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Perception and Acceptance of GMOs in Nigeria: Cultural, Media and Policy Dimensions

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Abstract

Agricultural biotechnology, particularly genetically modified organisms (GMOs), has been promoted as a solution to food insecurity and climate stress in Nigeria. However, despite policy adoption of Bt cotton, pod borer–resistant cowpea, and TELA maize, public perception and acceptance remain polarized due to cultural, religious, and media influences. This study examines how awareness, cultural values, media framing, and policy communication shape public perception and acceptance of GMOs in Nigeria, highlighting the gap between regulatory policy and societal attitudes. The study employs a qualitative documentary analysis, reviewing peer-reviewed literature, policy documents, and media reports from 2010 to 2024. Sources were selected from Scopus, Web of Science, AJOL, Google Scholar, government publications, and national media outlets using content analysis to identify themes linking perception, culture, media, and policy. Results show that public awareness of GMOs in Nigeria is low, with perceptions strongly mediated by cultural and religious beliefs, negative media framing, and limited trust in regulatory institutions. While government policies promote biotechnology adoption, weak science communication and policy ambiguity reinforce skepticism. Comparative insights from Kenya, South Africa, and Europe demonstrate that trust, transparent regulation, and effective communication are critical to shaping acceptance. The study concludes that GMO acceptance in Nigeria is constrained not by scientific capacity but by societal perceptions shaped by culture, media, and weak policy communication. It recommends culturally sensitive engagement strategies, strengthened science communication in the media, and improved regulatory transparency to build public trust. The study contributes to African scholarship on biotechnology governance and offers.

Keywords: Public Perception, Awareness, Media Framing, Biotechnology Policy

Introduction

Agricultural biotechnology has emerged as one of the most transformative yet controversial scientific innovations of the 21st century. Genetically modified organisms (GMOs), particularly crops, are promoted as tools for addressing global food insecurity, enhancing resilience to climate change, and reducing dependence on chemical inputs. Their potential benefits include higher yields, improved pest resistance, and tolerance to drought and other stresses that are especially relevant for smallholder farmers in developing countries (Adenle, 2021; Frewer et al., 2013). Within sub-Saharan Africa, countries such as South Africa, Ethiopia, Kenya, and Nigeria have taken steps to integrate GM crops into national agricultural systems, reflecting broader global trends in biotechnology adoption (AATF, 2024; U.S. FAS, 2024).

Nigeria, Africa's most populous country, has become a central case in this debate. The country approved the commercial release of Bt cotton in 2018, pod borer–resistant cowpea in 2019, and most recently, drought-tolerant and insect-resistant TELA maize in 2024 (NBMA, 2019; AATF, 2024). These policy decisions signal government confidence in biotechnology as a strategic response to chronic food deficits, rising population pressure, and climate variability. Yet, despite these official endorsements, public opinion about GMOs in Nigeria remains deeply divided.

Empirical studies suggest that knowledge about GMOs among Nigerians is generally low, creating fertile ground for skepticism and resistance (Fakoya, Fapojuwo, & Oladele, 2020; Akinbo, Oyekale, & Falusi, 2021). Misconceptions persist around health risks, environmental safety, and the ownership of agricultural resources, with some communities perceiving GMOs as "unnatural" or as instruments of foreign control (Aliyu, 2020; Egbe, Bukar, & Adebayo, 2019). These perceptions are shaped not only by direct knowledge gaps but also by the influence of cultural and religious values that guide decision-making in rural and urban households.

In addition to cultural considerations, the Nigerian media plays a pivotal role in framing the GMO debate. Research shows that local newspapers and broadcast outlets often emphasize controversy, political conflict, and public mistrust rather than scientific evidence (Omeje, 2019; Okeke, 2023). This selective framing reinforces public doubts and contributes to polarized views. Meanwhile, civil society organizations and advocacy groups amplify narratives of risk and uncertainty, sometimes framing biotechnology as a threat to indigenous seed sovereignty or as a domain dominated by multinational corporations (Tsanni, 2019; Tribune Nigeria, 2024).

The interaction of these cultural, media, and policy dimensions underscores the complexity of GMO acceptance in Nigeria. While government regulators and international partners view biotechnology as a pathway to agricultural transformation, public hesitation threatens to slow adoption, undermine trust in science, and hinder policy effectiveness. This tension makes Nigeria an important case for examining how societal perceptions influence the success or failure of technological innovations in food systems.

Statement of Problem

Nigeria faces an urgent challenge of ensuring food security for a population projected to exceed 400 million by 2050. Agricultural productivity is constrained by land degradation, pest infestations, erratic rainfall, and inadequate infrastructure. Biotechnology, particularly GMOs, has been promoted as a viable solution to these challenges by offering improved seed varieties capable of withstanding biotic and abiotic stressors (AATF, 2024; U.S. FAS, 2024). However, the success of these innovations depends not only on scientific efficacy and regulatory approval but also on public perception and societal acceptance.

