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Policy Brief



Balancing Innovation And Caution In The Quest For Food Security





POLICY BRIEF

Balancing Innovation And Caution In The Quest For Food Security

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LIST OF ABBREVIATIONS

GMO	–	Genetically Modified Organism
GM	–	Genetically Modified (used for crops/foods)
FAO	–	Food and Agriculture Organization of the United Nations
WHO	–	World Health Organization
UNICEF	–	United Nations International Children's Emergency Fund
AU	–	African Union
EU	–	European Union
ECOWAS	–	Economic Community of West African States
NABDA	–	National Biotechnology Development Agency (Nigeria)
NBMA	–	National Biosafety Management Agency (Nigeria)
SDGs	–	Sustainable Development Goals
R&D	–	Research and Development
CSOs	–	Civil Society Organizations
NGOs	–	Non-Governmental Organizations
NASS	–	National Assembly (Nigeria)
NBS	–	National Bureau of Statistics (Nigeria)
NCDC	–	Nigeria Centre for Disease Control and Prevention

BACKGROUND

Nigeria, Africa's most populous nation with an estimated 229 million people (UN DESA World Population Prospects, 2024), faces significant challenges in ensuring food security. The country ranks 109th out of 125 countries in the Global Hunger Index 2024, reflecting persistent issues of hunger, malnutrition, and food affordability.

Approximately 26.5 million Nigerians were projected to face acute food insecurity in 2025 (FAO, 2024), a crisis exacerbated by climate change, insecurity in food-producing regions, and poor agricultural infrastructure.

The Food Security Challenge:

Food inflation in Nigeria stands at double digits since 2016 contributing to the country's cost of living crisis, eroding incomes and savings, and reaching 40.1% in 2024, the highest in two decades, pushing millions below the poverty line (World Bank, 2024). The agricultural sector, which employs about 70% of the workforce, has faced numerous challenges, including low productivity, limited access to improved seeds and fertilizers, and inadequate irrigation systems. Climate change has also led to increased variability in weather patterns, resulting in droughts, floods, and other extreme weather events that further threaten food security.

The Introduction of Genetically Modified Organisms (GMOs)

In an effort to address these challenges, the Federal Government of Nigeria in 2018 approved the cultivation of genetically modified crops, including Bt cowpea and GM maize. Proponents of GMOs argue that these crops can improve crop resilience, increase yields, and reduce dependence on chemical pesticides. Nigeria is not new to biotechnology adoption; in 2018, the country became the first African country to approve commercial planting of genetically modified cowpea (Bt Cowpea), followed by the approval of GM maize and cotton. By 2023, Nigeria had already cultivated over 1 million hectares of Bt cotton and Bt cowpea (ISAAA, 2023). The National Biotechnology Development Agency (NABDA) and the National Biosafety Management Agency (NBMA) have consistently defended GMO adoption as safe, citing approvals from global regulatory agencies such as the World Health Organization (WHO) and Food and Agriculture Organization (FAO), which note that GM foods currently on the international market have passed safety assessments.

Potential Benefits and Risks of GMOs

However, critics—both within Nigeria and globally—raise concerns about the long-term health, environmental, and economic impacts of GMOs. For instance, studies on GMO adoption in countries like the United States, Brazil, and Argentina highlight risks of biodiversity loss, pest resistance, and heavy dependence on multinational seed corporations.

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In Nigeria, civil society organizations and experts have warned that GMOs threaten smallholder farmers, who produce about 80% of Nigeria's food (IFAD, 2023), by potentially increasing costs through patented seeds and undermining indigenous seed varieties.

Another concern is the lack of adequate public consultation and transparency in the decision-making process. Recent surveys show that over 65% of Nigerians are unaware of the difference between organic, hybrid, and genetically modified foods (NOI Polls, 2024), underscoring a massive knowledge gap. Without widespread sensitization and clear labeling, consumers may unknowingly consume products they would otherwise reject

Furthermore, the broader context of Nigeria's food crisis complicates the narrative. The World Bank (2024) reports that food inflation in Nigeria stood at 40.1% as of June 2024, the highest in two decades, pushing millions below the poverty line. While GMOs are presented as a quick-fix solution, critics argue that Nigeria's real challenge lies in structural inefficiencies—poor storage facilities, weak extension services, insecurity in farming areas, and lack of investment in smallholder farmers.

