



**ENHANCING AGRICULTURAL PRODUCTIVITY AND CLIMATE RESILIENCE
THROUGH CAPACITY BUILDING: A CASE STUDY OF GIWA AGRO ENTERPRISES'
TRAINING INITIATIVES IN BAUCHI STATE, NIGERIA**

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ABSTRACT

The study investigates the impact of Giwa Agro Enterprises' training programs on enhancing agricultural productivity and climate resilience among farmers in Bauchi State, Nigeria. A total of 400 respondents were surveyed, with 91.25% having participated in at least one or more training session, while 8.75% had not. The participants reported a gaining significant knowledge in climate-smart practices, including water conservation (53.95%) and planting drought-resistant crops (33.49%). Following the training, 53.5% of respondents observed moderate improvements in crop yields, with 49% experiencing a 10-20% increase in yield. In terms of confidence, 43.75% of farmers felt confident in managing climate-related challenges, while 49.25% felt moderately prepared to deal with weather extremes like drought and flooding. Despite these positive outcomes, challenges such as financial constraints (19%), lack of resources (14.5%), and insufficient follow-up support (29.75%) were identified as barriers to the full implementation of the practices learned. A regression analysis revealed that factors such as educational level ($p < 0.01$) and farm size ($p < 0.01$) significantly influenced participation in the training. The study concludes that while the training has made a positive impact on agricultural productivity and climate resilience, additional support mechanisms, including financial assistance, resource access, and gender-sensitive approaches, are needed to ensure the sustainable adoption of climate-smart practices among farmers. Enhancing follow-up support, improving infrastructure, and integrating technology to increase the effectiveness of the training programs were recommended.

Keywords: Capacity, Building, Climate, Resilience, Training, Initiatives

INTRODUCTION

The agriculture sector in developing nations faces the dual challenge of ensuring food security while also adapting to the increasing impacts of climate change. In Nigeria, agriculture is central to the economy, with a significant portion of the population relying on it for livelihood. However, climate change poses a growing threat, causing shifts in rainfall patterns, droughts, and unpredictable weather events that directly affect crop yields. To address these challenges, it is essential to enhance farmers' adaptive capacity through targeted capacity-building initiatives (World Bank, 2020). Agriculture plays a pivotal role in the Nigerian economy, particularly in rural areas where the majority of households depend on farming as a primary source of livelihood. However, challenges such as low productivity, climate change, and inadequate post-harvest handling continue to hinder the full potential of the agricultural sector in Nigeria. In response to these challenges, Giwa Agro Enterprises, through its contract farming scheme, has implemented a series of training initiatives aimed at enhancing agricultural productivity and promoting climate resilience in Bauchi State (UNFCCC, 2019).

The training programs focus on three key areas: the Farmer Business School, which equips farmers with essential business and financial management skills; Good Agronomic Practices (GAP), which teach farmers how to optimize crop production while maintaining environmental sustainability; and Harvest and Post-Harvest Handling of Grains, which emphasizes climate-smart practices to reduce post-harvest losses and improve food security. This study seeks to evaluate the effectiveness of these training initiatives in improving farm productivity and climate resilience in six selected Local Government Areas (LGAs) of Bauchi State (FAO, 2020). Capacity building in agriculture involves



equipping farmers with the knowledge, skills, and resources needed to manage climate risks effectively and enhance agricultural productivity. According to recent studies, training programs and extension services that focus on climate change adaptation have been instrumental in enhancing resilience and increasing farm productivity by up to 30% (Priya *et al.*, 2025). These initiatives not only impart knowledge of climate-resilient practices but also introduce farmers to new technologies and sustainable farming techniques that reduce dependence on unpredictable weather (Karri & Nalluri, 2024). Giwa Agro Enterprises has strategically incorporated such capacity-building initiatives into their operations, focusing on training farmers in Bauchi State on climate adaptation strategies. Their approach includes educating farmers on crop diversification, water-conservation techniques, and the use of drought-resistant crop varieties, all of which are critical for mitigating the effects of climate change.

