban Research Symposium 2009*.
 - iv Odjugo, P. A. (2010). General Overview of Climate Change Impacts in Nigeria. *J Hum Ecol*, 29(1): 47-55.
 - v Also see technical background paper to NASPA, *Climate Change Adaptation Strategy Technical Report (CCA STR)* at www.nigeriaclimatechange.org