ASSESSING FARMERS' PERCEPTIONS AND AWARENESS OF GENETICALLY MODIFIED TELA MAIZE IN SELECTED DISTRICTS OF PAIKO AND CHANCHAGA L.G.A.s OF NIGER STATE USING PARTICIPATORY RURAL APPRAISAL (PRA) APPROACH

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OCTOBER, 2025

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A PROJECT SUBMITTED TO THE DEPARTMENT OF BOTANY,

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DEPARTMENT OF BOTANY,

FACULTY OF LIFE SCIENCES,

AHMADU BELLO UNIVERSITY, ZARIA

OCTOBER, 2025

DECLARATION

I declare that the work in this project entitled "**ASSESSING FARMERS' PERCEPTIONS AND AWARENESS OF GENETICALLY MODIFIED TELA MAIZE IN SELECTED DISTRICTS OF PAIKO AND CHANCHAGA L.G.A.s OF NIGER STATE USING PARTICIPATORY RURAL APPRAISAL (PRA) APPROACH**" has been carried out by me in the Department of BOTANY, AHMADU BELLO UNIVERSITY, ZARIA. The information derived from literature has duly been acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at this or any other institution.

IDRIS SAMIR SAIDU _____

(U19BT1033) SIGNATURE DATE

CERTIFICATION

This project entitled "**ASSESSING FARMERS' PERCEPTIONS AND AWARENESS OF GENETICALLY MODIFIED TELA MAIZE IN SELECTED DISTRICTS OF PAIKO AND CHANCHAGA L.G.A.s OF NIGER STATE USING PARTICIPATORY RURAL APPRAISAL (PRA) APPROACH**" by IDRIS SAMIR SAIDU meets the regulations governing the award of the degree of Bachelor of science (B.Sc.) in Botany of Ahmadu Bello University, and is approved for its contributions to knowledge and literary presentation.

Dr. Abdullahi Mijinyawa _____

(Project Supervisor) Signature Date

Prof. R.E. Aliyu _____

(Head of Department) Signature Date

Prof. Saidu Abdulkadir _____

(External Examiner) Signature Date

DEDICATION

This work is dedicated to my beloved parents, whose prayers, love, encouragement, and unwavering support have been my greatest motivation.

To the farmers of Paiko and Chanchaga Local Government Areas, who generously shared their time, experiences, and knowledge to make this study possible, this research is a tribute to your resilience, hard work, and commitment to agricultural development.

Finally, to all researchers and advocates of agricultural innovation striving to improve food security and rural livelihoods through science and participatory engagement, this work is dedicated to you.

Table of Contents

Content **Page**

COVER PAGE..... i
TITLE PAGE..... ii
DECLARATION..... iii
CERTIFICATION..... iv
DEDICATION..... v
LIST OF TABLES..... viii
LIST OF FIGURES..... ix
ACKNOWLEDGMENT..... x
ABSTRACT..... xi
CHAPTER ONE..... 1
1.0 INTRODUCTION..... 1
1.1 Background of the Study..... 1
1.2 Farmers' Awareness and Perception of Genetically Modified Crops..... 2
1.3 The Participatory Rural Appraisal (PRA) Approach..... 3
1.4 Statement of the Problem..... 3
1.5 Justification of the Study..... 4
1.6 Aim of the Study..... 4
1.7 Objectives of the Study..... 4
1.8 Hypothesis..... 4
CHAPTER TWO..... 6
2.0 LITERATURE REVIEW..... 6
2.1 Maize Cultivation in Northern Nigeria..... 6
2.2 Tela Maize Varieties in Nigeria..... 7
2.3 Rural Households Perceptions Towards GM Maize..... 9
2.4 Factors that Influence GM Maize awareness, Participation, and Intensity of Production among Rural Households..... 10
CHAPTER THREE..... 14
3.0 MATERIALS AND METHODS..... 14
3.1 Study Area..... 14
3.2 Procedure..... 14
3.3 Questionnaire..... 15
3.4 Focus Group Discussion Guide..... 17
3.5 Key Informant Interview Guide..... 18

3.6 Experimental Design.....20
3.7 Data Collection.....20
3.8 Data Analysis.....20
3.9 Statistical Analysis.....20
CHAPTER FOUR.....21
4.0 RESULTS.....21
4.1 Socio-Demographic Characteristics of Respondents (Section A).....21
4.2 Awareness of TELA Maize.....24
4.3 Perception of TELA Maize.....27
4.4 Factors Influencing Adoption of TELA Maize.....29
4.5 Extension Services and Policy Recommendations.....32
4.6 Proportion Estimates (with 95% CIs).....35
4.7 Chi-square Goodness-of-Fit (vs neutral baselines).....37
4.8 Findings from Focus Group Discussions (FGDs).....39
4.9 Findings from Key Informant Interview (KII).....43
CHAPTER FIVE.....47
5.0 DISCUSSION, CONCLUSION, AND RECOMMENDATIONS.....47
5.1 Discussion.....47
5.2 Conclusion.....48
5.3 Recommendations.....48
REFERENCES.....50
APPENDIX.....53

LIST OF TABLES

Table **Title** **Page**

Table 4.1: Socio-Demographic Characteristics of Respondents (N = 205).....23

Table 4.2: Awareness of TELA Maize in Paiko and Chanchaga LGAs Niger State.....26

Table 4.3: Perception of TELA Maize in Paiko and Chanchaga LGAs Niger State (N = 205)...29

Table 4.4: Factors Influencing Adoption of TELA Maize (Normalized to N = 205 per Question).....31

Table 4.5: Extension Services and Policy Recommendations (N = 205).....34

Table 4.6 Proportion Estimates (with 95% CIs).....37

Table 4.7 Chi-square Goodness-of-Fit (vs neutral baselines).....39

Table 4.8: Focus Group Discussions on Farmers' Awareness and Perception of TELA Maize……42

Table 4.9: Key Informant Interview on Awareness and Perception of TELA Maize……..…46

LIST OF FIGURES

Table **Title** **Page**

Fig. 1: Age distribution of the respondent in Paiko and Chanchaga LGAs Niger State.....24

Fig. 2: Knowledge of TELA Maize in Paiko and Chanchaga LGAs Niger State.....27

Fig. 3: Factors Influencing Decision to adopt Tela Maize in Paiko and Chanchaga LGAs Niger State.....32

Fig. 4: Support needed to adopt TELA maize in Paiko and Chanchaga LGAs Niger State....35

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May Allah bless and reward all those who have in one way or another contributed to the success of this work.

ABSTRACT

This study ascertained maize farmers' perceptions and awareness of genetically modified (GM) TELA maize in specific districts of Paiko and Chanchaga Local Government Areas (LGAs) within Niger State, Nigeria. 205 respondents were selected for the survey using a mixed-methods approach. Data were collected with Surveys, FGDs (Focus Group Discussions) and KIIs (Key Informant Interviews) and analyzed with frequencies, percentages, and mean scores. Findings indicated that awareness of TELA maize was minimal (20.49%), with most participants receiving information mainly from fellow farmers and extension agents. Although awareness was limited, the perceptions of TELA maize were generally favorable: 76.10% believed it to be advantageous, and 76.59% showed readiness to grow it, citing its high yield potential and resistance to pests and drought as major incentives. Statistical evaluations revealed that significant variations in awareness and perceptions among different socio-demographic groups had a positive influence. More awareness of GMO maize crop should be created to enable farmers make informed decisions in line with their perception of the crop.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

Agriculture plays a vital role in Nigeria's economy, contributing significantly to food security, employment, and rural development. Maize (*Zea mays*), one of the most widely cultivated cereal crops in the country, serves as a staple food for millions of Nigerians and as a key raw material for livestock feed and agro-industries (IITA, 2020). Despite its importance, maize production in Nigeria faces numerous challenges, including climate change, pest infestations, and declining soil fertility (Badu-Apraku and Fakorede, 2018).

