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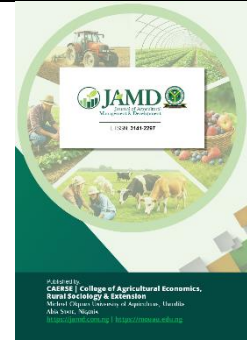
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Socio-economic, Institutional and Technological Determinants of Adoption of Recommended Melon (*Citrullus lanatus*) Production Practice and their Effects on Farmers' Productivity and Income in Nasarawa State, Nigeria

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ABSTRACT

This study examined the determinants and effects of adoption of recommended melon production practices among farmers in Nasarawa State, Nigeria. Despite the economic importance of melon production in the state, productivity remains low due to limited adoption of improved technologies. A multi-stage sampling technique was employed to select 355 melon farmers from selected Local Government Areas. Primary data were collected using structured questionnaires and analyzed with descriptive statistics, multiple regression analysis, and the Z-test. The regression results revealed that the model was statistically significant at the 1% level, with R^2 of 0.62, indicating that 62% of the variation in the adoption technology were explained by the socio-economic, institutional, and technological variables included in the model. Farm size, education, sex, access to credit, extension contact, sources of information, and affordability positively and significantly influenced their adoption level, while perceived complexity negatively affected adoption decisions. A paired sample z-test was employed to compare yield and income before and after adoption. The results revealed statistically significant increases in both yield and income after adoption ($p < 0.01$). Mean yield increased from 1,820 kg/ha to 3,460 kg/ha, while income rose from ₦210,000 to ₦495,000 per hectare. The findings confirm that adoption of improved melon technologies significantly enhances productivity and farm income. The study concludes that adoption of improved melon production practices significantly enhances farm productivity and profitability. It recommends strengthening extension services, improving access to agricultural credit, enhancing farmer education, promoting affordable technologies, and implementing gender-inclusive agricultural policies to improve rural livelihoods.

Introduction

In the broad landscape of agriculture, vegetable and horticultural crops play an increasingly important role in rural livelihoods, household nutrition, and regional trade. Among these crops, melon (*Citrullus lanatus*), locally known as *egusi*, commands high demand due to its wide use in Nigerian diets and its strong presence in domestic and regional markets. Recent agribusiness analyses estimate Nigeria's melon industry is valued in the hundreds of billions of naira annually, with substantial supply gaps pointing to potential productivity gains if recommended agronomic practices are more widely adopted (Donatus, 2025).

Melon production contributes meaningfully to household income in North-Central Nigeria, including Nasarawa State, where smallholder farmers dominate production. The crop is valued for its seeds, which are rich in protein and oil and form an essential ingredient in Nigerian cuisine. Despite its economic relevance, productivity remains relatively low compared to potential yield levels under recommended agronomic practices. Studies in Nigeria's horticultural sector indicate that adoption of improved production technologies significantly enhances yield and farm income (Abdulazeez, Adebayo, & Yusuf, 2023; Olagunju et al., 2022).

Agricultural technology adoption is widely recognized as a key driver of productivity growth in developing countries. According to Everett Rogers (2003), adoption decisions are influenced by the perceived relative advantage, compatibility, complexity, trialability, and observability of innovations. Similarly, empirical agricultural adoption studies show that socio-economic characteristics such as age, education, farm size, and farming experience significantly influence farmers' likelihood of adopting improved technologies. In Nigeria, access to extension services, credit facilities, and cooperative membership have also been found to positively affect adoption behaviour (Ahmed & Mesfin, 2021; Bako & Idris, 2023).

In Nasarawa State, melon production is still largely dependent on traditional practices, including local seed varieties, mixed cropping without recommended spacing, and minimal fertilizer application. While improved seed varieties, pest management techniques, and better agronomic recommendations are available through research institutes and extension agencies, adoption rates remain uneven and poorly documented. There is limited empirical evidence specifically examining melon production systems in the state, particularly regarding how socio-economic, institutional, and technological factors interact to influence adoption decisions and how such adoption translates into output and income gains.

