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FROM INDIGENOUS AGRICULTURAL SYSTEM TO GENETICALLY MODIFIED CROPS: NIGERIA AND THE RE-ENACTING OF DEPENDENCY ECONOMY IN SEARCH OF FOOD SECURITY

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Abstract
There is a growing argument that the inability of the local farmers in Nigeria (relying on the indigenous agricultural system and seeds) to produce enough for the growing populace is failing. The proponents of this argument opined that for the situation to improve, the farmers must embrace the cultivation of Genetically Modified Seedlings. This is misleading and false, as it has been established that in parts of the world, where Genetically Modified Seedlings have been wholly embraced and cultivated, the effects have been devastating, creating situations of total dependency on foreign aid/grants. It is therefore based on this that the paper suggests that there is an urgent need for the government and other stakeholders to first revive the indigenous agricultural system as well as provide the enabling environment (enlightenment, financial resources, good roads, and storage facilities) that will encourage the local farmers to put in their best in providing both for the nation and the market. Data obtained from primary and secondary sources were deployed to carry out the study with an analytical and narrative historical approach. This includes historical, descriptive, and analytical approaches based on gathered evidence. The primary source for this research is based on field investigations conducted in the area and surrounding territories. Among other things, the data collection process includes semi-structured interviews with individuals. The research also uses historical documents from the national archives. In this way, relying on previous research conducted on issues of agriculture/food production systems.

Keywords: Indigenous, Agricultural System, Genetically Modified Seedling, Dependency. Food Security

INTRODUCTION

Scholars have argued that as far as the history and practice of tradition preservation of seeds and seedlings is concerned (which is basically the practice of admixing of natural products or botanical for the storage of food grains), Nigeria in particular (Africa and Asia in general) has a long history that dates back to the very earliest periods of known history, well before the advent of synthetic insecticides/fumigants. According to Adesina, Mobolade, Nameirakpam, Dinabandhu, and Yallappa (2021), the practice is common in Africa and Asia, with the increasing development of resistance and the negative impact of these synthetic insecticides on human health and environments (Isman, 2008). However, the emergence of Genetically Modified Seedling and the propaganda that accompanied it led to a situation in which the local farmers jettisoned the long, safe, ancient practice.

Nigeria, Her Land and Agricultural Resources

In the case of Nigeria, available records indicate that it possesses approximately 36.9 million hectares of arable land, making it one of Africa's most agriculturally endowed countries. Agriculture employs nearly 70% of the population, and smallholder farmers account for about 80% of domestic food production (Akubor and Akubor, 2021).

With the above statistics as well as historical evidence, agriculture formed the backbone of Nigeria's economy before oil dominance. Each ecological zone supported specific crops adapted to soil and climate conditions (Sasu, 2025). Indigenous knowledge systems evolved around these ecological realities, ensuring relative self-sufficiency (Akubor and Akubor, 2021; Olodunmi, Usman, Olayemi, Adewusi, Abia, Terhemen, Umar, and Lucero-Prisno, 2022; Akubor, 2023; Tauna, 2024; Chima, 2024; Akubor, Ayoola, and Igbogbo, 2025).

Despite this potential, declining infrastructure, insecurity, poor storage, and policy inconsistency have weakened productivity. Rather than addressing these systemic constraints, policy discourse increasingly frames Genetically Modified Seedlings as the primary solution.

Research Objective

Basically, the objective of the work is to argue for the continuous sustenance of the indigenous agricultural system, which, in the view of the paper, would be of major benefit to the agricultural system as well as prevent a situation of food dependency of the people and the continent. Although the work is primarily on the farmers generally in Nigeria, examples will be drawn using the Indigenous farming communities in selected parts of Nigeria, especially the southern part (Akubor, 2022). The choice of these areas is based on the fact that the area and people remain one of the few examples of communities still actively involved in indigenous agricultural practices and have been able to sustain their immediate community as well as the surrounding territories to date (Akubor 2025).

Theoretical Framework

This study is anchored in Dependency Theory. The theory argues that underdevelopment in formerly colonized societies is structurally linked to global capitalist expansion. Economic stagnation in peripheral regions results from surplus extraction and unequal integration into global systems (Gunder, 1972; Leys, 1975; Nabudere, 1978; Rodney, 1977).