Current evidence suggests a significant gap between Nigeria's policy commitments and the views held by its citizens. Surveys and case studies consistently indicate low levels of public awareness and widespread misconceptions about GMOs. For example, studies in Cross River, Kaduna, and Southwestern Nigeria reveal that many farmers and consumers have little or no scientific understanding of biotechnology, often associating GMOs with health hazards, infertility, or environmental harm (Edu, Ekerette, & Adah, 2021; Egbe, Bukar, & Adebayo, 2019; Fakoya et al., 2020). Cultural and religious beliefs further reinforce this skepticism, framing GMOs as unnatural or incompatible with traditional practices (Aliyu, 2020).

Media representations exacerbate the problem by prioritizing conflict-based narratives over accurate science communication. Research on Nigerian print and broadcast media shows that coverage tends to highlight public protests, international controversies, and political disputes, while offering limited explanation of scientific processes or benefits (Omeje, 2019; Okeke, 2023). As a result, the public often receives incomplete or biased information, reinforcing suspicion and resistance.

The policy environment, while progressive in terms of regulatory approvals, has not adequately bridged this information gap. Agencies such as the National Biosafety Management Agency (NBMA) have made significant progress in establishing a legal framework for biotechnology, yet public engagement strategies remain weak. Without deliberate efforts to address cultural concerns, improve science communication, and build trust in regulatory institutions, the adoption of GMOs risks remaining a top-down policy initiative that lacks broad societal support.

The central problem, therefore, is the disconnect between Nigeria's biotechnology policy advances and the lived perceptions of its citizens. Unless this gap is addressed, GMO adoption will continue to encounter resistance, misinformation, and limited uptake. A deeper understanding of how cultural values, media framing, and policy processes intersect to shape public opinion is crucial for designing inclusive strategies that can enhance the acceptance of biotechnology in Nigeria.

Objective of the Study

The broad objective of this study is to interrogate the perception and acceptance of genetically modified organisms (GMOs) in Nigeria, with emphasis on cultural, media, and policy dimensions. Specifically, the study seeks to:

1. Examine the level of awareness and knowledge of GMOs among Nigerians.
2. Analyze cultural, religious, and policy factors influencing public attitudes toward GMOs.
3. Assesse how media coverage shapes public perception and acceptance of GMOs in Nigeria.

Research Questions

The study was guided by the following questions:

1. What is the level of awareness and knowledge of GMOs among Nigerians?
2. How do cultural, religious, and policy factors influence public attitudes toward GMOs in Nigeria?
3. In what ways does media coverage shape public perception and acceptance of GMOs in Nigeria?

Scope of the Study

This study is limited to examining the perception and acceptance of genetically modified organisms (GMOs) within the Nigerian context, while situating the findings in relation to broader African debates on biotechnology. The analysis focuses on three key dimensions Vis a Vis awareness and knowledge, cultural and policy influences, and media framing. Although GMOs are a global issue, Nigeria presents a particularly important case because of its large population, diverse cultural and religious environment, and ongoing policy debates on food security and agricultural innovation.

Literature Review

Conceptual Clarifications

Perception – Perception refers to the process by which individuals interpret and give meaning to new information, influenced by prior knowledge, cultural values, and social context (APA, 2023; Firestone & Scholl, 2016). In this study, perception relates to how Nigerians interpret information about genetically modified organisms (GMOs).

Acceptance – Acceptance goes beyond perception and refers to the willingness of individuals or communities to adopt or integrate GMOs into their agricultural practices and diets. It is shaped by cultural beliefs, trust in institutions, and policy communication.

Genetically Modified Organisms (GMOs) – GMOs are organisms whose genetic material has been altered using biotechnology to achieve traits such as pest resistance, drought tolerance, or higher yields (Frewer et al., 2013). In the Nigerian context, GMOs of interest include Bt cotton, pod borer–resistant cowpea, and TELA maize.

Policy Framework – Policy framework refers to the regulatory and institutional mechanisms, such as the National Biosafety Management Agency (NBMA), that govern the approval, communication, and oversight of GMOs in Nigeria.

Media Framing – Media framing is the way news outlets and journalists' structure narratives, emphasize risks or benefits, and shape public discourse around GMOs (McCombs & Shaw, 1972; Okeke, 2023).

Culture and Religion – Culture and religion encompass shared values, traditions, and beliefs that guide attitudes toward technology, including food innovations. In Nigeria, these dimensions are central in shaping perceptions of GMOs (Aliyu, 2020; Nnadi & Akwiwu, 2021).

