



Social Media Activism and Genetically Modified Organisms: A Systematic Review

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Abstract

This study systematically reviewed scholarship on social media activism and genetically modified organism (GMO) discourse, with emphasis on publication trends, theoretical and methodological approaches, actors and platforms, activist strategies, and dominant frames and narratives. A qualitative systematic review design was adopted, guided by the PRISMA 2020 framework and thematic synthesis. Literature was retrieved from Scopus, Web of Science, Communication & Mass Media Complete, ScienceDirect, African Journals Online, and Google Scholar. Following screening and eligibility assessment, 43 studies were included in the review. The findings indicate an emerging but uneven body of scholarship, characterised by fragmented theoretical perspectives and a predominance of descriptive, cross-sectional designs. Social-media discourse increasingly involves networked actors, including activists, opinion leaders, civil-society organisations, scientists, regulators and individual users, with X/Twitter receiving substantial scholarly attention. Reported activist strategies include information dissemination, counter-framing, influencer communication, engagement and narrative amplification. Seven major frames emerged: food security and agricultural productivity; health and food safety; environmental risk; science, expertise and trust; corporate control and food sovereignty; regulation and consumer rights; and misinformation, disinformation and polarisation. The review concludes that GMO communication research especially in Sub-Saharan Africa requires greater theoretical integration, mixed-method designs, and broader multi-platform analysis to explain how digital discourse shapes public engagement and perceptions.

Keywords: social media activism, genetically modified organisms, GMO discourse, digital activism, risk communication

Introduction

Sub-Saharan Africa continues to face persistent challenges associated with climate variability, crop pests and food insecurity, while agricultural biotechnology is increasingly considered in discussions of agricultural productivity and food security (Gbashi et al., 2021; Kavhiza, et al., 2022). In Nigeria, these debates have gained greater public attention following the regulatory approval and commercialisation of genetically modified crops, including pod-borer-resistant (Bt) cowpea and TELA maize (Akinbo, et al., 2025). These developments have extended discussions of genetically modified organisms (GMOs) beyond agricultural and scientific institutions into wider public and media spaces, where issues of food safety, environmental and health risks, agricultural productivity, consumer acceptance and regulatory oversight are debated. Nigerian studies have documented GMO coverage and discourse across newspapers, broadcast media and other public communication channels, with agriculture, safety, regulation, controversy and food security emerging as recurring frames (Egbe et al., 2019; Omeje, 2019; Oladipo & Ibrahim, 2020; Omoera & Guanah, 2023). The discourse involves diverse stakeholders, including government and regulatory officials, scientists, farmers, consumers, civil society and advocacy



groups, whose competing perspectives contribute to an increasingly contested communication environment surrounding agricultural biotechnology (Gbashi et al., 2021; Omeje, 2019).

A significant part of this communication now takes place through social media, where individuals and organisations can circulate information, express concerns, discuss perceived risks and benefits, and engage with competing claims about GMOs (Egbe et al., 2019; Xenos et al., 2019; Liu & Scheufele, 2023). Understanding this phenomenon is important because social media provides opportunities for different stakeholders to participate in, shape and contest public discussions surrounding agricultural biotechnology.

The emerging literature provides evidence of diverse forms of online engagement with agricultural biotechnology, but its findings remain dispersed across different areas of inquiry. Studies of online communication have raised concerns about the circulation of misinformation and contested claims about GMOs, including differences in how verified and unverified information is disseminated through social media (Xu et al., 2021). At the same time, concerns expressed in GMO debates are not necessarily reducible to misinformation or inadequate scientific understanding. Questions concerning environmental effects, consumer choice, food safety, regulatory oversight and competing stakeholder interests also constitute substantive dimensions of the debate (Frewer et al., 2002; Gbashi et al., 2021; Wang, 2023).

Research on GMO-related media framing, public perception and risk communication has examined these issues in different national and media contexts (DeRosier et al., 2015; Li et al., 2020; Pjesivac et al., 2020), while Nigerian research has documented the framing of GM crops around agriculture, controversy, regulation and safety and has identified government officials and anti-GM groups among the prominent sources in media coverage (Omeje, 2019). Studies of social-media engagement in Nigeria, although not specifically focused on GMOs, further demonstrate the capacity of digital platforms to facilitate collective engagement, mobilisation and the circulation of competing claims (Uwalaka & Watkins, 2018).

