



ROUTE
TO FOOD



THE PERCEPTION OF KENYANS ON **GENETICALLY MODIFIED FOODS**

DECEMBER 2022



EXECUTIVE SUMMARY

KEY QUESTIONS

ARE GMOs

1. Safe?

For human consumption and the environment

2. Sustainable?

What is the economic viability of GMOs

3. Necessary?

Do we really need GMOs

The debate about Genetically Modified Organisms (GMOs) has attracted much attention in Kenya over the past two decades. Three key areas of debate include: whether or not GMOs are safe for human consumption and the environment; the economic viability and sustainability of GMOs; and whether they are indeed necessary as promoted by its producers and pro-GMO actors. As the debate rages on, the two sides have estimated the perceptions and views of Kenyan consumers differently. Promoters of GMOs claim that the Kenyan consumer is willing and happy to consume GMO food, while those opposed to GMOs also claim that the Kenyan consumer does not want to consume GMO foods.

The Route to Food Initiative (RTFI) sought to assess the current situation in regard to the perception of Kenyans about GMOs. RTFI, contracted a research firm, Infotrak Research and Consulting to undertake the research. Over 8000 respondents from all counties in Kenya were contacted for this survey. Quantitative data was collected through Computer Assisted Telephone Interviews (CATI), targeting the Kenyan adult population across all the regions. The data was then systematically analysed. Key issues of focus included level of awareness, willingness to consume and grow GMOs, and access to information on GMOs. These variables were analysed against various demographic aspects of the respondents.

The study sought to determine the level of awareness of GMOs amongst Kenyans. This assessment was at two levels: Top-of-mind awareness (without probing) and overall awareness (after probing). Top-of-mind awareness stood at 49%, and an additional 36% of the respondents indicated awareness after probing. The overall awareness was 85%, with only 15% of the respondents expressing being unaware of GMOs even after probing

The survey showed that the majority of Kenyans, 57%, are not willing to consume GMOs. The rest, 43% of Kenyans, are willing to consume GMOs. While this clearly shows that a majority of Kenyans (50% + 1) are not willing to consume GMOs, 43% who are now willing to consume GMOs based on this study show a significant change in perception compared to 10 years ago. These statistics show that the overall perception of Kenyans has changed significantly over the past ten (10) years.



EXECUTIVE SUMMARY

The survey however shows a more worrying pattern showing that Kenyans who have more exposure to food insecurity, with lower knowledge of GMOs are more receptive to GMOs. This clearly indicates that the willingness to consume is a reflection, and unfortunately so, of vulnerability rather than choice and free will. The pro-GMO messages of false hope about ending food and nutrition insecurity, and guaranteeing increased productivity clearly take advantage of the fact that millions of Kenyans have either faced or stare at food insecurity. The collective impact that food insecurity has on the entire population is also a contributing factor to the increasing conviction amongst Kenyan consumers concerned about the food insecurity problem that GMOs are the solution.

Inadequate access to verified information makes the Kenyan consumer vulnerable to misinformation and manipulation by the industry players. According to the survey, only 18% of the respondents recalled receiving information about GMOs from the government. This is a clear indication of failure on the part of the National Biosafety Authority (NBA) whose one of its key mandates is to educate the population on the regulation of GMOs and other biosafety issues. The Authority has also continued to openly promote the use of GMOs, therefore losing its ability to communicate objectively and unbiasedly.

Civil society organisations on the other hand have also not been able to sustain the anti-GMO campaign and awareness creation. While a few organisations have strongly come out to protest against the introduction of GMO seeds and food in the country, other CSO actors have largely kept off the debate.

This report is based on an independent survey conducted by Infotrak Research Consulting Limited. The data was collected between October and November 2021.



57%

**OF KENYANS
DON'T WANT TO
CONSUME GMOs**

Table of Contents

1. Introduction.....

- 1.1. Seed, the basis of life
- 1.2. The evolution of seed business
- 1.3. The politics of GMOs

2. Methodology.....

- 2.1. Objectives of the Survey
- 2.2. Desk Review
- 2.3. Quantitative Telephone Interviews
- 2.4. Sampling Design
 - Sample size calculation
 - Sample Distribution
- 2.5. Data Analysis & Reporting

3. Survey Findings.....

- 3.1. Awareness of GMOs
 - 3.11. The level of awareness per region.
 - 3.12. The level of awareness by gender and age.
 - 3.13. Level of Awareness by Education.
- 3.2. Willingness to consume GMO foods
 - 3.21. Willingness to consume GMOs by region.
 - 3.22. Willingness to consume GMOs by religion.
 - 3.23. Willingness to consume GMOs by Gender and Age.
 - 3.24. Willingness to consume GMOs by the level of education.
 - 3.25. Willingness to consume GMOs (farmers vs. non-farmers)
- 3.3. Access to Information on GMOs.
- 3.4. Channels of Information on GMOs.
- 3.5. Willingness to Grow GMO crops.
 - 3.51. Willingness to grow GMOs by gender
- 3.6. Vulnerability to persuasion.
 - 3.61. Vulnerability due to inadequate access to information.
 - 3.62. Vulnerability due to exposure to food insecurity.
 - 3.63. Vulnerability due to inadequate knowledge.
 - 3.64. Vulnerability due to livelihood threats.

4. Conclusion and Recommendations.....

5. Appendices.....

- 5.1. Study Tool

List of Figures

Figure 1: Overall Awareness of GMOs.

Figure 2: Awareness of GMOs by Region.

Figure 3: Awareness of GMOs (Rural Vs Urban)

Figure 4: Awareness on GMOs by Gender and Age.

Figure 5: Awareness of GMOs by Education.

Figure 6: Willingness to consume GMO foods.

Figure 7: Willingness to consume GMO foods by Region.

Figure 8: Willingness to consume GMO foods by Location.

Figure 9: Willingness to consume GMOs by Religion.

Figure 10: Willingness to consume GMO foods by gender

Figure 11: Willingness to consume GMO foods by Age.

Figure 12: Willingness to consume GMOs by level of education.

Figure 13: Willingness to consume GMOs: Farmers and non-farmers.

Figure 14: Access to information on GMOs from the government

Figure 15: Access to information on GMOs from government by region.

Figure 16: Sources of information on GMOs.

Figure 17: Willingness to grow GMO crops.

Figure 18: Willingness to grow GMO crops by Region.

Figure 19: Willingness to grow GMO crops by gender

Figure 20: Willingness to grow GMO crops by Age.

Figure 21: Willingness to grow GMO crops by location.

Figure 22: Willingness to grow GMO crops by Education

List of Tables

Table 1: Sample Distribution.

Table 2: Tables showing GMOs County Awareness.

Table 3: Tables showing The Top and Bottom 5 counties willing to consume GMOs.

Table 4: Sources of information on GMOs across Region.

Introduction

Seed, the basis of life

Seed is the basis of life and all forms of agricultural production: food, feeds, and fibre. Seed refers to grains or ripened ovules of plants used for sowing. It can also be the fertilized ripened ovule of a flowering plant containing an embryo. In the latter definition, it has to be capable of germination to produce a new plant broadly or a propagative plant structure (such as a spore, cutting, sucker, or small dry fruit). Just as it embodies multiple complex forms of plant life, so does it attract much interest. Specifically, with much push and pull from those seeking more control and concentration of power in seed systems. In the same vein, some champion more open access, i.e., minimal control and decentralized seed systems.

Both crop and animal production systems rely on the availability of seeds and other planting materials. The components could be existing or self-propagating naturally or in the hands of producers who plant and tend to them. Since the first agricultural revolution, there have been intentional and unintentional selection processes to identify and give chance and prominence to selected varieties of crops that are deemed "superior" based on: the preference of the communities that used them; resistance to diseases; tolerance to harsh weather conditions; and most importantly productivity.



The evolution of seed business

During the industrial revolution, seeds became an area of interest for emerging corporations. This transformed natural seed selection and early breeding processes in different parts of the world into a more connected, coordinated, and regulated approach to improving valuable crops such as wheat, rice, and maize. The first seed companies were formed during the 17th century and went through the 18th and early 20th centuries to commodify seeds. However, significant corporate trade in seeds only happened from the early 20th century onwards. By 2010, the seed business had become one of the most lucrative businesses, with global agriculture policies and extension services encouraging the purchase of "certified seed" sold by seed companies. Today, four corporations — Bayer, Corteva, ChemChina, and Limagrain — control more than 50% of the world's seeds. These staggering monopolies virtually dominate the global food supply.

In Kenya, the first seed company, Kenya Seed Company, was registered in 1956 to promote improved strains of pasture seed. The company has grown to work on different varieties, from grains and pasture seeds to vegetable seeds. East African Seed Company was established in 1972. Simlaw Seed (a subsidiary of the Kenya Seed Company) was established and acquired by the Kenya Seed Company in 1979 and later renamed Simlaw Seeds in 2002. Since 2002, the Kenyan seed sector has seen the entry of other seed companies into the market, such as Bayer, Monsanto, and Syngenta.

The politics of GMOs



With access to world-class technology and bottomless funding, these companies work to advance seed technology to meet the perceived needs for "improved seed" and the insatiable human imagination of what can be achieved through a seed. The power of these seed companies has attracted much criticism in the past few

years, specifically on their growing influence on and promotion of genetically modified organisms (GMOs).

In Kenya, Bt Cotton patented by Monsanto Company was allowed commercialization through a cabinet decision in December 2019. This action marked an increased push by the government to have more GM crops commercially grown. It includes, amongst others, Cassava (modified for resistance against cassava mosaic virus), Bt Maize (modified for pest resistance), bananas, cowpea, pawpaw, sorghum, and other crops under development for different GMO traits. While there is still an active ban on GMO food imports, which has been in place since 2012, there have been many developments in policy and legal frameworks for managing and researching GM crops. The recent lift of the GMO ban and this narrative surrounding the need for GMOs present this technology as the solution to food and nutrition insecurity by enhancing productivity in the context of climate change.