Giwa Agro Enterprises' training programs are tailored to the specific needs of farmers in Bauchi State, a region that faces significant agricultural challenges due to erratic rainfall and seasonal droughts. The company's approach combines classroom learning with hands-on training, enabling farmers to directly apply the skills they acquire. The initiative focuses on sustainable agricultural practices such as integrated pest management, agroforestry, and organic farming, which are key to enhancing climate resilience. Research has shown that such training programs, when effectively implemented, can lead to increased crop yields and improved food security. In India, for example, similar programs have helped farmers practice climate-resilient agriculture, leading to better crop yield stability even under adverse climatic conditions (Rajesh *et al.*, 2024). This model has been adopted by Giwa Agro Enterprises, with a focus on both increasing productivity and promoting long-term sustainability. In addition to technical training, Giwa Agro Enterprises has integrated climate change awareness into their programs. This approach aims to change the mindset of farmers regarding climate risks, encouraging them to adopt more sustainable and adaptive farming methods. Capacity-building initiatives that emphasize the importance of understanding climate variability can improve farmers' decision-making and increase their ability to adapt to unforeseen environmental changes (Ozkan *et al.*, 2022). For instance, farmers are taught how to recognize early signs of climate distress and take preventive actions, such as adjusting planting dates or switching to more resilient crop varieties. Furthermore, incorporating climate change education into agricultural training ensures that farmers are better equipped to handle not only immediate challenges but also future climate-related uncertainties. Studies suggest that training in climate-resilient practices helps bridge the knowledge gap, enabling farmers to effectively cope with changes in weather patterns and agricultural practices (Kakumanu *et al.*, 2020).

While Giwa Agro Enterprises' training programs have been beneficial, there are still several challenges in scaling up such initiatives. The sustainability of these efforts depends on continuous funding, effective collaboration with local stakeholders, and ensuring that farmers remain engaged with the new techniques and technologies introduced during the training sessions.

Moreover, as climate change impacts vary from region to region, there is a need for localized solutions that consider the specific environmental, social, and economic conditions of each area. Future training programs could benefit from incorporating more localized knowledge and increasing the use of digital platforms to reach a wider audience.

The objectives of the study were to:

1. Assess the Impact of Giwa Agro Enterprises' Training Programs on Agricultural Productivity
2. Examine the Effectiveness of Capacity Building in Enhancing Climate Resilience
3. Identify the Challenges Faced by Farmers in Implementing Training Recommendations
4. Evaluate the Sustainability of the Practices Adopted by Farmers

METHODOLOGY

The Study Area

The study was conducted in Bauchi State. The State is located in the northeastern region of Nigeria, covering an area of approximately 49,119 square kilometers, making it one of the larger states in the country. The state is bordered by the states of Kano, Jigawa, Yobe, Gombe, and the Federal Capital Territory (FCT), as well as the Republic of Chad to the northeast. Bauchi has a diverse topography that includes the plains of the Sudan Savannah and the more arid, semi-desert Sahelian



region in the northern part. The state’s population is estimated at over 5 million people, with a significant proportion living in rural areas where agriculture is the primary source of livelihood.

Agriculture plays a central role in Bauchi's economy, with the state being a major producer of crops such as maize, millet, sorghum, groundnuts, and rice. The fertile lands in the southern and central regions are ideal for growing these staple crops, while livestock farming, particularly cattle, goats, and sheep, is common in the northern part of the state. Bauchi’s diverse agro-ecological zones allow for a variety of crops to be grown, although the state faces challenges related to climate change, which impacts farming seasons and crop yields. These factors make Bauchi an important area for studying agricultural productivity and climate resilience in Nigeria.

Research Design

This study employs a survey research design to collect quantitative data on the impact of Giwa Agro’s training initiatives. The study focuses on Three Local Government Areas (LGAs) in Bauchi State where the training programs were implemented, targeting a total of 400 respondents.