Despite the availability of recommended melon production practices, yields among smallholder farmers in Nasarawa State remain below achievable levels. Many farmers continue to rely on traditional methods that limit productivity and reduce income potential. Low adoption of improved technologies may stem from socio-economic constraints such as limited education and small farm size, institutional challenges such as inadequate extension contact and restricted access to credit, and technological factors such as perceived complexity or cost of innovations. Previous studies in Nigeria have established that adoption of improved agricultural technologies significantly increases farm productivity and income (Ogunleye, Arowolo, & Ayinde, 2022; Yusuf & Adebayo, 2023). However, most of these studies focus on staple crops such as maize, rice, and cassava, with limited attention given to melon production. Furthermore, there is inadequate empirical evidence isolating the combined influence of socio-economic, institutional, and technological determinants on adoption behaviour in Nasarawa State. Without such evidence, policy interventions and extension programmes may not effectively address the real constraints limiting technology uptake among melon farmers.

The objectives of this study are:

- i. to examine the socio-economic, institutional, and technological determinants of adoption of recommended melon (*Citrullus lanatus*) production practices;
- ii. to assess the effect of adoption on farmers productivity and income in Nasarawa State, Nigeria.

This study is justified on both empirical and policy grounds. Melon production constitutes an important source of income for rural households in Nasarawa State, yet its productivity potential remains underexploited so enhancing adoption of recommended practices could significantly increase yields and improve rural welfare. Evidence from smallholder farming systems in sub-Saharan Africa shows that technology adoption contributes to poverty reduction and income growth (Asfaw et al., 2012; Food and Agriculture Organization, 2023). In addition, by quantifying the effect of adoption on farm productivity and

income, this study will provide empirical evidence to support investment decisions in melon value chain development. Such evidence is critical for designing inclusive agricultural development strategies that promote sustainable intensification and improve smallholder livelihoods in Nigeria.

Methodology

The study was conducted in Nasarawa State, located in the North-Central geopolitical zone of Nigeria. The state was created in 1996 and occupies a strategic position within Nigeria's Middle Belt region. It shares boundaries with Kaduna State to the north, Benue State to the south, Kogi State to the west, Taraba State to the east, and the Federal Capital Territory to the northwest. The state covers approximately 27,117 square kilometres and lies between latitude 7°45'N and 9°25'N and longitude 7°00'E and 9°37'E (National Bureau of Statistics [NBS], 2023).

Nasarawa State falls within the Southern Guinea Savanna agro-ecological zone, characterized by moderate to high rainfall ranging between 1,100 mm and 1,800 mm annually and average temperatures between 25°C and 35°C. The rainy season typically spans from April to October, creating favourable conditions for rain-fed agriculture (Nigerian Meteorological Agency [NiMet], 2024). These climatic conditions are particularly suitable for the cultivation of melon (*Citrullus lanatus*), which thrives in well-drained sandy-loam soils common in the state. Agriculture is the dominant economic activity in Nasarawa State, employing a substantial proportion of the rural population. According to the National Bureau of Statistics (2023), crop production accounts for a significant share of household income in the state, with smallholder farmers cultivating staples and cash crops such as maize, rice, cassava, yam, sesame, and melon. The state government and agricultural development programmes have continued to emphasize crop intensification and improved technology adoption to enhance productivity and rural income (Federal Ministry of Agriculture and Rural Development [FMARD], 2022).

The study covered six Local Government Areas (LGAs): Doma, Lafia, Akwanga, Obi, Nasarawa, and Kokona. These LGAs were selected due to their strong agricultural base and active participation in melon production. Farming systems in these areas are predominantly small-scale and rain-fed, characterized by low mechanization, limited access to improved inputs, and dependence on family labour. Previous agricultural assessments in North-Central Nigeria indicate that smallholder farmers in such systems face constraints including inadequate extension contact, poor access to credit, and limited adoption of improved agronomic practices (World Bank, 2024; FAO, 2023). Melon production in Nasarawa State is largely undertaken by smallholder farmers cultivating between 0.5 and 3 hectares (FAO, 2023). The crop serves dual purposes: as a household food source and as a commercial commodity sold in rural and urban markets. Despite favourable agro-ecological conditions, productivity remains below potential yield levels due to partial adoption of recommended production practices such as improved seed varieties, proper spacing, fertilizer application, and integrated pest management. According to the National Bureau of Statistics (NBS) and the Federal Ministry of Agriculture and Food Security (FMAFS), average traditional melon yield in north central Nigeria, including Nasarawa State, ranges between 2.5–4.0 tonnes per hectare, depending on management practices. However, agronomic trials conducted by the National Horticultural Research Institute (NIHORT) indicate that improved melon varieties under recommended management practices can achieve potential yields of 6–8 tonnes per hectare, and in some experimental conditions up to 10 tonnes per hectare. Enhancing adoption of these practices is therefore critical to improving farm output and income among melon producers in the state (World Bank, 2024).