Anti-GMO campaigns mainly led by consumer and civil society organizations have continued to oppose the use of GMOs in the country. The campaigns against GMOs in Kenya have focused on creating awareness of the potential health risks associated with consuming GMOs and relying on various studies, especially the Séralini Study¹. Gilles-Éric Séralini's globally shared report on a two-year study on the effect of GMO maize feeding on rodents showed that genetically modified maize (corn) induces tumours in rats. However, the information in this report has been widely disputed by the European Food Safety Authority, among other entities. In its published review² of the study, EFSA concludes that the study as reported by Séralini et al. was inadequately designed, analyzed, and reported.

While the study might have failed to prove the adverse health effects of GMOs scientifically, it rightly contributed to raising awareness of the potential risks humanity is exposed to with GMOs. It raises the moral question of the right thing to be done if there is fear or doubt about a particular approach or technology. The absence of evidence on the potential negative impacts of GMOs does not confirm their safety. The precautionary principle should be applied to safeguard human and environmental health for all technologies that can potentially cause harm.

¹ Seralini Study: "Republished study: long-term toxicity of a Roundup herbicide and a Roundup-tolerant genetically modified maize" Link <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5044955/>

² EFSA: Final review of the Séralini et al. (2012a) publication on a 2-year rodent feeding study with glyphosate formulations and GM maize NK603 as published online on 19 September 2012 in Food and Chemical Toxicology, Link: <https://www.efsa.europa.eu/en/efsajournal/pub/2986>

The politics of GMOs

The promises of GMOs to address food security have also been questioned and debated. There is clear evidence in countries that widely use GMOs that they cannot solve their food security challenges by simply allowing the cultivation of GM crops. Misinformation from the promoters of GMOs, ascribing specific inexistent properties to GM crops, is also rampant, especially in developing countries grappling with food insecurity and dealing with increasing adverse impacts of climate change, such as Kenya. Bt Maize, for example, has been promoted in some quarters as more resilient in the face of climate change and reduced precipitation which is not a property of the variety.

From completely failed crops, costly seeds that rely on government subsidies, and inefficient distribution systems to failure to live up to the promises made by the producers, genetic modification remains a questionable approach to date. While a majority of Kenyans continue to be against the introduction and use of GMOs in the country, a growing number is increasingly getting convinced by the lofty promises from the pro-GMO groups and starting to consider GMOs as a solution to their food problems.

This report critically looks at the perception of Kenyans regarding GMOs and assesses some of the factors driving these perceptions.



Methodology

Objectives of the Survey

This national perception survey aimed to provide insights into the conversation around GMOs in Kenya. The study generates evidence and learning to fill in the gap of limited information on public participation and perception of issues related to GMO foods and inputs.

The specific objectives of the survey included:

- To establish the level of public awareness of GMOs;
- To establish the perception of Kenyans on GMOs;
- To establish the proportion of Kenyans reached by information on GMOs from relevant government entities;
- To assess the demographic characteristics driving/hindering awareness levels on GMO food products.

Desk Review

Relevant documents and reports on food policy and GMOs, in general, were reviewed. Desk review served as a data source and helped understand the existing information gaps. This stage also served to enrich or complement the primary data.

Quantitative Telephone Interviews

Quantitative data was collected through Computer Assisted Telephone Interviews (CATI), targeting the Kenyan adult population across all the regions. Respondents were sampled from all socio-economic classes, and the demographic characteristics of the respondents were captured.

Sampling Design

The survey adopted a multistage stratified sampling design with the regions, counties, sub-counties, and wards forming the strata. A random sample of adult Kenyans was selected and distributed to the forty-seven (47) counties through probability proportionate to size (PPS) using the 2019 population census to ensure complete county-level randomisation. The second stratification stage involved the counties, sub-counties, and wards based on PPS. Respondents were then selected through systematic random sampling in the wards chosen to ensure complete randomization.

Sample size calculation

The sample was drawn using the RaoSoft formula below:

$n = \{N (zs/e)^2 / N-1+(zs/e)^2\}$	<p>Where</p> <p>$z=1.96$ for 95 confidence level</p> <p>$s=0.5$ for standard deviation</p> <p>$e=0.011$ for margin of error</p> <p>$N= 25,709,463$ for national population of adult people (18+).</p> <p>$n=7935$, which is boosted to 8,000</p>
-------------------------------------	---

Sample Distribution

REGION	2019 CENSUS ADULT POPULATION PER REGION	REGIONAL ADULT PROPORTIONS	SAMPLE PER REGION	ACHIEVED SAMPLE PER REGION
COAST	2,329,950	9%	720	813
NORTH EASTERN	1,019,886	4%	320	341
EASTERN	3,863,774	15%	1,200	1,331
CENTRAL	3,438,358	13%	1,040	1,122
RIFT VALLEY	6,574,233	26%	2,080	2,342
WESTERN	2,469,568	10%	800	871
NYANZA	3,155,597	12%	960	1,009
NAIROBI	2,858,097	11%	880	958
TOTAL	25,709,463	100%	8,000	8,787

Table 1: Sample Distribution

Data Analysis & Reporting

Weighting was computed post-data collection to limit any sampling error and potential non-response bias. The quantitative data was analysed using SPSS software to produce an analysis table, charts, and figures that informed the reporting. Cross tabulations were conducted to assess the correlation of awareness levels with socio-economic characteristics, including location (urban/rural), geographical location (region/county), age, gender, and level of education. Chi-square association tests were conducted to assess the association of perceptions about GMOs with the socio-demographic profiles of the respondents.

Survey Findings

Awareness on GMOs

Both opponents and proponents of GMOs argue that their goal is to educate the public so that they can make informed decisions with regard to GMOs. The study sought to find out the level of GMOs among Kenyans. The level of awareness was further assessed on the basis of region, gender, age, education level and location (i.e urban vs rural). The survey question asked whether or not the respondents knew what GMOs are.

Key Findings

Only 49% had top-of-mind awareness of GMOs, i.e did not need to be probed further. Upon probing, overall awareness went up to 85%. This shows that the knowledge of GMOs amongst most Kenyans is inadequate. 15% of Kenyans still don't know what GMOs are even with probing showing that 15% of Kenyans are left behind in conversations about GMOs in the country.

Different regions of the country had different levels of awareness despite the high overall awareness of GMOs. Northern Kenya region had the lowest level of awareness.

The age groups 18 -24 and 60+ years had slightly lower awareness about GMOs. Urban dwellers also showed a slightly higher awareness than their rural counterparts did.



"My name is Jemo. I am 22 years old. I live in the suburbs. I only thought GMOs were meant for the first-world countries"

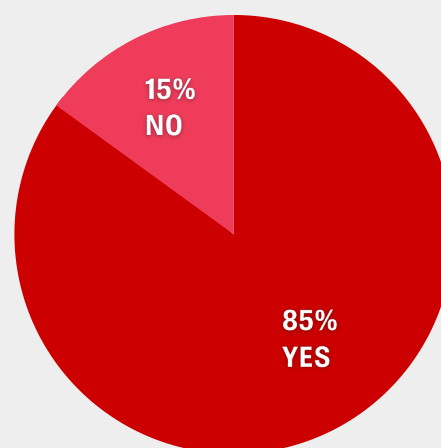


Figure 1: Overall Awareness of GMOs

The level of awareness per region

The level of awareness varied in the country's different regions, with Eastern and Central regions leading with 90 and 91%, respectively. At only 60%, the level of awareness was lowest in the North Eastern region, as shown in figure 2 below.

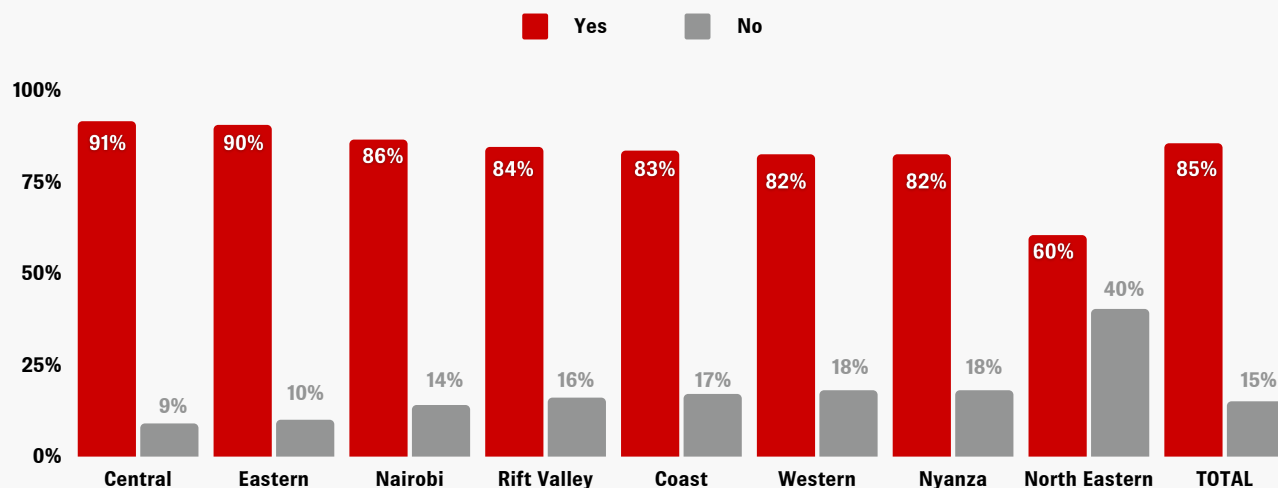


Figure 2: Awareness of GMOs by Region

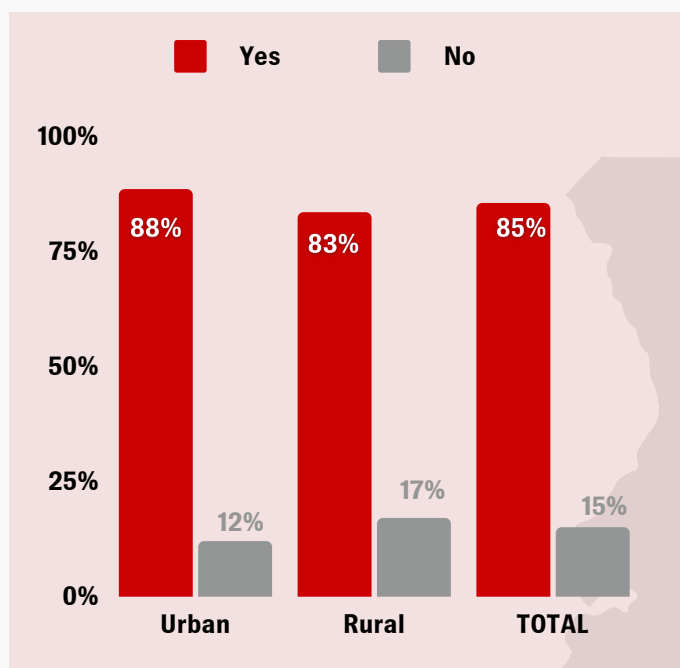


Figure 3: Awareness of GMOs (Rural Vs Urban)

Awareness levels of GMOs are higher in urban areas than in rural areas. Urban areas had an awareness level of 88% compared to rural areas at 83%.

