



**FACTORS INFLUENCING THE ADOPTION OF CABBAGE (*Brassica oleraceavar. capitata*)
PRODUCTION TECHNOLOGIES IN JOS SOUTH AGRICULTURAL ZONE
PLATEAU STATE, NIGERIA**

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ABSTRACT

The study examined the factors influencing adoption of cabbage (*Brassica oleracea var. capitata*) production technologies in Jos South Agricultural Zone of Plateau State, Nigeria. A multi-stage sampling technique was used to select 169 cabbage farmers from four districts (Du, Gyel, Kuru, and Vwang) and eight villages within Jos South LGA. Primary data were collected through structured questionnaires and analyzed using descriptive statistics (frequency, percentages, and means) and binary logistic regression. Findings revealed that, the mean age of respondents was 40.1 years, indicating that most farmers were within the active and productive age group, while the mean household size was 7.2 persons, suggesting availability of family labour. The average farming experience was 7.9 years, and mean annual farm income was ₦453,200, indicating moderate profitability. Extension agents were the major source of information, accounting for 35.4%, followed by fellow farmers (25.6%) and workshops/training (15.9%). The logistic regression results showed that, model was statistically significant ($\chi^2 = 68.32$, $p < 0.001$) with a Nagelkerke R^2 value of 0.69, indicating that 69% of the variation in adoption was explained by the included variables. Significant determinants of adoption included education ($\beta = 0.482$, $p < 0.01$), access to credit ($\beta = 0.621$, $p < 0.01$), extension contact ($\beta = 0.705$, $p < 0.001$), farming experience ($\beta = 0.298$, $p < 0.01$), household size ($\beta = 0.167$, $p < 0.05$), and market access ($\beta = 0.412$, $p < 0.05$). Input cost ($\beta = -0.533$, $p < 0.01$) and climate factors ($\beta = -0.298$, $p < 0.05$) negatively influenced adoption. Major constraints identified included insufficient credit (mean = 4.21), inaccessibility to loans (mean = 4.20), low capital base (mean = 4.18), high cost of production (mean = 4.19), and poor storage facilities (mean = 4.10), all indicating severe financial and infrastructural challenges. The study concluded that adoption of improved cabbage production technologies is largely driven by financial capacity, institutional support and access to information. Based on the result of this study, it is recommended that strengthening extension services, improving access to affordable credit and reducing input costs to enhance adoption and productivity among cabbage farmers in the study area.

Keywords: Factors, Adoption, Cabbage, Production, Technologies

INTRODUCTION

Vegetables are nutritionally important to man as they provide the much-needed vitamins, minerals and fibre. They are important protective food and highly beneficial for the maintenance of health and prevention of diseases. They contain valuable food ingredients which can be successfully utilized to build up and repair the body (Smith *et al.*, 2021). Cabbage (*Brassica oleracea var. capitata*) is a prominent cole crop of the Brassicaceae family that occupies maximum share in area and production, with a cultivation area of 398,500 hectares and a net production of 90.37 lakh metric tonnes, yielding 22.7 metric tonnes per hectare (Singh *et al.*, 2022). In view of these challenges, this study raises pertinent research questions aimed at examining the factors influencing the adoption of cabbage production technologies in Jos South Agricultural Zone of Plateau State, Nigeria; the following research questions were answered; The aim of the study were to analyze the factors influencing the adoption of cabbage (*brassica oleraceavar. capitata*) production technologies in Jos South Local Government Area of Plateau State, Nigeria. The specific objectives of the study were to; describe the socio-economic



characteristics of the cabbage farmers in the study area; identify the source of information on improve cabbage technologies; determine the factors influencing the adoption of cabbage production technologies; and identify the constraints faced by the cabbage farmers in the adoption of cabbage production technologies in the study area.

