OPEN ACCESS JOURNALS
Indiana Journal of Agriculture and Life Sciences
Abbriviate Tittle- Ind J Agri Life Sci
ISSN *(Online)*- 2583-1623
Journal Homepage Link- https://indianapublications.com/journal/IJALS
DOI- https://doi.org/10.5281/zenodo.16647579

INDIANA PUBLICATIONS
PRODUCTIVE AND QUALITY RESEARCH

Research Article

Volume-05|Issue-04|2025

Factors Influencing Adoption of Tme-419 Cassava Production by Farmers in the Federal Capital Territory, Nigeria

Jummai Mato, Taiye O. Fadiji, Julius Ajah and Samson Olayemi Sennuga

Department of Agricultural Extension and Rural Sociology, Faculty of Agriculture, University of Abuja, FCT, P.M.B. 117, Abuja, Nigeria

Article History
Received: 17.07.2025
Accepted: 25.07.2025
Published: 31.07.2025

Citation
Mato, J., Fadiji, T. O., Ajah, J. & Sennuga, S. O. (2025). Factors Influencing Adoption of Tme-419 Cassava Production by Farmers in the Federal Capital Territory, Nigeria. *Indiana Journal of Agriculture and Life Sciences, 5*(4), 7-14.

Abstract: This study examined the factors influencing the adoption of TME-419 cassava production by farmers in the Federal Capital Territory (FCT), Nigeria. A multi-stage sampling technique was employed to select 317 smallholder cassava farmers from a sample frame of 1,538 farmers. Primary data was collected using a structured questionnaire, which was administered by trained enumerators to the farmers. Descriptive statistics and logistic regression analysis were used to analyze the data. The study revealed that the majority (80.37%) of cassava farmers were male, with 75.39% married and 82.24% having formal education. The farmers were predominantly younger than 50 years, and most (98.13%) had between 21 and 40 years of farming experience. The results of logistic regression revealed that farm size ($p < 0.01$), access to credit ($p < 0.05$), contact with extension agents ($p < 0.01$) and education level ($p < 0.01$) significantly influenced adoption, were significant socio-economic factors positively influencing the adoption of TME-419 cassava., with extension contact having the highest marginal effect (0.756). Conversely, farming experience, household size, and cooperative membership had no significant impact on adoption. Despite these positive influences, farmers faced constraints such as illiteracy, bureaucratic delays in accessing inputs ($\bar{x} = 3.819$), illiteracy ($\bar{x} = 2.922$) and logistical challenges, distance to the market ($\bar{x} = 2.844$) and transportation ($\bar{x} = 2.551$). The adoption rate of TME-419 cassava was found to be 68.22%, with farmers generally expressing a high level of interest in continuing the cultivation of the variety. The study concludes that farm size, access to credit, extension contact, and education level influenced the adoption of TME-419 cassava, with a 68.22% adoption rate. Therefore, the study recommends that policies should be implemented to improve access to inputs, enhance extension services, and increase awareness about the benefits of TME-419 cassava to promote its adoption among farmers in the study region.

Keyword: Adoption, TME 419 cassava, farmers, awareness, extension services

INTRODUCTION

Cassava (*Manihot esculenta*) is one of the most important food crops for both urban and rural poor populations in Africa. As highlighted by Abdoulaye *et al.,* (2014), cassava serves as a significant regional food supply for approximately 200 million people in sub-Saharan Africa. Globally, Nigeria is the largest producer of cassava, followed by Indonesia, Thailand, the Democratic Republic of the Congo, and Angola. In 2010, Nigeria was estimated to have produced 37.5 million tonnes of cassava (FAOSTAT, 2012). Since 2005, the country has consistently maintained its position as the world's top cassava producer (FAOSTAT, 2012). Cassava is widely cultivated across Nigeria, with nearly every household involved in its production. Its adaptability to varying climatic and soil conditions, particularly in marginal soils, has made it a favored crop among farmers who cultivate it continuously on limited land. According to Olanrewaju *et al.,* (2009), the widespread consumption of cassava and its derivatives by Nigerians across all socioeconomic groups underscores its importance. Farmers rely on cassava not only as a source of family food but also as a means of generating income, given its status as one of the most actively marketed food crops and its potential for expansion and new market opportunities (IITA, 2017). In recent years, cassava has transitioned from a subsistence crop to an industrial income crop (Egesi *et al.*, 2016).

