# Assessment of the Adoption of Improved Agricultural Technologies among Cassava Farmers in Ondo State, Nigeria

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**Abstract:** The cultivation of cassava as one of the most important staple food crops in Nigeria needs to be enhanced by the use of Improved Agricultural Technologies (IATs). This study was conducted to assess the level of adoption of improved agricultural technologies among the cassava growers in Ondo State. Also, the factors influencing the adoption rate were determined. Random sampling method was employed to select 180 cassava farmers and with a well structured questionnaire, information on their socio-economic characteristics and farming activities were collected. The data were analysed with both descriptive statistics and tobit regression model. The results revealed that the mean age of the farmers was 41 years while 74.4 percent were men. Most (74.4%) of the respondents were married with the mean household size of 5 persons. Also, 87.8 percent had formal education while 66.7 percent were landowners. The mean farming experience was 10 years while 57.8 percent cultivated less than 4 hectares of land. Most (55.6%) of the farmers did not belong to any association while 60 percent had no access to credit facilities. About 63 percent used selective herbicides in controlling weeds in their farms while 64.9 percent adopted between 1 and 4 IATs. In addition, 86.7 percent of the respondents were not adequately visited by extension agents. The results revealed that the main determinants of the adoption rate of IATs among the cassava farmers were, age, household size, educational level, farming experience, tenancy status and organization membership. The study recommended that agricultural extension agents should intensify efforts in disseminating information on IATs to cassava farmers.
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## Introduction

Food is one of the basic necessities of life, but its provision is not always adequate for all nations especially in developing countries. This insufficiency of food had led man to better methods of producing and distributing it. Thus agriculture, the art and science of the cultivation of crops and rearing of livestock is a major occupation of both male and female in developing countries including Nigeria (Ajayi, 1995).

A new agricultural technology that enhances sustainable production of food and fiber is therefore critical for sustainable food security and economic development of all nations. This has made the dynamics of technical change in agriculture to be an area of intense research since the early part of twentieth century (Loevinsohn *et al.,* 2013). Most of these new agricultural technologies are particularly relevant to smallholder farmers in developing countries because they are constrained in many ways, which make them a priority for development efforts. These farmers for instance, live and farm in areas where rainfall is inadequate, and soils tend to be infertile. In addition, infrastructure and institutions such as irrigation, input and product markets, and credit tend to be poorly developed (Muzari *et al.,* 2012). In the past years, many studies have been conducted on innovation and adoption of new technologies in developing countries. In addition the process of adoption and the effects of adopting new technologies on smallholder farmers' productivity and income have been studied by various researchers. However new agricultural technologies are often adopted slowly and several aspects of adoption remain poorly understood despite being seen as an important route out of poverty and income inequality in most of the developing countries.

Cassava (Manihot esculenta Crantz) is one of the most important staple food crops grown in Nigeria. It is widely cultivated in the lowland humid tropics of the country. Cassava is capable of providing very high yields of energy/ha. For example about thirteen times more than maize or any cereal crop (Oke, 1990). According to James and Stephen (2000), cassava comprises about 25 percent of all food crops consumed in Nigeria. Apart from the nutritional importance to the people, cassava also serves as security crop producing income when other crops fail. It is a famine fighter, saving people from starvation (NEPAD, 2006).

The growth of cassava as one of the economic and food security crops over the last two decades has generated significant research interest at both national and international levels. For instance, the International Institute of Tropical Agriculture (lITA) and National Root Crop Research Institute (NRCRI), developed and distributed the Tropical Manihot Selection TMS 30555, 30572, 30211. 50395 and 60506. The varieties are not only high yielding but also resistance to diseases and pests such as cassava mosaic, bacteria blight and mealy bug.

Considering the trend of demand for cassava cuttings and products, it is envisaged that cassava farmers may have to adopt these improved technologies to boost their productivities and income.

Food crisis has occurred in the country partly due to high rate of population growth over the food production level (Ani, 2006). Onu and Madukwe, (2002) said the most important factors affecting adoption behaviour of farmers are their socio-economic characteristics. Also information sources have been reported as important stimulus to individuals in the adoption process of any technology (Rogers, 1995). With increasing globalization of information through modern Information and Communication Technologies (ICTs), farmers should have access to various channels of information and extension should forge new link, to create a network for sharing knowledge and experience.