METHODOLOGY

The Study Area

This study was conducted in Plateau State, Nigeria, located between latitude 8°22' and 10°24' North and longitude 8°32' and 10°38' East. Plateau State is predominantly agrarian in nature and covers a landmass of about 30,913 square kilometres (approximately 6,678,162 acres). The State comprises seventeen Local Government Areas with a population of 3,178,712 according to the 2006 National Population Census (NBS, 2006). Based on the projected annual population growth rate of 2.97%, the population of Plateau State was estimated at about 4.7 million in 2022 and further projected to approximately 5.07 million people by 2025 (NPC, 2022). Plateau State falls largely within the northern guinea savannah zone which consists mainly of cropland, short trees and grasses. The upper Plateau however has unique mountain vegetation which is influenced by the near temperate climate. The major soil types of the State belong to the broad category of tropical ferruginous soils which are much thinner on the Plateau but attain greater depths in the southern parts of the State. The State is characterized by a near temperate climate on the Jos Plateau with a hot and humid climate in its lower parts. Generally, weather conditions are warmer during the rainy season (April – October) and much colder during the Harmattan period (December – February). The mean annual temperature in the State ranges from 20 to 25 degree Centigrade, while the mean annual rainfall figures ranges from 131.75cm in the southern part to 146cm on the Jos Plateau. Employment-oriented Private Sector Development Programme (EoPSD, 2010). Its headquarters is located in Bukuru. The local Government lie on longitude 9°43'23.7623'' and latitude N9°14.1049''. The local Government occupies an area of approximately 5,10km². It is the second most populated Local Government Area in the state after Jos North. It has population of 311,391 (Nigerian Population Census, 2006). Plateau state has higher altitude of 1,238 meter and has its coldest period between 18°C and 22°C while it gets warm between March and April which occur in dry season. The main annual rainfall varies between 1347mm and 1460mm per annum (Michael, 2012)

The Local Government Area has a variety of climate condition which favour a growth of number of agricultural crops such as Irish potato, sweet potato, maize, millet, acha, cabbage, rice, and many other vegetables. Providing both small and large industries with raw materials predominant people living in the area are Berom people having the highest population. Other people living include Igbo, Yoruba and many other tribes residing in Plateau State.

Sampling Techniques and Sample Size

A multi-stage sampling technique will be employed to ensure representation across different farming communities in Jos South LGA. In the first stage, one Local Government Area Jos South will be selected using purposive sampling technique because of the concentration of cabbage farmers in the area. There are 14 districts in Jos South Local Government Area. In the second stage, four districts cabbage-producing communities (Vom, Du, Kuru, Bukuru) will be selected from the LGA making a total of four districts. Third stage: two villages will be randomly selected from each of the selected districts making a total of eight (8) villages.

In the final stage, 20% of cabbage farmers will randomly selected from the sampling frame giving a total sample of 169 farmers.



Table 1: Sampling Sample Size Selection Plan

| S/No | LGA | Districts | Villages | Sample Frame | Sample Size (@ 20%) |
|-------|-----------|-----------|------------|--------------|---------------------|
| 1 | Jos South | Du | Kwang | 130 | 26 |
| | | | Dadura | 114 | 23 |
| | | Gyel | Gura-Riyom | 110 | 22 |
| | | | Got | 80 | 16 |
| | | Kuru sa | Kumbuna | 125 | 25 |
| | | | Gatsen | 90 | 18 |
| | | Vwang | Chugwi | 119 | 24 |
| | | | Got | 75 | 15 |
| Total | | 4 | 8 | 843 | 169 |

Source: Computed by the Author, 2025

Method of Data Collection

The primary data will be collected by using well-structured questionnaires. The questionnaire will be divided into six section A: socio – economic characteristics, section B: sources of information on improved cabbage production technologies, section C: perceived effect of the adoption of cabbage technologies on farmer’s productivity, section D: assess the adoption level of cabbage production adopted by farmers, section D: improved adoption technologies of cabbage production, section E: factors influencing farmers adoption of cabbage production technologies source of information, section F: constraints faced by cabbage farmers in the study area.

