SOCIO-ECONOMIC FACTORS AFFECTING ADOPTION OF IMPROVED CASSAVA VARIETIES AMONG FARMERS IN ABIA STATE

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ABSTRACT
This work examined the socioeconomic factors affecting the adoption of improved cassava varieties in Abia State. The study was carried out in Abia State. Five out of 17 LGAs in Abia State were purposely selected due to their popularity in cassava production. One hundred and fifty farmers were randomly selected and interviewed with a structured questionnaire to find the socioeconomic characteristics of respondents, the factors affecting adoption of improved cassava varieties and suggestions to improve production of cassava in the area. The data were analyzed using descriptive statistics such as frequency, tables, percentages and probit model analysis. The result shows that the major factors affecting adoption of improved cassava varieties were adaptability of the technology compatibility, age, educational status, sex and complexity of the technology. The result also reviewed that more of elderly people farmed cassava in the study area and the farmers were more of women. It is thereby recommended that farmers suggestions should be adhere to in order to boost cassava production in Abia State. Men and youths should be encouraged to go into farming in the study area through individual motivation.

Key words: adoption, improved cassava farmers

INTRODUCTION
Cassava (*Manihot esculenta*) is a dicotyledonous root crop of the botanical family *Europhobiaceae,* and the major root crop grown in Nigeria. Some other principal root crops grown in Nigeria are sweet potato, turmeric, *rizga*, hausa potato, irish potato. Cassava which has been neglected by research workers is now receiving attention at both national and international research centers. The significance of the crop in tropical agriculture has been recognized in the area of its growth potentials, human and animal food, its enrichment and fortification, toxicity, industrial uses, economic of production and genetic improvement (Okereke and Ojewola, 2005).
Cassava produces bulky storage roots with about 80% carbohydrates concentration. The leaves constitute a good vegetable rich in protein, vitamins and minerals. The biochemistry of the crop has proved that the protein in the leaves is equal to the protein in egg (Lekule and Sarwatt, 2006). Cassava leaves and roots, if properly processed, can provide balanced diet protecting millions of African children against malnutrition. Cassava is the most important root crop grown in Nigeria. Its potentials in the fight against hunger and food insecurity is documented (Gregory J. Scott, Mark. W. Rose grant and Claudia Kingler (2000). Cassava ranks among the highest most important food crop world wide and the highest food crop produced in the developing countries. It

serves as food, provides employment and provides raw materials. Cassava can be eaten as fufu, garri, tapioca. It can be eaten raw, roasted or fried, boiled, and in many other forms. The leaves serve as source of protein for both human beings and livestock (Ravindran and Kenkpen, 2006). Cassava serves as raw material when processed into flour. It serves as raw material for bakery industries, starch for textile industries, adhesive glucose for pharmaceutical industries and ethanol for brewery and bottling industries (NRCRI, 2006).

Cassava utilization, as livestock feed, is very popular in the whole world, especially in Brazil, Columbia, Thailand etc. For example, about 22.0 million metric tonnes of cassava, produced annually in Nigeria, was used for feed, (Gregory J. Scott, Mark. W. Rose grant and Claudia Kingler (2000). Cassava peels, leaves and roots are used for manufacturing feed for pigs and ruminant animals. Research has shown that in the last few years, about 41.4 million metric tonnes of cassava was used by the whole world as feed. One tonne of fresh cassava root yields 150 litres of ethanol higher than other botanical crops. (Imo, 2006). Most of the farmers in the rural areas still depend on local cassava varieties for their planting materials which in turn result in a very poor yield at harvest. For example, research has shown that ten years ago, cassava yield in farmers field stood at 5 – 10 tonnes per hectare (Nwosu, 2005). This figure proved a very poor yield in cassava production.

Furthermore, Nigerian cassava yield of 9.98 tonnes per hectare is still lower than the world average yield of 10.76 tonnes/ha irrespective of her being ranked highest cassava producer in the whole world. The main solution to this problem is adoption of improved cassava varieties and production technologies by the farmers (Imo, 2006). In order to relieve farmers from this problem of poor yield during harvesting, the International Institute of Tropical Agriculture (IITA) Ibadan and National Root Crops Research Institute (NRCRI) Umudike collaborated to develop some improved cassava varieties capable of adapting to a wider range of ecological conditions and farming systems. Among these varieties are TME 419, NR 8082, NR 8083, TMS 96/0002 and TMS 92/0057 (Imo and Essien, 2005). NRCRI Umudike has developed about 27 hybrid cassava varieties through selective breeding.