Population and Sample Size

The population of interest includes smallholder farmers who participated in Giwa Agro’s training programs. The study will use a stratified random sampling technique to select respondents from the Three LGAs. The selected respondents will be distributed proportionally based on the number of farmers in each LGA.

Sampling Technique

The Three selected LGAs in Bauchi State served as the primary sampling units. Within each LGA, farmers were randomly selected based on their participation in the training programs. The sample size of 400 respondents is distributed proportionally across the LGAs based on their farming population.

Table 1. Sample Size Selection Plan

| Local Government Area (LGA) | Farm Population | Proportion of Total | Sample Size (400 respondents) |
|-----------------------------|-----------------|---------------------|-------------------------------|
| Bauchi | 12,500 | 1.82% | 227 |
| Ganjuwa | 4,000 | 1.82% | 73 |
| Dass | 5,500 | 1.82% | 100 |
| Total | 22,000 | 1.82% | 400 |

Source: Reconnaissance Survey (2025)

Data Collection

Data was collected through structured questionnaires administered to the selected respondents. The questionnaire covered various aspects of the training programs, including the application of business skills, agronomic practices, post-harvest handling techniques, and climate-smart innovations.

Data Analysis

Data were analyzed using descriptive statistics (such as frequencies, percentages, and mean scores) to summarize the effectiveness of the training programs. In addition, regression analysis was used to determine the factors influencing farmers participation in Giwa Agro’s Training.

Model specification

Multiple regression analysis was used determined the factors influencing farmers participation in Giwa Agro’s training. The regression model used was specified as;

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5 X_5 + b_6 X_6 + b_7X_7 + e \quad \dots (1)$$

Where;

Y = Number of trainings attended (numbers)

b₁ to b₇= Coefficients to be estimated;

a = Constant term;

e_i = Error term;

X₁= Age (years)

X₂= Gender (1=male, 2=female)



- X₃ = Educational level (1=primary, 2=secondary, 3=tertiary, 4=adult 5=not educated)
X₄ = Farm size (ha)
X₅ = Farming experience (years)
X₆ = Primary source of income (1=Farming, 2=Trading ,3 = Others)
X₇ = Yield before trainings (bags)
X₈ = Yield after trainings (bags)

RESULTS AND DISCUSSION

Socioeconomic Characteristics of the Respondents

The socioeconomic characteristics of farmers play a crucial role in determining their participation in agricultural training programs, as this study of Giwa Agro's training initiatives in Bauchi State demonstrates. Understanding these factors provides insight into how various demographic and economic factors can influence the adoption of climate-resilient agricultural practices. The study surveyed 400 respondents, with both male (49%) and female (51%) participants, suggesting a relatively balanced representation of gender in training participation. This gender balance is crucial for addressing the specific needs of both male and female farmers in terms of agricultural productivity and climate resilience.

Age distribution as presented in Table 2 revealed that 45% of the farmers are between 31-45 years, with a substantial 41% aged between 46-60 years. These age groups are typically more experienced and may view training as a tool to enhance their existing knowledge. Younger farmers, though only 8.25%, may exhibit higher enthusiasm for adopting new technologies. However, older farmers might be less receptive due to entrenched practices and resistance to change. This aligns with studies by Amissah *et al.* (2020), which found that younger farmers are more likely to adopt new agricultural technologies due to fewer constraints and more flexibility in learning.

The educational level of respondents shows a strong trend towards secondary education (51.25%), with 15.75% having tertiary education. This suggests that the farmers in the study are generally literate and capable of understanding the technical content of the training. However, the 6% with no formal education may face difficulties in grasping complex agricultural concepts, thus highlighting the need for more inclusive and accessible training methods, as suggested by Akinola and Agbede (2022). The primary education group (27%) may also benefit from simplified training modules tailored to their literacy level.