The information and data of the respondents will be collected base on each section listed above.

Method of Data Analysis

Data for this study will be analysed using descriptive and inferential statistics chi –square. Descriptive statistics such as means, frequency table and percentages will be used to achieve objective i, and ii. Adapting index to linear regression for objective iii, chi-square for objective iv, semi-regression model for objective v and logistic regression model for objective vi.

Model Specifications for Data Analysis

(A) Linear Regression Model

Used to examine the linear relationship between adoption and explanatory variables.

Model: $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + e$ --- (1)

Where:

- **Y** = Adoption level (continuous or binary).
- **X₁–X₉** = Independent variables (e.g., age, education, credit access, extension contact).
- **β₀** = Intercept.
- **β₁–β₉** = Coefficients.
- **ε** = Error term.

Where. **Y** = Income (₦)

- a = the intercept
- x₁ = Age in years (years)
- x₂ = Sex, (with 0= Female and 1=Male)
- x₃ = Marital Status, (with 0=Single and 1=Marital Status)
- x₄ = House hold size (number of persons)
- x₅ = Location (0=Rural and 1=Urban)
- x₆ = Educational Qualification, (No. of years spent in schooling)
- x₇ = Occupation, (Farming =1, Otherwise =0)
- x₈ =Technology adoption level (High =2, Moderate = 1, Low =0)
- x₉ = Extension agent visit, (No. of contact; weekly, frequently, monthly, yearly)
- b₁-b₉ = Regression coefficient
- e = the residual or error term



RESULTS AND DISCUSSION

Socio-Economic Characteristics of Quantitative Respondents

Age of Respondents

The result as presented in Table 2 revealed that, the mean age of respondents is 40.1 years, indicating that cabbage farmers in the study area are largely within the active and productive age group. The age distribution shows that 17.1% (28) of respondents are between 20–30 years, 32.9% (54) are between 31–40 years, 29.9% (49) fall within 41–50 years, while 20.1% (33) are above 50 years. This suggests that most of the farmers are physically capable of engaging in labour-intensive agricultural activities and are therefore more likely to adopt improved production technologies. This finding is consistent with Ogunleye *et al.* (2023), who observed that farmers within the active working age bracket are generally more innovative, energetic, and responsive to agricultural interventions compared to older farmers who tend to be more risk-averse.

Household Size

The average household size of respondents is 7.2 persons, indicating relatively large household structures in the study area. The distribution shows that 37.2% (61) of respondents have 1–5 persons per household, 44.5% (73) have 6–10 persons, while 18.3% (30) have more than 10 persons. This suggests that family labour is readily available for farming operations, thereby reducing dependence on hired labour and lowering production costs. According to Yusuf *et al.* (2021), larger household sizes enhance agricultural productivity by increasing the availability of household labour, which in turn improves efficiency and encourages the adoption of improved agricultural technologies due to reduced labour constraints.

Years in Cabbage Production

The mean farming experience in cabbage production is 7.9 years, showing that most respondents are moderately experienced farmers. The distribution indicates that 29.3% (48) have 1–5 years of experience, 37.8% (62) have 6–10 years, while 32.9% (54) have above 10 years of experience. This level of experience implies that farmers have acquired substantial practical knowledge of cabbage production systems over time. Adesoji *et al.* (2020) noted that farming experience significantly influences technology adoption, as experienced farmers are better able to assess the benefits and risks of improved agricultural innovations based on prior exposure and accumulated farming knowledge.

Farm Income (₦)

The average annual farm income of respondents is approximately ₦453,200, indicating a moderate level of profitability among cabbage farmers in the study area. The income distribution shows that 26.8% (44) earn between ₦100,000–₦299,000, 31.7% (52) earn ₦300,000–₦499,000, 23.2% (38) earn ₦500,000–₦699,000, while 18.3% (30) earn ₦700,000 and above. This suggests that cabbage production contributes meaningfully to household income, although earnings remain relatively modest. Consequently, farmers may face financial constraints in accessing and investing in improved agricultural technologies. This finding is consistent with the National Bureau of Statistics (2022), which reported that most smallholder farmers in Nigeria operate within low- to medium-income brackets due to challenges such as high input costs, limited access to credit, and unstable market prices.