88%

LEVEL OF AWARENESS OF
GMOs IN URBAN AREAS

83%

LEVEL OF AWARENESS OF
GMOs IN RURAL AREAS

Top 5 Counties - Awareness of GMOs

	COUNTY	AWARE (YES)	NOT AWARE (NO)
1	Machakos	95%	5%
2	Makueni	95%	5%
3	Nakuru	94%	6%
4	Kitui	93%	7%
5	Kiambu	93%	7%

Bottom 5 Counties - Awareness of GMOs

	COUNTY	AWARE (YES)	NOT AWARE (NO)
1	Nyamira	70%	30%
2	Garissa	61%	39%
3	Wajir	61%	39%
4	Mandera	58%	42%
5	Lamu	55%	45%

Table 2: Tables showing GMOs County Awareness

The level of awareness by gender and age

The survey results also show that men have a slightly higher awareness level than women. Top-of-mind awareness showed a more significant gap between men and women at 54% for men and 43% for women. Overall awareness (after probing) stood at 84% for women and 86% for men. Awareness of GMOs is also slightly influenced by age, with a somewhat lower proportion of respondents aged 18- 24 and those aged 60+ indicating awareness. The level of awareness was relatively higher in the middle ages.

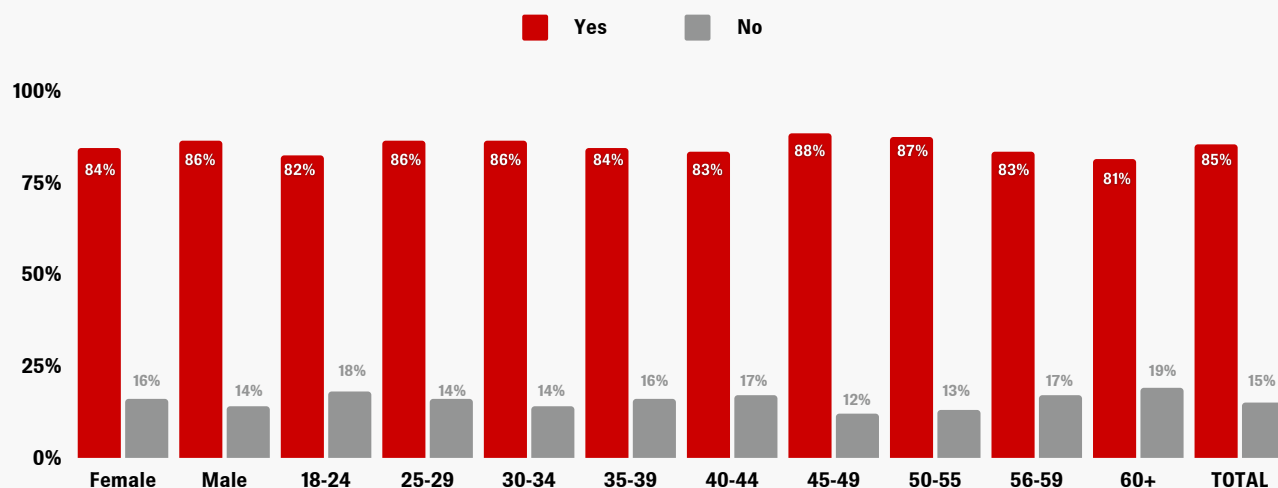


Figure 4: Awareness on GMOs by Gender and Age

Level of Awareness by Education

It is clearly shown in the figure below that 89% of the respondents who had a tertiary level of education were aware of what GMOs are, followed by those with secondary (85%) and primary (80%) levels of education. This observation clearly shows that the level of education impacts the level of awareness of GMOs. The higher the level of education, the more understanding of GMOs. Top-of-mind awareness also followed the same trend with respondents with tertiary education leading.

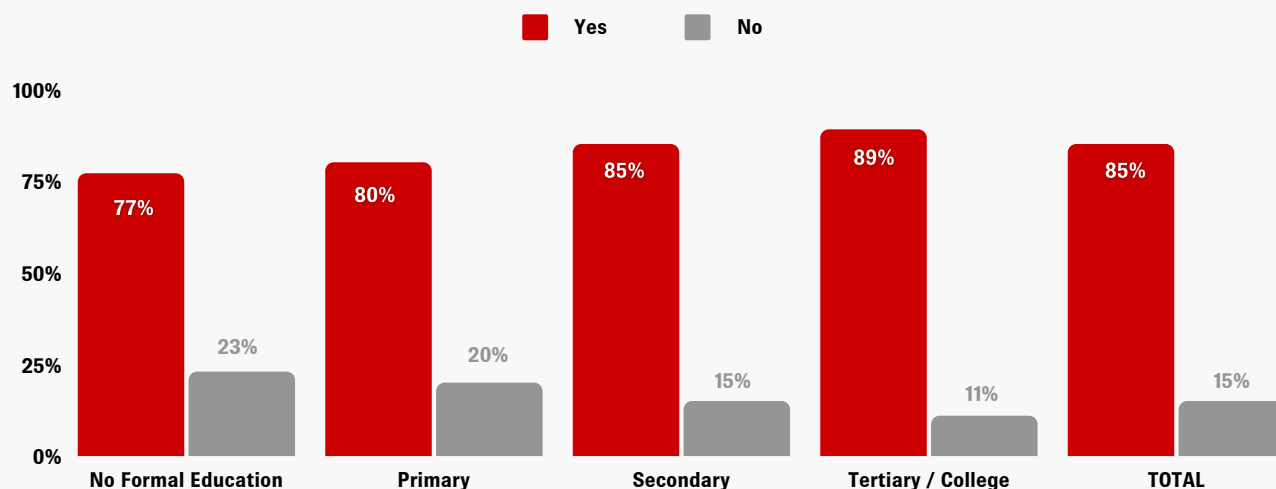


Figure 5: Awareness of GMOs by Education

Willingness to Consume GMO Foods

Key Findings

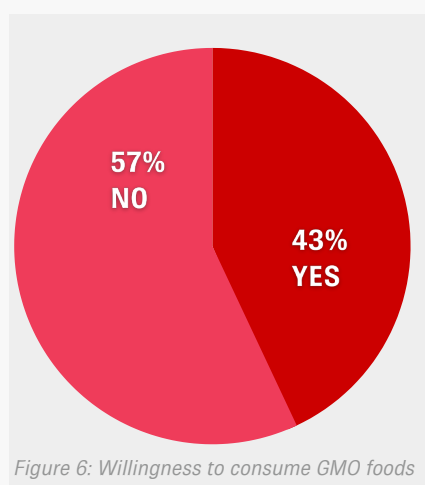


Figure 6: Willingness to consume GMO foods

Most Kenyans (57%) are unwilling to consume GMOs compared to 43% who are willing.

Respondents not engaged in any farming activities had a much higher unacceptable level with 64% expressing that they were not willing to consume GMO foods compared to those involved in farming activities where only 55% voiced unwillingness to consume GMO foods.

While these results confirm the status quo in terms of Kenyans' perceptions of GMOs over the last two decades, it shows a significant change in the overall perception. Willingness to

consume GMOs was much lower in 2010 - 2012 when the ban was put in place compared to the current numbers. This also shows reduced resistance amongst Kenyan consumers regarding the consumption of GMOs.

Personal attributes including gender, age, religion, and region/locality significantly influence people's perception of GMOs.

Willingness to consume GMOs by region

The willingness to eat GMO foods varies across the regions, from 48% in Nyanza to 37% in central Kenya (see Figure 7). There is a clear trend, except for a few exceptions showing more willingness to consume GMOs in low potential, food insecurity-prone regions compared to high potential areas. Consumers in the high potential zones (areas with ample rainfall and fertile soils) were less willing to consume GMOs than those in medium potential and low potential zones (arid/semi-arid areas with poor rainfall and soils).

This pattern shows that Kenyans in food insecurity-prone areas are more vulnerable to persuasion from GMO food and technology promoters due to their underlying exposure to food insecurity. GMO advocates continue to present GMO seeds as the only solution to hunger and food insecurity in the country despite most GMO technologies having very little to do with dryland production.