One of the most devastating threats to maize production in Nigeria is the Fall Armyworm (*Spodoptera frugiperda*), which has caused substantial yield losses since its invasion of Africa in 2016 (Prasanna *et al*., 2018). Traditional pest control methods, including chemical pesticides, have proven insufficient and unsustainable due to their high costs, environmental concerns, and resistance development among pests (Kumela *et al*., 2019). Additionally, recurrent droughts further threaten maize productivity, exacerbating food insecurity in the country.

In response to these challenges, genetically modified (GM) crops have been developed to improve resistance to pests and environmental stresses. One such innovation is TELA maize, a genetically modified variety bred to withstand Fall Armyworm attacks and tolerate drought conditions (ISAAA, 2021). The TELA maize project, an initiative supported by the African Agricultural Technology Foundation (AATF) and other research organizations, aims to enhance food security by providing farmers with maize varieties that require fewer pesticides and can withstand harsh climatic conditions. However, despite its potential benefits, the

adoption of TELA maize in Nigeria remains relatively low due to various socio-cultural, economic, and informational barriers.

Genetically modified foods (GMFs), GMOs or engineered foods refer to foods produced from genetically modified plants or animals, whose DNA have undergone modifications either by an inherent or a foreign DNA (transgenes) for improvement of the targeted organism. Genetically modified foods were introduced to Nigeria by National Biotechnology Development Agency (NBDA) to combat food security issues and other agricultural challenges. After the introduction, the Nigerian Government believed that the products can be released to the market. This brought persistent arguments by Nigerians on the perception and acceptance of the GM foods. The basis for the arguments were made on factors such as safety, environmental threat, price, means of colonization, food security, family size, potentiality, income, awareness of GM foods. These arguments were by individuals and organizations within various areas/fields in Nigeria. The perception led to the division of Nigerians to protagonists and antagonists with regards to GMOs (Jibril *et al*., 2022).

1.2 Farmers' Awareness and Perception of Genetically Modified Crops

The adoption of any new agricultural technology is largely influenced by farmers' awareness, knowledge, and perceptions of its benefits and risks (Akinbo *et al*., 2019). Studies have shown that many farmers in Nigeria have limited knowledge about genetically modified crops due to inadequate extension services, misinformation, and cultural biases (Gouse *et al*., 2016). Concerns about health risks, environmental safety, and corporate control over seeds have contributed to scepticism regarding GM crops, even when scientific evidence supports their safety and effectiveness (Adebayo *et al*., 2020).

Understanding farmers' awareness and perceptions of TELA maize is crucial for designing effective communication and policy strategies that encourage adoption. Previous research in

other African countries, such as South Africa and Kenya, has shown that targeted extension programs, farmer field schools, and participatory engagement significantly enhance the acceptance of GM crops (Chambers, 1994; Mignouna *et al*., 2020). However, there is limited empirical data on how Nigerian farmers, particularly in Niger State, perceive TELA maize and what factors influence their willingness to adopt it.

1.3 The Participatory Rural Appraisal (PRA) Approach

Traditional top-down approaches to agricultural research and development often fail to address the needs and concerns of local farmers effectively. The Participatory Rural Appraisal (PRA) approach, introduced by Robert Chambers in the early 1990s, offers an alternative method that emphasizes farmer participation in decision-making and knowledge sharing (Chambers, 1994). PRA involves using a range of participatory tools, such as focus group discussions (FGDs), transect walks, resource mapping, and key informant interviews, to gather insights from farmers about their experiences, challenges, and perceptions of new technologies.

PRA is particularly effective in rural agricultural settings because it allows farmers to express their views in a collaborative environment, fostering trust and engagement with researchers and policymakers (Pretty *et al*., 1995). By employing the PRA approach in this study, we aim to gain a deeper understanding of how farmers in Niger State perceive TELA maize and what factors influence their decision-making regarding its adoption.

1.4 Statement of the Problem

Although Tela maize was developed to improve productivity through pest resistance and drought tolerance, its acceptance among farmers in Niger State remains uncertain. There is limited understanding of how farmers perceive and experience its cultivation, creating a

major knowledge gap. This gap constrains the design of effective adoption strategies and slows the integration of biotechnology into local farming systems.

1.5 Justification of the Study

Farmers' perceptions and acceptance are critical for the success of Tela maize and other GMO innovations in Niger State. Addressing this knowledge gap will reduce misinformation, highlight real benefits and constraints, and support informed decision-making. The study will equip policymakers, researchers, and extension agents with evidence needed to design effective strategies for sustainable adoption.

1.6 Aim of the Study

This study aims to assess farmers' awareness and perceptions of genetically modified Tela Maize in selected districts of Niger State using the Participatory Rural Appraisal (PRA) approach.

1.7 Objectives of the Study

- To evaluate farmers' awareness and knowledge of TELA maize, and examine their perceptions of its agronomic, health, and environmental impacts.
- To identify the key benefits, barriers, and enabling factors such as seed costs, awareness levels, and technical support that shape adoption decisions.
- To generate evidence-based data that can guide policymakers, researchers, and stakeholders in promoting TELA maize as a pathway to improved productivity, food security, and climate resilience.

1.8 Hypothesis

Null Hypothesis (H_{01}): There is no significant difference in farmers' awareness and perceptions of TELA maize across the selected districts.

Null Hypothesis (H_{02}): There is no significant relationship between key factors such as seed cost, awareness level, and technical support, and farmers' decisions to adopt TELA maize.

Null Hypothesis (H_{03}): There is no significant difference in the evidence-based data generated that can guide policymakers, researchers, and stakeholders.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Maize Cultivation in Northern Nigeria

Maize (*Zea may* L.) is the third most important cereal crop in the world, after rice and wheat (FAO, 2023). It is a major cereal crop cultivated across all agro-ecological zones of Nigeria, where it serves as both a staple food and an industrial raw material. Globally, maize production reached approximately 1.22 billion tonnes from about 205 million hectares in 2023, reaffirming its position as one of the world's most widely grown crops (FAO, 2024).

Nigeria remains the largest producer of maize in Africa, with an annual production of about 12.7 million tonnes cultivated on approximately 6.5 million hectares of land and an average yield of 2.0 tonnes per hectare (FAO, 2024; USDA, 2023). Maize is grown across nearly all agro-ecological zones of the country, serving as both a staple food and a vital industrial raw material. The grains are consumed in various forms — boiled, roasted, baked, or processed into traditional foods such as Eko (Yoruba), Kamu (Hausa), and Akamu (Igbo) (Adepoju *et al.*, 2022). Nutritionally, maize provides approximately 3,400 kcal/kg of metabolizable energy, making it a major source of dietary carbohydrates (FAO, 2023). Beyond human consumption, maize is a key raw material for breweries, starch industries, and livestock feed production (IITA, 2021). Despite its importance, maize production in Nigeria is still dominated by smallholder farmers cultivating less than two hectares on average, often relying on traditional farming practices (FAO, 2024). Challenges such as low soil fertility, inadequate fertilizer application, and limited access to improved seed varieties continue to constrain productivity, particularly across sub-Saharan Africa (Abdulrahman *et al.*, 2023; IITA, 2024).