The researchers are of the view that adoption of improved agricultural technologies can lead to lots of benefit, which will lead to increasing yield and improving products quality. Despite the huge capital invested into the production and processing segment of agriculture by the research institutions in order to enhance high yield and reduce the drudgery of labour inherent in the manual or traditional method of production, yet cassava sector has not recorded much growth in Ondo State. Hence the need for this study to: examine the socio-economic characteristics of cassava farmers; identify the improved agricultural technologies available on cassava production; determine the level of adoption of improved agricultural technologies; examine the constraints to adoption of improved agricultural technologies in cassava production; and estimate the determinants of the rate of adoption of IATs among cassava farmers in the study area.

## Material and Methods

The study area

The study was carried out in Ondo State, Nigeria. The State is located in Southwest Nigeria. Ondo State was one of the States created from the old Western region. It was created on 3rd February, 1976. The population of Ondo State was about 3.5 million (National population Commission, 2006). Ondo State is bounded in the East by Edo and Delta States, in the North by Ekiti State, in the West by Ogun and Osun States and in the South by Atlantic Ocean.

At present Ondo State is made up of 18 Local Government Area (LGAs). The study area enjoy luxuriant vegetation, it composed of low lands and rugged hills. It has two distinct seasons; these are rainy season (April-October) and dry season (November-March). The annual temperature ranges from 21-28 degree centigrade with high humidity. The primary occupation of the people in the area is agriculture while the major crops grown are cocoa, yams, cocoyam, plantain, and cassava.

Sampling technique

A Multi-stage random sampling method was used to select the respondents. The first stage involved a random selection of two agricultural zones out of the four available in the State. The second stage involved a random selection of three Local Government Areas (LGAs) from the selected Zones. The third stage involved a random selection of three communities from each of the LGAs. In the last stage randomly 10 respondents were selected from each community. This gave a total of 180 respondents from the State.

Primary data were obtained through the aid of a well-structured questionnaire assisted with interview schedule.

Data analysis

Descriptive statistics such as frequency counts, percentage and mean were used to: analyze the socio-economic characteristics of the respondents; identify the improved agricultural technologies available; examine improved agricultural technologies adopted; describe the level of adoption of IATs and constraints to adoption of improved agricultural technologies in cassava production in the study area. Also tobit regression model was employed to determine the factors influencing the rate of adoption of IATs in cassava production by farmers.

Model specification

In 1958, Tobin proposed tobit regression model to investigate the effects of exogenous variables on homogenous variable. This model is explained by the threshold concept. Tobit regression model was adopted in this study because the proportion of the available IATs used by the farmer is a continuous variable but truncated between zero and one. Following Rahm and Huffman (1984), farmers' adoption decisions on the IATs are assumed to be based upon utility maximization. For example if j represents a technology with values given as j=1, for new technology, and J=2 for old technology if two technologies are involved, then the unobservable utility function which ranks the preference of the $i^{th}$ farmer is expressed as,

$U(M_{ji}A_{ji}e_{ji})$ ……..1

Where $M_{ij}$ is a vector of farms and farmers characteristics, $A_{ij}$ is a vector of the technology attributes and $e_{ij}$ is the error term with zero means. This can be presented as,

$$U_{ji} = \alpha_j G_i(M_i A_i) + \varepsilon_{ji}\ j = 1,2; i = 1, \ldots, n \ldots \ldots \ldots 2$$

Since the utilities $U_{ij}$ are random, the $i^{th}$ farmer will definitely choose the alternative j=1 provided $U_{1i} > U_{2i}$. The probability that $Y_i$ equal one is a function of the exogenous variables and is shown as,

$$P_i = Pr(Y_i = 1) = P_r(U_{1i} > U_{2i})$$

$$= Pr[(\alpha_1 G_i(M_i, A_i) + \varepsilon_{1i}) > (\alpha_2 G_i(M_i, A_i) + \varepsilon_{2i})]$$

$$= Pr[(\varepsilon_{1i} - \varepsilon_{2i}) > G_i(M_i, A_i)(\alpha_2 - \alpha_1)]$$

$$= Pr[\mu_i > -G_i(M_i, A_i)\beta]$$

$$= G_i(X_i\beta) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 3$$

Where X is the n × k matrix of the exogenous variables, and β is a k × 1 vector of parameters to be estimated, Pr (.) is a probability function, $\mu_i$ evaluated at $X_i\beta$.