For millions of Nigerians, cassava is a staple food consumed in various forms. Its low production costs make it a powerful tool for poverty reduction (Nweke, 2014; FAO, 2015). Although cassava roots are high in calories and primarily composed of soluble carbohydrates and starch, they are low in protein. These characteristics, among others, position cassava as a critical crop for bridging the gap between poverty alleviation and food security (Clair & Etukudo, 2010). Consequently, cassava production deserves immediate attention in the formulation of food policies.

For a nation striving to address a multi-divergent economy, adopting improved cassava varieties is essential to enhance productivity, which is key to addressing food insecurity and fostering economic recovery. Despite various initiatives, programs, and policies aimed at combating hunger, Nigeria ranked 34th out of 50 countries on the Global Hunger Index (GHI) in 2017, with a GHI score of 25.5, indicating a serious hunger situation (Ogbo *et al.,* 2018). Food insecurity is particularly prevalent in rural areas, where farming is the primary occupation. According to the National Bureau of Statistics (NBS, 2012), 48.3% of rural households are

***Corresponding Author:** Jummai Mato

classified as food poor, compared to 26.7% in urban areas.

The gap between potential and actual cassava yields per unit of land raises concerns about how effectively Nigeria is utilizing its comparative advantage. For instance, the national average cassava yield is estimated at 13.63 metric tonnes per hectare (MT/Ha), significantly lower than the potential yield of up to 40 MT/Ha (Adeleke *et al.,* 2020). Despite numerous government initiatives aimed at improving cassava production, a demand-supply gap persists. To address this, the International Institute of Tropical Agriculture (IITA) developed the TME 419 variety, which boasts higher starch content and superior production qualities for both industrial and household use. This variety was introduced to motivate production, increase farmers' output, and bridge the supply-demand gap.

The TME 419 variety meets the needs of cassava-related industries due to its high starch content and favorable consumption characteristics for local consumers. It also aligns with farmers' preferences for traits such as early maturity, high root yield, and large tuber size, while addressing processing and consumption preferences like fiber content and smoothness. The dry matter content of TME 419 ranges from 30.68% to 31.26% of total fresh root weight, with a cyanide content (CNP-Cyanogenic Potential) of 6.33 parts per million. Its field production ranges from 10.69 to 23.45 tonnes per hectare. This variety is predominantly composed of starch, with protein content ranging from 0.80% to 1.52% and starch content from 63.08% to 73.93% (IITA, 2010).

Unfortunately, many rural farmers continue to use local cassava varieties as planting materials, which yield poorly and contribute to food insecurity. This is particularly concerning given cassava's central role in the Nigerian diet. Additionally, the increasing industrial demand for cassava underscores the need for improved production. If harnessed effectively using high-yielding cultivars, cassava production could serve as a solution to economic recovery in Nigeria.

While cassava cultivation remains vital for food security, progress in production cannot be achieved without the adoption of yield-enhancing cultivars. In most regions, expanding the area under cultivation is no longer sufficient to meet the growing food demands of an increasing population (Obisesan, 2015). Despite various initiatives, Nigeria's ranking on the Global Hunger Index (GHI) in 2017 highlighted a serious hunger situation, with a GHI score of 25.5 (Adetunji *et al.*, 2020). Food insecurity remains more prevalent in rural areas, where 48.3% of households are classified as food poor, compared to 26.7% in urban areas (NBS, 2012). Agricultural growth is essential for food security, but this growth cannot occur without the adoption of yield-enhancing technologies. In most areas, simply increasing the land under cultivation is no longer viable to meet rising food demands (Obisesan, 2015). Therefore, research and the adoption of new technologies are critical for improving agricultural production and food security (Lai, 2017).