Thematic Review

Perception of GMOs in Nigeria

Perception refers to the way individuals interpret and make sense of new information, shaped by prior knowledge, beliefs, and social contexts (APA, 2023; Firestone & Scholl, 2016). In the Nigerian context, public perception of genetically modified organisms (GMOs) is complex and often contested, reflecting both limited scientific awareness and strong cultural predispositions. While *awareness* is not the primary focus of this study, it remains a crucial entry point for understanding perception: low awareness levels create fertile ground for misconceptions and skepticism.

Empirical evidence demonstrates that Nigerians' perceptions of GMOs are strongly mediated by gaps in knowledge. For instance, Fakoya, Fapojuwo, and Oladele (2020) found that farmers in Southwest Nigeria possessed only partial understanding of GMOs, leading many to conflate them with artificial or harmful products. Similarly, Akinbo, Oyekale, and Falusi (2021) observed that limited public understanding has reinforced a cautious—sometimes outright negative—perception of biotechnology. These findings align with Edu, Ekerette, and Adah's (2021) study in Cross River State, which revealed that misconceptions about health risks and environmental harm dominated local narratives about GMOs.

Perception is further shaped by the interaction between information sources and cultural context. Egbe, Bukar, and Adebayo (2019) reported that in Kaduna, where awareness campaigns were minimal, local perceptions were largely informed by rumor and religious framing. In such settings, GMOs were frequently viewed as foreign impositions or experiments on African populations. This is consistent with broader African studies that show skepticism toward GMOs often arises where communication gaps allow cultural or political interpretations to overshadow scientific messaging (Adenle, 2011).

Another striking dimension is the role of trust. Nigerians' perceptions are not merely about GMOs as products but about the institutions behind them. Weak trust in government policy implementation and skepticism toward international biotech firms contribute to the widespread perception that GMOs may prioritize corporate profit over public safety (Ajibade, Onwualu, & Bolarin, 2025). Thus, perception in Nigeria is not only about scientific facts but also about the perceived intentions of policymakers, regulators, and media actors.

In sum, public perception of GMOs in Nigeria is characterized by low awareness, high susceptibility to misinformation, and deep entanglement with cultural and institutional distrust.

Awareness functions as a gateway, but perception is sustained by broader societal narratives that move beyond knowledge to include values, beliefs, and trust dynamics. This layered understanding provides the foundation for exploring how cultural, media, and policy dimensions jointly shape the acceptance of GMOs in Nigeria.

Cultural and Religious Influences on Acceptance

Acceptance of GMOs in Nigeria is strongly mediated by cultural and religious beliefs that shape how risks and benefits are interpreted. Unlike purely scientific assessments, cultural frames embed GMOs within broader questions of identity, morality, and trust. The Cultural Theory of Risk (Douglas & Wildavsky, 1982) helps explain this dynamic: communities interpret technological risks not only on technical grounds but through shared cultural values.

In Nigeria, food is deeply tied to cultural identity, and traditional diets are often regarded as authentic and natural. As such, GMOs are frequently perceived as "unnatural" or "foreign" to Nigerian food systems. Nnadi and Akwiwu (2021) observed that in Southeastern Nigeria, indigenous seed systems are often preferred over genetically modified varieties, as they are viewed as central to cultural heritage and food sovereignty. This cultural preference reinforces resistance to GMO adoption, regardless of scientific assurances about safety.

Religious beliefs also play a significant role in shaping acceptance. In Northern Nigeria, Aliyu (2020) found that many respondents linked GMOs with tampering in "God's creation," creating moral objections that went beyond scientific risk assessments. These findings mirror similar concerns in other African contexts where religious leaders exert strong influence over community attitudes toward biotechnology (Adenle, 2011). In some Christian communities, too, GMOs are framed as symbols of Western imposition, deepening suspicion of their long-term impacts.

Cultural narratives are further reinforced by socio-economic realities. In communities with histories of exploitation by foreign corporations, GMOs are sometimes seen as another form of dependency on external actors. This perception was documented by Egbe, Bukar, and Adebayo (2019) in Kaduna, where respondents linked GMOs to fears of economic control by multinational seed companies. The concern is not simply about safety but about cultural and economic autonomy.

Globally, similar patterns emerge. In Europe, strong cultural attachment to "natural" foods has driven public resistance to GMOs despite regulatory approval (Frewer et al., 2013). In Asia, debates have also centered on whether GMOs align with cultural norms of purity and balance in food. These parallels suggest that Nigeria's case is part of a broader phenomenon where cultural and religious values exert a decisive influence on technological acceptance.

In summary, cultural and religious influences in Nigeria shape acceptance of GMOs in three key ways: by reinforcing attachment to indigenous seed systems, by framing biotechnology as a moral or religious violation, and by linking it to fears of economic and cultural dependency. These dynamics demonstrate that acceptance cannot be understood in isolation from cultural

identity and religious belief systems. Any policy aimed at increasing GMO acceptance must therefore engage not only with science communication but also with cultural and religious dialogues.