Applied to agricultural practices, dependency manifests when local production systems are displaced by externally controlled inputs, such as seeds, chemicals, patents, and technologies. When farmers depend annually on proprietary seeds controlled by multinational corporations, local autonomy declines (Fanon,1973).

The historical introduction of "improved seeds" during colonial rule reflected similar dynamics. Agricultural transformation was structured to serve metropolitan industries rather than indigenous welfare. The contemporary GM seed regime may represent a technological continuation of this pattern (Fanon,1973).

RESEARCH METHODOLOGY

The qualitative method was used for this particular research. Data obtained from primary and secondary sources were deployed to carry out the study with an analytical and narrative historical approach. This includes historical, descriptive, and analytical approaches based on gathered evidence. The primary source for this research is based on field investigations conducted in the area and surrounding territories. Among other things, the data collection process includes semi-structured interviews with individuals. The research also

uses historical documents from the national archives, relying on previous research conducted on issues of diplomacy, policy, and exchange among the various peoples, in addition to documentary data taken from newspaper accounts, diaries, letters, and verbal reports.

RESULTS AND DISCUSSION

Antiquity of Agricultural Practices among Indigenous People

Although agricultural practices are indigenous to various communities of the developing world, the antiquity of such practices among most societies in Africa is very visible in some of the traditional rights/rituals associated with land preservation, cultivation, seed preservation, and harvesting. This is well evident in the rituals, rights, and preparations that precede farming activities in most indigenous communities. For example, among the Edo, agriculture and other processes associated with their practices are so ancient that it is usually associated with the beginning of the world (Okodua 1997). The Esan have a conventional procedure they follow before cultivation and harvesting. However, the Esan have nameless moons at each farming stage. The appearance of these moons determines what will be done during that stint. They have moons for yams, moons for Bush clearing, moons for eating corns, etc. They mark the beginning of a new season (agricultural year) after the period of heavy rain, referred to as *Amukpe*. However, before *Amukpe,* they are expected to clear the Bush to be ready for a new cultivation phase. The appearance of *Amukpe* thrills every family head, as it marks the commencement of a new bountiful season. Hence, all family heads will make sacrifices to the image of their late father and the ancestors in a shrine called *Alluelimin*.

Among the Igbo people, there is always the observance of the Week of Peace and the purification of the earth before planting. During this week, prayers and sacrifices are made to the ancestors. After the sacrifices conducted by the family head, purification and land clearing ensue. Even after harvest, these products had some ritual tied to them before consumption. In the case of yams among the Igbo people, it was the celebration of the *Iwa ji, Iri ji,* or *Ike ji* (new yam) festival, while the accompanying thanksgiving is known as *Afia ji Oku* (Ayeni, 2014). The idea behind *Afia-ji Oku* seems to indicate exertion, industry, to strive, hence the trade; “iji”, to lay hold of, and “Oku”, riches. Thus, the full meaning is: “industry or trade brings wealth”. In those days, yams (as other agricultural produce) largely constituted wealth (Ayeni, 2014). This is also the practice among some Yoruba communities of the southwest, the Igala, Idoma, and Tiv communities of the Middle Belt, and communities in northern Nigeria.

Agriculture among Nigerian communities is deeply embedded in cultural and spiritual systems. Among the Edo and Esan, farming rituals are tied to lunar cycles and ancestral veneration. Agricultural seasons are marked ceremonially, reinforcing ecological awareness. Among the Igbo, the Week of Peace precedes planting, and the New Yam Festival (Iwa Ji) marks harvest celebrations. Such rituals reflect structured agricultural calendars and organized production systems.