Despite government initiatives, agricultural output has not kept pace with food demand (Ani, 2016). Small-scale, resource-poor farmers, who rely predominantly on traditional farming practices, produce the majority of the nation's food crops. This has led to repeated food crises, driven by rapid population growth, unpredictable crop yields, and environmental challenges such as insufficient rainfall, deforestation, continuous farming, and desert expansion. The adoption of appropriate technologies by rural farmers could mitigate these challenges. According to Onu and Madukwe (2012), farmers' adoption behaviors are influenced by their socioeconomic and personal characteristics. Information sources also play a significant role in motivating farmers during the adoption process (Rogers, 1995).

Furthermore, the adoption of improved cassava technologies could alter household production dynamics, potentially enhancing food security and economic stability. However, the persistent gap between the availability of improved cassava varieties (e.g., TME 419) and their limited adoption by rural farmers remains understudied. This gap highlights the need to investigate the socioeconomic, institutional, and informational barriers preventing widespread adoption, as well as the disparity between policy initiatives and on-ground implementation, which continues to hinder Nigeria's potential to achieve food security and economic recovery through cassava production.

Objectives of the Study

The broad objective of the study was to determine the factors influencing the adoption of TME-419 cassava variety by farmers in Federal Capital Territory (FCT), Nigeria. The specific objectives are to:

- describe the socio-economic characteristics of cassava farmers in the study area;
- evaluate the adoption rate of TME-419 cassava among farmers in FCT.
- determine the socio-economic factors influencing the adoption of TME-419 cassava by farmers in the study area;
- identify the constraints faced by the cassava farmers in FCT.

MATERIALS AND METHODS

The study Area.

The study was conducted in the Federal Capital Territory (FCT), Abuja, Nigeria. The Federal Capital Territory (FCT) is divided into six (6) Local Government Areas and it's located in the center of Nigeria with a land area of about 8,000 Square Kilometers. It falls within the coordinates of Latitude 9° 4' 20.1504" North and

Longitude 7° 29' 28.6872" East. The Federal Capital Territory (FCT) has a current population of about 3,095,000 which is a 6.03% increase from 2018 (Macrotrend, 2019). The Federal Capital Territory (FCT) experiences two weather conditions in the year. These are the rainy season which begins around May and runs through October, the dry season which begins from October and ends in April. Within these periods, there is a brief period of harmattan occasioned by the North East trade wind, with a resultant dusty haze and intense coldness and dryness. During the rainy season daytime temperatures averages around 28 °C (82.4 °F) to 23 °C (73.4 °F). In the dry season, temperatures averages around 40 °C (104.0 °F) to 12 °C (53.6 °F). The Federal Capital Territory (FCT) has a mean annual rainfall of 1389 mm. The Federal Capital Territory (FCT) has rich soil which support crops like cassava, rice, millet, cowpea, among others.

Sampling procedure and Sample Size

This study employed multi-stage sampling techniques to select cassava farmers from the Federal Capital Territory (FCT). In the first stage, four out of five Local Government Areas (LGAs)—Kuje, Abaji, Kwali, and Gwagwalada—were purposively selected due to their prominence in agricultural activities. In the second stage, two wards were randomly selected from each of the four selected LGAs, based on the high concentration of cassava farmers in these areas. In the third stage, two villages were randomly selected from each of the eight wards, resulting in a total of 16 sampled villages. In the final stage, a proportionate random sampling method, as described in equation. was used to select a total sample size of 317 smallholder cassava farmers from a sample frame of 1,538 cassava farmers. The sample size was estimated using Yamane (1967):

$$n = \frac{N}{1+N(e^2)} = 317 \qquad \textbf{(1)}$$

Where;
n = Sample Size (Units)
N= Sample Frame (Units)
e = Level of Precision (5%)

