# Influence of Socioeconomic variables on Cooperative farmers Adoption of Improved Cassava production Technology (ies) in Akwa Ibom state

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**Abstract**

*This study was designed to determine the extent to which socioeconomic variables influence cooperative farmers' adoption of improved cassava production technologies in Rivers State. The study adopted survey design. A multi-stage sampling technique was used to select 363 registered cassava cooperative farmers. The reliability coefficient of the instrument was done using a test-re-test method. The data were analyzed using percentages and a frequency count for socio-economic variables; the research questions were answered using mean and standard deviation while the hypotheses were tested using ANOVA at 0.5 level of significance. The findings from the study showed that there is a significant influence of cooperative farmers on some of the socio-economic variables such as level of education, years of farming experience, sources of Agricultural information, membership in the agricultural association and marital status on their adoption of improved cassava production technologies. Based on the findings of the study, the Rivers State Government (through the Rivers State Ministry of Agriculture, Rivers State Agricultural Development Programme (RISADEP) and other relevant agencies ) should encourage more farmers to join agricultural associations for sharing agricultural information. They should also facilitate registered farmers to access credit facilities with low-interest rate and markets access for their products.*

keywords: Cooperative farmers; socioeconomic variables; Post hoc; RISADEP

## 1.0. Introduction

The agricultural sector plays an essential role in economic growth, food security, poverty reduction and rural development. Agriculture was the main base of Nigeria's economy before the discovery of petroleum in commercial quantities and was also a significant source of revenue through the exportation of palm oil, timber, cocoa, rubber, groundnut and cotton. The agricultural sector also employed about 80% of the Nigerian workforce. Ekumanka and Nwankwo (2002) reported that agriculture in Sub-Saharan Africa (SSA) still provides a relatively large share of Gross Domestic Production (GDP), but productivity in the sector is still low. Nigeria currently faces severe food and agricultural problems due to the declining per capita food production, growing food importation, and accelerating ecological degradations. Ekpo and Umoh (2012) reported that surprisingly, by 1975, the country had become a net importer of essential food items. Philip, Nkonya, Pender and Oni (2009) stated that agricultural productivity estimates for Nigeria showed a decline in productivity from the 1960s to 1980s. However, Mbuk (2014) asserted that the decline in agricultural productivity between 1990 and 2006 was higher in Nigeria than other parts of the world. Several factors
hindered cassava production in Rivers state, among which are: the culture of soil conservation, use of traditional farming methods, planting of local cassava varieties, inadequate financial support, land tenure system, tools, high poverty rate, inadequate extension services, inadequate information and low f the level of education of farmers among others.. Hence farmers realization of the importance of improved cassava production technologies on the yield of cassava and the subsequent effect on their socio-economic welfare resulted in their formation of cooperatives to enable them to solve their problems and attract government attention. Agricultural cooperatives have been a platform for improving Nigerian Agricultural Productivity (Hailu, 2015). Nwankwo (2008) noted that agricultural cooperative is an autonomous association of farmers united voluntarily to meet their everyday economic, social and cultural needs. Cooperative societies encourage members who are farmers to be active in markets, locally, nationally and internationally as well as being the most effective vehicles for organizing modernized rural production. The adoption of new technologies is expected to facilitate increased production of the agricultural product. Adoption as a process is not a single unit act as it improves practices and technologies. It consists of a series of actions such as awareness, interest, evaluation, trial and adoption. Otherwise, the adoption process results in the making of relevant decisions and implementing actions which leads to desirable social changes. Adoption of improved cassava production technology could increase food crops and animal production, soil management practices, and farm mechanization. This result in the cultivation of cassava varieties characterized by resistance to pest and diseases, acceptable high market values regarding basic standard demands, high yields,

drought resistant and early maturity products. (Madukwe (2002).