A multistage sampling procedure was employed. In the first stage, Nasarawa state was purposively selected as one of the largest producing melon state in Nigeria. In stage two, six Local Government Areas (LGAs) in Nasarawa State, namely Doma, Lafia, Akwanga, Obi, Nasarawa, and Kokona were purposively selected due to their active involvement in melon production and agricultural prominence within the state. In stage three, three (3) melon-producing villages were selected from each LGA, resulting in a total of 18 villages. The villages were identified with the assistance of Agricultural Development Programme (ADP) extension officers and community leaders who provided lists of active melon-producing communities. In stage four, involves proportionate sampling technique used to select respondents from each ward based on the population of melon farmers identified in the villages using the Taro Yamane's (1973) formula in computing the required sample size for the study. Therefore, three hundred and fifty-five (355) farmers were selected across all selected villages for the study from the total sample frame of three thousand one hundred and fifty-three (3153) farmers.

The formula is expressed as follows:

$$n_0 = \frac{N}{1+N(e^2)} \tag{1}$$

n_0 = Sample size
 N = Total population of farmers in the selected area
 e = margin of error (0.05)
 $N=3153$
 $n_0=355$
 e = margin of error (0.05)
 $\frac{355}{3153} \times 100 = 11.25\% \cong 11\%$

Respondents from each ward was therefore selected proportionately using the expression below:

$$x = (X/n) \times N \tag{2}$$

Where,
 x = Sample size per village
 X = Number of selected registered farmers per villages
 n = Total number of farmers in the selected Local Government Areas
 N = Required sample size for the study (from Taro Yamane's 1973 formula)

The selected State, Local Government Areas, villages and number of sampled farmers from each village is as shown in Table 1.

Data for this study were obtained from primary sources with a structured questionnaire administered by melon farmers across the selected villages in Nasarawa State. A structured questionnaire was developed based on the objectives of the study and relevant literature on agricultural technology adoption. The questionnaire was administered through face-to-face interviews with the assistance of trained enumerators who were familiar with the local language. This method was adopted because the literacy levels among rural farmers varied, and the need to improve response accuracy.

The analytical techniques adopted for this study were guided by the objectives of examining the socio-economic characteristics of melon farmers, identifying the determinants of melon output, and testing specified hypotheses. The study employed descriptive statistics, multiple regression analysis, and the z-test as the major analytical tools. Descriptive statistics were used to analyze the socio-economic characteristics of melon farmers and other relevant farm-level variables which the use of include frequency distribution, percentages, mean and standard deviation. Inferential statistics, which include multiple regression analysis, was used to determine the factors influencing melon output in the study area. It examines the relationship between the dependent variable and multiple explanatory variables simultaneously. In addition, z-test analysis was employed to test differences in yield and income of farmers before and after adoption.