METHOD OF DATA COLLECTION AND ANALYSIS

Primary data were utilized for this study. A well-structured questionnaire was employed to collect information from cassava farmers. The researcher, assisted by well-trained ADP enumerators familiar with the area, administered the questionnaires directly to the farmers in the study region. The data collected included general information on the socio-economic characteristics of cassava farmers, such as age, gender, marital status, and farming experience. Additionally, data on the socio-economic factors influencing the adoption of TME 419 cassava and the constraints faced by cassava farmers in the study area were gathered. The instrument used for data collection was subjected to validation and reliability tests to ensure its accuracy and consistency. The primary data obtained were analyzed using both descriptive statistics (frequency and percentage) and inferential statistics (multiple regression analysis).

RESULTS AND DISCUSSION

Socio Economic Characteristics of the Farmers

The socio-economic characteristics of cassava farmers described in this study were sex, marital status, level of education, age, household size, size of farming cassava, farm experience, member of cooperative, farm size, contact with extension agents, number of contacts and amount of credit accessed. As revealed in Table 1, most (80.37%) of the cassava farmers were male, while females accounted for 19.63%. This suggests that cassava farming in the study area is male-dominated, possibly due to the labor-intensive nature of the activity. It also indicates that for every four cassava farmers, there was only one female. This is consistent with the findings of Ojeleye (2017), who reported that more males are involved in farming than females. Most of the farmers (75.39%) were married, while 24.61% were single. Marital status could influence farmers' levels of responsibilities, decision-making processes, and commitment to farming as a primary economic activity like cassava production

Moreover, as shown in Table 1, the majority (70.40%) of the farmers had primary education, 11.84% had secondary education, while 17.76% had no formal education. Consequently, this indicates that literacy levels among cassava farmers are moderate, implying that a significant proportion of farmers in the study area are well-positioned to adopt and implement improved technologies to boost cassava production. Likewise, farmers aged 31-40 years constituted the largest group (63.55%), followed by those aged 0-30 years (34.27%), while only 2.18% were between 41-50 years. Thus, this suggests that cassava farming is predominantly practiced by young and middle-aged farmers, who are likely to be more active and open to innovation. This result aligns with the findings of Brown and Roper *(*2017), who found that most farmers were younger, below 50 years and within the economically active age group.

Moreover, most farmers had household sizes ranging from 11-15 members (56.07%), followed by 0-10 members (40.19%), and 16-20 members (3.74%). As a result, larger households may provide labor for farming activities but could also increase financial burdens. In the same vein, a significant majority (84.42%) cultivated cassava on farm sizes of 6-10 hectares, while 13.71% had 0-5 hectares, and only 1.87% had 11-15 hectares. Therefore, this suggests that most farmers operate on a small-to-medium scale, which could limit production capacity and economies of scale.

***Corresponding Author:** Jummai Mato

Furthermore, the mmajority of farmers (98.13%) had 21-40 years of farming experience, whereas only 1.87% had 0-20 years of experience. Hence, this indicates that most farmers have extensive knowledge of cassava farming, which could positively influence productivity and decision-making. This agrees with the findings of John and Johny (2014), who posited that farmers with many years of farming experience possess the ability to make sound decisions regarding resource allocation and management of their farms. Similarly, a high percentage (92.83%) of the farmers were members of cooperatives, while only 7.17% were non-members. This suggests that cooperative societies play a crucial role in providing support, information sharing, credit access, and agricultural resources to farmers.This also helps them share information and project a collective demand (Lewis *et al.,* 2013).

Moreover, most farmers (94.08%) had access to extension services, while only 5.92% had no contact. Consequently, this high level of extension interaction suggests strong advisory services that could enhance farming practices and productivity. Notably, farmers with 6-10 extension contacts constituted the majority (66.36%), while 33.64% had 0-5 contacts. Thus, regular extension contact likely improves farmers' access to modern agricultural information and best practices.