Historical studies indicate extensive domestication of yam varieties (Dioscorea species), including cultivated and wild types. According to the source, some of the cultivated varieties include Odoli/Ondoli/ondori/Ohodoli, Ochebela-Agbo, Uche-ekpe/Ekpe, Itod-Ebe Akpochi, Idada, Akpoto, Ogbagwu, Ogoma, Olowu, Itangbo, Adolo, Aganya, Ilayi/Ulayi, Ikanaba, Didio, Acha, Efa, Atikpati, Ebiede, Ayago, Uga, Itake, and Elafu among others. All these belong to the species of Dioscorea cayenensis and Dioscorea rotunda. The cultivated varieties of Diocorea alata are Iyega,

Olowu-Ago, Kanaba, Olomgbo, Achiogo among others. Wild varieties include the ones locally called Achu, Uchu-Ibegwu, Ekpulu, Atulukpa, Edu, Elube-Oko, and Elube-Oya. Although sources opined that it is not possible to show which of these cultivated ones was first domesticated, Achu is the most important of the wild varieties because information from field work is unanimous about its food value during the period of famine (Coursey, 1975; Ukwedeh, 1984; Okodua, 1997; Akubor, 2005, 2010). Among the Edo Esan, mention is made of some other varieties like Ori and Asukhu (white yam), and Ikpein (yellow yam). Riverine communities engaged in vibrant yam trade networks. Colonial records from 1920 indicate significant commercial output, demonstrating indigenous productivity. According to the colonial assessment report by Brooke, N.J. (1920) riverine communities (Ane-Igala) yam trade alone for 1920 amounted to about £66,666. Out of an estimated total of £81,046 (Akubor 2014).

These systems sustained communities for centuries and supported urbanization and trade long before colonial intervention.

Indigenous Agricultural Practice among Farmers in the Post-Colonial Era

Agriculture remains central to rural livelihoods. According to WEF 2011, this represents the major subsistence activity for rural farmers, contributing up to 25% of the gross domestic product of the country (WEF, 2011). However, post-colonial challenges—soil degradation, insecurity, climate change, and rural-urban migration—have weakened indigenous systems.

Yet local farmers historically developed adaptive responses: crop rotation, mixed farming, natural pest control, and selective breeding. The problem today lies not in indigenous knowledge failure but in the erosion of institutional support as well as the attempt by the government to impose on the local farmers an alien agricultural system without indigenous support.

Indigenous Preservation Method among the Indigenous Edo farmers

Traditional methods of storage are a type of knowledge that has evolved in the community and has been passed on from one generation to another (Adesina, Mobolade, Nameirakpam, Dinabandhu, and Yallappa, 2019). Certain traditional methods of grain storage practices are unique to the culture of society and vary among countries, villages, locals, and even communities. These indigenous practices originate from the cultural connection with specific environmental conditions and are based on traditional societies having an intimate consciousness of their environment. In this way, an estimated 60-70% of food grains produced in developing nations are stored at the home level in traditional structures, either in threshed or unthreshed forms. Most of the structures are constructed at the beginning of the harvesting season, and harvesting time varies with the agro-climatic zones.

Among farmers in southern Nigeria, traditional methods derived from indigenous intelligence and technology (most often suitable to the prevailing environmental factors are adopted in preservation. For instance, in the case of maize, the produce was usually heaped on a raised crib-like platform. To make sure the produce was protected from weevils and other pests/rodents, a make-shift cooking facility was constructed directly under the granary. In this way, the smoke from the fire (made from firewood) would keep these foreign bodies far away from the produce. The specially selected seedlings (often high-yielding) for use during the next farming season were preserved on the kitchen roof, where the smoke from the fire kept insects away (Akubor, Ayoola, and Igbogbo, 2025).

Generally, the Traditional grain preservation techniques demonstrate technical ingenuity. These exist in the outlined form/method:

1. Smoke fumigation through raised cribs
2. Yam barns (Eru/Uban) with structured ventilation. In the *Eru/Uban*, the yams were stored/preserved in dry but cool areas, either in the farm or in the facility built within the family compound.
3. Solar drying: (heating grain in the sun to kill insects. It is an old age practice by farmers before storing the grains and pulses in regions where the outdoor temperature reaches 20 °C or higher),
4. Botanical pest control
5. Jute and woven storage systems

In all the above measures, it must be established that the fundamental requirements of every grain storage method or structure are to secure the grains from insects, rodents, and prevent spoilage of the grains by the activities of the microorganisms.