Also, periodic drought caused by irregular rainfall distribution reduces maize yields by an average of 15% each year (Omolaiye, 2016). In Northern Nigeria, maize farming faces plenty

of challenges that make it hard to produce on a large scale. The major issues are living threats like pests (both animals and insects), plant diseases, nematodes, and stubborn weeds. On top of that, there are non-living problems like poor soil nutrients, harsh weather conditions, and tough soil types. Farmers also deal with poor farming practices, transportation problems, and social factors that make things even harder. Maize production in the Northern parts of Nigeria is characterized with myriads of challenges which often limit large scale production. Chief among these bottlenecks are biotic in nature such as vertebrate and invertebrate pests, disease pathogens, nematode and weeds. Added to those are the abiotic challenges like nutrient deficiencies, environmental issues such as the unfriendly climatic and edaphic factors, agronomic, logistic and social constraints among others (Amos *et al*., 2023).

A number of crop production and protection challenges limiting maize production in the Northern part of Nigeria have been identified, which are largely the unfavourable biotic and abiotic factors. The way forward is by strictly following the control strategies such as using appropriate cultural, chemical and other methods to combat various production constraints; Pests can be reduced by manipulation of cultural practices, for example, depth of planting, soil and water management, soil amendments, establishment of plant quarantine laboratories and deployment of more extension workers to the region. Farmers should form cooperative societies to ease access to farm inputs. Also, government should buy excess produce from farmers and provide price incentives for them so as to increase the national food reserve base while reducing the global food crisis at large (Amos *et al*., 2023).

2.2 Tela Maize Varieties in Nigeria

In recent years, Nigeria has taken a bold step toward addressing key agricultural challenges by introducing TELA maize, a genetically modified crop designed to resist pests and tolerate moderate drought conditions. The varieties released in 2024—SAMMAZ 72T, SAMMAZ 73T, SAMMAZ 74T, and SAMMAZ 75T—were developed through the TELA Maize

Project, a public-private initiative led by the African Agricultural Technology Foundation (AATF) in partnership with Nigeria's Institute for Agricultural Research (IAR) and other global stakeholders (AATF, 2024).

TELA maize builds upon the success of the Water Efficient Maize for Africa (WEMA) project by incorporating Biotechnology for pest resistance and drought-tolerant traits. The name TELA is drawn from the Latin word "tutela," meaning protection—a fitting title for a crop designed to protect yields against common threats like fall armyworm and stem borers (CIMMYT, 2024). These pests have historically contributed to significant yield losses across Nigerian farms, especially in the North.

Field trials across various agro-ecological zones in Nigeria showed that TELA maize can produce yields up to 10 tonnes per hectare, a stark improvement over the national average of 2.2 tonnes per hectare under traditional farming systems (USDA FAS, 2024). This makes it particularly promising for smallholder farmers who struggle with declining productivity due to pest infestations and erratic rainfall patterns.

Moreover, the economic impact of adopting TELA maize is expected to be substantial. Estimates suggest it could save Nigeria about ₦256 million annually in pesticide imports and usage by reducing the need for synthetic insecticides (Vanguard, 2024). Farmers will also benefit from lower production costs and less environmental pollution—a major concern linked to the overuse of agrochemicals.

Importantly, safety assessments have been carried out by the National Biosafety Management Agency (NBMA), which confirmed that TELA maize is safe for both human consumption and environmental health. According to NBMA, the crop does not contain harmful chemicals or new allergens and is as safe as conventional maize varieties (NBMA, 2024; Science Nigeria, 2024).

By commercializing these TELA varieties, Nigeria became the second African country, after South Africa, to approve genetically modified maize for cultivation. This move is seen not only as a milestone in agricultural biotechnology but also as a step toward enhancing national food security and resilience in the face of climate change (USDA FAS, 2024).

2.3 Rural Households Perceptions Towards GM Maize

Understanding rural households' perceptions of genetically modified (GM) maize is crucial for assessing the potential adoption and impact of this technology in agricultural communities. Research indicates that awareness and perceptions of GM maize among rural farmers in Nigeria and other African countries are influenced by various factors, including education, access to information, and previous experiences with improved crop varieties.

A study conducted in Abia State, Nigeria, revealed that a significant majority (67.4%) of maize farmers were unaware of GM maize crops. The same study found that farmers' perceptions of GM crops were not particularly favorable, with an average perception score of 2.4 on a scale where higher values indicate more positive perceptions. Key concerns among farmers included difficulties in marketing GM crops (mean score of 3.4), potential negative impacts of climate change on yields (mean score of 3.2), and the possibility of increased input requirements such as fertilizers and herbicides (mean score of 2.8). Factors positively influencing farmers' perceptions included age (β=1.023), previous experience with improved crop varieties (β=2.112), and internet access (β=2.317). Conversely, a higher number of household members with tertiary education negatively influenced perceptions (β=-0.721) (Oparaojiaku *et al*., 2024).

In Oyo State, Nigeria, research assessing smallholder farmers' awareness of GM crops found that over half (52.07%) of the respondents were either unaware or lacked knowledge about the benefits and costs of GM crops. The study highlighted that factors such as being male,

years of education, and sourcing seeds from credible sources significantly influenced awareness levels. The authors concluded that increasing educational opportunities and ensuring the use of credible seed sources could enhance awareness and understanding of GM crops among farmers (Obi-Egbedi *et al*., 2020).

Similarly, a study in Jos Metropolis, Plateau State, Nigeria, focusing on agricultural workers, found that only 48.3% had good knowledge of GM foods, and a mere 29.9% had a positive perception of them. The length of work experience was significantly associated with both knowledge ($p=0.039$) and perception ($p=0.011$) of GM foods. The study recommended regular and continuous training to improve knowledge and perceptions of GM foods among agricultural workers (Daboer *et al*., 2020).

Beyond Nigeria, research in Northern Ghana examined smallholder farmers' perceptions of GM crops. The study identified mixed perceptions: some farmers viewed GM crops positively, citing potential benefits, while others were skeptical due to concerns about environmental, health, and market risks. The authors recommended intensified public education to enlighten farmers about GM crops and related policies (Sanou *et al*., 2020).

These studies collectively suggest that rural households' perceptions of GM maize are shaped by a complex interplay of factors, including awareness levels, educational background, access to information, and socio-economic variables. Addressing misconceptions and enhancing knowledge through targeted educational programs and extension services could play a pivotal role in influencing the acceptance and adoption of GM maize among rural farmers.

2.4 Factors that Influence GM Maize awareness, Participation, and Intensity of Production among Rural Households

Understanding the factors that influence awareness, participation, and intensity of genetically modified (GM) maize production among rural households in Nigeria is crucial for developing

effective strategies to enhance adoption rates and improve agricultural productivity. Several studies have identified key determinants that play significant roles in these aspects.

1. Education Level

Education significantly impacts farmers' decisions to adopt new technologies, including GM maize. Higher educational attainment enhances a farmer's ability to access, process, and utilize information about innovative agricultural practices. For instance, research in Kano and Katsina States indicated that the educational level of the household head positively influenced the adoption of improved maize varieties (Umar *et al*., 2014).

2. Household Size

The size of a farmer's household can influence the likelihood of adopting GM maize. Larger households may provide more labor, which can facilitate the adoption of labor-intensive technologies like GM maize cultivation. Studies have shown that household size was statistically significant and positively related to the probability of adoption (Obayelu *et al*., 2017).

3. Farm Size

The size of a farmer's landholding can influence the likelihood of adopting GM maize. Larger farms offer more flexibility to experiment with new technologies without jeopardizing overall food security. Research indicates that total farm size had a statistically significant influence on the adoption of improved maize varieties (Obayelu *et al*., 2017).

4. Access to Extension Services

Extension services act as a bridge between researchers and farmers, providing crucial information about new technologies. Access to these services has been positively associated

with both the decision to adopt GM maize and the extent of its cultivation. For example, contact with extension agents was found to positively influence adoption rates (Chete, 2021).

5. Farming Experience

Years of farming experience can positively influence the adoption of improved maize varieties. Experienced farmers may have better knowledge and skills to assess and implement new technologies effectively. The coefficient of farming experience was found to be positive and statistically significant, implying that more years in farming increase the likelihood of adopting improved maize varieties (Obayelu *et al*., 2017).