The multiple regression model is specified as follows:

$$Y = \beta_0 + \beta_1Z_1 + \beta_2Z_2 + \beta_3Z_3 + \beta_4Z_4 + \beta_5Z_5 + \beta_6Z_6 + \beta_7Z_7 + \beta_8Z_8 + \beta_9Z_9 + \beta_{10}Z_{10} + \beta_{11}Z_{11} + \beta_{12}Z_{12} + \beta_{13}Z_{13} + \beta_{14}Z_{14} + \beta_{15}Z_{15} + U_i \tag{3}$$

Where,
 Y = Adoption of the Improved Melon Technology
 β_0 = intercept
 $\beta_0 - \beta_{15}$ = Regression coefficients
 Z_1 = Age of farmer (years)
 Z_2 = Sex (1 = Male, 2 = Female)
 Z_3 = Marital status (1 = Married, 0 = Otherwise)
 Z_4 = Educational level (years of formal schooling)
 Z_5 = Household size (number of persons)
 Z_6 = Farming experience (years)

Z_7 = Farm size (hectares)
 Z_8 = Access to credit (1 = Yes, 0 = No)
 Z_9 = Sources of Information (1=Yes, 0=No)
 Z_{10} = Membership of Association (1 = Yes, 0 = No)
 Z_{11} = Extension contact (number of visits per season)
 Z_{12} = Relative Advantage (Likert scale score 1-5)
 Z_{13} = Complexity (Likert scale score 1-5)
 Z_{14} = Compatibility (Likert scale score 1-5)
 Z_{15} = Affordability (Likert scale score 1-5)
 a = Constant
 e =error term.

Results and Discussion

The linear regression results show that the model is statistically significant at the 1% level ($F = 38.42$). The adjusted coefficient of determination ($R^2 = 0.62$) indicates that 62% of the variation in adoption of recommended melon production practices is explained by the socio-economic, institutional, and technological variables included in the model. Age has a negative coefficient (-0.018) but is not statistically significant. This may be attributed to the conservative nature of older farmers who are often more attached to traditional farming methods and less willing to take risks associated with new technologies. Younger farmers, in contrast, are generally more receptive to innovation and experimentation. However, the variable was not statistically significant, indicating that age alone does not strongly determine adoption behaviour in the study area. This implies that both young and older farmers are equally capable of adopting innovations. Similar findings were reported by Abdullahi et al. (2022), who found age to be insignificant in adoption decisions among crop farmers in Northern Nigeria.

Sex is positive (0.221) and significant at the 5% level. This indicates that male farmers are more likely to adopt improved melon practices than female farmers. The positive coefficient suggests that being male increases the likelihood of adoption, possibly due to better access to land, capital, and extension services. This outcome may reflect prevailing gender disparities in access to productive resources such as land, credit facilities, extension services, and farm inputs. In many rural communities, men typically control larger farm holdings and have greater financial autonomy, which enhances their capacity to invest in improved technologies. This supports findings by Adebayo and Ogunleye (2021), who observed gender disparities in agricultural technology adoption in North-Central Nigeria.

Marital status is negative (-0.102) and not significant. This implies that marital status does not significantly influence adoption decisions among melon farmers. Education is positive (0.146) and significant at 1%. This suggests that farmers with higher levels of formal education are more likely to adopt improved melon production practices. Education enhances a farmer's ability to understand technical information, interpret extension messages, assess potential benefits and risks, and make informed production decisions. Educated farmers are also more capable of managing farm records and evaluating cost benefit outcomes, which strengthens their willingness to adopt innovations. This aligns with findings by Issa *et al* (2023), who reported that education significantly influences technology uptake in Nigeria.

Household size is positive (0.028) but not statistically significant. Although larger households may provide more family labour, the effect is not strong enough to influence adoption significantly. Farming experience is positive (0.041) but not significant. Farming experience displayed a positive relationship with adoption, indicating that experienced farmers may better appreciate the potential benefits of improved practices. Experienced farmers often possess accumulated knowledge that enables them to evaluate innovations more effectively. Nonetheless, the insignificance of this variable may reflect the possibility that highly experienced farmers may also be deeply rooted in traditional practices, which could offset their likelihood of adopting new technologies.

Farm size is positive (0.297) and highly significant at 1%. This indicates that farmers with larger landholdings are more likely to adopt improved practices. Larger farm size increases capacity to absorb risk and invest in improved technologies. This finding is consistent with FAO (2022), which identifies farm size as a major determinant of agricultural technology adoption.