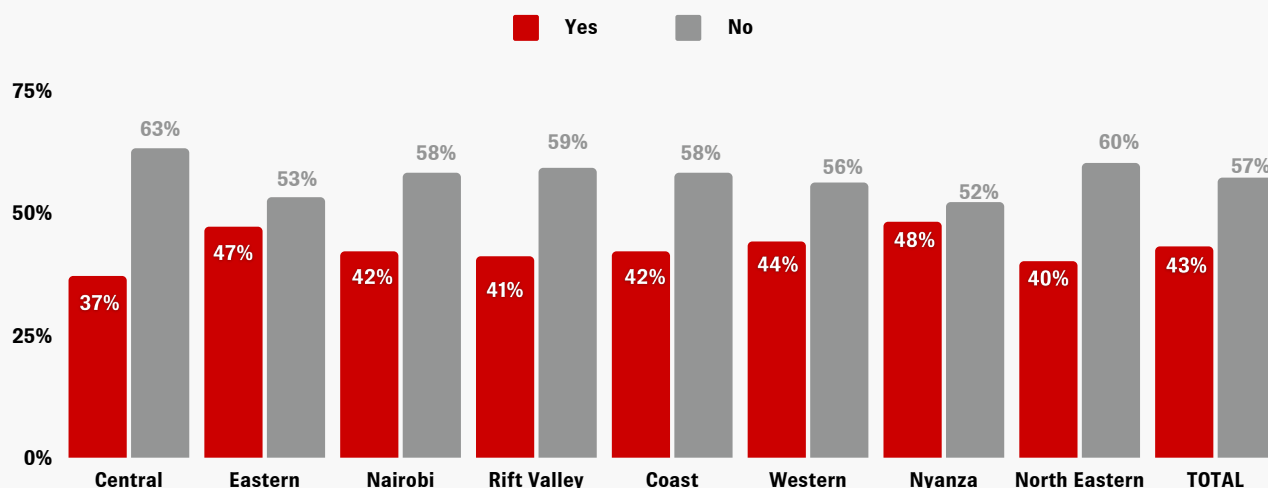


Figure 7: Willingness to consume GMO foods by region

Top-5 counties willing to consume GMOs

	COUNTY	AWARE (YES)	NOT AWARE (NO)
1	Kisumu	61%	39%
2	Makueni	57%	43%
3	Kitui	53%	47%
4	Laikipia	53%	47%
5	Busia	53%	47%

Bottom-5 counties willing to consume GMOs

	COUNTY	AWARE (YES)	NOT AWARE (NO)
1	Lamu	16%	84%
2	Kiambu	32%	68%
3	Uasin Gishu	35%	65%
4	Nandi	35%	65%
5	Wajir	36%	64%

Table 3: Tables showing The Top and Bottom 5 counties willing to consume GMOS

Lamu and Kisumu counties were at opposite ends of the ranking. Their willingness to consume GMOs was at 16% and 61%, respectively. It should be noted that Lamu was also ranked as having the least awareness, which might imply minimal penetration of Pro-GMO messages, therefore, maintaining negative consumer views regarding GMOs.

A higher proportion (61%) of consumers in urban areas are not willing to consume GMO foods compared to consumers in rural areas (55%). This observation could be attributed to higher access to information and public discourse on GMO foods' health and environmental concerns.

Willingness to consume GMOs by religion

Religious beliefs and teachings strongly influence people's perceptions of the food they eat. Religious bodies have been at the forefront, calling for caution regarding the introduction and use of GMOs in Kenya and therefore greatly influencing public perception of GMOs. Based on the survey data- there is a slight variation in how religions perceive GMOs. The study collected data on the essential religious categorization, including Catholic, Protestant Christians, Muslims, Hindu, and African indigenous religions. Those not conforming to any of the five groups were

separately assessed on their willingness to consume GMOs. The number of respondents from the Hindu and African indigenous religions did not reach a substantial number to be analyzed separately, hence not included in the table below.

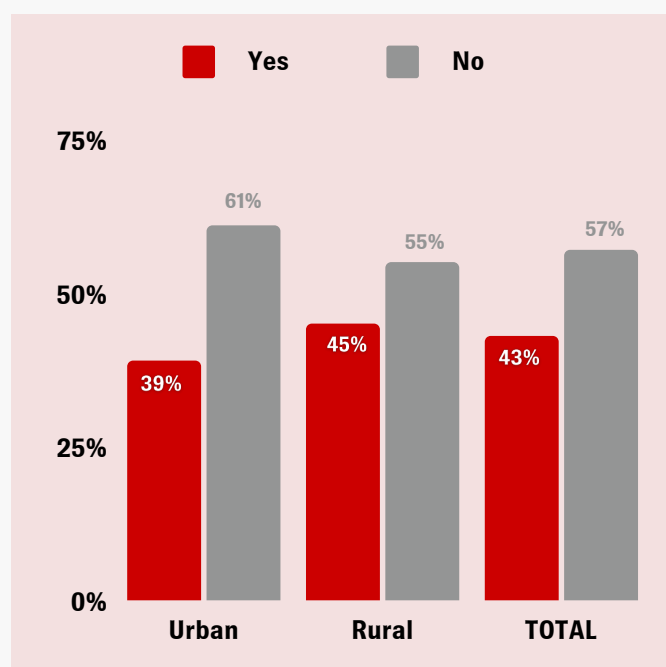


Figure 8: Willingness to consume GMO foods by Location

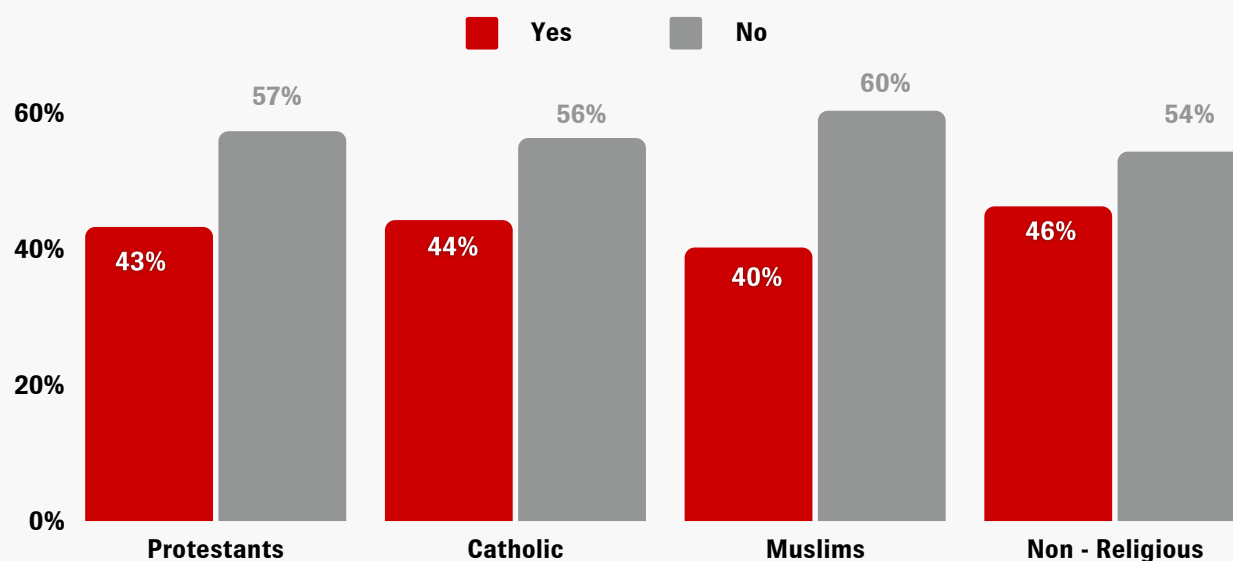
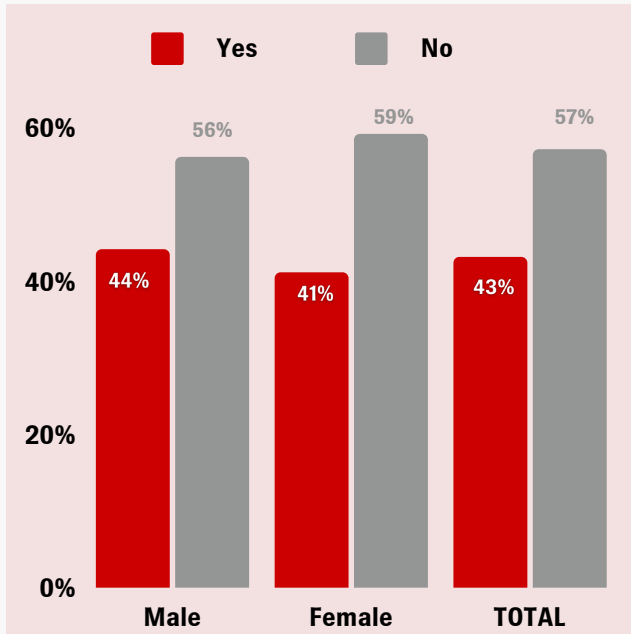


Figure 9: Willingness to consume GMOs by Religion

Willingness to consume GMOs by Gender and Age

A higher proportion of male consumers indicated a willingness to eat GMO foods compared to women at 44% and 41%, respectively. This result shows that gender plays a significant role in the perception of Kenyans on GMOs.



The survey shows that different age groups also have different perceptions of GMOs. The youth ages 18 - 24 lead with a higher willingness to consume GMOs (at 47%), followed closely by the age group 24-29 at 44%. Interestingly, the age group 29 – 34 had the least willingness to consume GMOs, breaking the trend. While there is no clear-cut pattern between the desire to consume and age, factor distinctions are visible amongst the different age groups.