TME 419, NR 8082 NR 8083, TMS 96/0002 and TMS 92/0057 are current improved cassava varieties being transferred by National Root Crops Research Institute (NRCRI) Umudike to farmers in Abia state and other states in the south east agro ecological zone of Nigeria. Up till now, many farmers are still planting non improved varieties.

This study therefore intends to find out those factors affecting the adoption of these varieties. The low or partial adoption of some agricultural technologies is as result of some personal and socio-economic factors, until these factors are verified and addressed, there should be no improvement in adoption of agricultural technologies in Nigeria. The general objective of the study was to determine the factors influencing the adoption of improved cassava varieties by farmers in Abia State. **Specifically the study was designed to** determine the socio-economic characteristics of the respondents; identify and analyze those factors affecting the adoption of improved cassava varieties; and to ascertain farmers opinion on how to increase cassava production in the study area.

METHODOLOGY
The study was carried out in Abia State. The State is made up of 17 local government areas (LGAs) and three agricultural zones, namely, Umuahia, Aba, and Ohafia. The 17 LGAs of Abia state are Umuahia North, Umuahia South, Ikwuano, Isiala Ngwa North, Isiala Ngwa South, Aba North, Aba South, Osisioma Ngwa, Obioma Ngwa, Ukwa East, Ukwa West, Ugwunagbo, Umunneochi, Isuikwuato, Ohafia, Bende, and Arochukwu. Umuahia is the state capital. The state is located in the south eastern part of Nigeria. The state lies on the longitude $7^0 00E$ and $8^0 00E$ and latitudes $4^0 45N$ and $6^0 17N$ of the green wich meridian. The climate is tropical and humid all the year. Annual rainfall ranges from 2000mm to 2500mm, temperature ranges within 22^0C and 31^0C (FOB 1999).
The population for this study comprised all the cassava farmers in Abia state. Out of the 17 LGAs in Abia state, 5 LGAs were purposively selected for the study. They are Bende, Isikwuato, Umunneochi, Umuahia South and Ukwa East. This is because people living in these areas are mainly cassava farmers. Two communities in each of the 5 local government areas were randomly selected. A total of 10 communities were therefore involved in this study. Fifteen farmers were randomly selected from each of these communities from the list of the registered farmers. This means that in each of the local government areas, thirty farmers were interviewed by means of structured questionnaire making it a total of 150 farmers that made up the sample size of this study.

Data Analysis
Descriptive statistics such as frequency distributions tables, percentages, means and ratios were used to present the data. Objective 2 was analyzed using the maximum likelihood probit analysis. The model is specified in the implicit form as follows

Where $Y = F (X_1, x_2, x_3 ….. X_{14} + U)$ is the implicit form of the model: and
$Y =$ Adoption Index (Stages of adoption by Respondents (Adoption = 1, non = 0)
$X_1 =$ Age of farmers (in years)
$X_2 =$ Sex (Male = 1, Female = 0)
$X_3 =$ Marital status (Married =1, Not married =0)
$X_4 =$ Household size (No of people feeding from the same pot)
$X_5 =$ Educational status (in years)
$X_6 =$ Level of income (per annum)
$X_{7 =}$ Farming experience (in years)
$X_8 =$ Membership of a co-operative or farm association (membership = 1 Non = 0)
$X_9: =$ Total farm size (in hectares)
$X_{10} =$ Contact with Extension staff (in months)
$X_{11} =$ Complexity of technology (Complex 1, non 0)
$X_{12} =$ Profitability Profitable 1, non 0)
$X_{13} =$ Adaptability (Adaptable 1, non 0)
$X_{14} =$ Compatibility (Compatible 1, non 0)
$U =$ Error term