The Need for a Balanced Approach

As Nigeria navigates the complex landscape of food security and GMO adoption, it is essential to strike a balance between innovation and caution. This requires careful consideration of the potential benefits and risks of GMOs, as well as the development of robust regulatory frameworks and public engagement strategies. By prioritizing transparency, accountability, and inclusivity, Nigeria can harness the potential of GMOs to improve food security while minimizing potential risks and ensuring that the benefits are equitably distributed.

Several countries have implemented successful GMO regulatory frameworks and public engagement strategies. For example, South Africa has established a comprehensive regulatory system for GMOs, which includes strict testing and labeling requirements. In contrast, countries like Kenya and Tanzania have taken a more cautious approach, restricting or banning GMOs due to concerns about their potential impact on human health and the environment. Nigeria's decision to adopt GMOs as a potential solution to food security challenges requires careful consideration of the potential benefits and risks.

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Extracted Data				
229M	109TH	29M	31.1%	65%
estimated population	out of 125 in 2024 Global Hunger Index	estimated for acute poverty	present inflation rate	food illiteracy rate



MAJOR CONCERNS

The adoption of GMOs in Nigeria is surrounded by significant controversies that cut across health, environmental, socio-economic, and governance dimensions. The Nigerian government established a regulatory framework for GMOs, which includes the National Biosafety Management Agency (NBMA) in 2015 and the National Biotechnology Development Agency (NABDA) in 2001. These agencies are responsible for ensuring the safe development, testing, and deployment of GMOs in Nigeria. The government, through these agencies, and biotech proponents frame GMOs as a solution to food insecurity, a closer look reveals multiple concerns that require urgent attention.



Public Health and Food Safety Risks

There is growing apprehension among health professionals and citizens about the long-term effects of GMOs on human health. Although international agencies such as the WHO and FAO affirm that approved GM foods are safe, independent studies raise concerns about potential allergenicity, antibiotic resistance markers, and unintended side effects. In Nigeria, the lack of independent local research and long-term clinical studies exacerbates fears. According to NOI Polls (2024), 71% of Nigerians express uncertainty about the safety of GM foods, reflecting mistrust in regulatory institutions. Compounding this issue is the absence of mandatory GMO food labeling, meaning consumers cannot make informed choices about what they eat.

Threat to Biodiversity and the Environment

Nigeria is home to over 7,895 plant species and 22,000 animal species (Nigerian Conservation Foundation, 2023), many of which are already under pressure from climate change,



deforestation, and urban expansion. Critics argue that the large-scale cultivation of genetically modified crops risks contaminating indigenous varieties through cross-pollination. This could erode Nigeria's rich biodiversity and threaten seed sovereignty. Additionally, pest resistance is emerging as a problem in countries with heavy GMO adoption. For instance, in the US, farmers reported infestations of “superweeds” resistant to glyphosate (the herbicide paired with GMO crops), forcing increased pesticide use (USDA, 2023). If replicated in Nigeria, such challenges could worsen soil degradation and chemical dependency.

Economic Dependence and Farmers' Livelihoods

Nigeria's agriculture is dominated by smallholder farmers who produce about 80% of the nation's food (IFAD, 2023). GMOs, however, are largely controlled by multinational corporations through patented seeds. Unlike traditional seeds that can be replanted, patented GMO seeds must be purchased every season, creating dependency and additional costs for farmers. With over 63% of Nigerians already classified as multi-dimensionally poor (National Bureau of Statistics, 2022), many smallholder farmers may not be able to afford repeated seed purchases. This could deepen inequality, displace traditional farming systems, and undermine local seed banks that have sustained communities for generations.