Media Framing and Public Perception

The media plays a pivotal role in shaping how Nigerians perceive and accept genetically modified organisms (GMOs). Through agenda-setting and framing, the media not only informs the public about biotechnology but also influences the salience of issues and the interpretive lenses through which they are understood. According to Agenda-Setting Theory (McCombs & Shaw, 1972), the more prominently and frequently the media highlights an issue, the more the public perceives it as important. Applied to GMOs, this means that public concerns often mirror the tone and emphasis of media narratives rather than independent scientific evaluation.

In Nigeria, research has demonstrated that media coverage of GMOs is often polarized, inconsistent, and heavily influenced by broader socio-political debates. Okeke (2023) found that Nigerian print media frequently frames biotechnology in terms of controversy, highlighting risks such as environmental damage, health concerns, and foreign domination. This framing tends to reinforce skepticism rather than build scientific literacy. Similarly, Omeje (2019) observed that Nigerian science journalism often lacks depth, relying heavily on elite statements and foreign news agencies rather than providing independent investigation or explanatory coverage. Such framing contributes to the dominance of fear and uncertainty in public discourse on GMOs.

The framing of GMOs is also influenced by political and economic interests. Reports from Tribune Nigeria (2024) emphasized misinformation and distrust, noting that competing stakeholders, government agencies, NGOs, multinational companies, and local farmer groups, each frame GMOs differently to advance their agendas. For example, while international pro-GMO organizations stress food security and innovation, domestic critics often frame GMOs as a neocolonial tool threatening Nigeria's agricultural sovereignty. This media polarization results in fragmented public understanding, where acceptance or rejection is mediated by which narrative audiences are most exposed to.

Globally, similar patterns exist. Studies in the United States and Europe show that the public's risk perceptions of GMOs are strongly correlated with how the media frames them (Frewer et al., 2013). In Europe, frequent framing of GMOs as unsafe and "unnatural" led to sustained public opposition, even after scientific institutions declared them safe. In contrast, countries such as Brazil and Argentina, where media often frames GMOs as tools for economic development and agricultural growth, have seen greater levels of acceptance. These comparative insights reinforce the argument that perception is not simply a matter of knowledge but of media framing and narrative emphasis.

In Nigeria, the lack of consistent, evidence-based science reporting is particularly significant. Tsanni (2019) notes that debates in Nigerian media tend to rely on moralistic or emotive rhetoric

rather than technical evidence. This creates an information vacuum in which misinformation and conspiracy theories thrive, particularly on social media platforms where unverified content circulates rapidly. The problem is compounded by limited investment in science communication and weak linkages between journalists and research institutions.

In summary, the Nigerian media shapes public perception of GMOs through three key dynamics: (1) emphasizing controversy and uncertainty rather than evidence, (2) reflecting the competing interests of stakeholders, and (3) allowing misinformation to circulate unchecked. These dynamics demonstrate that public understanding of GMOs is mediated less by direct exposure to science and more by the interpretive frames promoted by mass media. Addressing these challenges requires deliberate investment in science communication training for journalists and stronger partnerships between scientists, policymakers, and the media to ensure balanced, accurate reporting.

Policy Dimensions and Public Acceptance

Policy frameworks play a crucial role in shaping public acceptance of genetically modified organisms (GMOs), as they provide the regulatory and institutional context within which debates on safety, ethics, and benefits are situated. In Nigeria, the development of GMO policy has been slow, contested, and often poorly communicated to the public, which in turn undermines confidence in both the technology and the institutions promoting it.

The establishment of the National Biosafety Management Agency (NBMA) in 2015 was a milestone in Nigeria's GMO regulation. The agency was tasked with implementing the National Biosafety Management Act, which provides a legal framework for the safe application of biotechnology. However, despite this regulatory architecture, public trust remains low. Studies show that many Nigerians are either unaware of the existence of biosafety policies or perceive them as being driven by external pressures from international corporations and donor agencies rather than by local priorities (Ajibade et al., 2025; Egbe et al., 2019). This perception contributes to resistance, as people question whether policies serve national food security goals or foreign economic interests.

Policy ambiguity and weak enforcement also shape acceptance. For example, Daboer et al. (2020) observed that professionals in agriculture and health sectors in Nigeria often lacked clarity about GMO regulations, leading to inconsistent communication with the wider public. The resulting information gap fosters suspicion and aligns with broader concerns about governance deficits in Nigeria's policy implementation (Akinbo et al., 2021). This disconnect between regulatory frameworks and public understanding suggests that laws alone cannot foster acceptance; they must be supported by transparent, participatory communication strategies.