Access to credit is positive (0.534) and highly significant at 1%. Adoption of improved melon production practices often requires financial investment in inputs such as improved seeds, fertilizers, agrochemicals, and hired labour. Access to credit relaxes liquidity constraints and enhances farmers' ability to finance these inputs. Farmers with access to financial resources are therefore more capable of adopting recommended practices. The World Bank (2023) similarly emphasized that access to agricultural finance significantly promotes technology adoption in Sub-Saharan Africa. Sources of information is positive (0.061) and significant at 1%. Access to reliable agricultural information increases awareness and reduces uncertainty associated with innovation. This finding supports the diffusion theory of Everett Rogers, which identifies information flow as central to adoption behaviour.

Membership of association is positive (0.118) and significant at 5%. Farmers who belong to cooperatives or social groups benefit from shared information, peer learning, collective action, and improved access to inputs and credit facilities. Social networks enhance knowledge exchange and reduce uncertainty, thereby encouraging adoption of innovations. Extension contact has a strong positive coefficient (0.284) and is highly significant at 1%. This indicates that increased interaction with extension agents significantly increases adoption. The magnitude and significance suggest that extension services play a crucial role in technology dissemination. Musa et al. (2024) also reported extension contact as a key determinant of crop technology adoption in North-Central Nigeria. Relative advantage is positive (0.074) and weakly significant at 10%. This implies that when farmers perceive improved melon practices as more beneficial than traditional methods, adoption increases because perceived economic benefit is a key driver of technology uptake. Complexity is negative (-0.192) and highly significant at 1%. Technologies perceived as difficult to understand or implement discourage farmers from adopting them. High complexity increases uncertainty and perceived risk, thereby reducing the likelihood of adoption. Farmers generally prefer innovations that are simple and easy to apply. This means that the more complex farmers perceive the technology to be, the less likely they are to adopt it. This result strongly supports Rogers' diffusion theory, which identifies complexity as a barrier to adoption. Compatibility is positive (0.083) but not statistically significant. Although compatibility with existing practices may encourage adoption, its effect is not strong enough in this study. This suggests that when improved practices align with farmers' existing values, cultural norms, and farming systems, adoption becomes easier. However, other factors such as affordability and access to credit appear to play a more decisive role in influencing adoption decisions in the study area. Affordability is positive (0.256) and highly significant at 1%. When farmers perceive that recommended practices are financially manageable, they are more likely to adopt them. Cost considerations therefore remain central to farmers' decision-making processes.

A paired sample z-test was conducted to determine whether significant differences exist in melon yield and income of the same farmers before and after adoption of improved melon production technologies. The results indicate that mean yield increased from 1,820 kg/ha before adoption to 3,460 kg/ha after adoption, representing a mean difference of 1,640 kg/ha. The minimum and maximum yield levels also improved considerably after adoption. Similarly, mean income increased from ₦210,000 per hectare before adoption to ₦495,000 per hectare after adoption, resulting in a mean income gain of ₦285,000. The computed z-values for yield (17.58) and income (19.21) are statistically significant at the 1 percent level ($p < 0.01$). The null hypothesis of no significant difference is therefore rejected. These findings are consistent with empirical evidence from the International Institute of Tropical Agriculture (IITA, 2022), which reports that adoption of improved crop varieties significantly increases productivity through enhanced genetic potential and improved agronomic practices. Similar productivity gains have also been documented by the National Agricultural Extension and Research Liaison Services (NAERLS, 2021), which found that adoption of recommended crop production packages leads to significant improvements in yield and farm income in Nigeria. The results further align with Abdulai and Huffman (2014), who found that technology adoption significantly enhances farm productivity and economic returns due to improved input efficiency. Therefore, the findings confirm that adoption of improved melon technologies has a strong positive impact on farmers' productivity and income.

Conclusion and Recommendations

The regression result clearly shows that farm size, education, sex, access to credit, extension contact, sources of information, and affordability were the factors that significantly influence adoption technology decisions of melon farmers.

The study further concluded that the adoption of improved technology statistically record significant increases in both maize yield and farm income after adoption This confirms that improved melon production practices contribute meaningfully to increased productivity and profitability. Overall, the findings establish that adoption of recommended melon technologies is both economically beneficial and statistically significant in improving farmers' welfare in the study area.