Seed Selection Process for Planting

Indigenous farmers historically practiced careful seed selection. High-yielding, disease-resistant varieties were preserved seasonally. This process represented localized genetic improvement grounded in environmental adaptation. Through the processes, the farmers from historical times have been able to adequately provide for society and even for commercial purposes.

Such systems enabled farmers to remain seed-sovereign—free from annual external purchases.

The Local Framer in the Age of Genetically Modified Seeds: Understanding and Navigating the New World Agricultural Order.

From the discourse so far, it is clear that the local farmer, over the years, applying indigenous technology and environmental intelligence, has been able to deal with agricultural issues within his environment. In this way, the farmers have been able to provide not just for themselves, but also for the market. This is evident in the fact that up to the end of the 20th century, the indigenous farmers controlled the largest agricultural market with indigenous agricultural products. This was the case of the Esan farming community of the Edo tribe in the present-day state.

The above situation will certainly change with the introduction of GM Seeds into the world agricultural economy. It is in line with this that scholars have argued that the introduction of GM Crops poses great danger to the food production and distribution of the third world countries, including Nigeria. This, in their opinion, is based on the fact that most of the farmers who often are in the interior of Africa without modern facilities and gadgets are not carried along in this modification process, even though they are at the heart of production. This situation is made worse as a result of the low level of literacy among the peasant farmers.

Historicizing the Politics of "Improved Seed" in Nigerian History

Although the issue of Genetically Modified Seeds and Food has recently become popular, available historical evidence indicates that even during the colonial period, the invading powers made various attempts at introducing Genetically Modified Seeds under the name of "Improved Seed" in the agricultural practices of the indigenous farmers. For instance, it is on record that as early as 1906, just a few years after the conquest of the Benin area, about forty-six (46) rubber plantations comprising more than 38,415 transported seedlings flourished in the Esan and neighbouring territories. In 1913, Para rubber (*Hevea Brasiliensis*), upon which the world's natural rubber supply was to be based, was introduced into Nigeria, and the Edo area was one of the areas where this was practiced (NA, ID.744,

1942). It is also on record that when the people resisted either the new seeds or the method of planting, they were either threatened or, in some cases, actual force was employed, or such individuals or the community were termed a saboteur (Akubor 2005). In some other cases, the colonial Agriculture Inspectors travelled around the area enforcing the new seeds and practices. In the case of cotton, Akubor (2025) argued that there were cases where the local seeds were destroyed by the Inspectors, who insisted on the newly introduced seedlings, which the people complained about.

In most parts of northern Nigeria, both Tukur (1979) and Bello (1982) argued that there were cases of outright destruction of farmlands due to the inability of the indigenous farmers to cultivate the improved seeds imposed on them. In this way, the colonial system succeeded in destroying the internal capacity for production as a result of a lack of raw materials, labour, and land, which led to the increased subordination to European industries. These conditions led to peasant indebtedness and sales to moneyed individuals, all aimed at ensuring the centralization of land under colonial companies.

With the above and other propaganda applied, there was a gradual decline in the cultivation of indigenous seeds. For instance, they made sure the price paid for local cotton was so low that it was difficult for the farmers to make a profit. Secondly, with the large-scale importation of cheap cotton materials to the colonies, interest in local cotton industries declined, and the people therefore saw no need to continue with local production of cotton (Akubor 2005). Nzula, Potekhin, and Zusmanovich (1979) argued that in some other parts of Africa, there were cases where entire farms and villages were burnt down because the indigenous people failed to accept the newly introduced seedlings.

From Improved Seeds to Genetically Modified Seeds in the Post-Colonial Period: The Myth

The popular argument put forward by the proponents of Genetic engineering (GE) or modification (GM) on the African soil is due to the problems of food insecurity, poverty, and hunger. According to this school of thought, the issue of Food Insecurity, have currently become the concern not only of Africa but of the entire human race. It argues that Genetic engineering (GE) or modification (GM) is often justified as a humane technology, one that feeds more people with better food (Mmbando, 2024). On the need for Nigerian (African) farmers to adopt the technology, the scholarship opines that One-third of the 800 million people who suffered from chronic malnutrition worldwide in 2017 were found in Africa, and it also posits that, despite having 25% of all arable land, 10% of global agricultural production originates in Africa.