Therefore, with the introduction of various improved varieties of cassava by International Institute for Tropical Agriculture (IITA) and National Crop Research Institute (NCRI), as well as the proper agronomic information necessary for the cultivation of such varieties was assumed to increase the productivity of farmers. Agricultural Extension workers use various methods and models such as; Technology Transfer Model (TTM), Training and visit extension model (T&V), participatory Extension Model (PEM), Farm-Base Extension Organization, (FBEO), and University-Based Extension Model (UBEM) to pass vital agricultural information to the farmers (Survedi, 2011). Studies have shown that socio-economic characteristics of registered cooperative farmers are the primary factors influencing adoption of improved cassava production technologies.

This study, therefore, seeks to determine the extent to which socio-economic characteristics of cooperative farmers' influences adoption of improved cassava production technologies in Rivers State.

Specifically, it also examined the extent to which:

1) academic level,
2) years of farming experience,
3) source of agricultural information from extension agents,
4) membership in cooperative groups, and
5) marital status influenced farmers' adoption of improved cassava production technologies.

## 2.0. Research Methodology

2.1.The study area

The study was carried out in Rivers State. The state is along the coastlines of Niger Delta regions in Southern Nigeria. It is bounded by Bayelsa on the East, Anambra and the Imo States on the North, Abia and Akwa Ibom States on the West, and the Atlantic Ocean on the South. It constitutes 3.71 per cent of the Nigerian population with a total population of about 5,185,400 (National Bureau of Statistics, 2006). It has vast resources of land and water, influencing the cultures, traditions and professions of the people. The state is rich in Agro-based endowments as well as gas and crude oil, making it the highest producer of oil and gas in Nigeria. The state has twenty-three (23) Local Government Areas, out of which 15 are upland while eight are riverine. The inhabitants of the upland areas are farmers, hunters and traders while those from riverine areas are fishermen. Rivers State Agricultural Development Programme (RISADEP) divided the state into 3 Agricultural Zones, namely Nchia (zone 1), Degema (zone 2), and Ahoada (zone 3). Out of 9 Local Government Areas in zone 1, only five produce crops; only one local government is involved in crop production in zone 2 being mainly riverine; while all the seven local government areas in zone 3 are involved in crop production. The study was carried out on these 13 crop producing local government areas (LGAs).

### 2.2. Sampling Technique

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A multi-stage sampling procedure was used to select respondents for an interview. First, all the five cassava producing LGAs in zone 1 were purposively selected, while the only cassava producing LGA in zone 2 was equally selected purposively. However, four cassava producing LGAs were randomly selected out of the seven LGAs where crops are produced in zone 3. A list of all the registered cooperative farmers was collected from the RISADEP zonal offices. A random sampling method was used to select 10% of registered cooperative cassava farmers in each of the selected LGAs. In all, a total of 363 registered cooperative cassava farmers as respondents were selected for an interview.

### 2.3. Method of Data Collection

A structured questionnaire was used for data collection. The researcher gathered Information on the respondent's socioeconomic characteristics such as; age, marital status, Education level, farming experience, Sources of Agricultural Information

### 2.4. Analytical Technique

The data collected from the respondents were analysed using mean and standard deviation to answer all the research questions, while Analysis of Variance (ANOVA) was used to test the hypotheses at 0.05. A 5 point Likert type coding scale was used in accessing responses in section B which has the following variables age, marital status, Education level, farming experience. The options on the scale is as follows; Very Great Extent(VGE): 4.50-5.00; Great Extent (GE) 3.50 – 4.49; Moderate Extent (ME) : 2.50 - 3.49; Small Extent (SE): 1.50 - 2.49 Very Small Extent (VSE):1.00 – 1.49. Calculation of the cluster mean of responses was used to determine the extent of influence of socio-economic variables on cooperative farmers' adoption of improved cassava production Technologies in Rivers State.

## 3.0. Results and Discussion

**Influence of Education level of respondents on their adoption of improved cassava production technologies.**

As shown in Table 1, a cluster mean of 2.98 implies that level of education of cooperative farmers influences the adoption of improved cassava production Technologies to a moderate extent. The finding agrees with the findings of Ajewole (2010), Lavison and Namara (2013), Weligamage and Parker (2013) who asserted that education level influences attitudes, thoughts, making them more open, rational and able to analyse the benefits of new technologies. Also, the educational level of farmers increases their ability to obtain, process and use information relevant to the adoption of new technology. This finding also agrees with the findings of Mbuk (2014) that women farmers' educational level is the strongest factor that determines the rate of adoption and diffusion of agricultural innovation. Thus, the findings of this study indicate that education is an important factor to cooperative farmers' adoption of improved technologies as it enables the farmers to know how to seek for and apply information on improved cassava production technologies for increased cassava production in Rivers State.