The result in Table 2 also shows farm size, a significant 69.5% of respondents own medium-sized farms (1-5 hectares), indicating that Giwa Agro's training program is likely addressing the needs of small and medium-scale farmers, who form the backbone of agricultural production in Nigeria. This aligns with findings by Babajide *et al.* (2021), where medium-scale farmers were found to have better access to resources and more significant capacity for adopting new technologies compared to smallholders. However, only 14.25% of farmers own larger farms (over 5 hectares), which might limit their ability to implement certain training outcomes that require substantial resources.

The result of farmers' years of experience also play a role in their participation. The largest group, 50.25%, has 11-15 years of farming experience. Experienced farmers tend to participate in training as they have accumulated knowledge of farming challenges and recognize the need for upgrading skills, particularly in response to climate change and its impact on agricultural productivity. According to a study by Oyekale and Oyekale (2022), farmers with 10-20 years of experience are more likely to participate in training as they have encountered significant agricultural challenges over the years.

Finally, the source of income for the respondents shows that 56.25% rely on trading, while 42% depend on farming. This indicates that many farmers engage in supplementary income-generating activities beyond agriculture, which may affect their willingness and ability to attend training sessions. Trading income allows for more flexible participation in training programs, as farmers may have the financial means to attend without being overly dependent on immediate agricultural returns. This is consistent with findings from the World Bank (2021), which emphasize that farmers with diversified income sources are more resilient to economic shocks and can invest in capacity-building initiatives.



Table 2. Socioeconomic Characteristics of the Respondents (n =400)

| Sex | Freq. | Percent |
|---------------------------|-------|---------|
| Male | 196 | 49.00 |
| Female | 204 | 51.00 |
| Age | | |
| 18-30 years | 33 | 8.25 |
| 31-45 years | 180 | 45.00 |
| 46-60 years | 164 | 41.00 |
| 60 years and above | 23 | 5.75 |
| Educational level | | |
| no formal education | 24 | 6.00 |
| Primary education | 108 | 27.00 |
| secondary education | 205 | 51.25 |
| Tertiary education | 63 | 15.75 |
| Farm size | | |
| small size less than 1 ha | 65 | 16.25 |
| medium size 1-5 ha | 278 | 69.50 |
| larger size 5ha above | 57 | 14.25 |
| Farming experience | | |
| 1-5 years | 36 | 9.00 |
| 6-10 years | 133 | 33.25 |
| 11-15 years | 201 | 50.25 |
| 16 and above years | 30 | 7.50 |
| Source of income | | |
| Farming | 168 | 42.00 |
| Trading | 225 | 56.25 |
| Others | 7 | 1.75 |

Source: Field survey (2026)

Distribution of the Respondents Based on Participation and Impact of the Training

The results as presented in Table 3 showed the high level of participation in Giwa Agro's training programs, with majority (91.25%) of respondents having participated in at least one or more training program. This demonstrated the broad reach and success of Giwa Agro's initiatives in attracting farmers from various socioeconomic backgrounds. However, it is noteworthy that 8.75% of respondents have never participated in the training, suggesting potential barriers to access or awareness. This aligns with findings by Olorunfemi and Oloruntoba (2019), where participation in agricultural training programs was limited by factors such as geographic location, access to information, and financial constraints.

The number of trainings attended by participants revealed that more than half (57%) have attended 1-2 trainings, 30% have attended 3-5 trainings, and 13% have attended more than five. The substantial proportion of farmers attending multiple sessions reflects the perceived value of the training, as farmers likely return to gain more knowledge or deepen their understanding of specific topics. The commitment of these farmers to continuous learning could be attributed to the practical skills they gain from the training, as suggested by research by Khorassani and Vakhshouri (2020), who found that repeated training enhances knowledge retention and application.

