

ASSESSMENT OF THE ADOPTION OF VITAMIN A FORTIFIED CASSAVA VARIETY AMONG RURAL FARMERS IN NIGERIA

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ABSTRACT

This study was carried out to analyze the factors influencing the awareness and adoption of cassava Vitamin A varieties among rural farmers in Ondo State, Nigeria. Multi-stage sampling technique was used to select 120 cassava farmers in the selected local Government in the state. Data obtained were analyzed using frequency counts, percentages and chi square analysis. Results showed that a mean age of 80 years, 73.3% married and a high level of Educational attainment, farming experience was high. Majority of the respondents had a low level of awareness and adoption of cassava Vitamin A varieties. Chi-square analysis showed that significant relationships existed between ages, sex with the level of awareness of cassava vitamin A varieties. The study concluded that factors like inadequate planting materials and inadequate credit facilities has affected the adoption of Vitamin A fortified Cassava variety among rural farmers in Nigeria.

Keywords: *Adoption, Awareness, Vitamin A Fortified Cassava variety, Perception*

INTRODUCTION

Agriculture plays an important role in employment and revenue generation as well as in the provision of raw materials for the development of industries. Food production appears to be on the decline over the years while the rate of population is on the increase. The resultant effect is the creation of a vile gap between food demand and supply in Nigeria (Ugwoke, Adesope & Ibe, 2005). Agriculture remains a family enterprise in Nigeria left in the hands of the aged people who have little or no energy to contribute to its development. The current challenges in development are so demanding that only the participation of people who are innovative, productive and committed could bring development to the sector.

Cassava often referred to as 'poor' man's crop is an important staple food in the tropics (IITA 1992) which plays a major role in alleviating the African food crisis (Hahn, 1997). Nigeria is the world leading Cassava produce with about 21% share in the global market (FAO, 2013). A small fraction of cassava output in Nigeria is majorly produced for commercial use in the livestock feed, ethanol, textile and food Industries while the majorly is produced by small holder farmers for small scale processing (Ilons, Bouis, Palenberg, Moursi & Oparinde, 2017) Vitamin A Cassava varieties were introduced few year ago by two major research institutes (International Institute of Tropical Agriculture & Root and Tuba Expansion Programme) in order to combat Vitamin A deficiency which is very rampant among children and pregnant women in Nigeria.

Three yellow root cassava varieties, *UMUCASS 36*, *UMUCASS 37* and *UMUCASS 38* are being grown under the harvest plus project (Chiedozie, 2011). These cassava varieties have a high concentration of B-carotene which is a precursor to Vitamin A. Vitamin A deficiency is a major issue, especially in Africa. Nigeria in particular, sees a prevalence vitamin A deficiency in nearly one-third of children under five years (World Bank, 2012). Apart from children, it also affects 20% of the pregnant women. This deficiency in vitamin A lowers immunity and impairs vision thus leading to blindness and even death. Cassava is a major source of carbohydrate. In Nigeria 80% of which are starches (Bokanga 2000). The deficiency of Vitamin A in conventional Cassava led to the bio- fortification of the crop by Harvest plus and international Institute of Topical Agriculture IITA to provide up to 4% of the Vitamin A recommended daily allowance for children under five and pregnancy woman. Vitamin A fortified cassava represent an additional source of Vitamin A in Nigeria diets. The new yellow varieties have high yields and are resisted by many pest and diseases unlike ordinary cassava but farmers are still being faced with challenges in the cultivation of Vitamin A Cassava in Nigeria due to different factors which include low crop value marketing, processing facilities, on farm postharvest handling and rudimentary storage structures such as woven basket, traditional granaries and development of storage pests and microbial contaminants such as *Aspergillus flavus* (aflatoxins). The foregoing therefore makes it imperative to carry out a study to assess the adoption of Vitamin A fortified cassava varieties among rural farmers in two selected Local Government areas in Ondo State, Nigeria. The specific objectives are to: ascertain the socio-economic characteristics, of the farmers, determine the level of awareness and adoption, identify the sources of information on it and identify the problems encountered by the rural farmers.

HYPOTHESIS

H₀₁: There is no significant relationship between the socio-economic characteristics of rural farmers and adoption of Vitamin A fortified Cassava varieties.

METHODOLOGY

The study was conducted in Ondo State. Ondo state is bounded in the West by Osun and Ogun States, in North by Ekiti and Kogi States. Ondo State share boundary with Edo and Delta States in the East. The State has two dominant seasons – rainy and dry seasons. Rain falls between April and October while the dry season starts from November to early March. The Yoruba forms the major ethnic group. Christianity and Muslim religious are beliefs professed by the people. Agriculture is the mainstay of the Local Government basically due to the rich arable land suitable for agriculture. The major crops produced are cassava, oil palm, and cocoa etc. The sample frame and sample size for the study in the selected villages are represented in Tables I.