Comparative experiences illustrate the importance of effective policy communication. In South Africa, where biosafety regulations are clear and consistently enforced, GM crops like maize and cotton have been widely adopted with fewer public controversies (Adenle, 2011). In contrast, the European Union has some of the strictest biosafety policies globally, but persistent framing

of GMOs as risky has entrenched public resistance despite regulatory rigor (Frewer et al., 2013). These comparisons highlight that the presence of laws is not sufficient—policy credibility and communication are equally critical in shaping public acceptance.

Nigeria's situation is further complicated by policy incoherence. While the NBMA endorses biotechnology for agricultural development, other government agencies have issued conflicting statements on the safety and necessity of GMOs. This inter-agency contradiction, amplified by media coverage, deepens public mistrust. Furthermore, civil society groups and farmer associations often accuse policymakers of prioritizing corporate interests over farmers' rights and food sovereignty, creating additional barriers to acceptance (Tribune Nigeria, 2024; Tsanni, 2019).

In summary, the Nigerian policy environment shapes GMO perception and acceptance through three dynamics: (1) weak awareness and communication of biosafety laws, (2) contradictions between regulatory claims and public perceptions, and (3) contested legitimacy of policy processes perceived as externally driven. Strengthening public trust requires not only clearer policies but also participatory governance that involves farmers, consumers, scientists, and civil society in policy design and communication. Without this, Nigeria risks continued public resistance regardless of the potential benefits of biotechnology.

Empirical Review

Empirical studies on public perception and acceptance of genetically modified organisms (GMOs) in Nigeria reveal mixed attitudes shaped by awareness, culture, and media representation. Edu et al. (2021), in a study conducted in four local government areas of Cross River State, found that while a significant proportion of respondents had heard of GMOs, their understanding was limited, with many relying on informal sources of information such as friends and local media. Similarly, Egbe et al. (2019), studying urban residents in Kaduna, reported that awareness levels were moderate, but acceptance was low due to safety concerns and a perceived lack of trustworthy information from government agencies. These findings underscore that knowledge gaps continue to hinder informed decision-making.

Other Nigerian case studies highlight how socio-cultural and religious contexts shape GMO debates. Aliyu (2020) demonstrated that in northern Nigeria, religious leaders strongly influence public attitudes toward biotechnology, with skepticism often framed in moral or spiritual terms. Likewise, Nnadi and Akwiwu (2021), in southeastern Nigeria, showed that indigenous seed systems act as both a cultural anchor and a barrier to GMO adoption, as many communities view traditional seeds as safer and more authentic. These studies suggest that acceptance cannot be divorced from Nigeria's cultural and religious dynamics.

The role of media has also been empirically examined. Okeke (2023) analyzed Nigerian newspaper framing of biotechnology and found that reports often emphasized risks over benefits, contributing to heightened public suspicion. Omeje (2019) confirmed this through a content analysis of science journalism in Nigeria, which revealed limited depth and a tendency

toward sensationalism, leaving the public ill-informed. These studies affirm that media narratives remain central in shaping national discourse on GMOs.

Comparatively, studies from other African countries demonstrate similar patterns but with distinct nuances. In Kenya, GMO debates have been highly politicized, with public opinion polarized between pro-science advocates and those who view biotechnology as a threat to food sovereignty (Adenle, 2011). In South Africa, where GM crops are more widely cultivated, empirical evidence suggests higher farmer acceptance but persistent consumer skepticism tied to ethical and safety concerns (Paarlberg, 2014). These examples highlight how policy environments interact with cultural attitudes to shape acceptance.

Beyond Africa, European studies show widespread consumer resistance to GMOs, largely rooted in cultural values, risk perceptions, and distrust of corporations (Frewer et al., 2013). Global meta-analyses reinforce this trend, showing that acceptance is higher when there is trust in regulatory frameworks, transparent communication, and when benefits are clearly communicated (Frewer et al., 2013). These international perspectives confirm that Nigeria's challenges, low awareness, cultural resistance, and negative media framing, are not unique but resonate with broader global dynamics.

Gap in Literature

The reviewed literature provides valuable insights into how Nigerians perceive and accept genetically modified organisms (GMOs), but several gaps remain. First, while existing Nigerian studies (e.g., Egbe et al., 2019; Edu et al., 2021; Aliyu, 2020) document levels of awareness and public attitudes, they are often descriptive rather than analytical. Many focus on single states or localities, leaving a fragmented understanding of national patterns. There is a need for a more integrated analysis that brings together cultural, media, and policy dimensions to explain why attitudes remain skeptical despite years of biotechnology promotion.