According to White (1978), tobit model can be performed using an iterative maximum likelihood algorithm. The likelihood function of the observations is of the form,

$$L = \prod \frac{1}{\sqrt[\sigma]{2\pi}} exp\left[-\frac{1}{2\sigma^2}(Y_i - \beta_i X_i)^2\right] \prod \left[\int_{-\infty}^{0} \frac{1}{\sqrt[\sigma]{2\pi}} exp\left[-\frac{1}{2\sigma^2}(Y_i - \beta_i X_i)^2\right] dy_j\right] \ldots \ldots \ldots 4$$

Hence the tobit model for this study can be represented as,

$$Y_i = \psi_0 + \psi_1 X_1 + \psi_2 X_2 + \psi_3 X_3 + \psi_4 X_4 + \psi_5 X_5 + \cdots + \psi_{10} X_{10} + \varepsilon_i \ldots \ldots..5$$

Where;

$Y_i$= IATs adoption rate

$$Y_i = \frac{\text{Number of Improved Agricultural Technology adopted}}{\text{Number of Improved Agricultural Technology available in the area}} \ldots \ldots 6$$

$X_1$= Gender (Male = 1, Female = 0)
$X_2$=Age (year)
$X_3$=Household size (number)
$X_4$ = Educational level (year)
$X_5$=Cassava farm size (hectare)
$X_6$=Farming experience (year)
$X_7$=Tenancy status (owned land = 1, non land owner = 0)
$X_8$= Extension agents contact (visited = 1, non visited = 0)
$X_9$=Access to credit (access = 1, non-Access 0)
$X_{10}$= Organization membership (member = 1, non-member = 0)
$\Psi_0$...... $\Psi_{10}$ = parameters to be estimated.
$\varepsilon_i$ = Error term.

## Results and Discussion

Socio-economic characteristics of the cassava farmers.

Table 1: Distribution of respondents by socio-economic characteristics.

| variable | Frequency | Percentage |
|---|---|---|
| **Age (year)** | | |
| ≤ 20 | 12 | 6.7 |
| 21-30 | 14 | 7.8 |
| 31-40 | 68 | 37.8 |
| 41-50 | 52 | 28.9 |
| >50 | 34 | 18.8 |
| **Gender** | | |
| Female | 134 | 74.4 |
| Male | 46 | 25.6 |
| **Marital Status** | | |
| Single | 32 | 17.8 |
| Married | 134 | 74.4 |
| Divorced | 10 | 5.6 |
| Widowed | 4 | 2.2 |
| **Household Size** | | |
| 1 – 5 | 118 | 65.6 |
| 6 – 10 | 50 | 27.8 |
| 11 – 15 | 10 | 5.6 |
| 16 - 20 | 2 | 1.1 |
| **Educational Status** | | |
| No formal education | 22 | 12.2 |
| Primary education | 48 | 26.7 |
| Secondary education | 56 | 31.1 |
| Tertiary education | 54 | 30 |
| **Mode of Land acquisition** | | |
| Inheritance | 76 | 42.2 |
| Communal | 38 | 21.1 |
| Rent | 60 | 33.3 |
| Purchase | 6 | 3.3 |
| **Cassava farm size** | | |
| ≤3 | 104 | 57.8 |
| 4 – 8 | 58 | 32.2 |
| ≥9 | 18 | 10.0 |
| **Farming Experience** | | |
| 1 – 10 | 80 | 44.4 |
| 11 – 20 | 66 | 36.7 |
| >20 | 34 | 8.9 |
| **Members of Farmers organization** | | |
| Yes | 80 | 44.4 |
| No | 100 | 55.6 |
| **Credit Access** | | |
| Yes | 72 | 40 |
| No | 108 | 60 |
| **Source of Labour** | | |
| Family labour | 8 | 4.4 |
| Hired labour | 22 | 12.2 |
| Communal labour | 22 | 12.2 |
| Hired & family labour | 128 | 71.2 |

Table 1 shows that the age of cassava farmers ranged from 18 to 58 years and the mean age was 41 years. This showed that most of the respondents are within their productive years. Over the years, researches have shown that age of the farmer is related to decision to adopt technologies. Younger farmers have been found to be more knowledgeable about new innovations and may be more willing to bear risk due to their longer planning horizons (Polson and Spencer, 1991). Sex distribution of the respondents revealed that 74.4 percent were males while 25.6 percent were females. This shows that there are more male cassava farmers in the study area. Majority of the respondents (74.4%) were married. The mean value for household size was about 5 persons. This shows that the household size in the study area is fairly large.