Table 2: Distribution of Respondents Based on Quantitative Socio-Economic Characteristics (n = 164)

| Variable | Frequency | Percentage | Mean |
|------------------------------------|-----------|------------|-------------|
| Age (Years) | | | |
| 20–30 | 28 | 17.1 | 40.1 years |
| 31–40 | 54 | 32.9 | |
| 41–50 | 49 | 29.9 | |
| Above 50 | 33 | 20.1 | |
| Household Size | | | |
| 1–5 persons | 61 | 37.2 | 7.2 persons |
| 6–10 persons | 73 | 44.5 | |
| Above 10 | 30 | 18.3 | |
| Years in Cabbage Production | | | |
| 1–5 years | 48 | 29.3 | 7.9 years |
| 6–10 years | 62 | 37.8 | |
| Above 10 years | 54 | 32.9 | |
| Farm Income (₦) | | | |
| 100,000–299,000 | 44 | 26.8 | ₦453,200 |
| 300,000–499,000 | 52 | 31.7 | |
| 500,000–699,000 | 38 | 23.2 | |
| 700,000 and above | 30 | 18.3 | |

Source: Field survey, 2026

Sources of Information on Improved Cabbage Production Technologies

The distribution of respondents according to their primary sources of information on improved cabbage production technologies as presented in Table 3 indicated that, extension agents constitute the most dominant channel of information dissemination, accounting for 35.4% of the responses, followed by fellow farmers (25.6%), workshops and training sessions (15.9%), research institutions (12.1%), and online resources (11.0%). This pattern reflects the continued relevance of interpersonal communication channels in agricultural technology transfer within rural farming systems in Nigeria. The prominence of extension agents aligns with the findings of Nnadi *et al.* (2021), who emphasized that extension services remain the backbone of agricultural innovation dissemination in developing countries due to their ability to provide tailored, location-specific advisory services.

Similarly, Adebayo *et al.* (2022) observed that farmers tend to rely more on extension personnel because of the trust, credibility, and practical demonstrations associated with their activities. The significant role of fellow farmers further supports the diffusion of innovation theory, which posits that peer influence and social networks are critical in shaping adoption behaviour. According to Olagunju *et al.* (2023), farmer-to-farmer interactions facilitate experiential learning and reduce uncertainty associated with new technologies. However, the relatively low utilization of online resources suggests a digital divide, which may be attributed to limited access to internet facilities, low digital literacy, or infrastructural constraints, as reported by FAO (2022). The moderate contribution of research institutions indicates a weak linkage between research and end-users, a challenge also identified by World Bank (2021), which highlighted the need for strengthening agricultural knowledge systems to enhance technology uptake.



Table 3: Distribution of Respondents Based on Primary Source of Information on Improved Cabbage Production Technologies (n = 164)

| Source of Information | Frequency | Percentage |
|-----------------------|------------|------------|
| Extension agents | 58 | 35.4 |
| Fellow farmers | 42 | 25.6 |
| Online resources | 18 | 11.0 |
| Workshops/Training | 26 | 15.9 |
| Research institutions | 20 | 12.1 |
| Total | 164 | 100 |

Source: Field survey, 2026

Socio-economic Factors Influencing Adoption of Improved Cabbage Production Technologies

To further determine the factors influencing the adoption of improved cabbage production technologies, a binary logistic regression model was employed and the result is presented in Table 4. The dependent variable was adoption (1 = adopter, 0 = non-adopter), while the independent variables included socio-economic and institutional factors.