Second, cultural and religious influences have been highlighted in isolated studies (e.g., Aliyu, 2020; Nnadi & Akwiwu, 2021), but few works systematically link these factors to broader debates about trust in governance and regulatory institutions. This gap is critical because public resistance is often less about the science itself and more about mistrust in the institutions that regulate and communicate it.

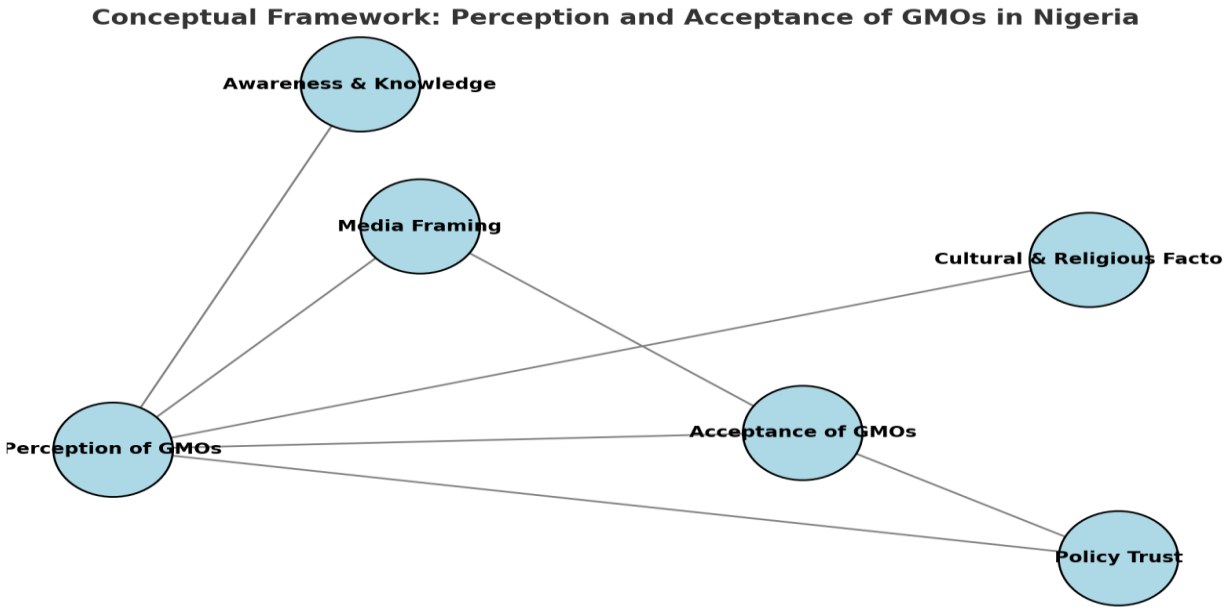
Third, while studies on media framing (Okeke, 2023; Omeje, 2019) show that Nigerian media often emphasize risks, there is limited work connecting these narratives to actual public acceptance trends. In other words, we know how GMOs are portrayed, but less is known about how these portrayals translate into everyday public decision-making.

Finally, most Nigerian scholarship remains under-theorized. Whereas international literature has applied frameworks such as diffusion of innovations, cultural theory of risk, and agenda-setting (Frewer et al., 2013; Paarlberg, 2014), Nigerian studies rarely adopt such analytical lenses. This leaves a gap in both conceptual depth and comparative positioning.

This study addresses these gaps by applying a multi-dimensional framework that combines cultural, media, and policy perspectives. It not only synthesizes Nigerian empirical evidence but also situates it within broader international debates, thereby providing a more holistic understanding of GMO perception and acceptance

Theoretical Framework

This study employs the Diffusion of Innovations Theory (Rogers, 2003), the Cultural Theory of Risk (Douglas & Wildavsky, 1982), and the Agenda-Setting Theory (McCombs & Shaw, 1972) to explain how awareness, cultural context, and media shape public perceptions of GMOs in Nigeria. The Diffusion of Innovations Theory is relevant because GMOs represent a technological innovation whose acceptance depends on how information spreads through social networks and communication channels, assuming that adoption follows stages of knowledge, persuasion, decision, implementation, and confirmation. The Cultural Theory of Risk emphasizes that perceptions of GMOs are socially constructed, reflecting cultural norms, religious beliefs, and traditional practices rather than purely scientific reasoning. The Agenda-Setting Theory complements these perspectives by showing that media does not dictate what people think but strongly influences what they think about, meaning that public understanding of GMOs is mediated by the framing, tone, and frequency of coverage. Together, these theories form a coherent framework for analyzing how communication, socio-cultural values, and media dynamics interact to shape Nigerian public attitudes toward GMOs.



Methodology

This study employed a qualitative secondary content analysis design to investigate Nigerians' awareness of genetically modified organisms (GMOs), the socio-cultural and religious factors shaping perceptions, and the role of media framing. Secondary analysis was appropriate

because of the availability of credible academic studies, policy documents, NGO briefs, and media sources that provide rich insights without requiring primary fieldwork.