Similarly, farmers operating on 6-10 hectares accounted for the highest percentage (48.60%), followed by 11-15 hectares (42.99%), and only 8.41% cultivated on 0-5 hectares. Therefore, this aligns with the earlier cassava farm size distribution and suggests a dominance of medium-scale farming operations. Additionally, most farmers (73.21%) accessed credit below ₦1,000,000, while 14.02% secured between ₦1,000,001 – ₦2,000,000, and 12.77% accessed credit above ₦2,000,000. Thus, limited access to high-value credit could constrain investment in modern inputs and mechanization.

Table 1: Socio Economic Characteristics of the Farmers in the Study

Socio Economic Variables	Frequency	Percent (%)
Sex		
Female	63	19.63
Male	258	80.37
Marital Status		
Single	79	24.61
Married	242	75.39
Level of Education		
Non-Formal Education	57	17.76
Primary Education	226	70.40
Secondary Education	38	11.84
Age of Farmer		
0-30	110	34.27
31-40	204	63.55
41-50	7	2.18
Household Size		
0-10	129	40.19
11-15	180	56.07
16-20	12	3.74
Active Members of Household		
Size Farming Cassava		
0-5	44	13.71
6-10	271	84.42
11-15	6	1.87
Farm Experience		
0-20	6	1.87
21-40	315	98.13
Member of Cooperative		
Non-Member	23	7.17
Member	298	92.83
Contact with Extension Agents		
Non-Contact	19	5.92
Contact	302	94.08
Number of Contact		
0-5	108	33.64
6-10	213	66.36
Farm Size		
0-5	27	8.41

***Corresponding Author:** Jummai Mato

6-10	156	48.60
11-15	138	42.99
Amount of Credit Accessed		
Below 1000000	235	73.21
1000001-2000000	45	14.02
2000000 Above	41	12.77
Total	**321**	**100**

Source: Field survey, 2021

Distribution of Farmers on the awareness and adoption of TME-419 Cassava

The results presented in Table 2 shows the distribution of farmers on the awareness and adoption of TME-419 in the study area. The results show the total area cultivated by cassava by farmers in the study area. About 67.29% of the farmers used between 6 to 15 hectares to cultivate cassava in the study area. The adoption rate was calculated to be 68.22% while 31.78% of the farmers did not adopt TME-419. This suggests that the majority of the farmers cultivated TME-419 on their farms which could be as a result of contacts with extension agents in form of sensitization and awareness campaigns on the availability, benefit, and use of improved varieties by farmers. This may have aided the adoption and use TME 419 variety in the study area.

This result is in line with the findings of Agwu and Anyaeche (2012), who reported that most farmers in their study adopted improved TME 419 variety. The study failed to conform to the findings of Nwakor *et al.,* (2011), that most of the farmers in the rural areas in Nigeria still depend on local cassava varieties for their planting materials, which in turn result in a very poor yield at harvest. Table 2 also shows the area cultivated with TME-419 cassava by the farmers. The result shows that majority (95.64%) of the farmers cultivated TME-419 cassava on at most 5 hectares of land while 4.36% of the farmers cultivate TME-419 cassava on 6 to 10 hectares of land. About 70.78%of the respondents that adopted TME-419 cassava expressed their interest to continue its cultivation while 29.22% plan to discontinue cultivation of TME-419 cassava in the study area.