In view of the findings of this study, several policy and practical recommendations were proposed to enhance the adoption of recommended melon production practices and improve farmers' productivity and income in Nasarawa State. Given that extension contact emerged as one of the strongest determinants of adoption, there is a need to strengthen agricultural extension services in the study area, government and relevant agricultural development agencies should increase the recruitment, training, and deployment of extension personnel to ensure regular farmer extension interactions. Similarly, financial institutions, microfinance banks, and cooperative societies should develop farmer-friendly credit schemes with minimal collateral requirements and flexible repayment conditions. The positive effect of education on adoption underscores the importance of farmer capacity development. Adult education programs, technical training workshops, and capacity-building initiatives should be intensified to enhance farmers' managerial and decision-making skills. Improved literacy and technical knowledge will facilitate better understanding and implementation of recommended technologies. Policymakers should consider input subsidy programs or promote cooperative bulk purchasing systems that can reduce the cost of improved melon production inputs. Encouraging collective action among farmers can improve knowledge sharing and reduce transaction costs associated with technology adoption. Finally, since sex was found to influence adoption decisions, agricultural policies should be gender-responsive. Female farmers should be provided with equitable access to land, credit facilities, extension services, and training opportunities to ensure inclusive agricultural development.

References

- Abdulai, A., & Huffman, W. E. (2014). The adoption and impact of soil and water conservation technology: An endogenous switching regression application. *Land Economics*, 90(1), 26–43. <https://doi.org/10.3368/le.90.1.26>.
- Abdulazeez, B., Adebayo, K., & Yusuf, T. (2023). Impact of improved production practices on productivity of horticultural crops in North-Central Nigeria. *African Journal of Agricultural Research*, 18(4), 287–298.
- Abdullahi, M., Yusuf, S. A., & Abdullahi, A. (2022). Determinants of adoption of improved crop varieties among smallholder farmers in Northern Nigeria. *Journal of Agricultural Extension*, 26(2), 45–56.
- Adebayo, O. O., & Ogunleye, A. S. (2021). Gender differences in agricultural technology adoption among vegetable farmers in North-Central Nigeria. *African Journal of Agricultural Research*, 17(4), 589–598.
- Ahmed, M., & Mesfin, Y. (2021). Institutional determinants of agricultural technology adoption among smallholder farmers in Nigeria. *Journal of Agricultural Extension and Rural Development*, 13(1), 14–26.
- Asfaw, S., Kassie, M., Simtowe, F., & Lipper, L. (2012). Poverty and the adoption of drought tolerant maize in Ethiopia: Panel data evidence. *Agricultural Economics*, 43(4), 405–416.
- Bako, R., & Idris, A. (2023). Influence of extension contact and credit access on agricultural technology adoption in Nasarawa State, Nigeria. *Nigerian Journal of Agricultural Economics*, 24(2), 45–60.
- Donatus, A. I. (2025). Agribusiness analysis of Nigeria's melon industry: Market value, supply gaps, and productivity prospects. Abuja, Nigeria: Agricultural Policy and Market Research Institute.
- Everett Rogers. (2003). *Diffusion of innovations* (5th ed.). Free Press.
- Federal Ministry of Agriculture and Rural Development (FMARD). (2022). National agricultural technology and innovation policy (NATIP) 2022–2027. Abuja, Nigeria.
- Food and Agriculture Organization. (2022). The state of food and agriculture 2022: Innovation in agrifood systems. FAO.
- Food and Agriculture Organization. (2023). FAOSTAT statistical database. Rome: FAO. <https://www.fao.org/faostat>
- International Institute of Tropical Agriculture. (2022). Improved crop varieties and productivity enhancement in Nigeria. Ibadan, Nigeria: IITA.
- Issa, F. O., Ibrahim, H. Y., & Musa, M. W. (2023). Human capital and technology adoption among smallholder farmers in Nigeria. *Nigerian Journal of Agricultural Economics*, 13(1), 77–89.
- Musa, A. T., Salihu, A., & Danjuma, I. (2024). Extension service delivery and adoption of improved crop technologies in North-Central Nigeria. *Journal of Agricultural Development Studies*, 8(1), 101–115.
- National Agricultural Extension and Research Liaison Services. (2021). Agricultural performance survey of wet season crops in Nigeria. Zaria, Nigeria: NAERLS, Ahmadu Bello University.
- National Bureau of Statistics. (2023). Agricultural performance survey report. Abuja, Nigeria.
- Nigerian Meteorological Agency. (2024). Annual climate review bulletin. Abuja, Nigeria.
- Ogunleye, O. S., Arowolo, A. O., & Ayinde, F. O. (2022). Adoption of improved maize technologies and its impact on household income in South-West Nigeria. *Journal of Agricultural Science and Practice*, 7(3), 31–42.