As a way of simplifying the process involved in the production of Genetically Modified Seed, Ikhide (2025) gave a graphic picture of the processes of modification, which, in the view of this paper, is even more complex for the peasant farmer. This is summarized thus:

> GM seeds may be hybrid seeds that are the products of crossing 2 pure lines. Usually, these parents are highly inbred lines (P1 X P2 = F1). In the F1, heterosis is maximized, and all the offspring are heterozygous at all loci (genes), and performance is very high. Heterosis or hybrid vigor describes the superior performance of offspring over the average of their parents (AA vs aa). This can also be achieved in any crop grown from improved seeds using conventional breeding to produce highly inbred lines. If you now plant seeds from this F1

> generation to get F2, the performance will be poor because you have segregation into AA, Aa, and aa, with the average yield of the entire population lower than the parents. Aa X Aa;…25% AA;...50% Aa;…25% aa;…If you go to F3, F4, etc., without going to buy new seeds, performance will get progressively worse each generation.

Highlight the danger of the above to the not too literate farming communities and farmers who have fallen into the trap of venturing into planting these seeds in the first place, Ikhide (2025) continued thus:

> …. They (the seeds) are designed to give you maximum yield only in the F1 generation. You can plant F1 seeds, but your yield will be poorer. The seed companies hold the intellectual property to the parental lines. And they use them to produce seeds for sale. In some cases, you are contractually obligated to buy seeds from them. You may be sued if you plant F1 seeds. To get F2, you crossed AA X aa, but there will be fewer and fewer AA to cross with fewer aa in subsequent generations. Only 50% is expected to be Aa with similar performance to F1 parents. Each generation's performance is cut in half because only 50% of the immediate past generation will be expected to be Aa (maximum yield is from Aa offspring). This is the genetics behind why performance is lower when you use hybrid seeds for planting. These are hybrids of highly inbred lines designed to produce maximum yield and performance when you cross the parental lines to get F1 (Aa) offspring. No one is prevented from planting F1 seeds, but you get a lower yield because of Mendelian segregation in F2, F3, F4, and so on.

Although the positions of both Mmbando (2024) and Ikhide (2025) are aimed at convincing the indigenous farmers, governments, and stakeholders to embrace the GMS as the way out of food insecurity in Africa, this is, however, not convincing enough. It is in line with this that this paper argues that, with very few exceptions, the whole enterprise of GE is to increase the sales of chemicals and bio-engineered products to dependent farmers. Thus, the whole argument for genetically modified seeds to combat poverty and hunger in Africa is suspect. This is because even during the colonial period, it was just to the benefit of the invading power and never about indigenous welfare. As far as the indigenous farmer is concerned, the above equation does not make any sense because he does not understand what it is all about, and the society (especially the government) is not interested in making him understand it. The government is not making any efforts at providing the farming with the resources, both human and material, to help them understand the new trend in the agricultural world.

Thus, it is therefore not surprising that with the above couples with the recent reality of the GM Seedlings and the possibility of agricultural colonization through monopolization of GM Seedlings, Afrocentric scholars as well as agriculturalists are clamoring for the return to the traditional method (Rajashekar, Nandagopal, and Thimmappa, 2012).

The Reality of Genetic engineering (GE) or modification (GM) and the Future: Perceiving the Danger Ahead.

Although it has been argued (and often clearly stated) that employing and using genetically improved seeds to produce a higher yield of crops that are pest-resistant, disease-resistant, and require less or no herbicides and pesticides

is a good thing. However, as it is in the case of the Nigerian farmers, the non-availability of modern technology and facilities within their reach could lead to disaster in the future of farming. In this way, while the use of modern technology in farming and preservation can create progress, the peasant farmers will struggle to spend their little earnings to buy improved seeds.