Despite these contributions, the collective literature presents important inconsistencies and limitations. Studies differ in how they conceptualise online activism, the actors and platforms they examine, the forms of communication they classify as activism, and the outcomes they associate with online engagement. Some emphasise participation, advocacy and the circulation of alternative perspectives, whereas others focus on contested information, risk narratives and public uncertainty. Consequently, there is limited clarity regarding the actors involved in GMO-related activism, the platforms and strategies they employ, the frames and narratives through which GMOs are presented, and the extent to which existing research has examined the relationships between online activism, public perceptions, risk communication, trust and regulatory processes. A systematic review is therefore warranted to bring these dispersed studies together, assess their methodological and theoretical approaches, compare areas of convergence and divergence, and establish what the available evidence can and cannot support.

Against this background, this study systematically reviews scholarly research on social media activism and GMO discourse in Nigeria. The review focuses on studies examining social media-based advocacy, mobilisation, framing, public engagement and contestation surrounding GMOs. It maps the characteristics of the literature, examines the theoretical and methodological approaches adopted, and synthesises reported evidence on GMO-related discourse. The review is guided by three questions:



1. What are the publication trends, theoretical perspectives and methodological approaches in research on social media activism and GMO discourse in Nigeria?
2. Which actors and social media platforms are examined, and what forms and strategies of GMO-related activism are reported?
3. What frames and narratives characterise GMO-related social media activism, including advocacy for and against biotechnology?

Methodology

Review Design and Synthesis Justification

This study employed a qualitative systematic review methodology with thematic synthesis to analyze scholarly literature on social media activism and GMO discourse in Nigeria. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) framework to ensure transparency across eligibility determination, database searches, study selection, data extraction, quality appraisal, and synthesis. A quantitative meta-analysis was inapplicable due to significant methodological heterogeneity among primary studies, which span varied designs. Thematic synthesis, approach of Thomas and Harden (2008), was selected to integrate qualitative, quantitative, and conceptual evidence without forcing statistical aggregation. This method enables the translation of concepts across disparate studies.

Inclusion Criteria

Studies were assessed against predefined inclusion and exclusion criteria to ensure geographical and theoretical relevance, conceptual consistency, and direct alignment with the research questions. Studies were included if they directly examined social media activism, digital campaign framing, public perception, risk communication, regulatory governance, or science communication relating to genetically modified organisms (GMOs), biosafety, or agricultural biotechnology. The review included primary empirical studies focusing specifically on Nigeria or comparative African contexts where Nigerian data were distinctly reported and could be independently analysed. This criterion ensured that empirical evidence directly relevant to the Nigerian context was prioritised in the synthesis. The review also included foundational and international theoretical literature on science communication, risk framing, social media. Only publications with accessible full texts were included to facilitate critical appraisal of their theoretical frameworks, methodological approaches, communication platforms, and empirical findings.

Exclusion Criteria

Studies were excluded when they discussed Sub-Saharan Africa or global agricultural biotechnology only in abstract terms without providing empirical evidence or actionable theoretical frameworks relevant to media, communication, and public engagement. This ensured that the review remained focused on scholarship capable of informing the communication dimensions of GMO discourse rather than biotechnology in general. Technical studies examining GMOs exclusively from agronomic, molecular, genetic, biochemical, or laboratory perspectives were also excluded unless they addressed public perception, media representation, risk communication, or digital discourse. This distinction was necessary because the review focused on the communication and public-engagement dimensions of biotechnology rather than its scientific or technical development.

Opinion pieces, newspaper commentaries, unverified blog posts, commercial industry briefs, non-peer-reviewed conference abstracts, and editorials were excluded from the formal evidence



synthesis because they did not meet the required scholarly evidence threshold. Studies focusing exclusively on legacy print or broadcast media were similarly excluded unless they incorporated online extensions, digital media spaces, or comparative multi-platform perspectives.