Olagunju, A., Oladimeji, A., & Akinyemi, J. (2022). Agronomic practices and productivity of cucurbit crops in Nigeria: Evidence from farm surveys. *Journal of Horticultural Science and Technology*, 15(2), 92–105.

World Bank. (2023). Transforming agriculture in Sub-Saharan Africa: Improving productivity and resilience. World Bank Group. <https://www.worldbank.org>

World Bank. (2024). Nigeria agricultural sector risk assessment: Pathways to food security and income growth. Washington, DC: World Bank.

Yamane, T. (1967): Statistics: An Introductory Analysis, 2nd Ed., New York: Harper and Row.

Yusuf, T., & Adebayo, K. (2023). Technology adoption and farm income among smallholder rice farmers in Nigeria. *Journal of Rural Studies*, 98, 67–79.

Appendix

Table 1: Distribution of sampled farmers from the selected LGAs and Villages in Nasarawa State.

State	LGAs	Villages	Sample Frame	Sample Size (11%)
Nasarawa	Nasarawa	Loko	210	24
		Tunga	230	26
		Nasarawa town	266	29
	Obi	Ikposoge	145	16
		Obi town	160	18
		Agwatashi	152	17
	Doma	Rukubi	155	17
		Ekye axis	185	21
		Akpanaja	162	18
	Akwanga	Gudi	107	12
		Andaha	121	14
		Nunku	148	17
	Konkona	Ga'ate	204	23
		Dari	220	25
		Kandare	218	25
	Lafia	Agyaragu	163	18
		Adogi	148	17
		Assakio	159	18
Total	6	18	3153	355

Table 2: Multiple Regression showing the Socio-economic, Institutional and Technological Determinants of Recommended Adoption Practices on Melon Production

Variable	Coefficient	Std. Error	t-value
Constant	2.846	0.982	2.898***
Socio-Economic Variables			
Age	-0.018	0.014	1.286
Sex	0.221	0.089	2.483**
Marital Status	-0.102	0.137	-0.744
Education	0.146	0.051	2.863***
Household Size	0.028	0.022	1.273
Farming Experience	0.041	0.030	1.367
Farm Size	0.297	0.036	8.250***
Institutional Variables			
Access to Credit	0.534	0.122	4.377***
Sources of Information	0.061	0.019	3.211***
Membership of Association	0.118	0.054	2.185**
Extension Contact	0.284	0.031	9.161***
Technological Variables			
Relative Advantage	0.074	0.042	1.762*
Complexity	-0.192	0.067	-2.866***
Compatibility	0.083	0.058	1.431
Affordability	0.256	0.063	4.063***
R = 0.79			
R ² = 0.62			
Adjusted R ² = 0.60			
F-value = 38.42*			

***Significant at 1% **Significant at 5% *Significant at 10%

Table 3: Mean Difference between the Yield and Income of Melon Farmers of Recommended Melon Technology Practices in Nasarawa State.

Category	Period	Mean	Std Deviation	Min	Max	Mean Difference	Z-Value	p-value
Yield (kg/ha)	Before Adoption	1,820kg	540	900	3,100			
	After Adoption	3,460kg	680	1,950	4,900	1,640kg	17.58	0.000
Income(₦/ha)	Before adoption	₦210,000	82,000	95,000	380,000			
	After Adoption	₦495,000	120,000	250,000	760,000	₦285,000	19.21	0.000