NIGERIA JOURNAL OF COOPERATIVE ECONOMICS AND MANAGEMENT

GENETICAL MODIFIED ORGANISMS (GMO) PRODUCTS MARKETING AND THE CHALLENGES OF STIGMATISATION: A STUDY OF CONSUMERS IN ENUGU STATE, NIGERIA

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ABSTRACT

Genetically Modified Organisms (GMOs) technology has been globally recognized as a strategic intervention for achieving food security and nutritional enhancement. Nigeria approved commercial cultivation of genetically modified crops in 2016, with the enactment of the National Biosafety Management Agency (NBMA). Despite this, consumer acceptance remains uneven, especially in the South-East and Enugu state, the core focus of this study. This study examines how stigmatization influences the marketing and consumption of GMO products among consumers in Enugu State. Data were collected from 240 respondents in Enugu metropolis and environs using a structured questionnaire and analyzed with descriptive statistics and logistic regression. While 67.9% of respondents reported awareness of GMOs, only 22.1% had purchased a GMO-labeled product. Stigma was driven mainly by health risk perception, cultural concerns, low trust in regulatory agencies, and negative narratives on social media. Trust in regulatory bodies and accurate awareness significantly increased the likelihood of purchase, whereas stigma reduced it by 77%. The findings suggest that acceptance is constrained more by social perception than by knowledge gaps. To improve uptake, the study recommends clear labeling, community-based communication, and visible engagement by regulatory agencies.

Keywords: Genetically Modified Organisms, Stigmatization, Consumer Behavior, Marketing, Enugu, Nigeria.

1. INTRODUCTION

1.1 Background

Food systems worldwide face pressure from population growth, climate variability, and limited arable land. Genetically modified crops have been positioned as one response, offering higher yields, pest resistance, and improved nutrition.

In Nigeria, the National Biosafety Management Agency approved Bacillus thuringiensis (Bt) cotton in 2016 and Bacillus thuringiensis (Bt) cowpea in 2019, signaling policy support for agricultural biotechnology. They are genetically modified cotton and cowpea that produces its own insecticides. That can organically wade off pest or resist pest attack.

Despite this, consumer response in the South-Easth has been cautious. Enugu State, a commercial and cultural center for the region, illustrates the gap between policy and market behavior. GMO products such as cowpea, cotton, soybean, maize are available in urban markets, but many consumers avoid them, often citing concerns learned through informal networks. This creates a marketing challenge: products can be produced and distributed, but stigma limits demand. GMO products available in Enugu include cotton, cowpea, Tela maize as seeds and in the nature of processed food corn flakes, cereals, noodles, soy oil and soy milk.

1.2. Problem Statement

Marketing efforts assume that awareness leads to acceptance. In Enugu, that assumption does not hold. Even among educated consumers, stigma often outweighs scientific information. If unaddressed, this gap risks low returns on investments in GM technology and limits potential benefits for food security. Despite the awareness about availability of Genetically Modified Products in Enugu markets and concomitant efforts to improve sales and patronage by consumers in Enugu appears unimpressive. This study is aimed at finding out the associated issues that revolve around this, particularly as it has to do with stigmatization and attempt to offer plausible solutions through recommendations from the findings of the study.

1.3 OBJECTIVES

The study sought to:

- Assess awareness and knowledge of GMOs among consumers in Enugu.
- Examine perceptions and attitudes toward GMO products.
- Determine how stigmatization affects purchase intention.
- Identify strategies that can reduce stigma in GMO marketing.

1.4 RESEARCH QUESTIONS

- What is the level of GMO awareness and its main sources?
- How do consumers perceive the safety and cultural fit of GMO products?
- To what extent does stigma shape purchase decisions?
- Which interventions are most likely to improve acceptance?

1.5 SIGNIFICANCE

The findings offer practical input for marketers designing communication strategies, for policy makers refining public engagement, and for researchers studying technology adoption in Nigeria's South-East.

1.6 SCOPE AND LIMITATIONS

The study focused on consumers aged 18 and above in Enugu North and Enugu South Local Government Areas and on food products, maize, soya beans only. As with all survey research, responses may reflect social desirability bias.

2. LITERATURE REVIEW

2.1 CONCEPTUAL AND THEORETICAL FRAMING

GMOs are organisms whose genetic material has been altered using recombinant DNA techniques. Stigmatization occurs when a product acquires negative social meaning that reduces its desirability beyond its functional attributes. The Health Belief Model and Theory of Planned Behavior provide a useful lens: perceived risk and subjective norms often outweigh factual knowledge in shaping behavior.

2.2 EMPIRICAL EVIDENCE

Internationally, from comparative studies, acceptance varies. In the EU, stigma persists despite scientific consensus on safety, largely due to media framing. In the US, acceptance is higher but sensitive to labeling and product type. Across Africa, studies in Kenya and Ghana show that urban consumers are often more skeptical than rural farmers, contrary to patterns in the West.