Weak Regulatory and Institutional Oversight

Although Nigeria established the National Biosafety Management Agency (NBMA) in 2015 to regulate GMOs, civil society organizations have raised concerns about regulatory capture and lack of transparency. CSOs have criticized NBMA for issuing approvals without robust public consultations or publishing comprehensive risk assessment data. In 2023 alone, Nigeria approved multiple GMO crop varieties—including maize and cotton—without clear evidence of wide-scale public awareness. According to a 2024 Transparency International survey, public confidence in Nigeria's regulatory agencies remains below 35%, raising fears that GMO approvals may prioritize corporate interests over public welfare.

Food Security vs. Food Sovereignty Debate

While GMOs are presented as a tool to boost food production, Nigeria's food crisis is not solely about production volumes. The World Bank (2024) reported that food inflation reached 40.1% in mid-2024, the highest in two decades, driven by insecurity in farming regions, poor logistics, and post-harvest losses.

Over 50% of Nigeria's fresh produce is lost annually due to lack of storage and cold-chain facilities (FAO, 2023). Critics have argued that unless these structural issues are addressed, GMOs will not solve the underlying causes of hunger. Instead, they may shift focus away from sustainable, climate-smart farming practices and agroecological models that prioritize food sovereignty—the right of people to healthy, culturally appropriate food produced through ecologically sound methods.

Regional and Continental Concerns

Nigeria's decision also raises geopolitical questions within Africa. While Nigeria embraces GMOs, several African countries have maintained strict bans or restrictions. For instance, Tanzania, Zambia, and Benin prohibit GMO cultivation citing health and biosafety risks. The African Union (AU), through its Science, Technology and Innovation Strategy (STISA-2024), has urged member states to exercise the precautionary principle when adopting biotechnology. Nigeria's rapid embrace of GMOs risks creating tension with neighboring countries that prioritize organic and indigenous farming systems.



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POLICY RECOMMENDATIONS

Based on the above concerns on the adoption of genetically modified organisms (GMOs) in Nigeria, the following policy recommendations are proposed:

1. Establish a National GMO Registry:

Government should create a publicly accessible registry of approved GMO events, including information on safety assessments, approvals, and labeling requirements. This registry would provide transparency and accountability, enabling stakeholders to track GMO development and deployment. According to a study by the International Food Policy Research Institute (IFPRI), such registries have been effective in promoting transparency in countries like South Africa and Kenya.

2. Strengthen Institutional Capacity:

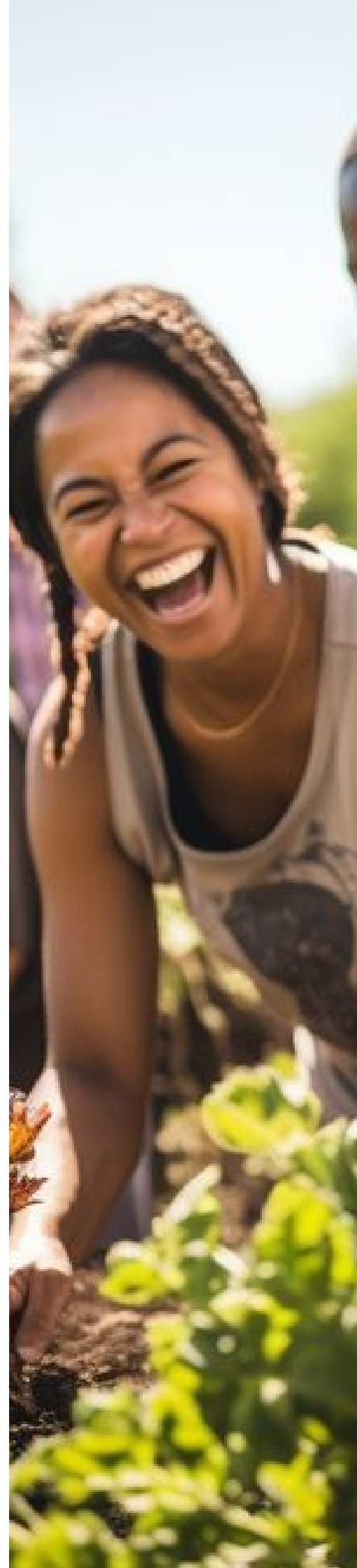
Nigeria Government should enhance the capacity of regulatory agencies like the National Biosafety Management Agency (NBMA) and the National Agency for Food and Drug Administration and Control (NAFDAC) through training, infrastructure development, and staffing. This would ensure effective oversight and enforcement of GMO regulations. Data from the World Bank indicates that investing in institutional capacity can yield significant returns, with every \$1 invested in agricultural research and development generating an average return of \$10.