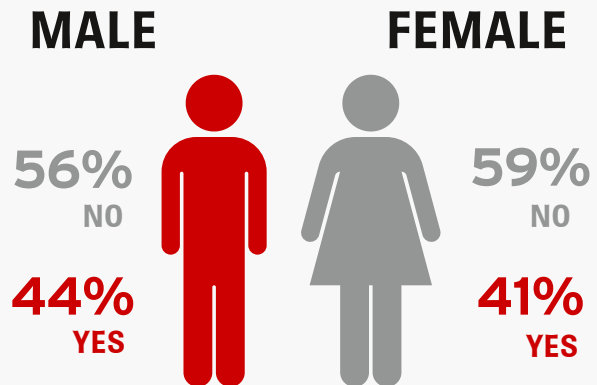


Figure 10: Willingness to consume GMO foods by gender

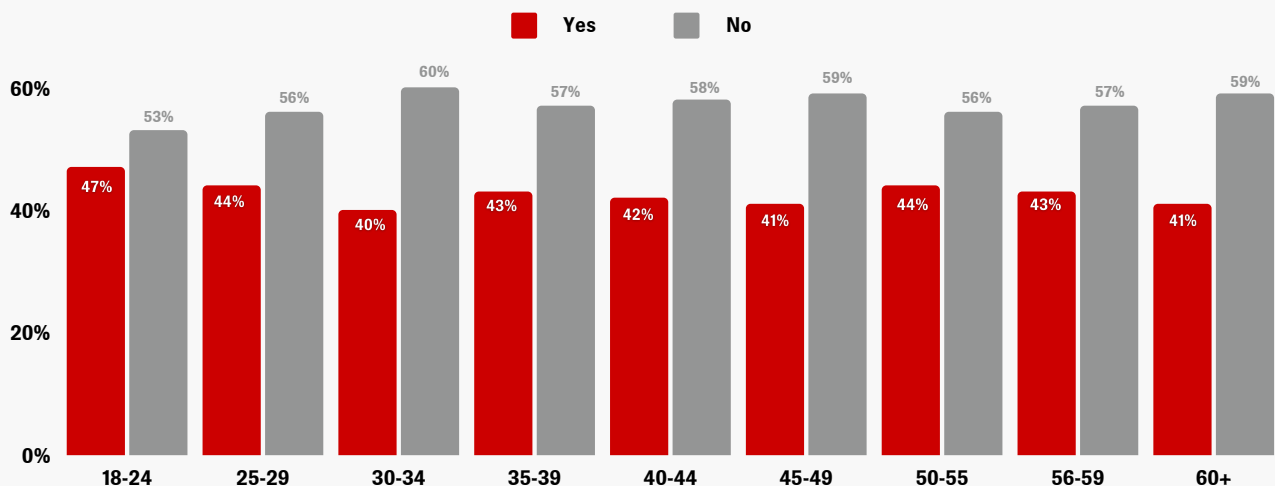


Figure 4: Awareness on GMOs by Gender and Age

Willingness to consume GMOs by level of education

The survey sought to assess whether the level of education influenced the perception of Kenyans on GMOs, measured through the respondents' willingness to consume GMOs. The survey results showed no clear trend regarding the level of education and willingness to consume GMOs. The table below shows the results and variations based on the survey data.

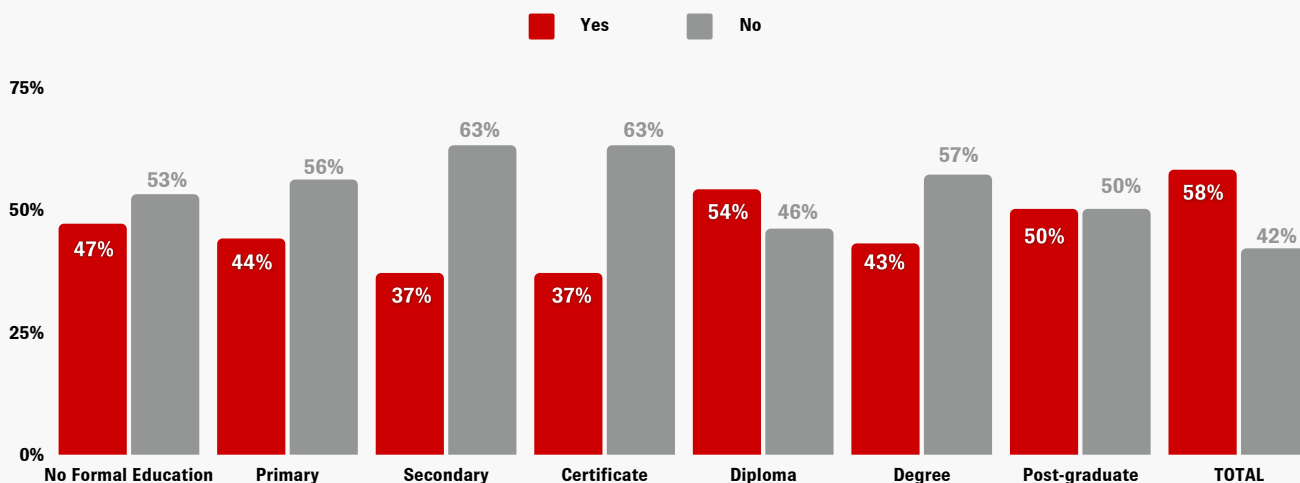


Figure 12: Willingness to consume GMOs by level of education

Willingness to consume GMOs (farmers vs. non-farmers)

To assess whether engagement in farming activities influenced the willingness to consume GMOs or not, willingness to consume was analyzed separately for respondents engaged in farming activities and those who didn't engage in any farming activities. The results showed a significant difference in perceptions of these two different groups.

Non-farmers had a much higher unacceptance level, with 64% expressing that they were not willing to consume GMO foods compared to those who engaged in farming activities, where only 55% voiced unwillingness to consume GMO foods, as seen in the side-by-side charts below.

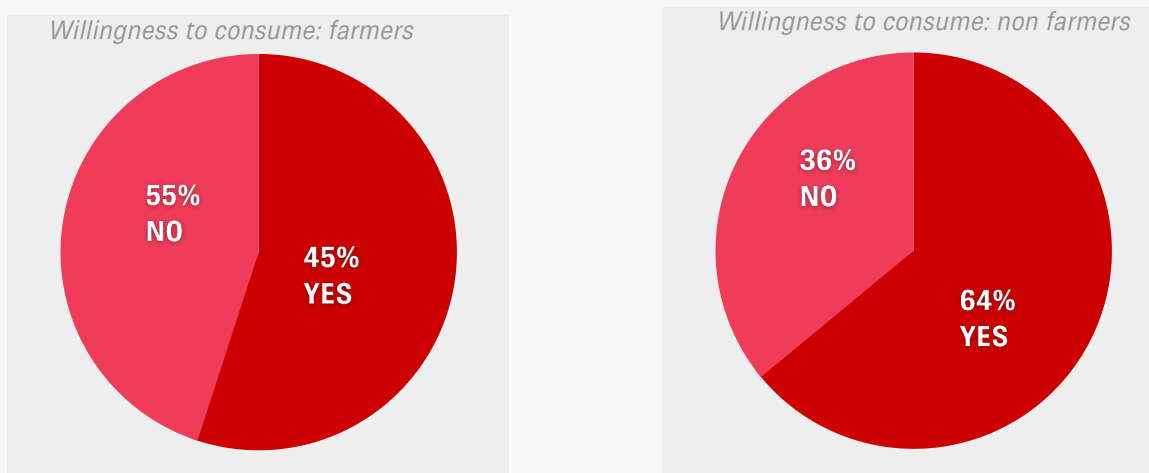


Figure 13: Willingness to consume GMOs: Farmers and non farmers

Access to Information on GMOs

Being a relatively new technology, the level of access to information is a fundamental determinant of meaningful participation and attitudes and perceptions of Kenyans towards GMOs. The source of information also determines or at least influences the perception of consumers on the particular subject, and in this case, the viability, and safety of GMO technologies in terms of human health and the environment. The survey, therefore, sought to find out the source of information on GMOs.

Key Finding

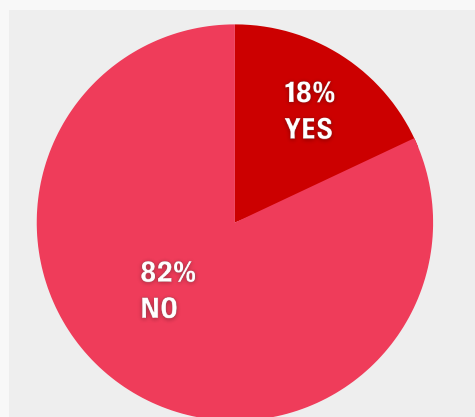


Figure 14: Access to information on GMOs from the government

82% of Kenyans have not received any GMO information from the government. This statistic indicates that the National Biosafety Authority, mandated to provide the public with unbiased information on GMOs, has not been able to fully play its role as the information is critical in informing public opinion. This implies that the information they have on GMOs is not coming from a non-partisan, neutral entity i.e. government authorities and therefore could influence their perception of GMOs in the interest of the provider of that information.

The gap in information access allows undue influence on the perception of Kenyans by multi national companies which have influence over major sources of information i.e. local media through advertising to promote GMOs in an unregulated manner. The trend is the same across regions, as shown in the figure below.

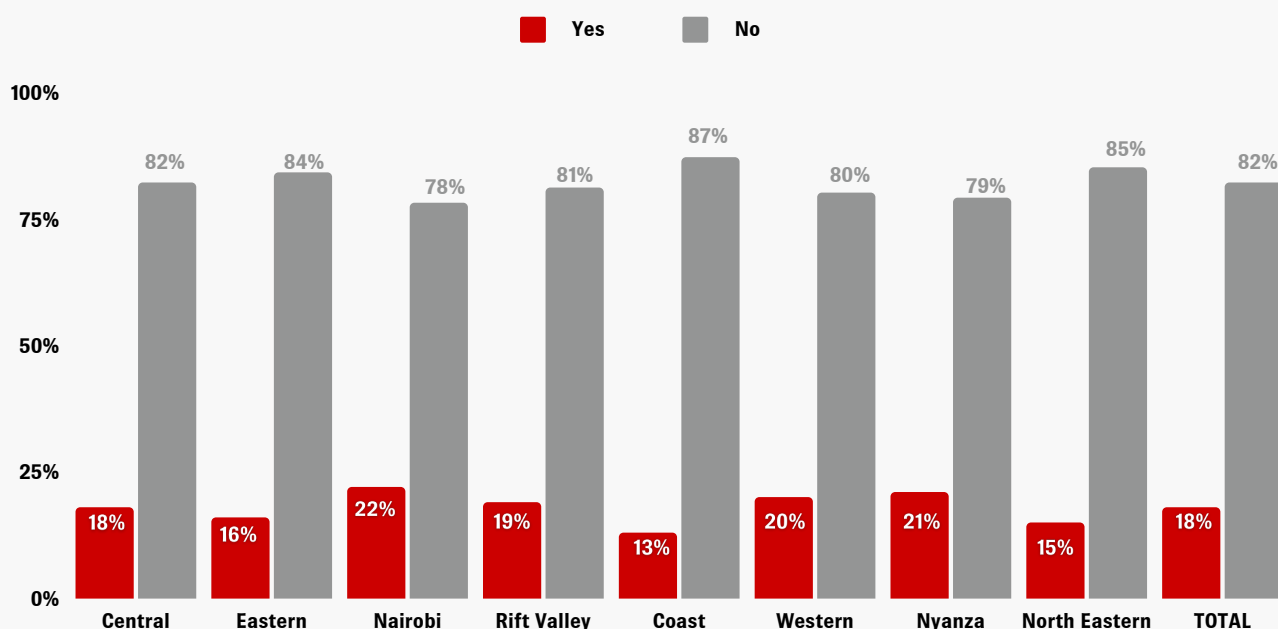


Figure 15: Access to information on GMOs from government by region

Sources of Information on GMOs

When asked where they get information about GMOs from, respondents stated: mainstream media, i.e., TV (29%); Radio (27%); Newspapers, and magazines (9%). Internet and social media was the primary source of information for 25% of the respondents. Based on this survey, the most common source of GMO information for Kenyans is family and friends (37%), who only receive information from mainstream media, the internet, and social media platforms.