**Table 1:** Effect of Level of Education of Co-operative Farmers on Adoption of Improved Cassava Production Technologies *n = 358*

| S/N | Items | $\bar{X}$ | SD | Remarks |
|---|---|---|---|---|
| 1 | IITA TMS 1011368 – Vitamin A cassava variety | 3.47 | 1.90 | ME |
| 2 | Recommended Spacing | 3.27 | 1.25 | ME |
| 3 | Cassava/maize/sweet potato intercrop | 3.51 | 1.36 | GE |
| 4 | Herbicides | 3.42 | 1.29 | ME |
| 5 | Cassava mini stem (rapid multiplication) | 3.52 | 1.20 | GE |
| 6 | Pesticides | 2.67 | 1.35 | ME |
| 7 | Disease resistant cassava varieties | 3.29 | 1.23 | ME |
| 8 | Cassava/maize/cocoyam intercrop | 3.87 | 1.13 | GE |
| 9 | Fertilizer | 2.95 | 1.20 | ME |
| 10 | Zero Tillage | 3.61 | 1.59 | GE |
| 11 | Integrated Pest Management (IPM) | 2.80 | 1.18 | ME |
| 12 | Mobile grater | 4.23 | 1.26 | GE |
| 13 | Pressers | 3.61 | 1.16 | GE |
| 14 | Sifter | 2.77 | 1.12 | ME |
| 15 | Stem cutter | 1.83 | 1.01 | SE |
| 16 | Automated Garri fryer | 1.93 | 1.37 | SE |
| 17 | Backpack grass slasher | 2.22 | 0.99 | SE |
| 18 | Sanitation of processing centre | 2.77 | 1.23 | ME |
| 19 | Cassava peeler | 2.13 | 1.19 | SE |
| 20 | Cassava chipper | 2.12 | 1.15 | SE |
| | **Cluster mean** | **2.98** | | **ME** |

The analysis in Table 2 showed a cluster mean of 3.10 indicating that the years of farming experience influenced the cooperative farmer's adoption of improved cassava production technologies to a moderate extent. This result showed that farmers with higher years of farming experience adopted improved technologies more than those having few years of farming experience.

It might be because farmers with higher years of farming experience identify possible advantages of adoption of innovations faster than those with lower years of experience as such, the higher the years of experience, the higher the influence on adoption. The finding of this study further agrees with the findings of Ede (2011) who submitted that farmers with higher farming experience adopted improved maize and cassava packages more than those having few years of farming experience in Nkanu East and West, Enugu State, Nigeria

**Table 2**: Effect of Farming Experience of cooperative Farmers Adoption of Improved Cassava Production Technologies *n= 358*

| S/N | Items | $\overline{X}$ | SD | Remarks |
|---|---|---|---|---|
| 1 | IITA TMS 1011368 – Vitamin A cassava variety | 3.77 | 1.19 | GE |
| 2 | Recommended Spacing | 3.75 | 1.28 | GE |
| 3 | Cassava/maize/sweet potato intercrop | 2.98 | 1.16 | ME |
| 4 | Herbicides | 3.52 | 1.26 | GE |
| 5 | Cassava mini stem (rapid multiplication) | 1.97 | 1.13 | VGE |
| 6 | Pesticides | 3.05 | 0.93 | ME |
| 7 | Disease resistant cassava varieties | 3.75 | 1.26 | GE |
| 8 | Cassava/maize/cocoyam intercrop | 2.98 | 0.98 | ME |
| 9 | Fertilizer | 4.89 | 1.20 | VGE |
| 10 | Zero Tillage | 2.75 | 1.33 | ME |
| 11 | Integrated Pest Management (IPM) | 4.85 | 0.69 | SE |
| 12 | Mobile grater | 2.65 | 1.04 | ME |
| 13 | Pressers | 2.75 | 1.12 | ME |
| 14 | Sifter | 2.75 | 1.06 | ME |
| 15 | Stem cutter | 2.27 | 1.02 | SE |
| 16 | Automated Garri fryer | 2.34 | 1.11 | ME |
| 17 | Backpack grass slasher | 3.54 | 1.14 | ME |
| 18 | Sanitation of processing centre | 2.75 | 1.07 | ME |
| 19 | Cassava peeler | 1.97 | 0.88 | SE |
| 20 | Cassava chipper | 2.98 | 1.16 | ME |
| | **Cluster mean** | **3.10** | | **ME** |