6. Age of Household Head

The age of the household head can affect awareness and adoption of GM maize. Younger farmers are often more open to new technologies, whereas older farmers may exhibit risk aversion. Studies have shown that age had a significant influence on the adoption of improved maize seed varieties (Chete, 2021).

7. Membership in Farmer Associations

Participation in farmer groups or associations facilitates access to information, resources, and support networks, thereby influencing the adoption of GM maize. Farmers engaged in such groups are more likely to be exposed to new technologies and receive assistance in implementation. Research has indicated that membership in associations positively influenced adoption decisions (Chete, 2021).

8. Proximity to Market Centers

The distance from a farmer's residence to market centers can impact adoption decisions. Proximity to markets reduces transportation costs and provides better access to inputs and

information. Longer distances to markets were associated with lower probabilities of adopting improved maize varieties (Obayelu *et al*., 2017).

In conclusion, multiple interrelated factors influence the awareness, participation, and intensity of GM maize production among rural households in Nigeria. Addressing these determinants through targeted interventions can enhance adoption rates and contribute to improved agricultural productivity and food security.

CHAPTER THREE

3.0 MATERIALS AND METHODS

3.1 Study Area

The study was conducted in selected districts of Paiko and Chanchaga Local Government Area of Niger State, Nigeria. Niger State is a major agricultural hub with extensive maize production. The districts were selected based on their level of maize cultivation, accessibility, and willingness of farmers to participate.

3.2 Procedure

Selection of study districts based on maize farming intensity and accessibility.

Identification of key stakeholders, including local farmers, extension officers, and community leaders.

Development of PRA tools, such as focus group discussions and key informant interviews.

Data collection through direct engagement with farmers using semi-structured questionnaires and PRA techniques.

3.3 Questionnaire

FARMERS' AWARENESS AND PERCEPTIONS OF GENETICALLY MODIFIED TELA MAIZE USING PARTICIPATORY RURAL APPRAISAL (PRA) APPROACH IN SELECTED DISTRICTS OF NIGER STATE

QUESTIONNAIRE

Instructions:

This questionnaire is designed for academic research purposes. Kindly answer all questions honestly. Your responses will be kept confidential and used solely for research purposes.

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION

1. Gender: [ ] Male [ ] Female
2. Age (in years): [ ] 18–30 [ ] 31–45 [ ] 46–60 [ ] Above 60
3. Educational Level: [ ] No Formal Education [ ] Primary [ ] Secondary [ ] Tertiary
4. Marital Status: [ ] Single [ ] Married [ ] Divorced/Widowed
5. Farming Experience (Years): [ ] Less than 5 [ ] 5–10 [ ] 11–20 [ ] Above 20
6. Farm Size (Hectares): [ ] Less than 1 [ ] 1–3 [ ] 4–6 [ ] Above 6
7. Membership in Farmers' Association/Cooperative? [ ] Yes [ ] No

SECTION B: AWARENESS OF TELA MAIZE

8. Have you heard about TELA maize? [ ] Yes [ ] No
9. _____ If yes, where did you first learn about TELA maize? [ ] Radio/TV [ ] Agricultural Extension Officers [ ] Social Media [ ] Fellow Farmers [ ] Research Institutions [ ] Others:
10. How familiar are you with genetically modified (GM) crops? [ ] Very familiar [ ] Somewhat familiar [ ] Not familiar at all
11. Do you understand the difference between conventional and genetically modified

maize? [ ] Yes [ ] No

SECTION C: PERCEPTION OF TELA MAIZE

12. What are your views on TELA maize? (Tick all that apply)

    [ ] Increases maize yield [ ] Reduces pesticide use [ ] Resistant to pests/drought [ ] Unsafe for consumption [ ] May harm the environment [ ] Don't know much about it

13. Do you think TELA maize is beneficial for farmers? [ ] Yes [ ] No [ ] Not Sure
14. Are you willing to cultivate TELA maize? [ ] Yes [ ] No [ ] Not Sure
15. If no, what are your reasons? (Tick all that apply)

    [ ] Do not trust GM crops [ ] Too expensive [ ] Lack of information [ ] Unavailable in my area [ ] Religious/cultural reasons [ ] Others: __

SECTION D: FACTORS INFLUENCING ADOPTION

16. What factors would influence your decision to adopt TELA maize? (Tick all that apply)

    [ ] Availability of quality seeds [ ] Market access [ ] Government support [ ] Positive farmer feedback [ ] Scientific proof of safety [ ] Agricultural extension influence [ ] Others: _

17. Have you received any training on TELA maize? [ ] Yes [ ] No
18. If yes, how often do you receive agricultural technology updates? [ ] Regularly [ ] Occasionally [ ] Rarely [ ] Never

SECTION E: EXTENSION SERVICES AND POLICY RECOMMENDATIONS

19. Should the government promote TELA maize? [ ] Yes [ ] No [ ] Not Sure
20. What support do you need to adopt TELA maize? (Tick all that apply)

    [ ] Free/subsidized seeds [ ] More education/awareness [ ] Government policy support [ ] Market assurance [ ] More research

THANK YOU FOR YOUR TIME AND COOPERATION!

3.4 Focus Group Discussion Guide

FOCUS GROUP DISCUSSION (FGD) GUIDE

Target Participants: Smallholder Farmers (diverse by age, gender, experience, etc.)

Opening Questions

1. What types of maize do you currently grow?
2. What challenges do you face in maize farming (pests, drought, yield, etc.)?

Awareness and Information

3. Have you ever heard of TELA maize? If yes, where did you hear about it?
4. What do you know about genetically modified crops in general?
5. What is your understanding of the difference between traditional maize and TELA maize?

Perception and Experience

6. What are your feelings about planting genetically modified crops like TELA maize?
7. What benefits or risks do you associate with TELA maize?
8. Would you consider planting TELA maize in the future? Why or why not?

Barriers and Concerns

9. What are the reasons that might stop you from adopting TELA maize?
10. Are there any fears or community concerns related to eating or growing GM crops?

Influencing Factors

11. What might encourage you to try TELA maize (e.g., training, proof of safety, availability)?

12. How do religion, tradition, or local beliefs influence your farming decisions?

Support and Extension

13. Have you ever received any information or training about improved or GM crops?
14. What kind of support do you need to try out a new crop like TELA maize?

Closing Questions

15. What advice would you give to researchers or the government about introducing new crop technologies?
16. What messages or campaigns do you think would help people understand GM crops better?

3.5 Key Informant Interview Guide

KEY INFORMANT INTERVIEW GUIDE

Target Informants: Agricultural Extension Officers, Community Leaders, Agricultural Researchers, Seed Vendors, Policy Makers

Section A: Background Information

1. Can you tell us about your role in agricultural development in this area?
2. How long have you been working with farmers in this district?
3. What crops are most commonly cultivated here?

Section B: Awareness and Knowledge

4. Are you aware of TELA maize or other genetically modified (GM) maize varieties?
5. How did you learn about TELA maize?
6. What is your level of knowledge regarding the characteristics and benefits of TELA maize?

Section C: Perception and Reception

7. What are your personal views on the introduction of GM crops like TELA maize in Nigeria?
8. How have farmers in this area reacted to TELA maize so far (if applicable)?
9. Are there any prevailing myths, fears, or concerns among farmers regarding GM crops?

Section D: Adoption Factors

10. In your opinion, what are the main factors influencing farmers' decisions to adopt or reject TELA maize?
11. How do socio-cultural or religious beliefs affect the acceptance of GM crops in your community?
12. Are there logistical or economic barriers (e.g., seed access, price, market demand) limiting adoption?