Educational status of the respondents revealed that 87.8 percent had formal education while 12.2 percent did not. This implies that most of the respondents can easily comprehend whatever they are taught on any improved agricultural technology. Majority (66.7 percent) of the respondents acquired their land through either inheritance, communal or purchase while just 33.3 percent rented the land used for cassava cultivation. Also, 57.8 percent of the respondents had less than 4 hectares as their cassava farm size. Farming experience of the respondents ranged between 1 and 40 years. The mean was 10 years. This means that respondents in the study area are experienced cassava farmers.

According to table 1, 44.4 percent were members of at least one farmers' organization while 55.6 percent did not belong to any farmers' organization. The distribution of respondents on credit accessibility in the study area shows that 40 percent, of the respondents had access to credit facilities, while 60 percent had no access. Non accessibility to credit facilities could hinder farmers from adopting improved agricultural technologies. About 71.2 percent employed both family and hired labour on their farms for cassava cultivation while just 4.4 percent used only family labour. Also, only 12.2 percent made use of hired labour.

Improved Agricultural Technologies on cassava production adopted by the respondents.

Table 2 shows that 46.7 percent of the respondents adopted improved cassava cultivars. It implies that in the study area few farmers cultivate improved cassava cultivars which are needed to boost cassava production. Large number of the respondents (63.3%) employed the use of selective herbicides in controlling weeds in their cassava farms. This means that most cassava famers in the study area could afford the purchase of herbicides in controlling weeds and this will definitely reduce the cost of labour and enhance productivity among farmers.

Cassava processing machine was used by 68.9 percent respondents in the study area. The availability of this processing machine will encourage farmers to cultivate more cassava because they can process cassava to non-perishable products. This is an indication that most of the cassava farmers in the study area do process their cassava roots.

In addition, those that used improved plant spacing of crop were few. About 16.7 percent used the recommended improved planting spacing of 1m x 0.75m. This might be due to the fact that the gaps between the heaps serve as a guide for the farmers.

Table 2: Distribution of respondents by improved agricultural technologies adopted

| **Improved Agricultural Technologies (IATs)** | **Frequency*** | **Percentage** |
|---|---|---|
| Improved cassava cultivars | 84 | 46.7 |
| Cassava planting machine | 0 | 0.0 |
| Selective herbicides for cassava | 114 | 63.3 |
| Different methods of land preparation | 60 | 33.3 |
| Pests and diseases control chemical | 28 | 15.6 |
| Cassava harvesting machine | 0 | 0.0 |
| Cassava processing machine | 124 | 68.9 |
| Improved plant spacing 1m x 0.75m | 30 | 16.7 |
| Application of fertilizer | 106 | 58.9 |

*Multiple responses allowed

Respondents' adoption level of improved agricultural technologies.

In the study area 9 IATs were identified by the researchers. These are, improved cassava cultivars, cassava planting machine, selective herbicides for cassava, different methods of land preparation, pests and diseases control chemical, cassava harvesting machine, cassava processing machine, cassava processing machine, improved plant spacing 1m x 0.75m, and application of fertilizer. The result in Table 3 reveals that 64.9 percent adopted between 1 and 4 improved agricultural technologies and are classified as low adopters. The moderate adopters (31.2 percent) adopted between 5 and 6 technologies. Also, 3.9 percent adopted above 6 technologies and are categorized as high adopter of improved agricultural technologies. The results imply that the level of adoption of the improved agricultural technologies is still very low.

Table 3: Distribution of respondents by number of technologies adopted.

| **Numbers of IATs Adopted** | **Frequency** | **Percentages** |
|---|---|---|
| 1 – 2 | 20 | 26.0 |
| 3 – 4 | 30 | 38.9 |
| 5 – 6 | 24 | 31.2 |
| >6 | 3 | 3.9 |

Constraints to adoption of improved agricultural technologies among cassava farmers.

Table 4 shows that 72.2 percent of the respondents said high cost of the innovation was a major constraint to them. Most of the farmers do not have sufficient money to buy necessary farm input and also to hire more hands.