The results as presented in Table 4 provided empirical evidence on the determinants of adoption of improved cabbage production technologies among farmers in the study area. The model is statistically significant, as indicated by the chi-square value (68.32, $p < 0.001$), suggesting that the explanatory variables jointly influence adoption decisions. The Nagelkerke R^2 value of 0.69 implies that approximately 69% of the variation in adoption behaviour is explained by the variables included in the model, indicating a good model fit.

The coefficient of age ($\beta = 0.215$, $p < 0.05$) is positive and significant, indicating that older farmers are more likely to adopt improved technologies. This may be attributed to their accumulated farming experience and resource base. This finding is consistent with Ogunleye *et al.* (2023), who reported that age positively influences adoption due to increased exposure to farming practices and decision-making capacity. However, sex was found to be statistically insignificant ($p > 0.05$), suggesting that gender does not significantly influence adoption decisions in the study area, which may indicate increasing gender inclusiveness in agricultural production.

Education shows a positive and highly significant relationship with adoption ($\beta = 0.482$, $p < 0.01$), implying that educated farmers are more likely to adopt improved technologies. This supports the findings of Okeke *et al.* (2022), who emphasized that education enhances farmers' ability to access, interpret, and utilize agricultural information effectively. Similarly, household size ($\beta = 0.167$, $p < 0.05$) is positively related to adoption, suggesting that larger households provide labour necessary for implementing improved practices, in line with Yusuf *et al.* (2021).

Farming experience ($\beta = 0.298$, $p < 0.01$) also significantly influences adoption, indicating that experienced farmers are more willing to adopt technologies due to their familiarity with agricultural systems. Access to credit ($\beta = 0.621$, $p < 0.01$) has a strong positive effect on adoption, highlighting the importance of financial resources in facilitating investment in improved inputs and technologies. This finding corroborates Ibrahim and Lawal (2020), who identified credit access as a major determinant of agricultural innovation adoption.

Extension contact emerged as the most significant factor ($\beta = 0.705$, $p < 0.001$), indicating that farmers who frequently interact with extension agents are more than twice as likely to adopt improved technologies ($\text{Exp}(\beta) = 2.024$). This underscores the critical role of extension services in promoting agricultural innovations. Nnadi *et al.* (2021) similarly found that extension contact significantly increases adoption rates by improving farmers' knowledge and skills.

Cooperative membership ($\beta = 0.389$, $p < 0.05$) positively influences adoption, reflecting the importance of social networks in facilitating access to information, credit, and inputs. This finding



aligns with Olagunju *et al.* (2023), who emphasized the role of farmer organizations in enhancing technology uptake.

The cost of inputs ($\beta = -0.533, p < 0.01$) has a negative and significant effect on adoption, indicating that high input costs discourage farmers from adopting improved technologies. This is consistent with World Bank (2021), which identified high production costs as a major constraint to agricultural transformation in developing countries. Similarly, climate factors ($\beta = -0.298, p < 0.05$) negatively influence adoption, suggesting that adverse environmental conditions such as unpredictable rainfall and pest infestations reduce farmers' willingness to adopt new technologies.

Market access ($\beta = 0.412, p < 0.05$) positively affects adoption, indicating that farmers with better access to markets are more likely to adopt improved technologies due to the assurance of profitable returns. This finding supports the argument of Adebayo *et al.* (2024) that market incentives play a crucial role in driving agricultural innovation.

The logistic regression results demonstrate that adoption of improved cabbage production technologies is significantly influenced by a combination of socio-economic, institutional, and environmental factors. Among these, extension contact, access to credit, education, and input costs are the most critical determinants. The findings highlight the need for policies aimed at strengthening extension services, improving access to affordable credit, reducing input costs, and enhancing market infrastructure to promote widespread adoption of improved agricultural technologies.