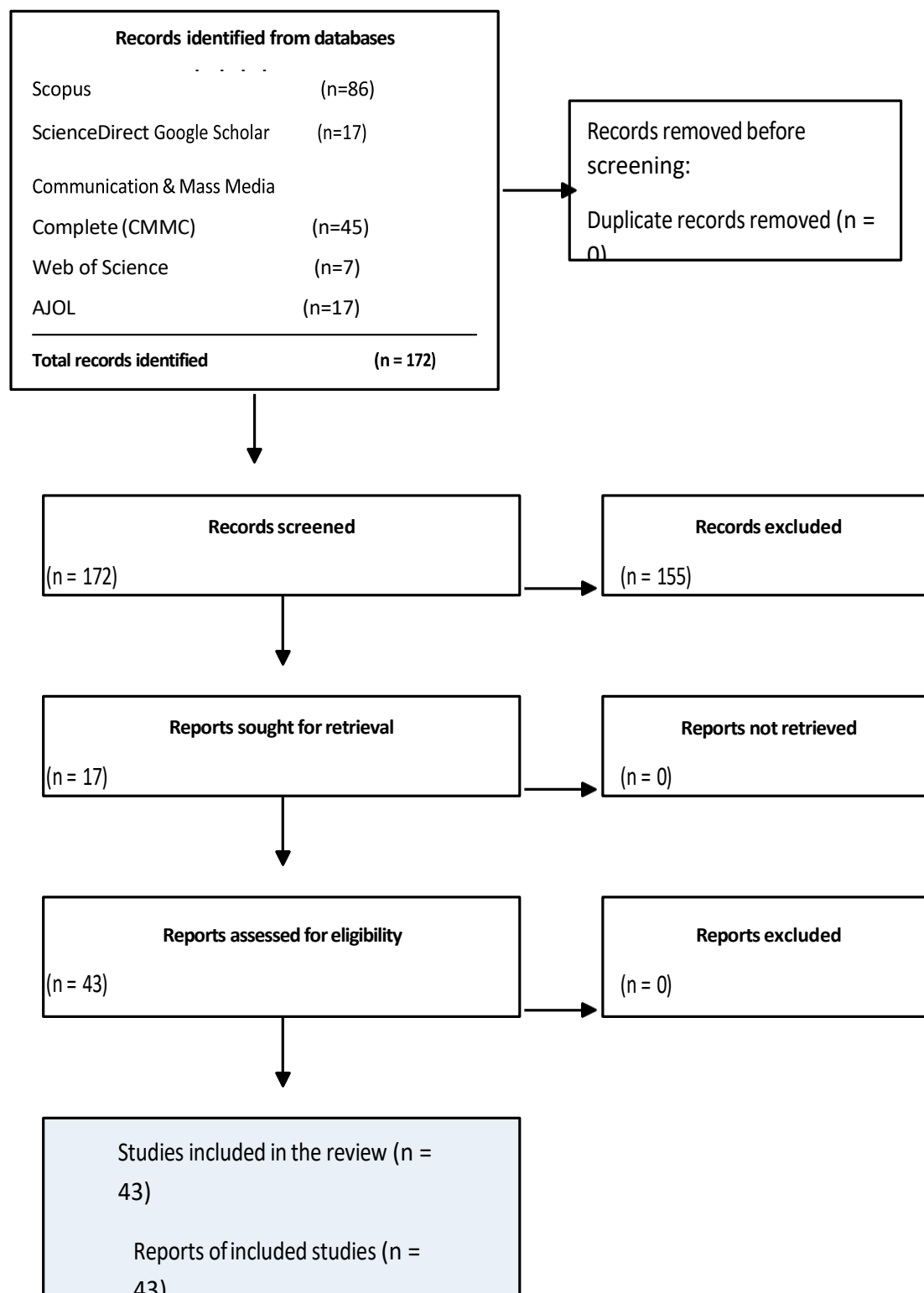
Search Strategy and Information Sources

A comprehensive electronic search was conducted across major multidisciplinary and specialised communication databases, including Scopus, Web of Science Core Collection, Communication & Mass Media Complete (CMMC), ScienceDirect, African Journals Online (AJOL), and Google Scholar. The searches were conducted between 15 May, 2026 and 10 September, 2026. The search strategy was organised around three interconnected conceptual blocks. Boolean operators were used, with OR applied within each block and AND used to connect the blocks. Where supported, searches were restricted to titles, abstracts, and keywords. The first block covered communication, media, and activism and included terms such as "social media", "digital activism", "Twitter", "X", "Facebook", "Instagram", "TikTok", "framing", "counter-framing", "public perception", "risk communication", "influencer", and "misinformation".