Inadequate farm inputs was another factor militating against adoption of improved agricultural technologies. About 76.6 percent of the respondents were faced with inadequate farm inputs problem. The respondents faced with pests and diseases attack as constraint were just 25.6 percent. This might be due to the fact that the planted varieties in the study area are resistant to both pests and diseases. Most (86.7%) of the respondents did not have regular contact with the extension agents. There were very few responses (12.2%) to the cumbersome nature of planting operation as a limitation. This means that nature of planting operation is not a problem beyond their control.

Table 4**:** Constraints to adoption of improved agricultural technologies among cassava farmers.

| Constraints Encountered | *Frequency | Percentages |
|---|---|---|
| Cost | 130 | 72.2 |
| Culture | 16 | 8.9 |
| Complexity | 120 | 66.7 |
| Inadequate farm input | 136 | 76.7 |
| Inadequate information | 152 | 84.4 |
| Insufficient land | 44 | 24.4 |
| Unstable market price | 152 | 84.4 |
| Lack of storage facilities | 134 | 74.4 |
| Lack of processing facilities | 40 | 22.2 |
| Transportation problem | 144 | 80.0 |
| Pests and diseases attack | 46 | 25.6 |
| Inadequate rainfall | 14 | 7.8 |
| Inadequate credit facilities | 114 | 63.3 |
| Inadequate extension visit | 156 | 86.7 |
| Difficult planting operation | 22 | 12.2 |
| Others | 46 | 25.6 |

*multiple responses recorded

Determinants of adoption of Improved Agricultural Technologies among cassava.

In Table 5, the likelihood estimates of the tobit model indicated that chi-square ($\chi^2$) statistic of 32.80 was highly significant with P value of 0.0003 suggesting that the model had a strong explanatory power. The pseudo coefficient of multiple determinations ($R^2$) shows that 77 percent variation in the dependent variable was explained by the included independent variables. This implies that the model showed a good fit to the data.

Table 5: Tobit model results for improved agricultural technologies adoption among cassava farmers

| Variable | Coefficient | T-ratio |
|---|---|---|
| Gender ($X_1$) | 0.566(0.610) | 0.93 |
| Age ($X_2$) | 0.010(0.005) | 2.00** |
| Household size ($X_3$) | -0.016(0.009) | -1.78* |
| Educational level($X_4$) | 0.013(0.007) | 1.86* |
| Cassava farm Sizes($X_5$) | -0.009(0.011) | -0.82 |
| Farming experience($X_6$) | -0.007(0.004) | -1.75* |
| Tenancy status($X_7$) | 0.065(0.026) | 2.53** |
| Extension agents contact ($X_8$) | 0.108(0.082) | 1.32 |
| Access to credit ($X_9$) | -0.118(0.073) | -1.62 |
| Organization membership ($X_{10}$) | 0.157(0.073) | 2.15** |
| Constant | -0.199(0.159) | -1.25 |
| Number of observation | 180 | |
| Log Likelihood | -5.048 | |
| Pseudo $R^2$ | 0.765 | |
| Prob> $chi^2$ | 0.0003 | |
| LR $chi^2$(10) | 32.80 | |

* and ** signify significant at 10 % and 5% levels of significance respectively.

Table 5 shows that gender was not significant but positively related to the rate of adoption of IATs by the cassava farmers. This implies that male respondents' rate of adoption is higher than their female counterparts. This indicates that in the study area male farmers adopt more improved agricultural technologies in cassava cultivation. This might be due to the fact that men have more shock absorbers when it comes to the use of new innovations. Also, the issue of land acquisition may come to play here since men are likely to have more access to land than women.

Also, age was positive and significant at 5 percent with the rate of adoption of IATs. This means that across the study area, older farmers are assumed to have gained knowledge and experience over time and are better able to evaluate technology information than younger farmers (Mignouna *et al,* 2011; Kariyasa and Dewi, 2011). Hence, the older the farmer the higher the rate of adoption of improved agricultural technologies. But this also contradicts the findings of Adesina and Zinnah (1993) that as farmer grow older, there is an increase in risk-averse and a decreased interest in long-term investment in the farm. The coefficient of household size was negatively related to the rate of adoption. The variable was significant at 10 percent level of significance. This means that in the study area increase in household size will lead to less adoption. Large household size may reduce adoption rate in the sense that resources (capital) that would have be used for the innovation might be diverted to cater for other needs of the family.