Table 4: Socio-economic Factors Influencing Adoption of Cabbage Production Technologies (n = 164)

| Variables | Coefficient (β) | Std. Error | Wald | Sig. (p-value) | Exp(β) |
|------------------------|---|-------------------|-------------|-----------------------|--------------------------------|
| Constant | -2.315 | 0.842 | 7.56 | 0.006 | 0.099 |
| Age | 0.215 | 0.098 | 4.82 | 0.028* | 1.240 |
| Sex | 0.134 | 0.276 | 0.24 | 0.622 | 1.143 |
| Education | 0.482 | 0.155 | 9.67 | 0.002** | 1.619 |
| Household size | 0.167 | 0.072 | 5.37 | 0.020* | 1.182 |
| Farming experience | 0.298 | 0.110 | 7.34 | 0.007** | 1.347 |
| Access to credit | 0.621 | 0.184 | 11.38 | 0.001** | 1.861 |
| Extension contact | 0.705 | 0.192 | 13.46 | 0.000*** | 2.024 |
| Cooperative membership | 0.389 | 0.168 | 5.36 | 0.021* | 1.476 |
| Input cost | -0.533 | 0.201 | 7.02 | 0.008** | 0.587 |
| Market access | 0.412 | 0.173 | 5.66 | 0.017* | 1.510 |
| Climate factors | -0.298 | 0.142 | 4.41 | 0.036* | 0.742 |

Model Statistics

-2 Log Likelihood = 112.45

Cox & Snell R² = 0.52

Nagelkerke R² = 0.69

Chi-square = 68.32 (p < 0.001)

Source: Field survey, 2026

Significant at 5% (), 1% (), and 0.1% () levels*

Constraints Faced by Farmers in the Adoption of Cabbage Production Technologies

The results as presented in Table 5 indicated that, farmers in the study area are confronted with multiple constraints that significantly hinder the adoption of improved cabbage production technologies, as all identified constraints recorded mean values above the decision threshold of 3.00, signifying that they are perceived as major constraints. Among these, insufficient credit or savings (mean = 4.21), inaccessibility to loans (mean = 4.20), and low capital base (mean = 4.18) emerged as the most critical constraints, highlighting the central role of financial limitations in agricultural



technology adoption. This finding underscores the persistent challenge of limited access to formal financial services among smallholder farmers, which restricts their ability to invest in improved inputs and technologies. Ibrahim and Lawal (2020) emphasized that inadequate financial resources remain one of the most significant barriers to agricultural innovation adoption in developing countries.

Closely related to financial constraints is the high cost of production (mean = 4.19), which further exacerbates farmers' inability to adopt improved technologies. The rising cost of inputs such as seeds, fertilizers, and agrochemicals reduces farmers' profit margins and discourages investment in modern farming practices. This finding is consistent with World Bank (2021), which identified high input costs as a major impediment to agricultural productivity growth in Nigeria. Similarly, poor storage facilities (mean = 4.10) rank among the major constraints, indicating post-harvest challenges that lead to significant losses and reduced income. According to FAO (2022), inadequate storage infrastructure is a major contributor to post-harvest losses in sub-Saharan Africa, thereby undermining the benefits of increased production.

Institutional constraints such as inadequate access to extension services (mean = 4.04) also significantly affect adoption. Extension services play a vital role in disseminating information and building farmers' capacity to adopt improved technologies. However, limited extension coverage and irregular contact reduce the effectiveness of these services. Nnadi *et al.* (2021) reported that weak extension systems in Nigeria limit farmers' access to timely and relevant agricultural information, thereby constraining innovation uptake.

Environmental and infrastructural challenges are also evident, as lack of access to irrigation water during drought (mean = 3.99) and lack of drought-resistant varieties (mean = 3.98) were identified as major constraints. These findings highlight the vulnerability of farmers to climate variability and the need for climate-resilient agricultural technologies. FAO (2022) emphasized that climate change poses significant risks to agricultural production, particularly for smallholder farmers who depend on rain-fed agriculture. The inability to access irrigation facilities limits dry season farming and reduces overall productivity.