The second block addressed biotechnology and GMO-related concepts and included "GMO", "genetically modified", "agricultural biotechnology", "Bt Cowpea", "TELA Maize", "food safety", "biosafety", and "food sovereignty". These terms were selected to capture both general GMO scholarship and specific biotechnology issues relevant to contemporary Nigerian public discourse. The third block addressed the geographical context and application of the research. It included "Nigeria", "Nigerian", and "Sub-Saharan Africa". Combining this block with the communication and biotechnology blocks helped narrow the search to literature relevant to the intersection of digital communication, biotechnology, and the Nigerian or broader African context.



PRISMA 2020 flow diag





Data Presentation

RQ 1. *What are the publication trends, theoretical perspectives and methodological approaches in research on social media activism and GMO discourse in Nigeria?*

The first research question examined how scholarship on social media activism and GMO discourse has developed over time, the theories that have guided the studies, and the methodological approaches used to investigate the phenomenon. Based on that, three broad themes emerged from the reviewed literature: an evolving but uneven publication trajectory, fragmented theoretical development, and a predominance of descriptive and cross-sectional methodologies.

Emerging but uneven publication trajectory

The literature shows a gradual shift from examining GMO awareness, knowledge, attitudes, trust and consumer perceptions towards analysing media representation, social-media discourse and digital activism. Earlier scholarship largely treated communication as a process of information provision and persuasion, whereas more recent research conceptualises GMO communication as a networked process of meaning construction, contestation and mobilisation (Adeoti & Adekunle, 2007; Ezezika & Daar, 2012; Omeje, 2019; Xu et al., 2018; Cheng, 2024). However, this digital turn remains uneven, as research directly examining social-media activism and GMO discourse in Nigeria is still limited relative to studies of public perception, traditional media and agricultural biotechnology. The field is therefore better understood as an emerging digital research stream than as a mature body of scholarship.

Theoretical perspectives remain fragmented

The literature is theoretically diverse, but its perspectives remain largely fragmented. Framing and risk communication dominate, explaining how competing interpretations of food security, health, environmental risk and regulation shape GMO discourse, while social-capital and civic-engagement perspectives emphasise the role of networks, information seeking and participation (Omeje, 2019; Guo et al., 2020; Wen & Wei, 2018; Cheng, 2024). Social-media studies further extend these perspectives by examining networked framing, opinion leadership and audience engagement (Xu et al., 2018; Cheng, 2024). However, these approaches are rarely integrated to explain how actors, platforms, strategies, frames, trust and engagement interact in shaping GMO discourse. This theoretical fragmentation is particularly evident in the Nigerian literature, where an integrated explanation of digital GMO activism remains underdeveloped.

Methodological preference for descriptive and cross-sectional designs

Methodologically, the literature relies mainly on content analysis, surveys and qualitative case studies to examine media representation, public perceptions and specific GMO controversies (Omeje, 2019; Lore et al., 2013; Yu et al., 2023). Though, some studies have extended this approach to social-media data, examining posts, opinion leaders, audience reactions and patterns of information diffusion (Xu et al., 2018; Cheng, 2024; Cheng & Jin, 2025). The evidence remains predominantly cross-sectional and descriptive, limiting understanding of how GMO narratives evolve and whether online engagement produces changes in perceptions, behaviour or public debate. This methodological limitation is particularly significant in a rapidly changing digital environment, highlighting the need for longitudinal and mixed-method research to explain how actors, frames and engagement develop over time.



RQ 2. Which actors and social media platforms are examined, and what forms and strategies of GMO-related activism are reported?

The second research question examined who participates in GMO-related social-media discourse, which digital platforms provide spaces for this activity, and the forms and strategies through which actors engage in GMO advocacy, opposition and contestation. Four broad patterns emerged from the reviewed literature: the transition from institutional to networked actors, the prominence of X/Twitter, the expansion of visual and participatory platforms, and the use of information dissemination, counter-framing, influencer communication and engagement as forms of digital activism.

From institutional communicators to networked actors

The literature indicates a shift from institution-centred GMO communication towards networked participation, with social-media research increasingly recognising opinion leaders, individual users, activists and civil-society actors as active contributors to GMO discourse (Xu et al., 2018; Price, 2021; Cheng, 2024). This shift challenges the conventional sender–receiver model because social-media users can simultaneously produce, interpret, contest and redistribute information. Thus, social media is better understood not simply as another communication channel but as a networked arena in which diverse actors negotiate visibility, credibility and interpretive authority.