The Case of Cotton Production

Throughout the colonial era and even after, Cotton production was a major source of foreign income for the country. Akubor (2010) argued that the Nigerian area over the years possesses historical evidence showing that the area was self-sufficient with high-quality raw materials, especially cotton. For instance, in 1902, the British Prime Minister Arthur Jane Balfar was quoted in the House of Commons as having argued that if Lancashire is to survive and continue production, in Nigeria lies salvation to supplement the shortfall in the supply of cotton from the United States. In fulfillment of this, the British Cotton Growers Association, which was founded in 1902 and incorporated by the Royal Charter in 1904, was invited to promote and develop the cultivation of cotton in the colonies. This program was therefore to ensure cotton supply to Lancashire as well as a crest, or reinvigorating the export trades from the colonies. The production of cotton continued throughout most parts of Nigeria (especially northern Nigeria) even after the colonial period, sustaining the textile companies as well as building the foreign reserve. This was basically based on local seeds sourced from within the local farmers and surrounding communities.

However, in 2018, Cotton farmers in Nigeria were excited when genetically engineered cotton seeds were introduced for cultivation, raising hopes of bumper harvests and pest-free cotton regimes. Six years later, however, the introduction of the genetically modified MRC 7377BG11 and MRC7361BG11 seeds failed to increase the cotton yield per hectare and revive the dying industry. According to Anibe Achimugu, President, National Cotton Association of Nigeria (NACOTAN), farmers who cultivated the two genetically modified strains introduced six years ago did not record any significant increase in their yields compared to the local seed varieties (Okojie and Jayesimi, 2024).

The most recent data from the Food and Agriculture Organization shows that the country's cotton production declined marginally to 115,000 metric tons in 2021 from 125,000 metric tons in 2020. According to experts, Nigeria's dying cotton market has led to the extinction of the textile industry and the loss of multiple jobs. Data from the Ministry of Industry, Trade and Investment shows that between 1980 and 2016, about 145 companies operating in the textile sector had shut down, due to policy somersaults, poor research and development, shortage of raw material, smuggling, and poor power supply, among others. Further research shows that between 2019 and 2023, there has been a steady rise in textile imports, reflecting Nigeria's inability to meet its local demands. In 2019, N220.5 billion worth of textile products were imported into the country; N182.5 billion in 2020; N278.8 billion in 2021, and N365.5 billion in 2022, according to data from the National Bureau of Statistics (NBS). The danger of GMOs is that it creates an imbalance in the ecosystem, and they will push our farmers into seed slavery (Okojie and Jayesimi, 2024).

GMS Ginger and the Disappointed Farmers

Nigeria has historically been a key supplier of ginger (globally), due to the high oil and oleoresin content of its ginger, which makes it particularly desirable for food, beverage, and nutraceutical applications. It is argued that, compared to ginger from other major producers

such as China and India, Nigerian ginger is known for its stronger aroma and more intense flavour, making it a preferred choice for flavouring extracts, essential oils, and medicinal formulations. The high concentration of bioactive compounds, including gingerol and shogaol, enhances its appeal in the health and wellness sector, where ginger is used for its anti-inflammatory and digestive benefits (www.ingredientsnetwork).

Thus, up to 2017, the indigenous ginger farming in Nigeria was one of the largest in the world, ranking only behind China and India. In 2017/2018. The USAID entered into a partnership with Tak Integrated, and it was aimed at supplying ginger farmers with GM Seeds and other planting aids. After receiving farm inputs that came in as a grant from the international community, the country began to experience a decline in production as well as diseases and fungi, which led to the rejection of the production in the international market. As of 2025, Nigeria had become a major importer of ginger from China, South Africa, and Niger (Faloju, 2025).

The above situation is considered devastating, as seen in light of the fact that before the crisis, the country was producing an estimated 523,000 metric tons of ginger annually. At $2,500 per ton, Nigeria's ginger industry was worth $1.3 billion annually in the global market. However, due to the challenges facing farmers, Nigeria has lost an estimated 313,800 metric tons of ginger in one year, valued at $784.5 million (₦1.2 trillion) annually. The monthly loss is estimated at $65.4 million (₦103 billion), while the daily loss stands at approximately $2.1 million (₦3.3 billion); with about 100,000 farmers affected, each farmer must have lost an estimated ₦10 million to ₦15 million (Nigeria Info, 2025).