Results in Table 3 shows a cluster mean of 3.59 indicating that the sources of agricultural information influence to a great extent the cooperative farmers' adoption of improved cassava production strategies in Rivers State. This result agrees with the findings of Lucky and Achebe (2013) that, information about improved agricultural practices speed up the adoption of improved practices by getting information about such practices to the more significant number of people engaged in Agriculture. However, modern information and communication technology (ICT) is a primary source of agricultural information. These include the use of mobile phones, radio dial-up and broadcasts, The forum has more comprehensive coverage although the economic potentials of the cooperative farmer may not possibly enable them access and possession of these sources of information.

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Table 3: Influence of Respondents' Source of Agricultural Information on Adoption of Improved Cassava Production Technologies.

| S/N | Items | $\overline{X}$ | SD | Remarks |
|---|---|---|---|---|
| 1 | IITA TMS 1011368 – Vitamin A cassava variety | 4.63 | 1.21 | VGE |
| 2 | Recommended Spacing | 4.55 | 1.13 | VGE |
| 3 | Cassava/maize/sweet potato intercrop | 3.71 | 1.18 | GE |
| 4 | Herbicides | 3.96 | 0.96 | GE |
| 5 | Cassava mini stem (rapid multiplication) | 3.17 | 1.14 | ME |
| 6 | Pesticides | 3.69 | 1.20 | GE |
| 7 | Disease resistant cassava varieties | 3.69 | 1.15 | GE |
| 8 | Cassava/maize/cocoyam intercrop | 3.66 | 0.93 | GE |
| 9 | Fertilizer | 4.54 | 1.22 | VGE |
| 10 | Zero Tillage | 3.55 | 1.05 | GE |
| 11 | Integrated Pest Management (IPM) | 3.59 | 1.29 | GE |
| 12 | Mobile grater | 3.51 | 1.24 | GE |
| 13 | Pressers | 3.82 | 1.35 | GE |
| 14 | Sifter | 4.73 | 1.21 | VGE |
| 15 | Stem cutter | 2.89 | 0.52 | ME |
| 16 | Automated Garri fryer | 3.01 | 1.01 | ME |
| 17 | Backpack grass slasher | 3.05 | 1.26 | ME |
| 18 | Sanitation of processing centre | 3.69 | 1.45 | GE |
| 19 | Cassava peeler | 1.98 | 0.96 | SE |
| 20 | Cassava chipper | 1.90 | 0.88 | SE |
| | Cluster mean | 3.59 | | GE |

The analysis in Table 4 showed a cluster mean of 3.39 indicating that the respondents' membership of agricultural associations influences the adoption of improved cassava production technologies to a moderate extent in Rivers State. The findings of Abebaw and Haile (2013), Benard and Taffese (2012) all agree to the fact that cooperative membership has a positive effect on the adoption of innovations. Moreso, Ogutu and Obare (2015) reported that farmers involved in informal or formal organisations would be in a better position to access information and markets, hence responding faster to the adoption of innovation for increased productivity.