Table I: Sampled Local Government Areas

Local Government Area	Village	Sample size
Ondo West L.G. A	6	60
Ondo East L.G. A	6	60

The multi-stage technique was used to select the respondents for the study, at the first stage, two Local Government Areas were purposely selected out of the 18 Local Government Areas. The reason for the selection was based on the high level of production and processing of cassava in the area. At the second stage, six villages were randomly selected from each Local Government Area. At the last stage, random sampling technique was used to elicit information from 10 cassava farmers in each of the selected villages given a total of one hundred and twenty respondents (120) for the study.

The study made use of primary data. The primary data were collected by administering questionnaire to the farmers through interview schedule. The data collected were on personal characteristics of the respondents such as age, family size, and marital status, years of formal education, sex, farm size, farming experience, extension contact etc. other data collected include the level of adoption and awareness. Descriptive statistics such as the tables, percentages, frequency distribution and multiple regression analysis were used to analyze the variables.

The dependent variable is adoption of Vitamin A cassava fortified varieties which was measured by asking the respondents if they have adopted or not. Adoption was given value of '1' while non-adoption was given a value of '0'. The independent variables of the study includes age, sex, marital status, educational status farming experience, religion and household size, which were measured at nominal and interval level.

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

Table II shows that the majority (50.8%) of the farmers sampled were male. It is a general belief are more actively productive and efficient in farming practices due to labour intensive nature of cassava production especially in developing economy like Nigeria. These findings are in consonance with the findings of Alfred (2005) who observed that male are often more energetic and dominates agricultural production in Nigeria. However, Oladeji, Oyedokun and Bankole (2003) also observed that it is generally believed that males are often more energetic and could readily be available for energy demanding jobs like cassava farming.

The result in Table II reveals that 23.3 percent of the respondents were less than 35years while 20.7 percent and 36.1 percent were between 36-45years and 46-55years, respectively. However, 19.6 percent of the respondents were more than 56years the mean age of the farmers was 50years \pm 11.6 years. The finding reveals that majority of the farmers were in their middle and productive age and can still undergo the rigors of farming activities. The findings also reveal that 73.3 percent were married while 2.5percent were single as shown in Table II. Marital status of the farmers had a lot of influence on the production performance of farmers as family members could facilitate farmer's production process especially in terms of labor supply. The result also shows that 4.1percent of the respondents had no formal education while 41.7percent, 10percent, 30percent and 14.2percent had attempted primary education, completed primary education, attempted secondary Education and completed secondary education, respectively. The implication of Education and completed secondary Education as opined by Ojukaiye (2001) who

posits that education is an important socio-economic factor that influences a farmer's decision because of its influence on the farmer's awareness, perception, reception and the adoption of innovation that can bring about increase in production. Findings shows that the mean farm experience of the farmers was 29years \pm 7.05 years and with this experience, it is expected that the respondents will be able to make a sound decision as regards the type of innovation to be adopted, resource allocation and management of their cassava farms. Ibitoye and Onimisi (2013) opined that the length of time of farming business can be linked to the age of farmers, access to capital and experience in farming which may explain the tendency to adopt innovation and new technology.

The result in Table II revealed that 43.3 percent of the respondents had less than 4 people in their family 45 percent had between 4-7 people while 11.7 percent had more than 7 people in their families. The implication is that respondents had a low household size which has implication for labour unavailability for farm work. The result in Table II also shows that 8.3 percent of the respondents had access to credit facilities, while majority 91.7percent did not have access to credit facilities. Credit is a very strong important factor that is needed to develop farm enterprise (Ekong, 2003). Its availability could determine the level of adoption of improved cassava and its production.

Majority (84.2 percent) of the respondents were Christians, 7.5percent were Muslims while traditional worshipper was 8.3 percent.

Table II: Respondent's socio-economic characteristics

Variables	Frequency	Percentage	Mean	Standard Deviation
Age				
Less than35yrs	28	23.3	50 years	\pm 11.6
36 – 45yrs	25	20.7		
46 – 55yrs	43	36.1		
56- above	24	19.9		
Sex				
Male	61	50.8		
Female	59	49.2		
Marital status				
Single	3	2.5		
Married	88	73.3		
Widowed	17	14.2		
Divorced/separated	12	10		
Educational level				
Non-formal education	5	4.1		
Attempted pry education	50	41.7		
Completed pry education	12	10		
Attempted secondary education	36	30		
Completed Secondary Education	17	14.2		

Farming experience

<10yrs	8	6.7		
11 – 20 yrs.	22	18.3		
21 – 30yrs	74	11.6	29 years	± 7.05
31 – 40yrs	18	15		
41 – 50yrs	17	14.2		
51year above	41	34.2		

Household size

<4	52	43.3
4-7	54	45
>7	14	11.7

Access to Credit

Yes	10	8.3
No	110	91.7

Religion

Christianity	101	84.2
Muslim	9	7.5
Traditional	10	8.3

Source: Field data survey, 2018

Awareness and adoption of cassava Vitamin A varieties

The data presented in Table III shows that 84 percent of the respondents had no awareness of the improved Vitamin A varieties and 85% of the respondents also did not adopt this variety. This is an indication that the respondents were not aware making adoption very low.