Regarding the types of skills or knowledge gained from the training, water conservation techniques stand out as the most popular, with 34.75% of respondents indicating they learned about these practices. This reflects the growing concern around water scarcity in the region and highlights the relevance of such training in addressing climate-induced water challenges. Drought-resistant crop varieties were also emphasized, with 25% of farmers reporting knowledge gain in this area. This is in line with the findings of Nwachukwu *et al.* (2020), who found that drought-resistant crops are key to maintaining agricultural productivity under climate stress conditions.

The impact of the training on crop yields showed that 53.5% of respondents experienced moderate improvements in their crop yields after participating in the training, with 9.25% reporting



significant improvements. This is an encouraging outcome, suggesting that the training has a positive impact on farm productivity. However, 4% of farmers reported no increase in yields, which could be due to factors such as poor access to resources, limited follow-up support, or inadequate implementation of new techniques. This finding highlights the importance of ongoing support and monitoring post-training, as emphasized by Oloyede *et al.* (2021), who found that continuous support is crucial for the successful application of new agricultural practices.

The results also reveal that water conservation techniques (53.95%) and planting drought-resistant crops (33.49%) were the most widely adopted climate-smart agricultural practices among participants. These findings align with the increasing recognition of water management and crop resilience as essential strategies for climate adaptation in agriculture. A study by FAO (2021) emphasizes that the adoption of such practices is critical for building resilience to climate variability and ensuring sustainable agricultural production.

Table 2. Distribution of the Respondents Based on Training and Participation and Impact (n =400)

| Have you participated in any training programs organized by Giwa Agro Enterprise | Freq. | Percent |
|---|--------------|----------------|
| No | 35 | 8.75 |
| Yes | 365 | 91.25 |
| Number of trainings participated | | |
| 1-2 trainings | 228 | 57.00 |
| 3-5 trainings | 120 | 30.00 |
| more than 5 trainings | 52 | 13.00 |
| Skills or knowledge gain from the training | | |
| climate resilient agricultural practice | 40 | 10.00 |
| crop diversification | 56 | 14.00 |
| drought resistant crop varieties | 100 | 25.00 |
| water conservation techniques | 139 | 34.75 |
| pest and diseases management | 59 | 14.75 |
| Others | 6 | 1.50 |
| To what extent do you believe the training improved your crop yields | | |
| No improvement | 13 | 3.25 |
| Slight improvement | 136 | 34.00 |
| Moderate improvement | 214 | 53.50 |
| Significant improvement | 37 | 9.25 |
| What percentage increase in crop yield noticed since implementing the training | | |
| No increase | 16 | 4.00 |
| Less than 10% | 109 | 27.25 |
| 10-20% | 196 | 49.00 |
| more than 30% | 62 | 19.75 |
| Aspect of climate smart Agriculture adopted | | |
| Crop diversification | 43* | 10.000 |
| Planting drought resistant crops | 144 | 33.490 |
| Water conservation | 232 | 53.950 |
| Others | 11 | 2.560 |

Source: Field survey (2026)

Distribution of the Respondents Based on Confidence, Preparedness and Effectiveness in Dealing with Climate-Related Issues in Their Farms after Training

The result as presented in Table 4 showed a positive impact of Giwa Agro’s training on farmers' confidence, preparedness, and effectiveness in addressing climate-related challenges. The 43.75% of respondents feel confident in their ability to manage climate-related challenges, such as drought, with



an additional 43% expressing some degree of confidence. This reflects a shift in farmers’ mindset, where they no longer feel helpless in the face of climate risks. According to research by Yaro (2020), increased confidence in managing climate-related risks is a key outcome of training programs that focus on practical, hands-on knowledge.