A survey carried out among the ginger farmers (mostly situated in northern Nigeria) revealed the devastating crisis threatening the livelihood of farmers and Nigeria's comparative advantage in the global ginger market. According to the source, there are over 10,000 ginger farmers who have been thrown out of business even after applying GM seeds. As it is currently, ginger farming in Nigeria has become nearly impossible due to the Ginger Blight fungal infections like rhizome rot and bacterial wilt, which have devastated yields. It is on record that the issues facing ginger farmers including the high cost of production. According to the sources, globally, it costs about $2,000 to $3,000 to produce one metric ton of ginger, but in Nigeria, the cost is about $100,000. Other issues include the high cost of seeds and declining yields, as farmers lose 90 per cent of their crops to disease outbreaks (Faloju, 2025).

GMS Maize Production and Cereal Production in Nigeria

Traditionally, maize represents one of the most staple food crops in Nigeria, with all ethnic groups deriving one or more delicacies from it. Among the Yoruba people, pap (*og*i) and *agidi* or *eko* (solid pap meal) are derived from it. In northern Nigeria, *Koko* (pap), *Kunu* (maize drink), and *madidi* (corn meal) are made from maize. However, the recent issue of insurgency and insecurity has affected its production. It is estimated that about 148.7 million people in Nigeria are facing food shortages after its worsening decade-long insecurity issues that have crippled production activities (https://www.fao.org/nigeria/news/detail-events/en/c/1735060/).

In January 2024, the federal government approved 23 new maize varieties for commercial planting, including four genetically-modified Tela-maize varieties (drought and insect-resistant), making it the second country in Africa to approve commercialization of genetically engineered maize (Okojie, 2024). It is also important to note that these varieties of GM maize are

completely controlled by foreign biotech companies.

The decision of the Nigerian government's recently approved genetically-modified maize (Tela varieties) has come under serious criticism, as some farmers and rights groups are calling for the reversal of the approval to cultivate and trade GM maize in the country. Experts argue that the country's sudden embrace of GM maize, purported to be pest-resistant with high yield, would undermine farmers' livelihoods, destroy the environment, and lead to mass sterilization of Nigerians.

The above position has been the fear of most farmers and industrialists having witnessed the impact of GMS in other areas of agriculture. Specifically, Njemanze, (2024), argued and called for the total ban of genetically-modified foods in Nigeria as it represents a national threat.

The Local Framers and the Future of Food Production in Nigeria: Thinking Beyond GMS.

Although it has been argued (and often clearly stated) that employing and using genetically improved seeds to produce a higher yield of crops that are pest-resistant, disease-resistant, and require less or no herbicides and pesticides is a good thing. However, as is the case with the Nigerian farmers, it must be stated that it is rather the systematic neglect of the indigenous farming system (with its own ways of seed modification and domestication) that has been the major problem, which must be supported by the availability of modern technology and facilities within their reach. In this way, while the use of modern technology in farming and preservation can create progress, the peasant farmers will struggle to spend their little earnings to buy improved seeds.

Indigenous Farming System and Efficiency: The Desired

It is in line with the above and the quest to curb the looming food insecurity that the paper requests the government and various institutions to focus on the following.

Genuine Poverty Alleviation and Minimizing Illiteracy among farmers

Scholars have argued that one of the major impediments standing against adaptation of modern technologies among the local farmers is the issue of literacy. In the case of Esan land, farmers play significant roles in contributing to (not just the local economy), the national economy. However, the majority of the farmers are poor and illiterate. Even in this age and time, the situation has not changed much, except for the fact that some of the farmers (elite farmers) are trying to become literate and grab the knowledge and trying to implement the new skills and techniques, as the performance and productivity of farmers gone down than expected due to lack of awareness and knowledge on modern agricultural farming methods and technology (Akubor 2023).

With the above situation (poverty and illiteracy), the peasant farmers are unable to identify opportunities that are provided by the different government and private organizations, and only a few people who are educated are making use of them, and different schemes for the betterment of farmers. This is the exact situation the farmers all over Nigeria are confronted with.