3. Implement Mandatory Labeling:

Regulatory agencies should ensure mandatory labelling requirements for GMO foods to enable consumers to make informed choices. This also involve developing clear guidelines on labeling, including threshold levels for GMO content. According to a survey by the Nigerian Consumer Protection Council, 75% of Nigerian consumers support labeling of GMO foods.

4. Conduct Regular Risk Assessments:

Government regulatory agencies should conduct regular risk assessments to identify potential risks associated with GMOs and develop strategies to mitigate them. This could involve engaging experts from various fields, including biotechnology, environmental science, and human health. The World Health Organization (WHO) emphasizes the importance of risk assessment in ensuring the safety of GMOs.



5. Foster Public Engagement:

There is the need to foster public engagement and participation in GMO decision-making through public awareness campaigns, stakeholder consultations, and public hearings. This could ensure that diverse perspectives are considered and trust are built in the regulatory process. A study by the University of Ibadan found that public engagement can increase public acceptance of GMOs.

6. Develop a National Biotechnology Strategy:

Policymakers and regulatory agencies should consult with CSOs and develop a national biotechnology strategy that outlines clear objectives, priorities, and timelines for GMO development and deployment. This would provide a roadmap for the development of the biotechnology sector and ensure alignment with national development goals. According to the African Development Bank (AfDB), investing in biotechnology can drive economic growth and food security in Africa.

7. Encourage International Cooperation:

Encourage international cooperation and knowledge sharing on GMO regulation and development. This would involve collaborating with international organizations, research institutions, and other countries to leverage best practices, address cross-border issues, and stay up-to-date with global developments in biotechnology. The International Service for the Acquisition of Agri-biotech Applications (ISAAA) reports that international cooperation has facilitated the development and deployment of GMOs in countries like Kenya and Uganda.



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CONCLUSION

Nigeria stands at a critical crossroads in shaping its agricultural and food systems. The adoption of genetically modified (GM) crops and foods has ignited public debate about food safety, sovereignty, and long-term sustainability. While biotechnology presents opportunities for addressing food insecurity and climate-related agricultural challenges, it also poses significant risks — ranging from ecological disruption and health uncertainties to dependence on multinational seed corporations.

The concerns raised by civil society organizations, farmers' associations, consumer rights groups, and international experts underscore that the GMO debate is not simply about science, but about governance, accountability, and the right of citizens to safe, nutritious, and culturally appropriate food. Current statistics reveal that Nigeria still loses over 50% of its harvests annually due to poor storage and distribution systems — a problem that could be solved without resorting to GMO adoption. Furthermore, the nation faces a malnutrition rate of 33% among children under five (UNICEF, 2024), not because food is insufficient, but because of inequitable access, weak agricultural support, and systemic corruption.

The introduction of GMOs, if pursued without robust safeguards, could worsen vulnerabilities by marginalizing smallholder farmers, eroding biodiversity, and exposing the population to food sources that remain contested globally. The precautionary principle, widely accepted in international food policy, suggests that governments must adopt a cautious and transparent approach when scientific evidence of safety is incomplete or inconclusive.

Nigeria's food future must prioritize resilience, health, and sovereignty. This requires a shift towards agroecology, climate-smart agriculture, and farmer-centered innovations, rather than the wholesale importation of foreign biotechnologies that could compromise long-term well-being. Public policy must also focus on strengthening food safety regulations, investing in research by Nigerian scientists, and creating inclusive platforms for citizen participation in agricultural policy decisions.

The debate on GMOs provides an opportunity for Nigeria to rethink its agricultural pathway — one that places people before profit, health before haste, and sustainability before short-term gains. By embracing transparent governance, evidence-based decision-making, and genuine engagement with farmers and citizens, Nigeria can chart a course towards a future of food that is safe, sustainable, and sovereign.

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