Furthermore, 49.25% of respondents felt moderately prepared to deal with climate-related disruptions after the training, and 11.25% felt very prepared. This indicates that the training has equipped farmers with the necessary tools to respond to climate challenges effectively. However, the 5% of farmers who felt unprepared highlight the need for further improvement in training delivery and follow-up support. Previous studies, such as that of Mgendi, (2021), This study found that participation in training significantly influenced yield outcomes, indicating that structured agricultural training can improve aspects of productivity and preparedness among smallholder farmers

Regarding the successful mitigation of climate-related risks, pest and diseases (46.25%) and crop failure due to climate change (27.25%) were the most successfully mitigated risks. These findings suggest that the training’s emphasis on integrated pest management and climate-smart agriculture techniques is yielding tangible results in improving farm resilience. However, drought (7.5%) and flooding (19%) were less effectively mitigated, which could indicate a need for more targeted training in these areas, as drought and flooding are particularly challenging for small-scale farmers in Nigeria. Akinyemi *et al.* (2021) also noted that while pest management is relatively easy to implement, mitigating extreme weather events such as floods and droughts requires more robust, large-scale interventions.

The overall effectiveness of the training in enhancing farmers' climate knowledge was reported as moderately effective by 52.75% of respondents, and 10.5% deemed it very effective. This suggests that while the training has had a positive impact, there is room for improvement in content delivery and the depth of training materials. Continuous evaluation and feedback from farmers could help refine the training program to address specific needs. The importance of feedback and continuous assessment to adapt agricultural training programs, especially in the face of climate challenges, is also recommended by Tadesse & Haji (2020).

Table 4. Distribution of the Respondents Based on Confidence, Preparedness and Effectiveness in Dealing with Climate-Related Issues in their Farms after Training (n = 400)

| How confident are you in your ability to manage climate-related challenges (e.g., drought) | Freq. | Percent |
|---|--------------|----------------|
| Not confident | 16 | 4.00 |
| Somewhat confident | 172 | 43.00 |
| Confident | 175 | 43.75 |
| Very confident | 37 | 9.25 |
| Do you feel more prepared to deal with climate-related disruptions after the trainings | | |
| Not prepared | 20 | 5.00 |
| Slightly prepared | 138 | 34.50 |
| moderately prepared | 197 | 49.25 |
| very prepared | 45 | 11.25 |
| Which climate-related risk have you successfully mitigated through training | | |
| Drought | 30 | 7.50 |
| Flooding | 76 | 19.00 |
| Pest and diseases | 185 | 46.25 |
| crop failure due to climate change | 109 | 27.25 |
| Overall effectiveness of the training in enhancing your climate Knowledge | Freq. | Percent |
| Not effective | 19 | 4.75 |
| Slightly effective | 128 | 32.00 |
| Moderately effective | 211 | 52.75 |
| very effective | 42 | 10.50 |

Source: Field survey (2026)



Factors Influencing Farmers' Participation in Giwa Agro's Training

The regression analysis conducted in this study revealed a several key factors that significantly influenced farmers' participation in Giwa Agro's training program. The result showed that educational level ($p < 0.01$), farm size ($p < 0.01$), and farming experience ($p < 0.1$) were significant predictors of training participation. This indicates that farmers with higher levels of education and larger farms are more likely to participate in training, as they are better able to access and apply the knowledge gained. These findings are consistent with studies by Ayinde *et al.* (2021), who found that education and farm size positively correlate with training participation.

The analysis also showed that gender and primary source of income had no significant effect on participation, suggesting that other factors such as education and farm size may play more critical roles in determining participation. The yield before participation was also not a significant predictor, which may imply that farmers participate in training programs regardless of their current yield, possibly because they recognize the long-term benefits of learning new techniques.

These findings emphasize the importance of targeting specific groups, such as educated farmers with larger farms, to increase participation. However, they also highlight the need for inclusive strategies that cater to smaller farmers and those with lower educational levels, as they may also benefit from the training but face unique barriers to access.