Improving accessibility to reduce agricultural losses.

Most of the major farming communities are inaccessible by road. This is the case of most riverine farming communities. In the southern part of the country, communities along the banks of the river Niger and other major rivers suffer great losses yearly. For instance, the Igala and Igbo farmers along this axis have, in the last 12 years, been suffering severe losses. One of such communities is the Southwest Ibaji community, the Ebu, Inyalen, and Illushi

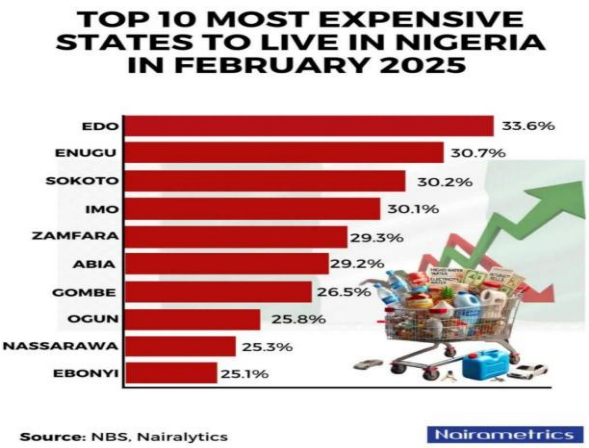
neighbours. According to sources, during the colonial period (specifically 1920), the yam trade alone amounted to about £66,666. Out of an estimated total of £81,046, yet this area to date cannot be accessed by road (Ukwedeh, 1976; Akubor 2005)

Lack of Access to Supporting Modern Storage Facilities

Although the state has always lamented the inability of the farmers to preserve their harvested produce properly, no attempt has been made to provide these farmers with such facilities. This is even more among the indigenous farmers, most of whom still depend on their local savings/loans to provide a storage system, which has often been described as outdated and unhealthy by the government. Thus, in the absence of such facilities and inaccessible roads to the interior where most of these are produced, the farmers have continued to record losses.

The situations currently among the indigenous farming communities are clear indications that the inability of the government to provide the enabling environment for the local farmers to key into the new trend in the world agricultural economy is already impacting negatively on society. This is evident in the skyrocketing prices of food and other related agricultural products. The table below clearly indicates this.

Table I: Top Ten Most Expensive States to Live in Nigeria (February 2025)



Apart from the above identified problems within the local economies of the indigenous farmers and their neighbours, scholars have argued that with the snail-pace approach of most third-world countries in the direction, little or nothing may be achieved at the end of the day.

CONCLUSION

Although the paper has been able to interrogate some of the issues facing agricultural development in the modern global system with specific reference to Nigeria, there is therefore a need to trace back the country's agricultural steps. This was the situation in which the colonial government met the people; it was the same situation that gave her a pride of place in the international market both before and during the colonial period. Unfortunately, the intervention of the global agricultural system in the name of Genetically Modified Seeds has turned around (in the negative direction), the agricultural prowess of the indigenous farmers. It is in line with this that the paper concludes by posing these questions, which must be answered by governments of countries like Nigeria, if the local farmers are to survive the new age of development in agriculture, especially as it relates to GMS. The important questions are:

1. Should staple crops be genetically engineered to be more pest-resistant,

disease-resistant, have increased nutrient content, and require less water and shorter growth periods?
2. For which pathogens should vaccines be developed? And who should pay for the vaccine development?
3. Should global corporations hold the patents for the intellectual property represented by products?
4. Who should pay for the adoption of GM products?
5. How should GMOs be regulated, and who should do the regulating?
6. How much should GM products cost?
7. How should the research be paid for, and by whom?
8. Should private companies be able to self-regulate?
9. Who decides on how environmental management can be done using biotechnology tools? And who pays?
10. Which crops and livestock should be genetically modified?

The paper concludes by arguing that the Genetically Modified Seed agenda is purely another plot at creating a situation of dependency on the West, especially in the area of Food Security, which is part of the global historical process of socioeconomic stagnation and underdevelopment of developing nations.

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