Section E: Extension and Policy Support

13. Have there been any formal training or awareness campaigns on TELA maize?
14. What role have extension services played in promoting or demystifying GM crops?
15. What support do you think is necessary from the government or NGOs to encourage adoption?

Section F: Recommendations

16. What strategies do you suggest to improve farmers' understanding and acceptance of TELA maize?
17. Are there specific communication channels you believe would be most effective?

18. What policy changes or interventions would facilitate greater use of GM crops like TELA maize?

3.6 Experimental Design

The study adopted a descriptive survey research design with a mixed-method approach, combining qualitative and quantitative data. Farmers were selected using a multistage sampling technique, incorporating:

Purposive sampling to select districts with high maize production.

Stratified random sampling to ensure representation across age, gender, and farm size categories.

3.7 Data Collection

Data were collected using the following PRA techniques:

Focus Group Discussions (FGDs): To capture farmers' collective opinions and concerns about TELA maize.

Key Informant Interviews (KIIs): Conducted with extension agents and agricultural experts.

Questionnaires and Surveys: To quantify awareness levels, perceptions, and adoption trends.

3.8 Data Analysis

Qualitative Data: FGDs and KIIs were analysed using thematic content analysis.

Quantitative Data: Surveys were analysed using descriptive statistics, including frequencies, percentages, and mean scores.

3.9 Statistical Analysis

Chi-square test (χ^2): To examine the relationship between farmers' awareness and socio-demographic factors. T-test and ANOVA: To compare awareness levels and perceptions across different groups.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-Demographic Characteristics of Respondents (Section A)

Table 4.1 shows that majority of respondents were male (83.90%), while females constituted 16.10%. Most farmers were aged between 31–50 years (51.71%), followed by those above 50 years (28.78%) and 21–30 years (19.51%). Educationally, 39.02% had secondary education, 34.15% tertiary education, 18.54% primary education, and 8.29% had no formal schooling. Regarding marital status, 82.44% were married, 10.24% single, and 7.32% widowed or divorced. In terms of farming experience, 45.37% had over 10 years, 34.63% between 5–10 years, and 20.00% less than 5 years. Farm sizes varied, with 43.41% cultivating 2–5 hectares, 36.10% less than 2 hectares, and 20.49% more than 5 hectares. The majority (62.93%) depended on farming as their main source of income.

Table 4.1: Socio-Demographic Characteristics of Respondents (N = 205)

Variable	Category	Frequency	Percentage
Gender	Male	172	83.90%
	Female	33	16.10%
Age	21–30 years	40	19.51%
	31–50 years	106	51.71%
	Above 50 years	59	28.78%
Education Level	None	17	8.29%
	Primary	38	18.54%
	Secondary	80	39.02%
	Tertiary	70	34.15%
Marital Status	Single	21	10.24%
	Married	169	82.44%
	Widowed/Divorced	15	7.32%
Farming Experience	< 5 years	41	20.00%
	5–10 years	71	34.63%
	> 10 years	93	45.37%
Farm Size	< 2 hectares	74	36.10%
	2–5 hectares	89	43.41%
	> 5 hectares	42	20.49%
Main Income Source	Farming	129	62.93%
	Non-farming activities	76	37.07%

(PRA, 2025)

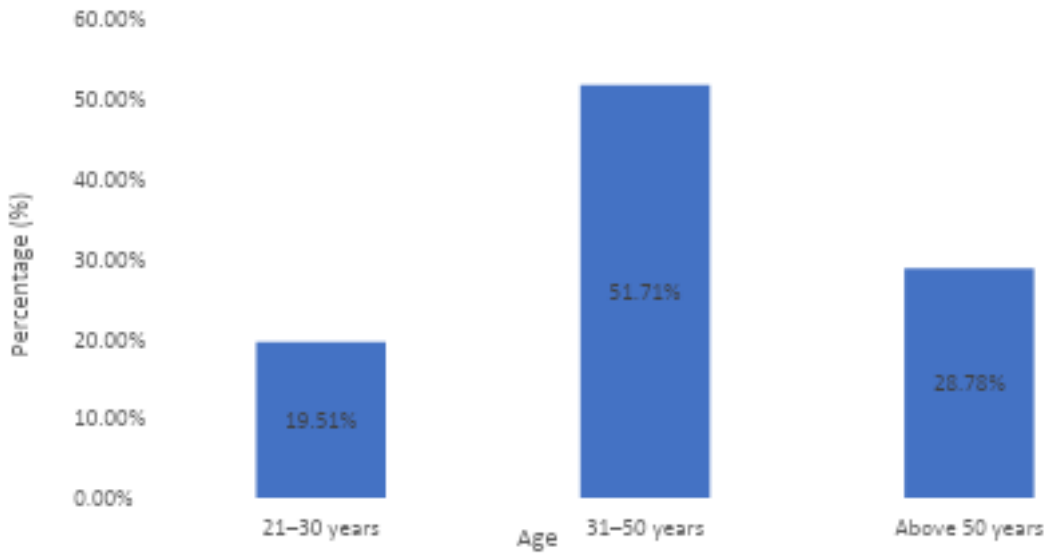


Fig. 1: Age distribution of the respondent in Paiko and Chanchaga LGAs Niger State

4.2 Awareness of TELA Maize

Table 4.2 shows the awareness of TELA maize among respondents was generally low. A majority (79.51%) had not heard about the crop, while only 20.49% reported awareness. This indicates a significant knowledge gap, suggesting that targeted sensitization efforts are needed to improve farmers' exposure to the technology.

Among those who had heard about TELA maize, the most common source of information was fellow farmers (35.29%), followed by agricultural extension officers (17.65%). Radio/TV, research institutions, and social media each accounted for 14.71% of responses, while 2.94% mentioned "no one." This reflects the importance of peer-to-peer learning and extension services as key channels for promoting agricultural innovations.

In terms of general knowledge about genetically modified (GM) crops, most respondents (64.39%) reported being "not familiar at all," 22.93% were "somewhat familiar," and only 12.68% were "very familiar." This shows a limited understanding of biotechnology concepts in the study area.

When asked if they understood the difference between conventional and genetically modified maize, 61.95% responded "No," while only 38.05% indicated "Yes." This highlights the need for targeted farmer education to build informed decision-making capacity.

Table 4.2: Awareness of TELA Maize in Paiko and Chanchaga LGAs Niger State

Variable	Category	Frequency	Percentage
Have you heard about TELA maize?	No	163	79.51%
	Yes	42	20.49%
If yes, where did you first learn about TELA maize?*	Fellow Farmers	12	35.29%
	Agricultural Extension Officers	6	17.65%
	Radio/TV	5	14.71%
	Research Institutions	5	14.71%
	Social Media	5	14.71%
	No one	1	2.94%
How familiar are you with genetically modified (GM) crops?	Not familiar at all	132	64.39%
	Somewhat familiar	47	22.93%
	Very familiar	26	12.68%
Do you understand the difference between conventional and genetically modified maize?	No	127	61.95%
	Yes	78	38.05%

(PRA, 2025)