Table 2: Distribution of farmers on the awareness and adoption of TME-419 Cassava

	Frequency	Percentage
Area Cultivated with Cassava		
0-5	105	32.71
6-10	209	65.11
11-15	7	2.18
Cultivation of TME 419		
No, I have Not	102	31.78
Yes, I Have	219	68.22
Area Cultivated with TME 419 Cassava		
0-5	210	95.89
6-10	9	4.11
Continued to Cultivated TME 419		
No, I will Not Continue	64	29.22
Yes, I will Continue	155	70.78

Source: Field survey, 2021

Factors Influencing the Adoption of TME 419 Cassava in the Study Area

The results of logit regression of factors factors influencing the adoption of TME 419 cassava in the study area are presented in Table 3. The pseudo R^2 of the regression was 0.084 and the chi-square was 33.90. The chi-square was statistically significant at 1% level of significance and suggest that the model was well specified. From the results, negative coefficient indicates inverse relationship while positive coefficient indicated direct relationship of adoption rate with the socioeconomic factor. From the results farm size, access to credit contact with extension agent, level of education were the significant variables that influenced the adoption of TME 419 in the study area.

Farm size was positive and significant at 1% probability level. This means that farm size had a positive effect on the adoption of TME 419 cassava in the study area. The result shows that a unit increase in farm size will lead to a 0.119 marginal increase in the adoption of TME 419 cassava. This result disagrees with the findings of Ojeleye *et al.,* (2017), who reported that farm size did not significantly affect the adoption.

Access to credit was positive and significant at 5% probability level. This means that access to credit had positive effect on the adoption of TME 419 cassava in the study area. From the results a unit increase in access to credit led to a 0.216 marginal increase in the adoption of TME 419 cassava. This suggest that as farmers

accessed more credit they had more funds to venture into the cultivation of TME 419 cassava.

Extension contacts had a positive and significant relationship with adoption of TME 419. The level of significant was 1%, meaning that extension contact influenced adoption of this improved variety. The reason may be that the farmers were already used to old variety and they were eager to try newly released varieties for the potential economic benefit. The result suggests that a unit increase in contact with extension agents led to 0.756 marginal increase the probability of adoption of TME 419. This is in conformity with the research findings of Charles *et al.,* (2018), which reported that 90% of small-scale farmers in rural communities obtained agricultural information from extension agents.

Level of education was positive and significant at 1% probability level. This shows a positive interaction between level of education and adoption of TME 419 in the study area. This means that as the level of education increases, adoption of TME 419 increases. From the result, we deduced that a unit increase in level of education led to a 0.201 marginal increase in the adoption of TME 419 in the study area. This implies that the higher the educational level of farmers, the more likely they would be involved in large production because of their better exposure to information and better opportunities on loan and credit facilities etc. Farmers who are educated are likely to easily adopt new technologies and practices and they majorly constitute the innovators and early adopters of new innovations and practices.

Table 3: Factors Influencing the Adoption of TME 419 in the Study Area

Factors	Coefficient	Standard Error	t-value	Marginal Effect
Farm Size (Ha)	0.608***	0.226	2.69	0.119
Farming Experience	0.008	0.039	0.20	0.002
Access to Credit	0.910**	0.522	2.11	0.216
Contact with Extension Agent	861***	.265	-3.05	0.756
Member of Cooperative	-0.362	0.601	-0.60	-0.071
Household Size	0.018	0.059	0.30	0.004
Educational Level of Farmers	0.902***	0.266	3.86	0.201
Constant	0.608	0.226	2.69	
Pseudo R-Squared	0.084			
Chi-Square	33.901**			

***** 1% Significant Level (p<0.01), Level (* p<0.10)**
****5% Significant Level (p<0.05), 10% Significant**
Source: Field survey, 2021

Constraints in Adoption of TME 419 Cassava by the Farmers

The result presented in Table 4 shows the constraints associated with the adoption of TME 419 cassava based on the perception of farmers in the study area. From the result, bureaucracy in accessing inputs, illiteracy, distance to market, transportation were the significant constraints based on the mean cut of level of 2.5. From the result, bureaucracy to accessing inputs had a mean and standard deviation of 3.819 and 0.517 respectively and was ranked first based on the perception of the farmers as the major constraint they faced when trying to adopt TME 419. This suggest that the farmers were more concerned about the inputs needed to cultivate TME 419 to get the most from the production. Other contraints include illetracy, distance to market, and transportation ranked 2nd, 3rd, and 4th respectively based on the magnitude of the mean were the major constraints faced in the adoption of TME 419 cassava. The result conformed with the findings of Ojeleye *et al.* (2017) who identified the constraint faced in the adoption of TME 419 cassava.