It is important to note that all these major channels are heavily influenced by paid advertising and marketing. Therefore, most of the information consumed by Kenyans is mainly information that interested parties perpetuate.

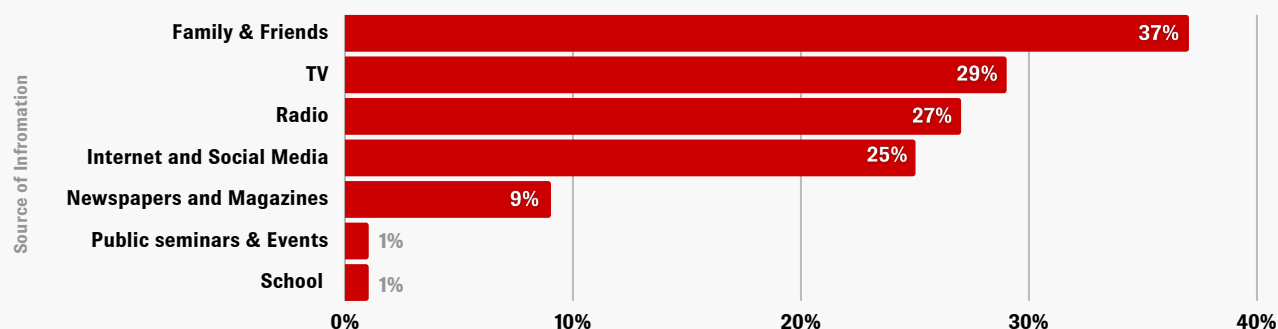


Figure 16 : Sources of information on GMOs

The trend is the same across the regions, as shown in the table below.

	Coast	North Eastern	Eastern	Central	Rift Valley	Western	Nyanza	Nairobi	TOTAL
Family & Friends	40%	40%	42%	37%	36%	45%	33%	31%	37%
TV	30%	33%	27%	29%	28%	25%	27%	33%	29%
Radio	26%	25%	26%	23%	30%	27%	33%	25%	27%
Internet & Social Media	23%	27%	21%	27%	25%	20%	22%	33%	25%
Newspapers & Magazines	7%	7%	7%	7%	9%	11%	9%	12%	9%
School	0.3%	0.5%	1%	1%	1%	1%	2%	1%	1%
Public Seminars & Events	2%	0.5%	2%	1%	1%	1%	1%	0.1%	1%

Table 4: Sources of information on GMOs across Regions

Willingness to Grow GMO crops

The perception of Kenyans on GMOs is not limited to their willingness to consume. The survey sought to also assess the willingness of Kenya's producers to grow GMO crops. Out of the 8,787 respondents in the survey, 5,335 (61%) reported engaging in different farming activities. Out of those engaged in farming activities, more than half (58%) expressed willingness to grow GMO crops.

Different from the willingness to grow GMOs, respondents engaged in food production activities expressed a higher willingness (58%) to grow GMO crops/use GMO seeds. The reasons for the considerable variation are unclear, but this trend follows the level of willingness of those engaged explicitly in production activities and also to consume GMO foods.

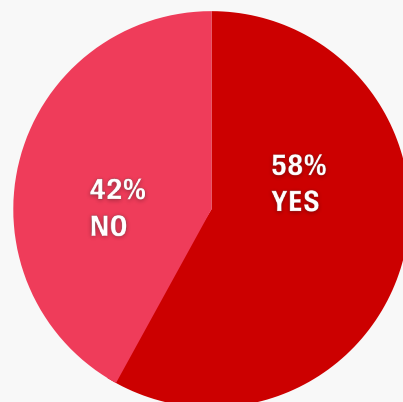


Figure 17: Willingness to grow GMO crops

Willingness to grow GMOs by gender

The trend varies across regions, with the highest willingness to grow GMO crops recorded in the Eastern (64%) and the lowest levels recorded in North Eastern (43%). This trend may be influenced by agroecological factors as well as religious beliefs. Farmers in high-potential zones could be more reluctant to grow GM crops than those in arid and semi-arid areas. The North Eastern region had the lowest willingness to grow GMO crops, explainable by the dominant Muslim religion, which has the most insufficient acceptance of GMOs among the country's religious orientations. Crop farming is also not a major economic activity in North Eastern as the region is majorly inhabited by pastoralist communities.

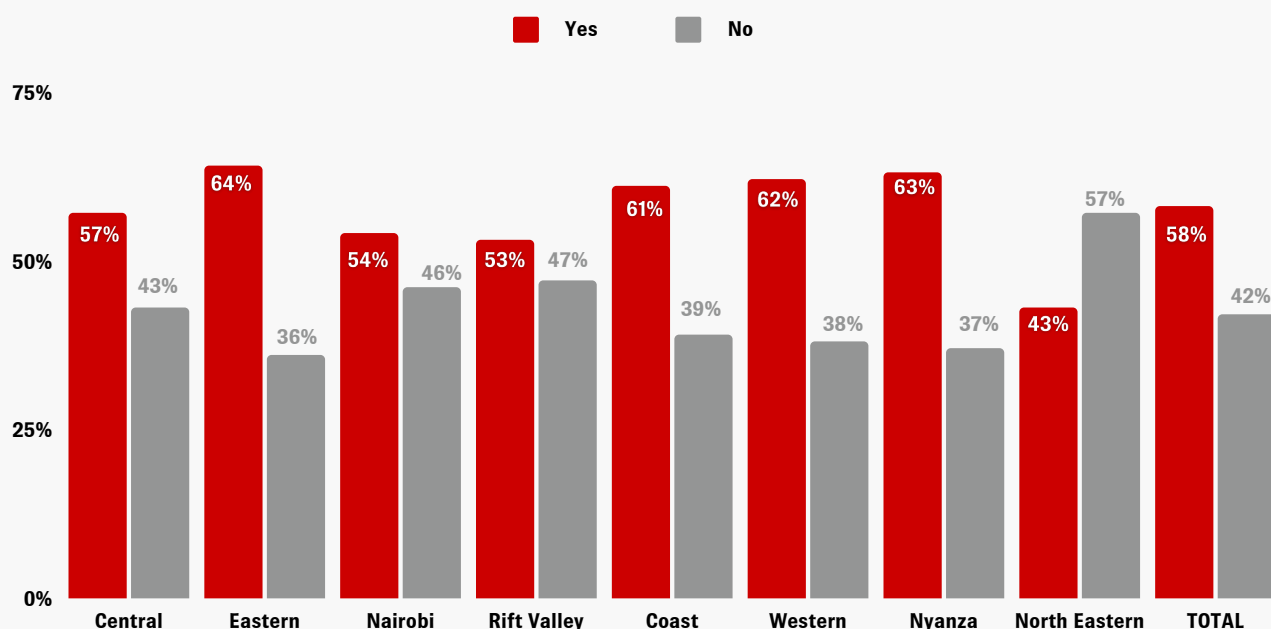
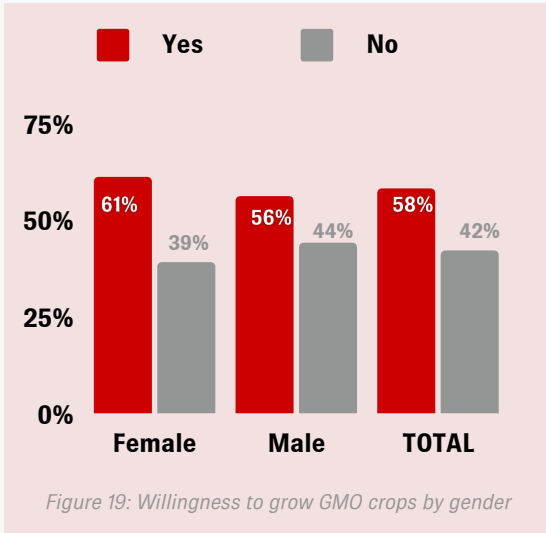
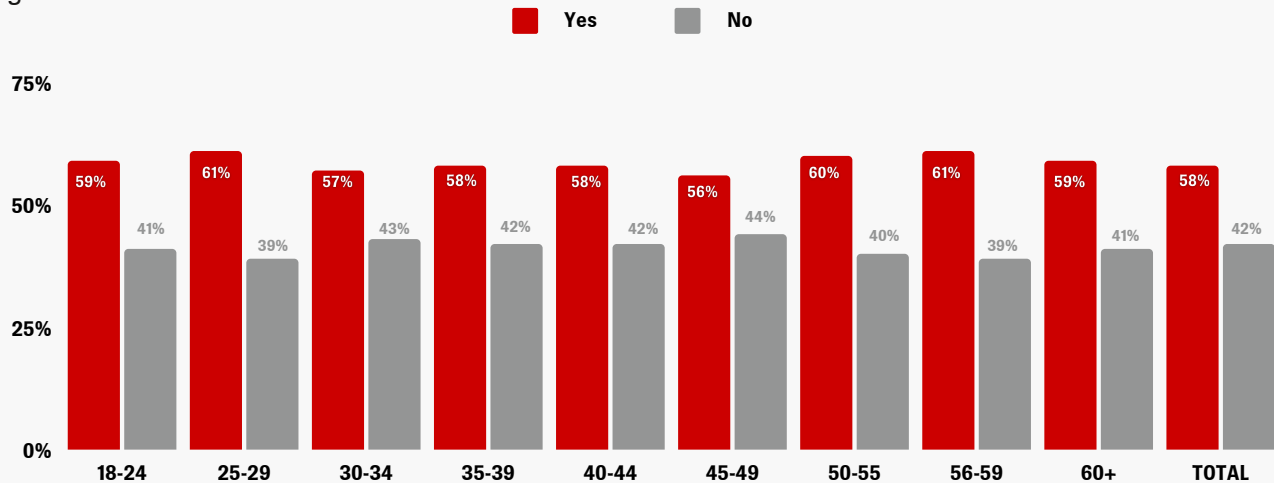