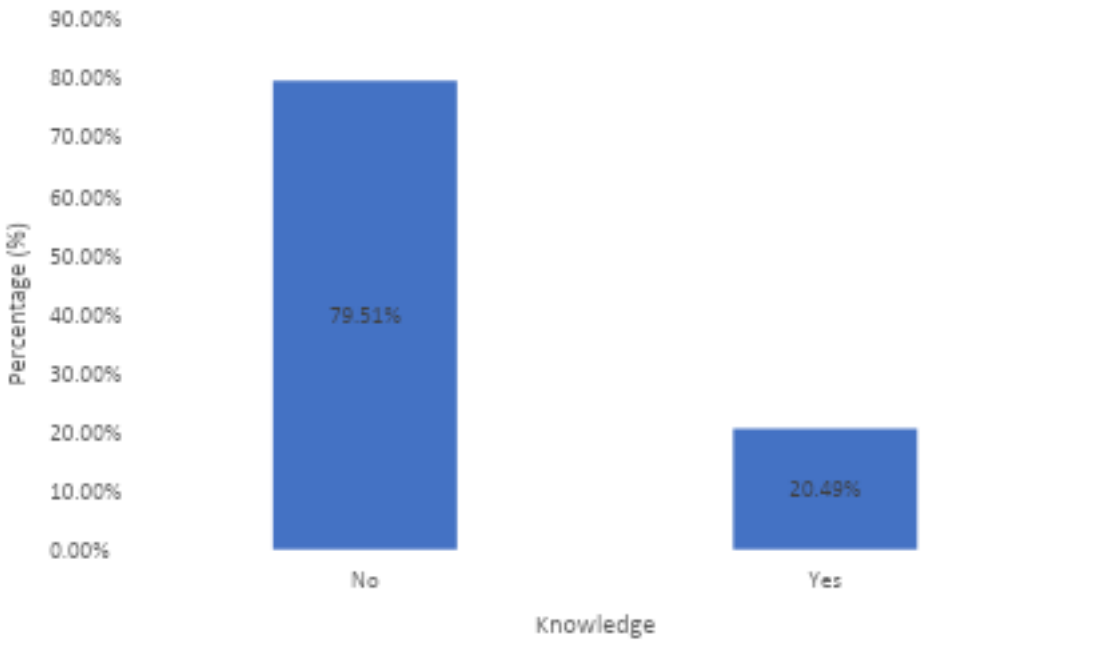


Fig. 2: Knowledge of TELA Maize in Paiko and Chanchaga LGAs Niger State

4.3 Perception of TELA Maize

Table 4.3 shows the perception of TELA maize among respondents was largely positive. In terms of specific views, the highest proportion (41.46%) believed that TELA maize increases maize yield, followed by those who saw it as resistant to pests/drought (20.49%) and capable of reducing pesticide use (20.49%). A smaller share admitted they did not know much about it (9.76%), while very few respondents associated it with being unsafe for consumption (4.88%) or harmful to the environment (2.93%).

When asked if TELA maize is beneficial for farmers, the majority (76.10%) agreed, while 23.90% disagreed. Similarly, most respondents (76.59%) expressed a willingness to cultivate TELA maize, suggesting a strong adoption potential should awareness and access improve.

For those unwilling to cultivate TELA maize, the most common reasons were that it was too expensive (38.54%) and a lack of trust in genetically modified crops (38.54%), with a smaller percentage citing lack of information (15.12%) and religious/cultural reasons (7.80%). These findings highlight that while perceptions are mostly favorable, addressing cost barriers, trust issues, and knowledge gaps will be key to increasing adoption rates.

Table 4.3: Perception of TELA Maize in Paiko and Chanchaga LGA Niger State (N = 205)

Variable	Response	Frequency	Percentage
What are your views on TELA maize?	Increases maize yield	85	41.46%
	Resistant to pests/drought	42	20.49%
	Reduces pesticide use	42	20.49%
	Don't know much about it	20	9.76%
	Unsafe for consumption	10	4.88%
	May harm the environment	6	2.93%
Do you think TELA maize is beneficial for farmers?	Yes	156	76.10%
	No	49	23.90%
Are you willing to cultivate TELA maize?	Yes	157	76.59%
	No	48	23.41%
If No, what are your reasons?	Too expensive	79	38.54%
	Do not trust GM crops	79	38.54%
	Lack of information	31	15.12%
	Religious/cultural reasons	16	7.80%

(PRA, 2025)

4.4 Factors Influencing Adoption of TELA Maize

In Table 4.4 Respondents identified several factors that would influence their decision to adopt TELA maize. The most frequently cited factor was high yield potential 28.9%, followed closely by pest/drought resistance, 22.44% and availability of seeds 18%. Other important considerations included affordability of seeds 13.66%, access to information 11.22%, and market demand 6.34%. These findings suggest that farmers' adoption decisions are shaped by both agronomic benefits and practical considerations such as cost and access.

With regard to training, the majority of respondents reported not having received any training on TELA maize, indicating a gap in farmer capacity-building efforts. For those who had received training, most reported getting agricultural technology updates occasionally, with smaller proportions receiving them frequently or rarely.

Table 4.4: Factors Influencing Adoption of TELA Maize (Normalized to N = 205 per Question)

Variable	Response	Frequency	Percentage
Factors influencing decision to adopt TELA maize	High yield potential	58	28.29%
	Pest/drought resistance	46	22.44%
	Availability of seeds	37	18.05%
	Affordability of seeds	28	13.66%
	Access to information	23	11.22%
	Market demand	13	6.34%
Training on TELA maize	Yes	68	33.17%
	No	137	66.83%
Frequency of agricultural technology updates	Frequently	32	15.61%
	Occasionally	107	52.20%
	Rarely	66	32.20%

(PRA, 2025)

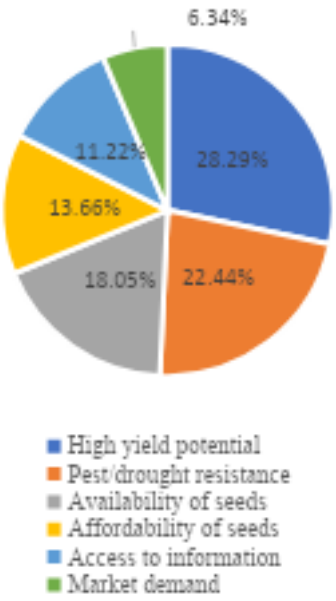


Fig. 3: Factors Influencing Decision to adopt Tela Maize in Paiko and Chanchaga LGAs Niger State

4.5 Extension Services and Policy Recommendations

In Table 4.5, when asked whether the government should promote TELA maize, an overwhelming 90.73% of respondents agreed, while only 9.27% disagreed. This demonstrates strong farmer support for policy interventions aimed at encouraging TELA maize adoption.

In terms of specific support needs, the most frequently cited was subsidy on seeds (31.71%), followed by training and capacity building (26.83%) and access to credit facilities (21.95%). Smaller proportions of respondents mentioned market linkages (9.27%), extension service visits (6.34%), and provision of farm inputs (3.90%). These results suggest that while financial incentives such as seed subsidies and credit access are critical, knowledge transfer and consistent technical support remain equally important to ensure sustained adoption.

Table 4.5: Extension Services and Policy Recommendations (N = 205)

Variable	Response	Frequency	Percentage
Government promotion of TELA maize	Yes	186	90.73%
	No	19	9.27%
Support needed to adopt TELA maize	Subsidy on seeds	65	31.71%
	Training and capacity building	55	26.83%
	Access to credit facilities	45	21.95%
	Market linkages	19	9.27%
	Extension service visits	13	6.34%
	Provision of farm inputs	8	3.90%

(PRA, 2025)

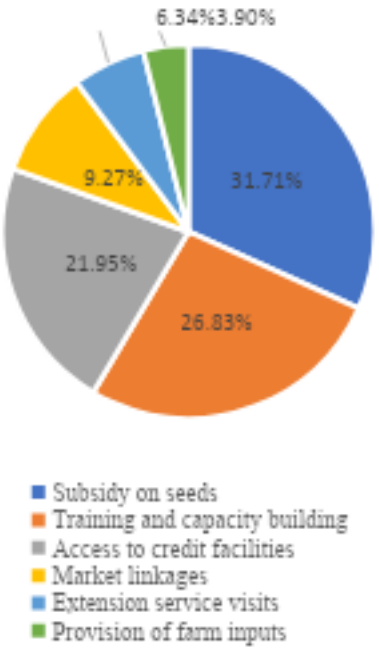


Fig. 4: Support needed to adopt TELA maize in Paiko and Chanchaga LGAs Niger State

4.6 Proportion Estimates (with 95% CIs)

Table 4.6 shows Awareness is low (~20%). Understanding GM vs conventional is below 40%. Perceptions and willingness are high (~76–77%). Training exposure is low (~33%). Support for government promotion is very high (~91%).