Educational level (years spent in formal school) was found to be positively related to adoption rate and significant at 10 percent level of significance. This implies that the higher the level of formal education the higher the rate of adoption of improved agricultural technologies. This is in line with Waller *et al.,* (1998) that higher education influences respondents' attitudes and thoughts towards the benefits of new technologies.

Cassava farm size was negatively related to rate of adoption in the study area. The result shows that the larger the farm size the lower the adoption rate of IATs. Farming experience was found to be negatively correlated to the rate of adoption and it was a significant factor at 10 percent level of significance. This shows that increase in the farming experience will bring about decrease in adoption of the improved agricultural technologies in the study area. This contradicts Okoronkwo and Ume (2013). This might be due to the fact that experienced farmers must have been used to their methods of farming and are not ready to change to the newly introduced technologies.

Tenancy status as a factor was estimated to have a positive relationship with the rate of adoption. It was significant at 5 percent level of significance. This means that across the study area, increase in land acquisition through inheritance or purchase will bring about increase in the rate of adoption of IATs for cassava cultivation. It implies that those that rented their farmlands might not be ready to adopt IATs. The coefficient of extension agents contact was estimated to be positively related to the rate of adoption. This implies that the rate of adoption among the farmers that have contact with the extension agents is higher than those that have no contact. Farmers frequent contacts with extension officers give them opportunity to learn about the availability and use of new farming techniques. Alabi *et al.,* (2012), stated that as extension service increases, tendency for smallholder's farmers' to adopt a new technology increases. In fact the influence of extension agents can counter balance the negative effect of lack of years of formal education in the overall decision to adopt some technologies (Yaron *et al.,* 1992 and Bonababa–Wabbi, 2002).

Access to credit was negatively related to the rate of adoption. Access to credit has been reported to stimulate technology adoption (Mohammed and Temu, 2008). Despite the significance of credit to adoption his negative relationship in our analyses implies that there is decrease in the adoption rate with access to credit facilities. This may happen when the farmers divert the available credit to non – farm businesses.

Also, Organization membership as a factor was found to have a positive relationship with adoption rate and it was significant at 5 percent level of significance. This means that involvement of cassava farmers in cooperative societies will enhance adoption of IATs. This corroborates the work of Katungi and Akankwasa, (2010). They found out that farmers who participate more in community-based organizations are likely to engage in social learning about technologies hence raising the likelihood to adopt the technologies. Farmers within a social group learn from each other the benefits and usage of new technologies. The results showed that the main determinants of the adoption of IATs among the cassava farmers are, age, household size, educational level, farming experience, tenancy status and organization membership.

**Conclusion and Recommendation**

Over the years, provision of improved agricultural technologies by governments through research institutions has remained one of the major strategies put in place to increase agricultural productivity. Descriptive statistics were employed to, analyse the socio-economics characteristics of the respondents, identify the available IATs, describe the adopted IATs among the respondents, examine the adoption level and identify the constraints to adoption of IATs. Tobit regression model was used to determine the factors influencing the rate of IATs adoption.

The results indicated that averagely, the cassava farmers are within their productive age and most of them are male with the majority married. Also, most of the households have fairly large household size and most of them have formal education. The majority of the respondents are landowners and they are experienced cassava farmers. Most of them are not members of associations and very few have access to credit facilities. Also, the majority use both family and hired labour for cassava cultivation. The most widely used IATs are selective herbicides, cassava processing machine and fertilizer. The rate of adoption of IATs is low among the farmers. The respondents are faced mainly with the problems of inadequate extension agents' visitation, transportation problem, unstable market prices, inadequate information and inadequate credit facilities. The main determinants of the rate of adoption of IATs are age, household size, educational level, farming experience, and tenancy status and organization membership. Based on the results of this research, the following recommendations are hereby proffered:

- ❖ Agricultural extension agents should intensify efforts in disseminating information on improved agricultural technologies to the cassava farmers. This can be achieved by making use of the modern ICTs. This would increase farmers' skills and knowledge in cassava production and also improve their living standard.
- ❖ Cassava farmers should be given adequate credit facilities by the government. This must be accompanied with relatively low interest rate with fair and sensible collaterals to combat the problem of lack of credit facilities.
- ❖ Government should allow those equipment and inputs (fertilizer, herbicides, cassava planting machine, cassava harvesting machine, etc.) needed for the cultivation of cassava be available at highly subsidized rate.
- ❖ Also, women should be encouraged to take up cultivation of cassava.

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