Table 4: Constraints in Adoption of Certified Seeds by the Respondents (N=321)

Constraints	Mean	Standard Deviation	Rank	Decision
Bureaucracy in Accessing Inputs	3.819	0.517	1st	S
Illiteracy	2.922	0.268	2nd	S
Distance to the Market	2.844	0.537	3rd	S
Transportation	2.551	1.158	4th	S
Lack of Good Stem to Plant	2.498	1.107	5th	NS
Lack of Funds	2.492	1.118	6th	NS
Language Barrier	1.165	0.618	7th	NS

NS-non-Significant, S- Significant

Source: Field survey, 2021

***Corresponding Author:** Jummai Mato

CONCLUSION

From the foregoing, it can be concluded that most of the respondents had a formal education, were male, married, and had an average age of 45.21 years. The adoption rate of TME-419 cassava was 68.22%, while 31.78% of farmers had not adopted the variety. The study identified key factors influencing adoption, including farm size, access to credit, contact with extension agents, and education level. Constraints such as bureaucracy in accessing inputs, illiteracy, distance to markets, and transportation challenges were also significant. These findings highlight the importance of extension services and supportive policies in enhancing the adoption of improved cassava varieties. Addressing these constraints and further engaging farmers through targeted extension programs could accelerate the adoption of TME-419, leading to higher productivity and improved livelihoods for cassava farmers in the study region.

RECOMMENDATIONS

Based on the findings of the study the following recommendations were made.

- Policymakers should focus on the cassava sector by implementing policies that improve access to seeds, technical training, and credit, creating an environment conducive to scaling the adoption of TME-419 among farmers.
- Bureaucratic delays in acquiring inputs were a major constraint to adoption. To address this, governments and relevant agencies should streamline and expedite the process of obtaining inputs, ensuring farmers have timely access to high-quality planting materials and other essential resources to improve adoption rates
- More awareness campaigns should be conducted to encourage the adoption of the TME-419 cassava variety, which could lead to higher adoption rates among farmers.
- Extension agents should ensure that extension materials are translated into local languages, and they should be trained to communicate more effectively with farmers who may not be fluent in the dominant language.