Table 4: Influence of Agricultural Association Membership on Respondents adoption of improved cassava Production Technologies. *n = 358*

| S/N | Items | $\overline{X}$ | SD | Remarks |
|---|---|---|---|---|
| 1 | IITA TMS 1011368 – Vitamin A cassava variety | 3.61 | 1.21 | GE |
| 2 | Recommended Spacing | 2.92 | 1.09 | ME |
| 3 | Cassava/maize/sweet potato intercrop | 3.09 | 1.13 | ME |
| 4 | Herbicides | 3.24 | 1.18 | ME |
| 5 | Cassava mini stem (rapid multiplication) | 3.07 | 1.06 | ME |
| 6 | Pesticides | 3.01 | 0.98 | ME |
| 7 | Disease resistant cassava varieties | 3.05 | 1.03 | ME |
| 8 | Cassava/maize/cocoyam intercrop | 3.24 | 1.10 | GE |
| 9 | Fertilizer | 3.21 | 0.96 | GE |
| 10 | Zero tillage | 3.09 | 0.85 | ME |
| 11 | Integrated Pest Management (IPM) | 2.71 | 1.20 | GE |
| 12 | Mobile grater | 3.07 | 1.16 | ME |
| 13 | Pressers | 2.74 | 1.02 | ME |
| 14 | Sifter | 2.82 | 0.93 | ME |
| 15 | Stem cutter | 3.06 | 1.20 | ME |
| 16 | Automated Garri fryer | 3.10 | 1.07 | GE |
| 17 | Backpack grass slasher | 3.05 | 0.49 | ME |
| 18 | Sanitation of processing centre | 3.51 | 1.31 | GE |
| 19 | Cassava peeler | 3.03 | 0.94 | ME |
| 20 | Cassava chipper | 2.75 | 1.07 | ME |
| | **Cluster mean** | **3.39** | | **ME** |

Results in Table 5 showed a cluster mean of 3.09 indicating that the respondents' marital status influenced the adoption of improved cassava production technologies to a moderate extent. This result is in line with the findings of Nsoanya and Nenna (2011) who reported that 80% of the sampled population of cassava producers were all married with a household size of six. It implies that one of the socio-economic factors of farmers that influence their use of improved farm practices include marital status

Table 5: Influence of Marital Status of Respondents on the Adoption of Improved cassava Production. n = 358

| S/N | Items | $\bar{X}$ | SD | Remarks |
|---|---|---|---|---|
| 1 | IITA TMS 1011368 – Vitamin A cassava variety | 3.59 | 1.16 | GE |
| 2 | Recommended Spacing | 4.52 | 1.09 | VGE |
| 3 | Cassava/maize/sweet potato intercrop | 3.27 | 1.07 | ME |
| 4 | Herbicides | 2.83 | 0.84 | ME |
| 5 | Cassava mini stem (rapid multiplication) | 4.57 | 1.16 | VGE |
| 6 | Pesticides | 2.94 | 1.00 | ME |
| 7 | Disease resistant cassava varieties | 3.55 | 1.21 | GE |
| 8 | Cassava/maize/cocoyam intercrop | 2.92 | 0.86 | ME |
| 9 | Fertilizer | 3.61 | 1.12 | GE |
| 10 | Zero tillage | 3.22 | 1.05 | ME |
| 11 | Integrated Pest Management (IPM) | 2.83 | 1.02 | ME |
| 12 | Mobile grater | 3.65 | 1.08 | GE |
| 13 | Pressers | 4.71 | 0.79 | ME |
| 14 | Sifter | 3.09 | 1.15 | ME |
| 15 | Stem cutter | 2.13 | 0.78 | SE |
| 16 | Automated Garri fryer | 2.20 | 1.07 | SE |
| 17 | Backpack grass slasher | 2.74 | 1.45 | ME |
| 18 | Sanitation of processing centre | 2.95 | 1.41 | ME |
| 19 | Cassava peeler | 2.02 | 0.96 | SE |
| 20 | Cassava chipper | 2.36 | 1.16 | SE |
| | Cluster mean | 3.09 | | ME |

Source: Data Analysis, 2016

Table 6 showed that there is a significant influence of cooperative farmers' educational level on the adoption of improved cassava production technology. This influence was found to be statistically significant at the .05 alpha level. It implies that an educated farmer would adopt improved cassava production Technologies faster than an uneducated farmer.