Table 4.6: Proportion Estimates (with 95% CIs)

Measure	Yes (n)	N	Proportion	95% CI (Wilson)
Aware of TELA	42	205	0.2049	0.1553 – 0.2653
Understands GM vs conventional	78	205	0.3805	0.3168 – 0.4486
Thinks TELA is beneficial	156	205	0.7610	0.6981 – 0.8142
Willing to cultivate TELA	157	205	0.7659	0.7033 – 0.8186
Received training on TELA	68	205	0.3317	0.2709 – 0.3987
Supports government promotion	186	205	0.9073	0.8598 – 0.9399

(PRA, 2025)

4.7 Chi-square Goodness-of-Fit (vs neutral baselines)

Table 4.7 shows awareness of TELA maize was significantly lower than a neutral 50% baseline, $\chi^2(1, N = 205) = 71.42$, $p < .001$; 20.5% (95% CI: 15.5%–26.5%) reported awareness. Familiarity levels were non-uniform, $\chi^2(2, N = 205) = 92.20$, $p < .001$, with most respondents "not familiar." Perceived benefit (76.1%) and willingness to cultivate (76.6%) were each significantly higher than 50% (both $p < .001$). Support for government promotion was very high (90.7%), $\chi^2(1, N = 205) = 136.04$, $p < .001$. Training exposure (33.2%) was significantly below 50%, $\chi^2(1, N = 205) = 23.22$, $p < .001$.

Table 4.7: Chi-square Goodness-of-Fit (vs neutral baselines)

Test	N	χ^2	df	p-value
Awareness (Yes/No) vs 50/50	205	71.42	1	< .001
Understands GM (Yes/No) vs 50/50	205	11.71	1	< .001
Familiarity (3 levels) vs Uniform	205	92.20	2	< .001
Thinks beneficial (Yes/No) vs 50/50	205	55.85	1	< .001
Willingness (Yes/No) vs 50/50	205	57.96	1	< .001
Training (Yes/No) vs 50/50	205	23.22	1	< .001
Govt promotion (Yes/No) vs 50/50	205	136.04	1	< .001

(PRA, 2025)

4.8 Findings from Focus Group Discussions (FGDs)

Table 4.8 shows two focus group discussions were conducted to gain deeper qualitative insights into farmers' awareness, perceptions, and adoption considerations for TELA maize. Each group comprised diverse participants in terms of age, education, and farming experience, providing a rich perspective on the topic.

Awareness of TELA Maize

As shown in Table 4.8, in Group 1, awareness levels were generally high, with most participants having heard about TELA maize through agricultural extension officers, radio programmes, and other farmers. Several participants could articulate the specific benefits of TELA maize, such as drought tolerance, pest resistance, and high yield potential. As one farmer put it:

"If it can resist pests and give me more harvest, then I am ready to try it."

By contrast, Group 2 displayed mixed levels of awareness. While a few members had heard about TELA maize, many were either unfamiliar with the name or unsure about its attributes. Information sources were limited, and there was some confusion between TELA maize and other improved maize varieties.

Perceptions and Attitudes

In Group 1, the perception of TELA maize was largely positive, especially regarding its ability to reduce pesticide use and improve productivity. Farmers expressed interest in trying it, provided the seeds were accessible and affordable.

Conversely, Group 2 exhibited more doubts. Concerns were raised about the safety of genetically modified (GM) crops, potential effects on human health, and environmental impacts. One participant cautioned:

"*We don't know what will happen to our health in the long run if we keep eating it.*"

Factors Influencing Adoption

Both groups agreed that yield performance, pest and drought resistance, and cost of seeds would be key determinants of adoption. However, Group 1 placed stronger emphasis on market demand and the potential to increase income, while Group 2 highlighted trust in the source of seeds and assurance of safety as prerequisites.

Barriers and Challenges

Common barriers identified across the groups included high seed costs, limited access to credit, and inadequate information dissemination. Group 2 particularly stressed the absence of effective extension service outreach in their communities, which they saw as a major limitation to adoption.

Support Needed for Adoption

Participants across both groups recommended government and NGO interventions, such as seed subsidies, training programmes, and provision of credit facilities. Group 1 also advocated for demonstration plots to enable farmers to see the crop's performance firsthand, while Group 2 emphasised the need for public sensitisation campaigns to address safety concerns and build trust.

Table 4.8: Focus Group Discussions on Farmers' Awareness and Perception of TELA Maize

Themes	Group 1 Responses	Group 2 Responses	Overall Insight
Type of Maize Grown	Mostly local and hybrid varieties	Primarily traditional/local maize	Traditional maize still dominant; limited GM exposure
Key Challenges	Pest infestation, drought, low yield, poor seed access	Pest outbreaks, small farm sizes, poor technical support	Shared constraints: pests, poor input access, and low productivity
Awareness of TELA Maize	Majority aware via radio, extension, or research institutions	Low awareness; few heard from peers or media	Group 1 shows much higher exposure to TELA maize
Knowledge of GM Crops	Moderate understanding—seen as high-yield, pest/drought resistant	Low understanding; linked to health risks or foreign influence	Knowledge gaps persist; misinformation common
Perceptions of GM Crops	Generally positive; viewed as solution to climate and pest issues	Skeptical; fear long-term effects, distrust technology	Perception split by exposure level and trust
Willingness to Plant TELA Maize	Majority willing; motivated by potential yield and income	Majority unwilling; hindered by fear and distrust	Awareness directly affects adoption willingness
Perceived Benefits	High yield, pest/drought resistance, reduced pesticide use	Pest resistance and yield potential (few mentioned)	Benefits recognized more by informed farmers

Risks or Concerns	Fear of consumption safety; misinformation	Fear of safety, religious objections	Common concern: perceived health risks
Adoption Barriers	High seed cost, limited availability, misinformation	Lack of trust, cultural skepticism, limited proof	Economic and cultural barriers constrain uptake
Encouraging Factors	Awareness campaigns, government support, affordable seeds	Research-backed evidence, subsidies, testimonials	Both groups call for support, training, and affordability
Training/Extension Support	Few trained, mostly through demonstrations	Very few trained, limited exposure	Extension contact still insufficient overall
Advice to Government/Researchers	Ensure seed affordability, involve farmers in trials	Provide proof of safety, respect beliefs, local engagement	Farmers want transparency, affordability, and involvement
Preferred Communication Channels	Radio, social media, local leaders	Local language, religious/community leaders	Locally grounded, language-appropriate outreach preferred

(PRA, 2025)

4.9 Findings from Key Informant Interview (KII)

Table 4.9 shows a key informant interview was conducted with an agricultural extension officer who has been working with farmers in the district for over 10 years. The officer provided insights on awareness, perceptions, adoption factors, and the role of extension services in promoting TELA maize.

Awareness and Knowledge

The informant demonstrated a high level of awareness of TELA maize, noting that they first learned about it after its formal introduction and confirmation by the Institute for Agricultural Research (IAR), Zaria. They described TELA maize as a drought-resistant, high-yielding, early-maturing variety suitable for consumption.