X (Twitter) as a prominent site of GMO contestation

X (Twitter) is prominent in GMO research because its affordances support rapid commentary, opinion leadership, reposting and real-time contestation, with studies linking these features to the circulation and engagement of GMO narratives (Xu et al., 2018; David et al., 2026). However, the concentration of research on X leaves limited evidence on GMO activism across platforms such as Facebook, YouTube, Instagram and TikTok. This platform imbalance is important because differences in affordances and audience practices may shape how GMO narratives are produced, circulated and contested, making a platform-specific understanding necessary.

Facebook and Instagram as spaces for participatory GMO discourse

The literature shows that social media enables GMO discourse to extend beyond formal advocacy into participatory practices such as commenting, reposting, challenging and reinterpreting content (Lin, 2021; Xu et al., 2021; Yu et al., 2023; Lin & Liu, 2025). This makes activism a distributed process in which users can contribute to the circulation and contestation of GMO narratives through diverse forms of digital content. However, Nigerian research has yet to establish whether different platforms generate distinctive forms of GMO activism or mainly reproduce similar narratives across digital spaces.

Information dissemination as a dominant activist strategy

Information dissemination is a recurrent strategy in GMO discourse, but the literature suggests that its function depends on how information is framed. Supportive narratives commonly emphasise agricultural productivity, pest resistance, food security and scientific innovation, while critical narratives foreground health and environmental risks, regulatory uncertainty, corporate interests and food sovereignty (Omeje, 2019; Omoera & Guanah, 2023; Ruan et al., 2019; Clark, 2013). Thus, social-media information is not simply educational; within networked activism, it can also serve advocacy, persuasion and mobilisation. The critical issue is therefore not the volume of



GMO information circulated but how actors select, frame and position information within competing narratives.

Counter-framing and narrative contestation.

Counter-framing emerges as a key strategy through which actors contest not only GMO claims but also the way the issue itself is defined. Competing narratives variously construct GMOs as solutions to food insecurity, threats to health and the environment, products requiring precautionary regulation, or instruments of corporate control (Omeje, 2019; Ruan et al., 2019; Tourangeau, 2017; Wessler & Zilberman, 2017). Social media strengthens this contestation by enabling actors to directly challenge institutional, media and influencer narratives. GMO activism therefore involves a struggle over interpretive authority, as actors seek to shape which problems, risks and interests receive legitimacy in public discourse.

Influencer-mediated activism.

The emergence of influencers and opinion leaders represents an important development in GMO-related digital activism. Their activities can involve interpreting complex scientific information, amplifying particular claims, personalising biotechnology debates, endorsing positions, encouraging audience participation, and challenging institutional narratives. Xu et al. (2018) demonstrate the relevance of opinion leadership to engagement in online GMO discourse, while David et al. (2026) extend this issue to Nigerian X influencers. Influencer communication therefore provides an alternative pathway through which credibility and visibility can be constructed outside formal scientific and governmental institutions. However, the literature does not establish that high visibility or engagement necessarily produces persuasion, attitude change, or behavioural mobilisation. Likes, reposts, and comments are indicators of interaction, but they should not automatically be interpreted as evidence of substantive activist outcomes.

Engagement and amplification as forms of digital activism

The literature further indicates that likes, comments, and particularly reposting function as important forms of user engagement through which GMO narratives gain visibility and circulate across social-media networks (Xu et al., 2018; Yu et al., 2023; Cheng & Jin, 2025). Xu et al. (2018) demonstrate the relationship between opinion leadership, message characteristics, and user engagement, while networked GMO studies show how interactions can contribute to the amplification or fragmentation of particular narratives. This broadens the meaning of activism beyond organised campaigns, as repeated sharing, commenting, and counter-messaging can contribute to the visibility of an issue or frame. Nevertheless, a major methodological limitation remains: digital engagement is often measured through observable platform metrics without establishing whether it produces offline participation, sustained attitude change, behavioural change, or influence on regulatory processes. This therefore provides stronger evidence of the circulation and amplification of GMO narratives than of their broader social or policy consequences.

RQ 3. *What frames and narratives characterise GMO-related social media activism, including advocacy for and against biotechnology?*

The third research question examined how GMO-related social-media activism constructs, interprets and contests the meaning of genetically modified organisms, including narratives supporting and opposing biotechnology. The thematic synthesis shows that GMO discourse is not organised around a single pro- or anti-biotechnology narrative. Rather, actors employ competing frames that emphasise different dimensions of the issue. Seven interconnected themes emerged:



food security and agricultural productivity; health and food safety; environmental risk; science, expertise and trust; corporate control and food sovereignty; regulation and consumer rights; and misinformation, disinformation and polarisation.