Table 6. Factors Influencing Farmers Participation in Giwa Agro's Training (n = 400)

| Number of trainings attended | Coef. | St.Err. | t-value | p-value |
|------------------------------|-------------------|---------|---------|----------|
| Age | .079 | .056 | 1.40 | .163 |
| Gender | -.049 | .069 | -0.71 | .479 |
| Educational Level | .163 | .044 | 3.73 | 0.000*** |
| Farm Size | .292 | .074 | 3.96 | 0.000*** |
| Farming Experience | .1 | .056 | 1.77 | .078* |
| Primary Source of Income | -.033 | .067 | -0.48 | .628 |
| Yield before participation | .065 | .042 | 1.54 | .125 |
| Yield after participation | -.003 | .052 | -0.06 | .955 |
| Constant | 2.011 | .249 | 8.06 | 0.000*** |
| R-squared | 0.818 | | | |
| F-test | 220.677*** | | | |

Source: Field survey (2026)

*** $p < .01$, ** $p < .05$, * $p < .1$

Respondents' Challenges to Adoption and Financing the New Training Acquired

The challenges faced by farmers in financing and adopting the new farming techniques learned in Giwa Agro's training program as presented in Table 6 revealed a significant barrier to effective implementation. Financial constraints (19%) and lack of access to resources such as irrigation systems and drought-resistant seeds (14.5%) were identified as the most common barriers. This aligns with research by Olajide *et al.* (2021), which found that financial constraints and inadequate resources are major obstacles to adopting climate-smart agricultural practices in rural areas.

Additionally, insufficient follow-up support from the training organization (29.75%) was a major concern for farmers. This suggests that while the training itself may be effective, ongoing support and guidance are essential for farmers to fully implement what they have learned. Studies by Hassan *et al.* (2021) emphasize the importance of continuous support to ensure the sustainability of training outcomes and to help farmers overcome implementation challenges.

Despite these challenges, 46% of farmers reported receiving moderate support from the training program, indicating that Giwa Agro has made efforts to address these barriers. However, there is still room for improvement in terms of providing adequate resources, financial support, and follow-up assistance to ensure successful adoption of the practices learned.



Table 6. Distribution of the Respondent based on Challenges Encountered

| Experienced any challenges in financing the adoption of new farming technique | Freq. | Percent |
|--|--------------|----------------|
| No | 227 | 56.75 |
| Yes | 173 | 43.25 |
| Barriers encountered in implementing the practices learned from the training | Freq. | Percent |
| Lack of access to resources/tools eg irrigation system, drought resistant seeds etc | 58 | 14.50 |
| Financial constraint | 76 | 19.00 |
| Limited knowledge of how to implement the practice effectively | 108 | 27.00 |
| Insufficient follow-up support from the training organization | 119 | 29.75 |
| Poor infrastructure (eg access to markets, roads etc) | 35 | 8.75 |
| Others | 4 | 1.00 |
| Training programs have provided support in addressing the Farmers Problem | | |
| No support | 23 | 5.75 |
| limited support | 135 | 33.75 |
| moderate support | 184 | 46.00 |
| adequate support | 58 | 14.50 |

Source: Field survey (2026)

CONCLUSION AND RECOMMENDATION

The study concluded that there is a positive impact of Giwa Agro Enterprises' training programs in Bauchi State, with 91.25% of farmers participating and gaining valuable skills in climate-smart agriculture, particularly in water conservation, pest management, and drought-resistant crop varieties. However, while many farmers reported moderate improvements in crop yields and increased confidence in managing climate-related challenges, barriers such as financial constraints, limited access to resources, and insufficient follow-up support hindered the full implementation of the training. These challenges emphasize the need for enhanced post-training support and improved access to resources like irrigation systems and drought-resistant seeds. To further improve the effectiveness and reach of the training, it is recommended that Giwa Agro Enterprises establish robust follow-up mechanisms, collaborate with financial institutions to provide credit access, and strengthen community networks for peer support. Additionally, gender-sensitive approaches should be incorporated, with a focus on supporting women farmers and smallholders, who often face greater constraints. Advocacy for improved infrastructure, market access, and the integration of technology in training delivery will also enhance the program's impact. By addressing these recommendations, Giwa Agro Enterprises can increase the sustainability of its training programs, ultimately contributing to long-term agricultural productivity and climate resilience in the region.

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