Objective 3 was analyzed by means of percentages

RESULTS AND DISCUSSION

Table 1 reveals that majority (86.1percent) were within the age range of 40 – 60 years and above. This shows that cassava farmers in Abia State were more of elderly people rather than youths who are between 20 – 40 years, and still very active. This agrees with Pur, Ibrahim; and Sabo (2007) and Nwakor, Ekwe, Amangbo, and Okoye (2008) that the level of youths involvement in agriculture has reduced due to schooling and part-time farming. Also majority (54.7 percent) of the cassava farmers in the study area were female which also agrees with the finding of Ironkwe and Asumugha (2007). Majority (70.7percent) were married people. About 81.3 percentage) were educated at their varying levels, and this has positive influence on adoption. Majority (57.3 percent) of the respondents were part-time farmers. Full time farmers are expected to have high adoption rate than part-time farmers. About (70 percentage) of the respondents had above 21 – 30 years farming experience which is expected to have positive influence on adoption. Majority of the respondents (89.3 percent) cultivated less than 5 acres of land. The farmers were more of part-time and it affects their production. This agrees with Mba (2007) in Enugu State. Mixed cropping is the major farming system in the study area.

Table 1:   Socio-economic Characteristics of Respondents (n=150)

Age	Frequency	Percentages
20 or less	03	2.0
21 – 30	07	4.6
32 – 40	11	7.3
41 – 50	49	32.7
50 – 60	55	16.7
Above 60	25	
Sex		
Male	68	45.3
Female	82	54.7
Marital Status		
Single	44	29.3
Married	106	70.7
Membership of cooperative		
Membership	83	55.3
non	67	44.7
Educational Status		
No School	28	18.7
Primary	29	19.3
Secondary	58	38.7
Tertiary	35	23/3
Farm Involvement		
Full Time	64	42.7
Part Time	86	53.3

Farming Experience

1 – 10	13	8.7
11 – 20	31	20.7
21 – 30	45	30.0
Above 30	61	40.0

Farm Size

0 - 1 acre	44	29.3
2 - 3 acre	49	32.7
4 - 5 acre	41	27.3
6 - 7 acre	6	4.0
8 acres & above	10	6.7

Income

< 20, 000	10	6.7
21, 000 - 40, 000	10	6.7
41, 000 – 60, 000	65	43.3
61, 000 – 80, 000	25	16.7
> 80, 000	40	26.6

Source: Field survey, 2009

Table 2: The Result of Probit Model Analysis on the factors affecting Adoption of improved cassava varieties

Variable	Coefficient	Standard error	T value
Age (X1)	-.435444	.1824578	-. 39**
Sex (X2)	.6810573	. 3301048	2.06**
Marital status (X3)	-82755974	. 5924909	- 1.40
Household (X4)	.0742263	. 1769382	0.42
Education status (X5)	.5418162	. 181666	2.98***
Income (X6)	-1868641	. 2085854	- 0.90
Family experience (X7)	.1544868	. 1724209	0.90
Member of cooperative (X8)	.452327	. 3066208	1.48
Farm size (X9)	-0817202	. 1513319	- 0.54
Extension contact (X10)	-1920288	. 1861979	- 1.03
Complexity of technology (X11)	-0796184	. 0309869	- 2.57**
Profitability (X12)	-6556734	. 8629816	- 0.76
Adaptability (X13)	.2760361	. 543703	5.15***
Compatibility (X14)	.6237272	. 2990147	2.09**
Constant	.4853969	. 9585796	0.51

Source: Field survey, 2009   Stata 8 Computer Programme

*** Significant at 10% level; ** Significant at 5% level

The result of probit model analysis (Table 2) shows an R^2 value of 0.2677 for the improved cassava variety studied, This indicates that 27.0% of the variation in adoption of these Cassava varieties was explained (or accounted for) by the independent variables considered in this study. Also, the log likelihood of -53.934663 and chi-square of 0.0003 indicates a good fit for the model. Specifically, educational status, age, sex, complexity adaptability of the innovation and compatibility of the technology were significant factors on adoption of improved cassava varieties at varying degree of significance. Adaptability (X_{13}) has a positive and significant relationship at 10% level with these varieties the implication is that any increase in this variable will lead to increase in adoption. This agrees with Asiabaka (2002) that factors related to determinants of adoption include adaptability and appropriateness of the technology.

Compatibility (x_{14}) has positive and significant relationship adoption at 5% levels for the improved varieties showing that the compatibility of the innovation increase the adoption of the innovation when the technology is similar and agreed with the existing culture it will hasten the adoption of such technology. This agreed with Rogers (1995) that there are characteristics of the farmers that affect their rate of adoption such as compatibility and complexity of the technology.

The above findings agree with the findings of Uwakah (1990) that educational status affects adoption. Adoption is higher among farmers of high social class who are literate because such farmers can read papers and interact affectively with extension agents.