Table III: Level of awareness and adoption of improved cassava vitamin A variety

Cassava vitamin A varieties	Aware		Not aware		Adopted		Not adopted	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
<i>Umucass 44</i>	9	7.5	101	84.2	8	6.7	102	85

Source: Field data survey, 2018

Sources of information

The result of the responses of cassava farmers as regards their various sources of farm information is presented in Table IV. It shows that 66.7 % of the sampled respondents in the study area depend solely on the information obtained from radio and television 30% got their information from friends and relatives while only 3.3% extension agents. This is an indication that extension services had no impact in terms of information delivery.

Frequency of extension contact is an important factor in the promotion of innovation targeted at small holder farmers hence low frequency result in low rate of adoption of innovation. The result in Table IV also highlighted the relevance of Radio and Television in Technology transfer because of its potentials and ability to reach a large audience on time.

Table IV: Sources of Information

Information source	Frequency	Percentage
Radio/ Television	80	66.7
Friends and Relatives	36	30
Extension agents	4	3.3
Total	120	100

Source: Computed from field survey, 2018.

Constraints encountered

The constraints encountered by the farmers are presented in Table V. These includes inadequate planting materials (73.4%), Lack of Capital (13.3%) and inadequate enlightenment of the product (13.3%). The result in Table V is in line with Umunakwe *et al* (2015) that inadequate planting materials, inadequate credit facility, poor government support are major constraints to production of impound Cassava varieties in Nigeria.

Table V: Constraints Encountered

Constraints Encountered	Frequency	Percentage
Inadequate planting materials	88	73.4
Inadequate Credit Facilities	16	13.3
Inadequate enlightenment	16	13.3
Total	120	100

Source: Field survey, 2018.

TEST OF HYPOTHESIS

The null hypothesis stated that there is no significant association between personal characteristics and awareness of cassava Vitamin A varieties. The variables considered included sex, age, family size, marital status, educational level, and religion. Results showed that there is a significant association between Age, Level of education and adoption of Vitamin A Cassava usually. While sex, religion, marital status has no significant association adoption of Vitamin A variety. This implies that Age and Educational level had a great influence on the adoption of Vitamin A Cassava usually in the study area. Generally education crated a favorable mental attitude for adoption of new practices (Casswell, Fugile, Ingram, Jana & Kasek, 2001).

Table VI: Chi Square analysis of the Association between the selected personal characteristics of the respondents and adoption of vitamin A fortified cassava varieties.

Variables	Cal	Tab	Level of significance	Degree of freedom	decision
Age	13.17	7.615	0.05	3	S*
Sex	0.03	3.84	0.05	1	NS
Religion	0.25	3.84	0.05	2	NS
Marital Status	0.33	5.9	0.05	2	NS
Educ Level	24.22	9.4	0.05	4	S*

** - Significant at 5%

Source field data 2018

CONCLUSION AND RECOMMENDATIONS

The study sought to assess the adoption of Vitamin A fortified Cassava variety among rural farmers in Ondo State, Nigeria, Multistage Sampling technique was used to select respondents for the study. The mean age was 50years. The implication is that respondents were still in this middle age, strong and energetic. This has great influence in adopting new technologies. Respondents were mostly male (50.8%). About 95 percent of the respondents had formal education. The implication is that it will hasten the adoption of improved cassava technologies; the only 8.3percent of the respondents had access to credit. Some of the socio-economic attributes of the respondents were found to have positive influence which is very helpful in adopting new cassava Vitamin A varieties. Majority or the farmers (85%) had low awareness and adoption of cassava vitamin A varieties probably due to unavailability of planting materials and lack of adequate enlightenment on the materials by extension agencies. The result of the multiple regression analysis showed that education, sex and marital status were positive and statistically significant at 0.01% level of probability also the t-value with respect to family size and religion was 5.42, 2.03 which was statistically significant at 0.05 level of probability strong a direct influence of adoption. The study, therefore, recommends that agricultural extension agencies should be strengthened, and empowered to deliver up to date information about improved technologies to farmers. Also, Agricultural Development project should carryout massive sensitization campaign on the medicinal benefits of these cassava varieties to farmers and the public at large.

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