Furthermore, the use of crude farming methods (mean = 3.93) indicates a persistence of traditional practices, which may be due to limited access to modern tools, knowledge, or capital. This aligns with the findings of Adesoji *et al.* (2020), who noted that technological backwardness is often linked to poverty and lack of institutional support. Similarly, lack of market information (mean = 3.96) constrains farmers' ability to make informed marketing decisions, affecting their income and willingness to adopt improved technologies. Adebayo *et al.* (2024) highlighted that access to market information enhances farmers' bargaining power and encourages market-oriented production.

Knowledge-related constraints, including ignorance of adoption strategies (mean = 3.89) and poor knowledge of climate and weather conditions (mean = 3.88), also affect adoption, although they rank relatively lower compared to financial and institutional factors. This suggests that while awareness of improved technologies exists, there are still gaps in technical knowledge and capacity among farmers. Ogunleye *et al.* (2023) emphasized that continuous training and capacity building are essential for improving farmers' understanding and utilization of agricultural innovations.

The findings demonstrate that the adoption of improved cabbage production technologies is constrained by a combination of financial, institutional, environmental, and knowledge-related factors. Among these, financial constraints are the most critical, followed by infrastructural and institutional limitations. Addressing these challenges requires a holistic approach that includes improving access to affordable credit, strengthening extension services, investing in rural infrastructure such as irrigation and storage facilities, and enhancing farmers' technical knowledge through training and capacity-building programs. Such interventions are essential for promoting the widespread adoption of improved agricultural technologies and enhancing the productivity and livelihoods of cabbage farmers in the study area.



Table 5: Mean Ranking of Constraints Faced by Farmers in Adoption of Improved Cabbage Production Technologies (n = 164)

| Constraints | SA | A | U | D | SD | Mean | Rank | Decision |
|-------------------------------------|----|----|----|----|----|------|------|----------|
| Insufficient credit/savings | 90 | 46 | 8 | 11 | 9 | 4.21 | 1st | Major |
| Inaccessibility to loans | 88 | 48 | 9 | 10 | 9 | 4.20 | 2nd | Major |
| Low capital base | 85 | 50 | 10 | 11 | 8 | 4.18 | 3rd | Major |
| High cost of production | 87 | 49 | 10 | 9 | 9 | 4.19 | 4th | Major |
| Poor storage facilities | 82 | 48 | 12 | 12 | 10 | 4.10 | 5th | Major |
| Inadequate extension services | 78 | 50 | 12 | 13 | 11 | 4.04 | 6th | Major |
| Lack of irrigation water | 75 | 50 | 14 | 13 | 12 | 3.99 | 7th | Major |
| Lack of drought-resistant varieties | 74 | 52 | 13 | 13 | 12 | 3.98 | 8th | Major |
| Use of crude methods | 70 | 52 | 15 | 15 | 12 | 3.93 | 9th | Major |
| Lack of market information | 72 | 51 | 15 | 14 | 12 | 3.96 | 10th | Major |
| Ignorance on adoption strategies | 68 | 50 | 18 | 15 | 13 | 3.89 | 11th | Major |
| Poor knowledge of climate/weather | 70 | 49 | 17 | 14 | 14 | 3.88 | 12th | Major |

(Decision Rule: Mean ≥ 3.00 = Major Constraint; Mean < 3.00 = Minor Constraint)

Source: Field survey, 2026

CONCLUSION AND RECOMMENDATION

The study revealed that the adoption of improved cabbage production technologies is significantly influenced by socio-economic, institutional, and environmental factors, with extension contact, access to credit, education, and input costs playing the most critical roles. The findings also Recommended that Government and development agencies should strengthen extension services, improve access to affordable credit, and subsidize key farm inputs to enhance adoption of improved cabbage technologies. Additionally, investment in rural infrastructure such as irrigation systems, storage facilities, and market access should be prioritized to support sustainable agricultural productivity.

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