Figure 18: Willingness to grow GMO crops by region

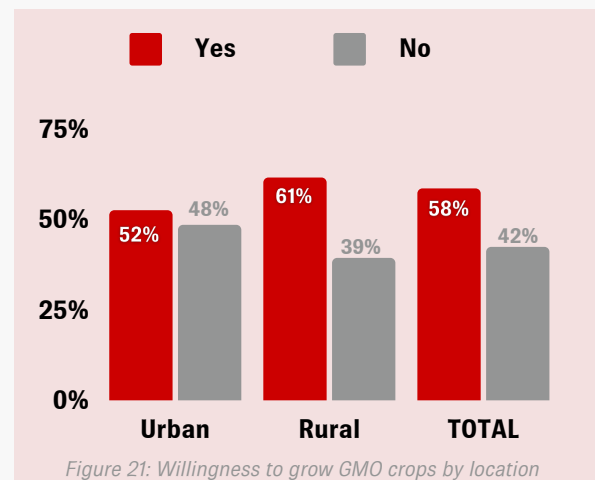
A higher proportion of female farmers are willing to grow GMO crops than male farmers.



There was no clear trend regarding age and willingness to grow GMO crops, as shown in the figure below.



Farmers in rural areas (61%) are more receptive to GMO seeds than their urban counterparts (52%).



The willingness to grow GMO crops among farmers varies with the level of education. Farmers with no formal education are more receptive to GMO seeds than those with formal education.

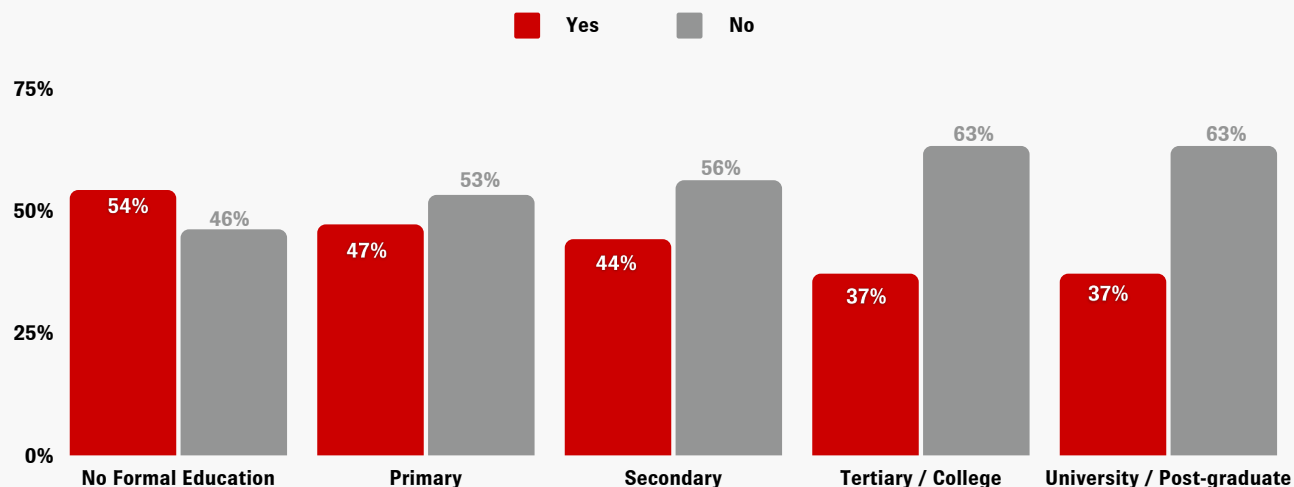


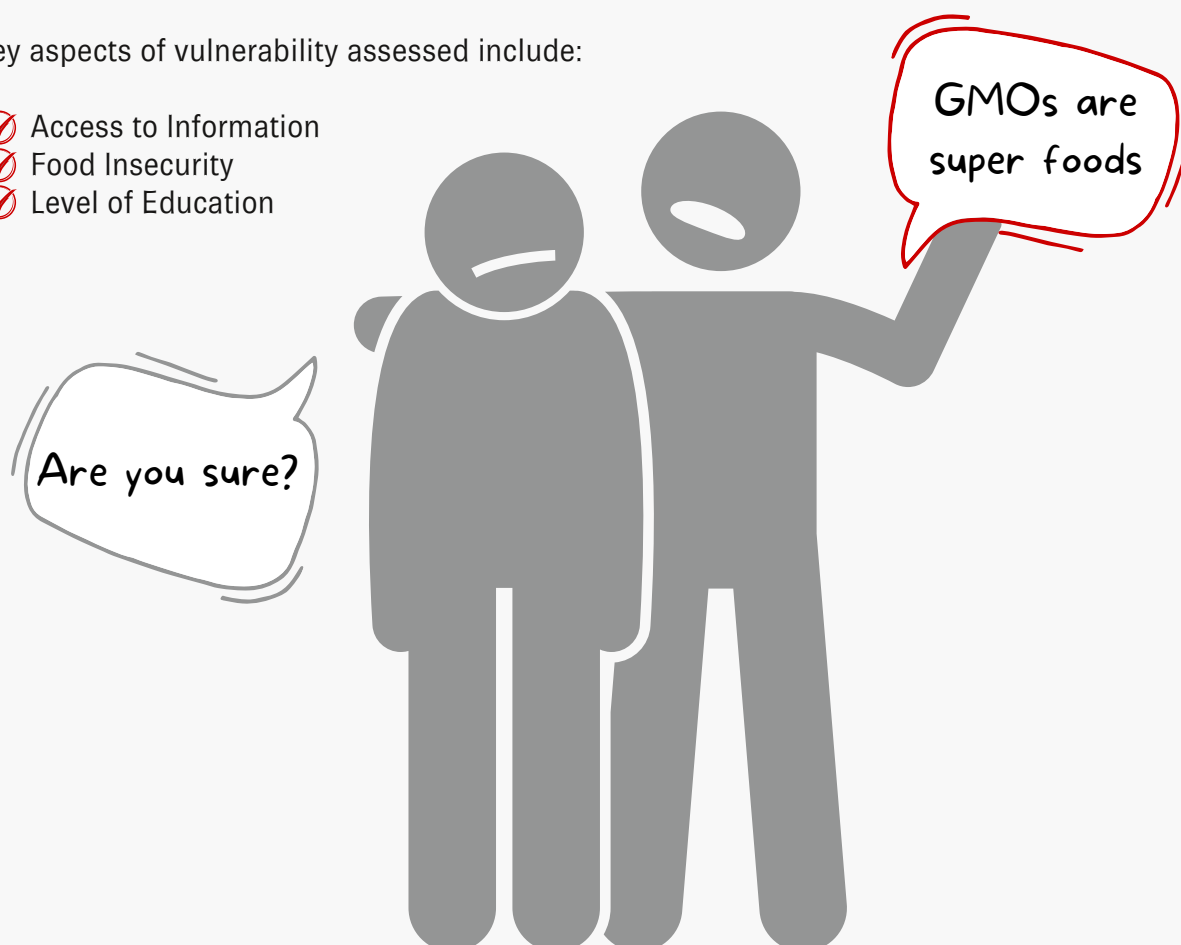
Figure 22: Willingness to grow GMO crops by Education

Vulnerability to persuasion

The analysis of this survey shows a clear correlation between the perceptions of people towards GMOs and their vulnerability to persuasion. While people can always make choices between different options presented to them, constant messaging that uses the most pressing challenges and needs can influence people's perceptions about a product or technology. The proponents of GMOs continuous presentation as the solution to malnutrition, climate change, crop pests, and disease management targets the very core of the food security challenges affecting Kenyans.

Key aspects of vulnerability assessed include:

- ✓ Access to Information
- ✓ Food Insecurity
- ✓ Level of Education



Vulnerability due to inadequate access to information

Access to information is critical in ensuring that people can make informed choices. Since GMOs are a relatively new subject in Kenya, providing verified, non-biased information to all consumers is necessary. This state will enable everyone, regardless of their level of education or social status, to make informed opinions on GMOs and adequately participate in the ongoing debate about GMOs in the country.

This study establishes that 51% of Kenyans do not have top-of-mind awareness of GMOs. This situation means they cannot understand what GMOs are without some explanation/probing. Only 49% of Kenyans had top-of-mind awareness of GMOs. When explained to them, an additional 36% (a total of 85%) of the surveyed respondents indicated awareness of GMOs.

In summary, 36% of Kenyans might not fully understand/appreciate the GMO debate due to their limited knowledge and understanding of GMOs. Additionally, perhaps more worrying is that 15% of Kenyans have no clue completely what GMOs are and therefore cannot participate in any decision-making or public participation platforms discussing the issue of GMOs. This state means that the ongoing discussions and processes about the use of GMOs in Kenya are leaving behind 15% of Kenyan consumers who equally have the right to have their opinions on this subject heard.



The study further shows that 82% of Kenyans who are aware of GMOs have not received information from the government. This position means that the information they have on GMOs is not coming from a non-partisan, neutral entity, i.e., government authorities, and therefore could potentially influence their perception of GMOs in the interest of the information provider.



Vulnerability due to exposure to food insecurity

Apart from a few counties, other factors such as religious beliefs play a more significant role in determining people's perceptions of GMOs. There was a clear correlation between willingness to consume GMOs and the level of exposure to food insecurity. Counties with considerably higher levels of food insecurity, mainly attributed to drought, showed a higher willingness to consume GMOs than those with less exposure to food insecurity.