REFERENCES

1. Abdoulaye, T., Abass, A., Maziya-Dixon, B., Tarawali, G., Okechukwu, R., Rusike, J., Alene, A., Manyong, V. & Ayedun, B. (2014) Awareness and adoption of improved cassava varieties and processing technologies in Nigeria. *Journal of Development Agricultural Economics,* 6(2): 67-75.
2. Adeleke, B. O., Adeleke, F. O., & Adepoju, A. O. (2020). Socio-Economic Determinants of Adoption of Cassava Production Technologies among Farmers in Ondo State.*Nigeria. International Journal of Agriculture and Biology*, 24(5), 1005-1013.
3. Adetunji, A. S., Akeredolu, O. A., Arowolo, O. V. & Ogundoyin. A.A. (2020). Effect of Adoption of Improved Cassava Varieties on Household Income in Oyo State, Nigeria *Nigerian Agricultural Journal,* 51(2):362-369.
4. Agwu, A. E. & Anyaeche, C.L. (2012). Adoption of improved cassava varieties in six rural communities in Anambra State, Nigeria; *African Journal of Biotechnology,* 6(2):89-98.
5. Ani, A.O. (2016). Effect of Desertification on cassava Production Potentials in the North Eastern Nigeria. *Journal of Agricultural Research and Policies,* 1(1): 37-41.
6. Brown, P., & Roper, S. (2017). Innovation and networks in New Zealand farming. Australian, *Journal of Agricultural and Resource Economics*. 61(1): 1-21
7. Charles, U., Ugbo, C., Muojiama, S. O. & Eze, S. (2018). Agronomic Evaluation of New Varieties of Cassava (*Manihot esculenta*Crantz) under Different Rates and Modes of NPK (12-12-17-2) Fertilizer Application in Two Seasons. *Notulae Scientia Biologicae*. 10(1):14-18
8. Clair, A.W. & Etukudo, O.J. (2010). *Food security and Nigeria agriculture.* A paper presented in food security conference in Lokoja. Nigeria. Pp: 119-127
9. Egesi, C., Mbanaso, E., Ogbe, F., Okogbenin, E. & Fregene, M. (2016). Development of cassava varieties with high value root quality through induced mutations and marker- aided breeding. *NRCRI, Umudike Annual Report*. Pp. 2-6
10. Food and Agricultural Organization (FAO), (2015). *Food and Agricultural Organization: Food Outlook*. Pp. 36-39
11. Food and Agriculture Organization Statistical Database (FAOSTAT), (2012). Retrieved from: http://www. faostat.org/site/339/default.aspx
12. International Institute for Tropical Agriculture (IITA). (2017*). Summary Report on the Nigeria Food Consumption and Nutrition Survey (NFCNS)*. International Food Policy Research Institute. 2016 Global Hunger Index. Retrieved fromhttp://ghi.ifpri.org.
13. John, H. A. & Johnny, M. (2014). The Role of Farming Experience on the Adoption of Agricultural Technologies: Evidence from Smallholder Farmers in Uganda, *The Journal of Development Studies*, 50(1), 666-679.
14. Lai, P. C. (2017). The literature review of technology adoption models and theories for the novelty technology. *JISTEM-Journal of Information Systems and Technology Management*, 14, 21-38.
15. Lewis, W., Agarwal, R., & Sambamurthy, V. (2013). Sources of influence on beliefs about information technology use: An empirical study of knowledge workers. *MIS Quarterly*, 27(4):657-678.
16. National Bureau of Statistics. (2012). Nigeria Poverty Profile. Abuja; NBS. Nsoanya L.N. and Nenna M.G. (2011). Adoption of improved cassava production technologies in Anambra East Local

***Corresponding Author:** Jummai Mato

Government Area, Anambra State. *Journal of Research in National Development,* 9(2):36-42.
17. Nwakor, F. N., Ifenkwe, G. E., Onummadu, F. N., &Ekwe, K. C. (2010). Determinant of the Adoption of Improved Cassava Varieties (Time 419 and NR 8082) Among Farmers in Abia State. *Nigeria Agricultural Journal*, *41*(1), 101-109.
18. Nwakor. F.N, Ifenkwe, G.E & Asumughha, G.N. (2011). Potentials in Adoption of Improved Cassava Varieties for increased Food Security in Nigeria. In Root and Tuber Crops Research for Food Security and Empowerment. Eds Amadi, C.O., Ekwe, K.C., Chukwu, G.O, Olojede, A.O and Egesi, C.N. National Root Crops Research Institute Umudike. Pp 563-571.
19. Nweke, F.I. (2014). New challenge in the cassava transformation in Nigeria and Ghana. *A view point IITA research,* 14(1):23-34.
20. Obisesan, A.A. (2015). Causal effect of off-farm activity and technology adoption on food security in Nigeria. *Agris,* 7(3): 3-11.
21. Ogbo, C. R., Oselebe, H. O., & Okoye, B. C. (2018). Sustainability considerations for the adoption of biofortified crops: The case of vitamin A cassava in Nigeria. *Sustainable Development*, 26(6), 613-623.
22. Oyeleye, O.A, Ibraim, E.A, Suleman, R., Olorunfemi, S.D & Isah, I. (2017). Factors Affecting the Adoption of Improved Cassava Varieties in Some Selected Communities In Ajokuta LGA, Kogi State, Nigeria. *Nigeria Journal of Agricultural Extension,* 18(3): 2-7.

***Corresponding Author:** Jummai Mato