Perceptions and Reception

The extension officer viewed the introduction of GM crops like TELA maize positively, emphasizing their role in ensuring food security and addressing climate change challenges. They pointed out that drought tolerance and early maturity are critical traits that align with farmers' cropping systems. While some farmers who have adopted TELA maize have experienced improved yields, the informant noted that sensitization efforts are still ongoing.

However, they acknowledged the presence of misconceptions and fears among farmers, including concerns about the safety of genetically modified crops for human consumption and potential adverse effects.

Adoption Factors and Barriers

According to the informant, the primary factors influencing adoption are yield potential and drought tolerance. Adoption is limited by logistical and economic barriers, such as the limited availability of seeds, high seed prices, and low market penetration. Socio-cultural and

religious beliefs also play a role, with some farmers rejecting GM crops due to fears about genetic modification.

Extension and Policy Support

The officer reported that there have been formal training sessions and awareness campaigns on TELA maize. Extension services have promoted adoption through farmer sensitization and the use of demonstration plots to showcase the crop's performance.

They recommended that government and NGOs support adoption through intermediaries, grants, and loan facilities. The officer also suggested the use of social media and video-based extension methods to improve outreach and understanding among farmers.

Table 4.9: Key Informant Interview on Awareness and Perception of TELA Maize

Section	Question Area	Key Responses	Summary Insight
A. Background	Role in Agriculture	Extension and Agric. Officer, 10+ years' experience	Respondent has strong field experience and direct contact with farmers
	Common Crops	Rice, Maize, Soybean, Millet, Yam, Sorghum, Cowpea	Maize is a major staple among other key crops
B. Awareness & Knowledge	Awareness of TELA Maize	Yes; learned after introduction and IAR confirmation	Official awareness through institutional channels
	Knowledge of Benefits	Drought-resistant, high-yielding, early maturity, good for consumption	Strong technical understanding of TELA traits
C. Perception & Reception	Views on GM Crops	Supports GM maize for food security, drought tolerance, and climate adaptation	Positive perception toward TELA maize adoption
	Farmers' Reactions	Sensitization ongoing; adopters see higher yields	Early adopters satisfied; awareness still limited
	Fears/Myths	Some fear it's unsafe for consumption	Mild resistance due to misinformation

D. Adoption Factors	Drivers of Adoption	High yield, drought tolerance	Agronomic performance drives adoption
	Cultural/Religious Influence	Some see GM as unnatural	Cultural beliefs slightly hinder acceptance
	Barriers	Limited seed access, high cost, low adoption	Economic and logistical barriers remain key
E. Extension & Policy Support	Training Campaigns	Yes	Active awareness efforts exist
	Extension Role	Sensitization, demonstration plots	Extension crucial in promoting adoption
	Government/NGO Support Needed	Intermediaries, grants, loans	Financial and institutional support needed
F. Recommendations	Communication Channels	Social media, video-based extension	Modern, visual outreach recommended
	Policy Suggestions	No direct comment	Indicates need for clearer communication policies

(PRA, 2025)

CHAPTER FIVE

5.0 DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

5.1 Discussion

The study assessed farmers' awareness, perceptions, and adoption readiness regarding genetically modified (GM) TELA maize. The results show a significant awareness gap, with only 20.49% of respondents having prior knowledge of TELA maize. This is consistent with Akinwale *et al*. (2022), who found that low exposure to biotechnology innovations in rural Nigeria is largely due to weak extension coverage and poor information dissemination strategies. The reliance on peer farmers for information, rather than formal extension services, mirrors the findings of Olayemi *et al*. (2021), who noted that informal farmer networks remain the dominant source of agricultural knowledge but often perpetuate incomplete or inaccurate information.

Perceptions of TELA maize among informed farmers were generally favorable, with a substantial proportion associating it with high yield potential, pest and drought resistance, and reduced pesticide use. These perceptions align with Nwaogu *et al*. (2021), who reported that farmers are more receptive to GM crops when they are aware of tangible benefits. However, concerns over food safety, environmental risks, and ethical implications were also noted—reflecting the skepticism identified in Kimenju and De Groote's (2020) study on GM crop acceptance in Africa.

Adoption decisions were influenced by both agronomic benefits and economic considerations. While yield improvement and resilience traits were key motivators, high seed costs, limited access to credit, and insufficient market linkages emerged as major barriers. This dual influence echoes Ouma *et al*.'s (2020) argument that successful technology

adoption requires not only desirable agronomic traits but also favorable economic conditions and value chain integration.

Policy and institutional support were also recognized as critical factors. The overwhelming support (90.73%) for government promotion of TELA maize indicates readiness for formal policy-backed interventions. According to FAO (2021), such institutional endorsements when coupled with clear communication and access facilitation can accelerate technology uptake. Farmers in this study identified seed subsidies, training, and improved credit facilities as their top priorities for government and NGO support, which aligns with the recommendations of Maredia *et al*. (2021) for enhancing the adoption of agricultural innovations in developing economies.

Overall, the findings reveal a paradox: while there is strong potential for adoption of TELA maize, this potential is constrained by limited awareness, economic challenges, and lingering safety concerns. Bridging these gaps will require a coordinated strategy involving awareness creation, policy action, and market development.

5.2 Conclusion

The study concludes that TELA maize has strong potential to enhance agricultural productivity, food security, and climate resilience in Niger State.

Farmers expressed generally positive perceptions of its agronomic benefits demonstrating latent willingness to adopt, provided that critical barriers, such as limited awareness, high seed costs, and lack of technical support are addressed.

The study provides evidence-based data to policymakers, researchers, and stakeholders for overcoming these barriers and strengthening sustainable adoption of TELA maize.

5.3 Recommendations

Government and research institutions should scale up the promotion and adoption of TELA maize to strengthen agricultural productivity, ensure food security, and build climate resilience among farmers.

Implement targeted interventions to reduce barriers including farmer training, seed subsidies, and stronger extension support to encourage widespread adoption of TELA maize.

Utilize the study's findings to develop informed policies, collaborative programs, and long-term strategies that enhance the sustainable adoption of TELA maize in Niger State.

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APPENDIX

WORK PLAN

Activity	**Duration**
Proposal Development and Approval	2 weeks
Literature Review and Data Collection Preparation	3 weeks
Questionnaire Design and Pre-testing	2 weeks
Field Data Collection (Surveys and PRA Sessions)	4 weeks
Data Entry and Cleaning	2 weeks
Data Analysis and Interpretation	3 weeks
Report Writing	4 weeks
Final Review and Submission	2 weeks
Presentation of Findings	1 week

Total Duration: 5 Months and 1 Week

BUDGET

Item	**Estimated Cost (NGN)**	**Notes**
Proposal Development and Printing	2,400	Printing, binding, and documentation
Literature Review (Internet and Library Fees)	1,600	Subscription, printing, and materials
Questionnaire Printing (150 copies)	3,000	Estimated cost per copy: NGN 20
Training of Enumerators (5 persons)	6,000	Training fees and materials
Data Collection (Transport and Fieldwork Allowances)	12,000	Covering selected districts
PRA Sessions (Focus Groups and Workshops)	8,000	Venue, logistics, refreshments
Data Entry and Cleaning	4,000	Software subscriptions, assistants' fees
Data Analysis (Software and Consultancy)	6,400	SPSS/STATA software, expert fees
Report Writing and Editing	4,000	Proofreading, technical editing
Final Report Printing and Binding (2 copies)	3,200	Estimated NGN 1,600 per copy

Presentation of Findings (Stakeholder Engagement and Logistics)	6,000	Venue, materials, transportation
Miscellaneous/Contingencies (10%)	5,760	Unforeseen expenses

Total Estimated Budget: NGN 62,360

Notes:

1. Costs are estimates and may vary based on market prices.
2. This budget covers all research phases, including fieldwork, data processing, and report presentation.
3. External funding or institutional support may be considered to reduce individual expenses.