Food security and agricultural productivity.

The food-security frame is one of the prominent advocacy-oriented narratives in the GMO literature, presenting biotechnology as a response to food insecurity, crop losses, pest infestation, and declining agricultural productivity (Omoera & Guanah, 2023; Gakpo & Baffour-Awuah, 2024; Gakpo et al., 2025). Within this narrative, GMOs are associated with improved crop performance, pest resistance, increased yields, and agricultural development (Lore et al., 2013; Omoera & Guanah, 2023; Gakpo et al., 2025). However, counter-narratives question whether biotechnology alone can address the institutional and socioeconomic conditions that shape agricultural productivity, including inadequate infrastructure, limited farmer support, weak institutional capacity, seed control, and unequal access to agricultural resources (Herre et al., 2015; Randall, 2014; Olawale & Sheidu, 2025). The resulting contestation therefore extends beyond the efficacy of GM technology to competing understandings of the causes of food insecurity and the appropriate pathways for addressing it. Thus, food security functions not simply as a justification for GMO adoption but as a contested frame through which different actors define the agricultural problem, its causes, and the solutions considered appropriate.

Health, food safety and consumer risk

The health and food-safety frame is central to GMO discourse, particularly because debates over genetically modified foods frequently focus on their implications for human consumption and consumer protection (Omeje, 2019; Pjesivac et al., 2020; Lin, 2021). Supportive narratives emphasise scientific evidence, expert authority, and regulatory assessment of GMO safety, whereas sceptical narratives foreground potential health effects, uncertainty, inadequate information, and the need for consumer protection (Bode et al., 2021; Wang, 2021; Lin, 2021; Edu et al., 2021). The resulting discourse is therefore structured around competing interpretations of safety and risk, with the credibility of information sources influencing how scientific claims and corrective information are evaluated (Poortinga & Pidgeon, 2005; Bode et al., 2021; Wang, 2021). Social media can intensify this contestation by enabling competing safety claims, misinformation, and corrective messages to circulate alongside one another, while source cues and prior beliefs shape how users interpret such information (Bode et al., 2021; Wang, 2021; Xu et al., 2021). Therefore, health framing extends beyond the transmission of food-safety information to become a site where trust in scientists, regulatory institutions, government agencies, and other information providers is constructed and contested.

Environmental risk and ecological uncertainty.

The environmental-risk frame constructs biotechnology in terms of its potential ecological consequences, including effects on biodiversity, gene flow, non-target organisms, soil ecosystems, and longer-term environmental uncertainty (Bauer-Panskus et al., 2022). In GMO discourse, these concerns provide a basis for risk and precautionary narratives that emphasise ecological protection, uncertainty, and the need for rigorous assessment and governance rather than necessarily rejecting technological innovation itself (Pjesivac et al., 2020). At the same time, opportunity-oriented narratives present particular GM applications as potentially useful responses to agricultural problems, creating competing interpretations of the environmental implications of biotechnology (Pjesivac et al., 2020). Social-media research further demonstrates that environmental risk is one



of several competing frames through which GMO controversies are constructed and circulated, alongside health, scientific, economic, and regulatory frames (Cheng, 2024). GMO activism therefore involves contestation over how environmental consequences, uncertainties, and potential benefits should be interpreted rather than simply disagreement over whether environmental concerns exist.

Science, expertise and trust.

The literature reveals a persistent contest over epistemic authority in GMO discourse, involving scientists, experts, regulators, opinion leaders, journalists, activists, and social-media users (Xu et al., 2018; Yu et al., 2023; Njagi et al., 2026). Conventional science communication privileges expert knowledge and formal scientific assessment, but social media enables diverse actors to interpret, simplify, challenge, and redistribute GMO-related information through networked communication (Xu et al., 2021; Lin, 2021). The central issue is therefore not merely the availability of scientific information but the credibility audiences assign to different sources and messages. Studies show that source characteristics, expert cues, social endorsement, prior beliefs, and patterns of online engagement can influence how GMO information is interpreted, corrected, and circulated (Bode et al., 2021; Wang, 2021; Ji et al., 2021). In this networked environment, visibility and familiarity may coexist with, but do not necessarily substitute for, perceived expertise and credibility, as different source characteristics can shape different forms of engagement (Xu et al., 2018). Trust consequently emerges as a cross-cutting mechanism linking information sources, framing, information circulation, and public perceptions, making source credibility an important dimension of digital GMO discourse and activism (Bode et al., 2021; Hu et al., 2020; Njagi et al., 2026).