A systematic search strategy guided data collection. Academic sources were reviewed from Google Scholar, JSTOR, and ScienceDirect using combinations of keywords such as *"genetically modified organisms in Nigeria," "GMO awareness," "cultural perceptions of GMOs," "religious views on biotechnology,"* and *"media framing of GMOs."* Policy reports were drawn from the National Biosafety Management Agency (NBMA), the National Biotechnology Development Agency (NABDA), and international partners such as the African Agricultural Technology Foundation (AATF). NGO briefs and civil society publications were included where they documented grassroots perspectives, while media sources were selected from widely circulated Nigerian newspapers and online platforms.

Inclusion criteria required that sources (a) were published between 2010 and 2025, (b) directly addressed GMO awareness, perception, or acceptance in Nigeria, and (c) provided empirical evidence, interpretive discussion, or media analysis. Excluded were materials that focused solely on the technical science of GMOs without reference to public perception, or sources lacking identifiable authorship or institutional credibility. This process ensured that the dataset reflected relevant, reliable, and context-specific insights.

The analysis followed the principles of qualitative content analysis. After familiarization with the materials, texts were coded into three broad categories aligned with the study objectives: awareness and knowledge, socio-cultural and religious influences, and media framing. Within each category, sub-themes were inductively identified (e.g., "misconceptions and misinformation," "religious framing of GMOs as tampering with God's creation," "risk-oriented media coverage"). To capture the relative prominence of themes, the study used qualitative descriptors such as *"commonly reported," "repeatedly emphasized," "occasionally noted,"* and *"rarely mentioned."* These reflect the frequency of recurrence across reviewed sources but do not represent statistical counts. Triangulation across academic, policy, NGO, and media evidence was applied to strengthen validity and reduce bias.

By combining a systematic search strategy, explicit inclusion and exclusion criteria, and a structured coding framework, this methodology enhances transparency, replicability, and interpretive depth. It ensures that the study moves beyond descriptive summaries to provide a rigorous, thematically grounded account of how awareness, socio-cultural values, and media dynamics shape Nigerian perceptions of GMOs.

Data Presentation and Analysis

The data were synthesized through qualitative secondary content analysis, guided by a coding framework aligned with the study's objectives. Sources were coded under three thematic categories: (1) awareness and knowledge of GMOs, (2) socio-cultural and religious influences, and (3) media framing. Within each category, sub-themes were inductively identified, with descriptors such as *"commonly reported," "occasionally noted,"* and *"rarely mentioned"* used to

indicate recurrence across sources. The following tables and narratives present the findings as thematically interpreted patterns rather than simple listings of sources.

Table 1: Awareness and Knowledge of GMOs in Nigeria (Coded Themes, 2010–2024)

Theme	Pattern Across Sources	Illustrative Evidence	Interpretation
Limited technical knowledge	Commonly reported across most academic studies	Farmers often conflate GMOs with "chemically altered" or "unnatural" food (Fakoya et al., 2020; Akinbo et al., 2021).	Awareness exists, but misconceptions dominate.
Uneven distribution of awareness	Occasionally noted in policy and NGO reports	Urban respondents more likely to hear about GMOs via media/government outreach than rural populations (NABDA, 2021; Oladele et al., 2019).	Awareness is stratified by geography and education.
Misconceptions and misinformation	Repeatedly emphasized across multiple studies	Beliefs that GMOs cause infertility or are "foreign control tools" (Aliyu, 2020; Egbe et al., 2019).	Misinformation fuels distrust and skepticism.

***Narrative Analysis*:**

The coded data indicate that while public exposure to GMOs is gradually increasing, accurate knowledge remains scarce. Urban populations, with greater access to formal education and government outreach, are relatively more informed than rural groups. However, even among the more aware groups, misconceptions persist, often framing GMOs as unsafe or foreign. This suggests that awareness is not translating into acceptance, but rather reinforcing suspicion due to poor-quality information.

Table 2: Socio-Cultural and Religious Influences on GMO Perception

Theme	Pattern Across Sources	Illustrative Evidence	Interpretation
Attachment to indigenous seeds and farming	Repeatedly emphasized in cultural studies	Preference for local seed varieties as "authentic" (Nnadi & Akwiwu, 2021).	GMOs are resisted as threats to cultural heritage.
Religious framing of GMOs as "tampering with God's creation"	Commonly reported in northern and rural studies	Northern Nigerian respondents reject GMOs on moral/religious grounds (Aliyu, 2020).	Faith-based objections strongly shape community attitudes.