Table 3: Distribution of Respondents According to Suggested Remedies to improve Cassava Production

Farmers suggested remedies	Respondents	Percentage %
Establishment of Demo plots	30	20
Provision of loan	60	40
Provision of input	112	74.7
Provision of expert advice	02	1.3
Creation of market	60	40.0
Agricultural subsidy/labour	97	64.7
Agric. Shows workshop/seminar	04	2.7
Employ more extension staff	08	5.3
Mechanized agriculture	58	38.7
Improved processing	12	8.0
Awareness Campaign	12	8.0
Development of variety that resist Goat attack	30	20
Provision of land	50	33.3
Reduce cost of pre-emergence herbicides	10	6.7
	10	6.7
Farm settlement scheme	50	33.3
Regular supply of improved varieties		

Source: Field Survey 2009   * Multiple responses recorded

Table 3 shows the suggested remedies by the farmers to improve cassava production in Abia State. Majority 74.7 percent suggested provision farm input. (64.7 percent) suggested agricultural labour subsidy (40.0 percent) and (40.0 percent) suggested provision of loan and creation of market for cassava (38.7 percent) and (6.7 percent) suggested mechanized agriculture and provision of land. Others suggested establishment of demonstration plots, the use of agric show/seminar, and release of goat resistant variety. The interpretation is that the farmers will adopt innovation more when the inputs are available and when the cost of labour become reduced. This agrees with Kanku and Mukerji (1998) who stated that labour is the primary instrument for increasing production and a critical determinant of agricultural production.

CONCLUSION

This study was designed to study farmer's adoption of two improved cassava varieties developed and transferred by NRCRI Umudike to farmers in five Local Government Areas in Abia State. These varieties are (TME 419, NR 8083 and NR 8082). The data collected in this study were analyzed using frequency tables, percentages, means and probit model analysis. The probit model was used to analyze the determinants of adoption of the improved cassava varieties among farmers in five local government areas of Abia State. Results from the study showed that both socio-economic characteristics of the farmers and the characteristics of the technology attributed to the adoption of improved cassava varieties in the study area. The result of the socio-economic characteristics of the farmers shows that majority (86.1 percent) were above 40 years of age which influenced adoption negatively.

Majority (4.7 percent) were women which also has influenced on adoption. Majority (81.3 percent) were literate and this has a positive and serious influence on adoption of improved cassava varieties. Majority were members of farmers co-operative (55.3 percent). About 70.6 percent have 21 – 30 years farming experience. The result of the awareness of these varieties showed that majority (96.7 percent) and (80.9 percent) were aware if these varieties (TME 419 and NR 8082). The source of information about this technology shows that majority (34.0 percent) heard about this technology from extension agents followed by farmers (30.0 percent) and research institute (11.4 percent). The result of probit model analysis shows that ten out of fourteen variable considered affect the adoption of improved cassava varieties studied. About 17 out of the factors considered affects adoption positively, while three out these factors have negative effect on adoption. The constraints in growing cassava by these farmers were lack of input, fund and high cost of labour. The provision of these amenities will help to increase cassava production and adoption of improved varieties in the study area.

RECOMMENDATIONS

Since the ADP extension agents are the major source of information of technology transfer. The government should improve the working condition of ADP staff and equip the body with necessary equipment for work. The government should therefore encourage the youths into farming by creating awareness campaign, provision of incentives like loans and other tangible gifts/awards. The developers of this technology (Research Institutes) should be more equipped and encouraged financially by the government for them to release more and better breeds or cultivars in order to reduce the

problems of food crisis in the country. Land inheritance problem which affect women more today should be removed and land should be equally distributed in families among the male and female in the family for increase production. Government policy should consider these farmers demand. Farmers requested that a variety that can resist goat and attack of higher animals be released for them. Cassava breeders should take note of this demand. Farmers also complained of lack of planting material for cassava production. Government should therefore supply the farmers with improved planting materials at subsidize rate, Government should provide other inputs such as fertilizer and agricultural chemical at affordable price to farmers for increase production.

It is recommended that Agricultural Research Institute should continue to release these varieties for farmers in Abia State, for increased food production and to reduce global food crisis in Abia State in particular and Nigeria in general. Farmers should be encouraged into cassava production by citing of cassava market closer to the farmers in the rural communities to sell their farm product easily.

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