Corporate control, food sovereignty and political economy

A further narrative shifts the GMO debate from questions of scientific safety towards the political economy of agricultural biotechnology, particularly issues of seed commercialisation, intellectual-property regimes, corporate interests, and control over agricultural resources (Esquivel et al., 2023; Amanor, 2024; Ekumah, 2025). Within this frame, critical narratives associate biotechnology and proprietary seed systems with commercialisation, farmer dependence, and the concentration of control over agricultural resources, while food-sovereignty perspectives emphasise farmer autonomy, local seed systems, and greater control over food production (Amanor, 2024; Ekumah, 2025; Ojambo & Magoti, 2026). These narratives suggest that GMO scepticism may reflect concerns about ownership, governance, economic power, and agricultural autonomy in addition to perceptions of scientific risk. The frame therefore broadens GMO discourse from a technical debate about biotechnology to a wider contest over how seeds, agricultural resources, and food production should be organised and governed.

Regulation, transparency and consumer rights

The regulatory-governance frame focuses on the legitimacy and adequacy of processes through which genetically modified products are assessed, approved, monitored, labelled, and communicated to the public (Amedu et al., 2025; Nielsen et al., 2021). Supportive narratives may interpret regulatory approval and scientific assessment as evidence of institutional scrutiny, whereas critical narratives question the transparency of regulatory procedures, adequacy of monitoring and enforcement, labelling requirements, institutional accountability, and opportunities for public participation (Amedu et al., 2025; Emenike & Uzor, 2026). Consumer-rights narratives similarly emphasise access to accurate information and the ability to make



informed choices about GM products (Amedu et al., 2025). This frame is significant because GMO commercialisation transforms the issue from an abstract biotechnology debate into questions of public governance, regulatory legitimacy, and institutional trust. Social media further expands this contestation by providing networked spaces in which regulatory information, scientific claims, and public concerns can be circulated, interpreted, and challenged (Wang, 2021; Xu et al., 2021; Yu et al., 2023). Thus, regulatory governance becomes not merely a technical process of approving biotechnology but a communicative process through which transparency, accountability, consumer choice, and institutional credibility are negotiated.

Misinformation, disinformation and polarization

The literature identifies misinformation, misleading information, and contested interpretations as important features of contemporary GMO discourse, particularly where unverified health claims, decontextualised scientific information, conspiracy narratives, and emotionally or morally charged messages circulate through digital networks (Xu et al., 2021; Wang et al., 2021; Wang, 2021; Lin & Liu, 2025). Studies show that GMO misinformation can acquire distinctive patterns of online dissemination, while users' prior beliefs and source characteristics influence how misinformation and corrective information are evaluated (Xu et al., 2021; Wang, 2021). Social-media research also documents fragmented GMO-risk discussions and competing frames, allowing divergent interpretations of GMO safety and risk to coexist (Cheng, 2024). Taofeeq (2026), for example, examines disinformation frames associated with the Aproko Doctor GMO controversy and illustrates how competing narratives can shape interpretations of science and health information. However, critical GMO discourse should not automatically be classified as misinformation or disinformation, as concerns about regulation, environmental effects, corporate interests, consumer choice, and food sovereignty may coexist with inaccurate or misleading claims.

Conclusion, Implications and Limitations

This study systematically maps the emerging literature on social media activism and GMO discourse in Nigeria. It demonstrates a clear shift from institution-centred communication toward networked contestation characterized by diverse actors, multi-platform strategies, and competing narratives, while also highlighting key theoretical and methodological fragmentations in existing scholarship. Practically, these findings indicate that GMO risk communication must move beyond one-way information dissemination toward participatory, transparent frameworks that account for social media as an arena of contested trust and scientific authority. The scope of these conclusions is necessarily constrained by the current evidence base, which remains small, predominantly cross-sectional, and methodologically heterogeneous. To address these gaps, future research should adopt mixed-method, and comparative designs to track how GMO frames evolve across platforms, evaluate the mechanisms of narrative circulation, and measure whether digital engagement directly influences public attitudes, civic action, or biotechnology policy.

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AI Use Disclosure:

None.