The pro-GMO messages have therefore targeted to present GMOs as the solution to the country's hunger crises citing pest and drought resistance properties of their varieties. These claims have gotten many Kenyans shifting their perspective that one would rather eat "something bad, unsafe" than die of hunger. It is a straightforward game of manipulation, riding on the current food insecurity challenges used by the pro-GMO groups to mislead the public. Bt maize and Bt Cotton varieties might have (as designed by the producers of these varieties) pest resistance to specific pests but do not in any way have any advantages in terms of drought resistance.

By claiming that GMOs will enhance production in the context of climate change, reducing precipitation/increasing drought frequency and severity, the pro-GMO groups are taking advantage of the current situation to persuade uninformed Kenyans. When promoting GMOs, reference to the hunger situation also creates a false perception that GMOs are meant to solve the hunger crisis.



Vulnerability due to inadequate knowledge

Based on the study, only 49% of Kenyans had top-of-mind awareness of GMOs. This state, however, does not translate to extensive knowledge and understanding of the subject matter. The lack of or inadequate knowledge of GMOs, including understanding the technology and process of genetic modification and the different GM traits, predisposes Kenyans to misinformation and manipulation. While a more profound analysis would be helpful to understand what pro-GMO messages are deployed to sway the opinions of Kenyans, it is clear that most of the messages shared by the pro-GMO groups are inaccurate/exaggerated.



Stay Alert

Ensure all the information
received on GMOs is verifiable

Vulnerability due to livelihood threats

This study further reveals that, contrary to popular belief, people engaged in farming activities are more willing to consume GMOs than those not involved in farming activities. This observation is attributable to the perception that farming will be impossible without GMOs. Pro-GMO groups continue to refer to climate change effects on agriculture and propose that GMO varieties can withstand extreme weather conditions and climate change effects.

The high willingness of producers to embrace GMOs further shows how the persistent misinformation on GMOs and climate change is influencing the perception of Kenyans who are either affected directly or concerned about the country's food security. Reference to Kenyans who struggle as a result of hunger in the pro-GMO campaigns creates a false impression that as soon as GMOs are approved, the hunger problem will be solved.

As livelihoods are threatened,
more and more Kenyans
embrace GMOs



Conclusion and Recommendations

The survey results have shown that consumers are generally not willing to consume GMO foods. It is important therefore that the government respects the views of consumers and stop any further push for GMO products until there is clear evidence that consumers are not only willing to eat GMOs, but actually demand and ask through public participation and democratic representation structures. It will be against the will of the Kenyan people to introduce GMO foods in the country when it is clear that a majority of Kenyans do not want to consume that kind of food as is clearly demonstrated in this report.

However, the proportion of Kenyans willing to consume GMOs has increased over the last few years, which is important to note. It is incumbent upon the government of Kenya, through the National Biosafety Authority which is the institution mandated to manage all GMO and biosafety-related issues in the country to ensure that there are clear mechanisms and capacity to be able to manage as per globally accepted practice a food market where both GMO and non-GMO food exists. Mechanisms for safety checks, labelling, and robust monitoring in the market to ensure compliance should be put in place as the minimum requirement for any further developments around GMOs in the country.

The current perceptions among many Kenyans on GMOs are based on highly polarising and unfactual information from both sides of the debate. Civil Society Organisations chanting anti-GMO slogans have mainly made their case based on the highly controversial Selarini study with claims that GMOs have been scientifically proven to be carcinogenic. While there are reasonable doubts about the health effects of GMOs, the claims that genetically modified foods cause cancer are still disputed globally and unverifiable. There is however no evidence also that GMOs are 100% safe for human consumption as they haven't been used long enough to give substantial data/assurance of safety. The pro-GMO group has also been misinforming the public, intentionally to get attention and lure the general public to believe that GMOs are the solution to their problems. Some of the misleading claims include: that GMOs are resistant to all pests and diseases, that GMO crops (eg. Bt. Maize) can grow in drought conditions and therefore ensure production in ASAL areas, that GMO crops (mainly Bt. Maize) have better nutrition.

The survey reveals that the government, through the National Biosafety Authority, has done very little to ensure the dissemination of factual, unbiased information to Kenyan consumers on GMOs and emerging biosafety issues. Only 18% of the surveyed consumers indicated having received information about GMOs from the Government of Kenya. This clearly shows the existing room for manipulation of the public through misinformation on issues related to GMOs. There is a need for the National Biosafety Authority to step up and ensure that it not only provides the needed information to the public but also regulates what information is made available to the public.

Considering that the Kenyan audience has been treated to 10 years of controversy and misinformation, it is incumbent upon the government, to ensure that before any further "public participation" processes are undertaken, there should be clarity and factual information provided to Kenyans about GMOs. Any public participation processes in the context of an unformed and misinformed public can not be substantiated as opinions are shared and issues discussed on the basis of wrong information and judgement.

Conclusion and Recommendations

Socio-economic factors also play a major role in determining perceptions, and willingness to consume GMO foods. While the majority of Kenyans said they are not willing to consume GMOs throughout the country- regions with high levels of food insecurity and exposure to drought and other food production challenges except for a few showed higher willingness to consume GMOs. This clearly indicates willingness as a result of desperation, whereas one chooses the lesser evil between the food they don't want and facing hunger and starvation. It is clear from the analysis of pro-GMO conversations and statements in media from the lead protagonists that there is a tendency to take advantage of the food insecurity situation affecting millions of Kenyans, some directly and others indirectly to push the pro-GMO narrative.

Civil society organisations should go beyond sensational health claims about GMOs. There is a need to have a deeper conversation about GMOs, the real issues surrounding GMOs with clear facts rather than focus on unverifiable health claims. While raising health concerns might have been a great strategy to maintain the status quo, Kenyans are now ready to have a more structured debate to understand the politics, and economics of GMOs. From the growing reception of GMOs, it is clear that the Kenyan consumer is not buying the health argument and therefore increasingly getting attracted to the socio-economic arguments from pro-GMO groups. It is important for CSOs to systematically challenge the misinformation on GMOs and put to the table a strong alternative argument.



Appendices

Study tool

Introduction and Consent

Good morning/ Good afternoon/Good evening/ Sir/Madam!

My name is ... from Infotrak Research & Consulting. We are surveying the awareness and perceptions of Kenyans regarding GMOs. These are plants where the seeds' genetic material (DNA) has been altered in a way that does not occur naturally. The Route to Food Initiative has commissioned the survey. I hope you can spare a few minutes to share your thoughts. If you agree to participate in this survey, your views will be consolidated with those of other Kenyans to produce a report on Kenyan's knowledge, awareness, and perceptions regarding GMOs. Any information or feedback you provide will be kept strictly confidential and will not be used for any other purpose than this study. None of the answers you give will be attributed to you directly but will be pooled together with different responses to give us an idea of general views. There are no right or wrong answers. Your honest opinion will be highly valued. The interview will take approximately 10 minutes to complete, and your participation is voluntary. Are you willing to participate in the survey?

1. Yes [Thank Respondent and Proceed] 2. No [Thank respondent and terminate]

Region	
County	
Constituency	
Ward	

MAIN SURVEY

1. Do you know what GMOs are?
 - Yes (Skip to Q3)
 - No (READ OUT the definition of GMOs and ask Q2. These are plants in which the genetic material (DNA) of the seeds has been altered in a way that does not occur naturally).
2. Do you now understand what GMOs are?
 - Yes (Continue)
 - No (Terminate)
3. Would you be willing to consume GMO food?
 - Yes
 - No
4. Are you aware of the ban that was imposed on GMO plants by the Government of Kenya?
 - Yes
 - No

5. Where do you get information about GMOs?
 - Internet and social media
 - Family and friends
 - Newspapers and magazines
 - TV
 - Radio
 - Nutrition and healthcare providers
 - Extension officers
 - Others (specify)
6. Have you ever received information about GMOs from the government?
 - Yes
 - No
7. Have you been vaccinated against COVID-19?
 - Yes
 - No
8. If NO, do you intend to take any COVID-19 vaccines available in Kenya?
 - Yes
 - No
9. If NO, why do you not intend to take any of the available COVID-19 vaccines in Kenya?
 - I do not trust the makers of the vaccines
 - The side- effects of the vaccines are likely to be harmful/fatal
 - I doubt the efficacy of the vaccines because of the virus strains and constant mutations
 - I do not think they are safe
 - It would be against my religious beliefs to receive any of the vaccines
 - Other (specify)

DEMOGRAPHICS

Thank you very much. Your responses have been beneficial. I need to confirm some of your details as we close.

D1. Gender	Male
	Female
D2. Age	18-24 years
	25-35 years
	36-45 years
	46-55 years
	56-59 years
	60+ yrs.
D3. Location: Do you live in an urban or rural setting?	Urban Rural
D4. Do you have any form of Disability	Yes
	None
D5. The highest level of education attained	No formal education
	Primary
	Secondary
	Certificate
	Diploma
	Degree
	Post-graduate
	Other (Specify)
D6. Do you practice any form of farming (Crop farming / Livestock Rearing)?	Yes No
Respondent Name	[Type Name]

Thank you for participating

Publication Information

Publisher	Route to Food Initiative
Publication Date	December 2022
Design & Layout	Genio PR Limited



Opinions expressed in this report are based on data collected independently by Infotrak Research & Consulting. The findings in this report are subject to Creative Commons License CC BY-NC-ND 4.0: <https://creativecommons.org/licenses/by-nc-nd/4.0>

About the Route to Food Initiative

The Route to Food Initiative (RTFI) is a programme of the Heinrich Böll Stiftung in Nairobi. The Initiative works towards realising the human right to food in Kenya through awareness creation on food rights and food systems-related issues, facilitating dialogue on equitable, sustainable approaches to food and farming systems.

Our activities aim to challenge the status quo, and we ask pertinent questions around the political and economic interests for example that continue to sustain chronic hunger, malnutrition, inadequate and unaffordable food, in addition to the various social divisions like gender that mediate women's personal and community experiences with food.

The initiative relies on mainstream and alternative communications and an influencer-led campaign to promote agroecology as the most viable approach to food security and attainment of the Right to Food for all.

The report will be available on our website (www.routetofood.org). For more information and inquiries, email Emmanuel Atamba at atamba@routetofood.org or call +254(0)202680745.