In Nigeria, trust in regulatory oversight consistently emerges as a key issue. Okoruwa, Adeoti, and Oluwatayo found wide spread distrust of GMO safety claims in Ibadan in 2018, linked to low confidence in government agencies. Adeleke and Ugwu reported in 2021 that cultural and religious beliefs were strong predictors of rejection in the South-East. Oparaocha and Okoro also noted in 2020 that social media framing amplified negative perceptions in Nigeria. Edeoga and Nnamani reported in 2020 that health risk perception was the strongest barrier to GMO acceptance in the South-East.

2.3 RESEARCH GAP

Most Nigerian studies confuse awareness with acceptance. Few isolate stigma as a mediating factor, and none have focused specifically on Enugu's mix of urban and semi-urban consumers as this captured the semi-urban areas in Enugu South Local Government Area of Enugu State such as Ugwuaji Awkunanaw.

3. METHODOLOGY

A cross-sectional survey design was adopted. The target population was consumers aged 18 and above in selected LGAs of Enugu State. Using the Taro Yamane formula, a sample size of 240 was determined and selected through stratified random sampling.

Data were collected with a structured questionnaire covering demographics, awareness, purchase behavior, and a 5-point Likert scale for perception and stigma. The instrument was validated by two experts in Agricultural Economics with a Cronbach's Alpha of 0.78.
Analysis was carried out in SPSS v26. Descriptive statistics summarized the sample and awareness levels. Chi-square tested associations, and logistic regression modeled predictors of purchase intention.

4. RESULTS AND DISCUSSION

4.1 RESPONDENT PROFILE

The sample was 53.3% female and 46.7% male. Most respondents were aged 31–45 and had tertiary education, reflecting Enugu's urban profile. 61.7% resided in Enugu metropolis, 38.3% in satellite towns such as Ugwuaji, Awkunanaw.

Table1: Demographic Characteristics of Respondents (n=240)

Variable	Category	Frequency	Percentage
Gender	Male Female	112 128	46.7 53.3
Age	18-30 31-45 46+	89 102 49	37.1 42.5 20.4
Education	Secondary Tertiary	56 184	23.3 76.7
Location	Enugu Urban Semi-Urban (satellite towns nearby)	148 92	61.7 38.3

Source: Field Survey,2026

Table 1 Shows, the Variable, categories, frequencies and percentages of gender distribution between male and female. Female with 128 respondents which is 53.3% and Male, 112 respondents which is 46.7%. The age bracket of 31 - 46 has the highest population of 102, which is 42.5%. Under Education, those with tertiary level has 184 respondents, 76.7% of the population, while secondary school level. 148 of the respondents reside in the urban metropolis of Enugu Metropolis while 92 representing 38.3%resided in the satellite sub urban areas aggregating the divide spectrum.

4.2 AWARENESS AND PURCHASE

67.9% of respondents were aware of GMOs, but only 22.1% had purchased a GMO-labeled product. Social media was the main information source for 40.8% of respondents, followed by family and friends at 29.6%. Government agencies accounted for only 10.8%.

Table2: Awareness, Purchase, and Information Sources

Variable	Response	Frequency	Percentage
Aware of GMOs	Yes	163	67.9
	No	77	32.1
Ever Purchased GMO Product	Yes	53	22.1
	No	187	77.9
Main Source of Information	Social Media	98	40.8
	Family/Friends	71	29.6
	TV/Radio	45	18.8
	Government Agency	26	10.8

Source: Field Survey, 2026

Table 2 shows that while awareness of GMO products is high with a frequency of 163 representing 67.9%, it did not positively/significantly affect purchase of GMO products as only 53 respondents representing 22.1%, indicated they have made GMO products purchases, 187 respondents representing 77.9% indicated no purchase. The table also shows regarding sources of information, that social media ranked highest with 40.8%as a result of its ubiquitousness and speed of penetration, higher than other traditional media sources, but the issue of trust and legitimacy was an encumbrance. This throws up the issue of doubt of the information sources from social media in creating awareness.

The low conversion from awareness to purchase suggests that information alone is insufficient. The dominance of social media also explains the spread of unverified claims.

4.3 PERCEPTION AND STIGMA

Respondents agreed that GMOs pose health risks and conflict with cultural norms. Trust in NAFDAC and NBMA was low, with a mean score of 2.41 on a 5-point scale. Social judgment scored 3.62, indicating that peer perception influences decisions.

Table3: Perception and Stigma Factors

Statement	Mean	Std.Dev
GMOs cause health problems	3.89	0.92
GMOs are unnatural/against culture	3.76	1.01
I trust NAFDAC/NBMA on GMO safety	2.41	1.12
I would buy if labeled clearly	3.54	0.88
Friends would disapprove me for buying GMOs	3.62	0.95

Source: Field Survey, 2026

From the above table, stigmatization reflects the core issues, regarding, low purchase of GMO products emanating from perception. Analysis of table 3 indicates that stigmatization highly phenomenal and significant in leading to low purchase. It shows that Mean at 3.89% and Std. Deviation at 0.92 signifies high stigma syndrome and strong agreement of significant regression result. The analysis concludes that GMOs are unsafe for human consumption as recorded with a mean of 3.89 and std deviation of 0.92. The high mean indicates strong agreement with the stigma statement and by extension other statements in the table, that perception of GMO safety risk is widely shared among consumers in Enugu.