Socio-economic concerns (costs, seed dependency, livelihood risks)	Occasionally highlighted in NGO and farmer reports	Farmers fear loss of autonomy due to expensive GMO seeds (Egbe et al., 2019).	Resistance tied to survival and sovereignty, not just science.

***Narrative Analysis*:**

Socio-cultural and religious contexts emerge as decisive filters in shaping GMO acceptance. Communities view indigenous seeds as integral to cultural identity, making GMOs appear as alien to local food systems. Religious narratives frame biotechnology as morally problematic, often described as interference with divine creation. Economic anxieties about affordability and dependency add practical barriers, while memories of past failed agricultural programs deepen mistrust. These findings reveal that GMO resistance is less about the science itself and more about identity, morality, and survival.

Table 3: Media Framing of GMOs in Nigeria (2015–2024)

Framing Theme	**Pattern Across Sources**	**Illustrative Examples**	**Interpretation**
Conflict/controversy emphasis	Repeatedly emphasized in print and online media	"Scientists, Activists Clash Over GMO Safety" – The Punch (2023).	Media frames GMOs as conflict-driven issues, reinforcing skepticism.
Risk and uncertainty framing	Commonly reported in content analyses	"GMOs Linked to Health Risks, Say Experts" – Vanguard (2024).	Risk-focused coverage overshadows scientific explanations.
Policy/regulatory framing	Occasionally noted	"NBMA Rolls Out New Biosafety Guidelines" – Daily Trust (2022).	Media acknowledges regulation but rarely explains science.

***Narrative Analysis*:**

Media coverage plays a pivotal role in shaping public perceptions, but the evidence shows that Nigerian outlets overwhelmingly highlight conflict and risk, while giving limited space to balanced scientific explanations. Policy-related stories are covered, but often without depth, while success stories remain under-reported. This imbalance creates an environment where public skepticism thrives, as controversy and alarm dominate media narratives

Integrated Analysis

Taken together, the findings suggest that public perception of GMOs in Nigeria is influenced by three interrelated dynamics. First, while awareness is growing, it is often accompanied by misconceptions and uneven distribution of knowledge. Second, socio-cultural and religious filters strongly mediate acceptance, framing GMOs in ways that transcend technical risk

assessments. Third, the media reinforces skepticism by emphasizing conflict and risk over balanced reporting. These dynamics demonstrate that resistance to GMOs is not simply a matter of knowledge deficits but reflects the interplay of cultural identity, economic realities, and communication practices.

Findings

The analysis revealed three key patterns consistent with the study's objectives. First, awareness of GMOs in Nigeria remains low and uneven, with urban populations more informed than rural communities but misconceptions persisting across both. This indicates the need for targeted, accurate science communication strategies by agencies such as NBMA and NABDA to close the knowledge gap and counter misinformation.

Second, socio-cultural and religious factors strongly shape attitudes toward GMOs. Attachments to indigenous seeds, faith-based objections, and socio-economic concerns about affordability and dependency continue to drive resistance. These findings suggest that policy interventions must be culturally sensitive, participatory, and engage trusted community actors to build legitimacy and trust.

Third, media framing reinforces skepticism, as coverage often emphasizes conflict and risk while under-reporting scientific explanations or positive outcomes. This underscores the importance of media management in policy implementation, including journalist training and stronger agency–media partnerships to promote balanced reporting.

Overall, the findings highlight that effective GMO governance in Nigeria requires more than regulation alone. Without integrating communication, cultural engagement, and media strategies

Conclusion

This study found that GMO perceptions in Nigeria are shaped by three factors: limited and uneven awareness, strong socio-cultural and religious influences, and media narratives that privilege conflict and risk. These insights advance scholarship by showing how knowledge, culture, and communication intersect in shaping acceptance, moving beyond descriptive accounts in the Nigerian literature.

For policy and administration, the study highlights that biosafety regulation alone cannot secure public support. Effective governance requires culturally sensitive communication, engagement with trusted community and faith actors, and stronger collaboration with the media to counter misinformation.

In practical terms, the research underscores that Nigeria's biotechnology policy must combine regulation with inclusive, trust-building strategies if it is to improve adoption and public confidence.

Recommendations

Based on the findings, three policy directions are critical. First, to address low and uneven awareness, government agencies such as NBMA and NABDA should strengthen grassroots education programs that directly counter common misconceptions about GMOs.

Second, since socio-cultural and religious beliefs shape acceptance, policymakers should collaborate with community leaders, faith institutions, and farmer associations to design participatory communication strategies that respect local values while promoting innovation.

Third, because media framing reinforces skepticism, deliberate investment in science communication training for journalists and partnerships with media houses is needed to ensure balanced reporting.

Overall, Nigeria's governance of biotechnology must integrate regulation with communication, cultural engagement, and media management to build trust and improve public acceptance.

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