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**Table 6**: Analysis of Variance of the Influence of Farmer's Educational Levels on their Adoption of Improved Cassava Production Technologies

| Source of Variance | SS | df | Ms | F | P-value |
|---|---|---|---|---|---|
| Between Educational Levels | 10197.501 | 2 | 5098.750 | 270.779* | .000 |
| Within Educational Levels | 6684.622 | 355 | 18.830 | | |
| **Total** | **16882.123** | **357** | | | |

*Significant

Table 7 showed that the years of farming experience of cooperative farmers significantly influenced their adoption of improved cassava production technologies. It implies that farmers with a higher number of years of cassava production will adopt innovations faster for increased productivity and income.

Table 8 showed that the sources of agricultural information significantly influenced cooperative farmers' adoption of improved cassava production at 0.05 alpha level. It implies that information obtained from cooperative meetings has the greatest influence as it enhances personal contact and trust in the source of information thus enabling cooperative farmers' adoption of improved cassava production technologies

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**The significant Influence of Co-operative Farmers' Years of Experience on their Adoption of Improved Cassava Production Technologies**

Table 7: Analysis of Variance of the Influence of Co-operative Farmers' Years of Experience on their Adoption of Improved Cassava Production Technologies

| Source of Variance | SS | df | Ms | F | P-value |
|---|---|---|---|---|---|
| Between Years of Experience | 11448.711 | 2 | 5724.355 | 374.009* | .000 |
| Within Years of Experience | 5433.412 | 355 | 15.305 | | |
| **Total** | **16882.123** | **357** | | | |

*Significant

Table 8: Analysis of Variance of the Influence of Co-operative Farmers' Source of Agricultural Information on their Adoption of Improved Cassava Production Technologies

| Source of Variance | SS | df | Ms | F | P-value |
|---|---|---|---|---|---|
| Between Sources | 10299.185 | 2 | 5149.592 | 277.704* | .000 |
| Within Sources | 6582.938 | 355 | 18.543 | | |
| **Total** | **16882.123** | **357** | | | |

*Significant

Table 9 showed that membership of Agricultural groups significantly influenced cooperative farmers' adoption of improved cassava production at 0.05 alpha level. It implies that farmers involved in formal or informal organizations are in better positions to access information on markets, loans, and available technological innovations than non-members. It exerts the greats' influence that enhances cooperative farmers' adoption of improved cassava production technologies

Table 9: Analysis of Variance of the Influence of Co-operative Farmers' Membership in Agriculture Association on their Adoption of Improved Cassava Production Technologies.

| Source of Variance | SS | df | Ms | F | P-value |
|---|---|---|---|---|---|
| Within Groups | 10680.424 | 2 | 5340.212 | 305.686* | .000 |
| Within Group | 6201.699 | 355 | 17.470 | | |
| **Total** | **16882.123** | **357** | | | |

**Significant*

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Table 10 further showed that marital status significantly influenced cooperative farmers' adoption of improved cassava production technologies at the 0.05 alpha level. It implies that married farmers adopt agricultural innovations faster than unmarried farmers leading to higher productivity in cassava farming.

Table 10: Analysis of Variance of the Influence of Co-operative Farmers' Marital Status on their Adoption of Improved Cassava Production Technologies

| Source of Variance | SS | df | Ms | F | P-value |
|---|---|---|---|---|---|
| Between Marital Status | 6941.521 | 2 | 347.760 | 123.948* | .000 |
| Within Years of Experience | 9940.602 | 355 | 28.022 | | |
| **Total** | **16882.123** | **357** | | | |

$N_1$ = 118, $N_2$ = 108, $N_3$ 132 *Significant

**Conclusion and Recommendations**

The research has shown that the socio-economic characteristics of the cooperative farmers influence their adoption of improved cassava production technologies in Rivers State, Nigeria. Therefore, adoption of improved cassava production technologies cannot succeed without considering socio-economic characteristics such as educational level, years of farming experience, sources of Agricultural information, membership in Agricultural associations and marital status among others.

Based on the findings of the study, the Rivers State Government through the Rivers State Ministry of Agriculture, RISADEP and other relevant agencies should intensify efforts in encouraging cooperative farmers to belong to agricultural associations to share agricultural information;

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