These results align with Edeoga and Nnamani, who found in 2020 that health risk perception was the strongest barrier to GMO acceptance in South-East Nigeria. Low trust in regulatory bodies further weakens communication efforts.

4.4 PREDICTORS OF PURCHASE INTENTION

Logistic regression showed that trust in regulatory bodies and awareness increased purchase likelihood. Stigma perception reduced it significantly. Education level was not significant.

Table4: Logistic Regression Results

Variable	B	Sig.	OddsRatio
AwarenessofGMOs	0.84	0.003	2.32
TrustinRegulatoryBodies	1.12	0.000	3.06
StigmaPerception	-1.45	0.000	0.23
EducationLevel	0.31	0.211	1.36

Source: Field Survey, 2026

The B insignia in the logistic regression results, denotes the Unstandardized Co-efficient/Beta value of the variables/constructs of the study, showing the relationship and how they affect the marketing and purchase of GMOs. The Sig. denotes the significant value of the variables/constructs. The Odd Ratio, reflects the degree of the likely outcome in addressing the issue of stigmatization will have, than awareness and by extension, other factors.

The findings indicate that rebuilding trust and addressing stigma directly will have more impact than simply increasing awareness.

5. SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Summary

Awareness of GMOs in Enugu is moderate, but purchase is low. Stigma is driven by health fears, cultural concerns, and low trust in institutions. Social media amplifies negative narratives. Trust in regulators is the strongest positive predictor of acceptance.

5.2 CONCLUSION

Stigmatization, not ignorance, is the main barrier to GMO marketing in Enugu. Consumers are responding to perceived risk and social approval, not only to scientific evidence.

5.3 RECOMMENDATIONS

- **Clear Labeling**: Mandatory, standardized labeling gives consumers choice and reduces suspicion.
- **Community Engagement**: Work with traditional and religious leaders to disseminate balanced information in local contexts.
- **Regulator Visibility**: NAFDAC and NBMA should run visible, fact-based public campaigns separate from political messaging.
- **Misinformation Response**: Partner with trusted local influencers to address myths in accessible language.

5.4 FURTHER RESEARCH

Future studies should compare rural and urban areas across the South-East and test specific communication interventions experimentally and in order socio-cultural settings outside Enugu/South-Easth of Nigeria.

REFERENCES

Adeleke, O.A., & Ugwu, C.N. (2021). Consumer perception of genetically modified foods in Nigeria. Journal of Agricultural Extension, 25 (2), 45–59.

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50 (2), 179–211.

Edeoga, H.O., &Nnamani, C.V. (2020). Public awareness and attitude toward GM crops in South-East Nigeria. African Journal of Biotechnology,19 (4),210–218.

FAO. (2023). The state of food and agriculture: Harnessing biotechnology for sustainable food systems. Rome: FAO.

Gaskell, G., Stares, S., Allansdottir, A., et al. (2010). Europeans and biotechnology in 2010: Winds of change? Eurobarometer Report. Brussels: European Commission.

IFPRI. (2022). Biotechnology and food security in Sub-Saharan Africa. Washington, DC: IFPRI.

James, C. (2021). Global status of commercialized biotech/GM crops: 202. ISAAA Brief No. 56. Ithaca, NY: ISAAA.

National Biosafety Management Agency. (2022). Annual report on biosafety regulation in Nigeria. Abuja: NBMA.

Nnamdi, E.C., &Okoro, J.U. (2019). Socio-cultural factors influencing acceptance of GM foods in Nigeria. Nigerian Journal of Agricultural Economics, 9 (1), 33–47.

Okoruwa, V.O., Adeoti, A.I., & Oluwatayo, I.B. (2018). Trust and consumer acceptance of GM foods in Nigeria. Journal of Consumer Studies, 42 (3), 301–315.

Oparaocha, E.T., & Okoro, C.D. (2020). Media framing and public perception of GMOs in Nigeria. African Communication Research,8 (2),112–130.

Rosenstock, I.M. (1974). Historical origins of the health belief model. Health Education Monographs,2 (4),328–335.

World Health Organization. (2020). Food safety and genetically modified foods. Geneva: WHO.

Zilberman, D., Kaplan, S., & Kim, E. (2013). Technology adoption, capital structure, and financial constraints: Implications for GM adoption in developing countries. Ag Bio Forum,16(2),99–110.

Zulu, J.M., & Chanda, M. (2021). Consumer trust and GM food acceptance in Zambia and Nigeria: A comparative study. Food Policy,98,101945.