EVALUATION OF THE EFFECT OF AGRICULTURAL EXTENSION DELIVERY ON CASSAVA PRODUCTION IN NIGERIA: A CASE STUDY OF CROSS RIVER STATE OF NIGERIA.

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ABSTRACT

Cassava is widely grown in Nigeria. The production level of the crop is, however, far below the country's potentials. Improvement in the yield of the crop has not been encouraging in spite of the efforts of some Research Institutes in the development of improved varieties packaged to farmers through extension services. The study was, therefore, conducted to determine the effect of adoption of extension recommendations on production of the crop in Nigeria, using Cross River State as a case study. The result showed low adoption rates of improved cassava production technologies by farmers, and significant effect of extension services on the yield of the crop at 5% level using simple correlation and regression analyses. The study found a positive correlation between adoption of extension recommendations and cassava production. This means that cassava production would increase from its present level if farmers' rate of adoption of improved cassava production technologies recommended by agricultural extension increased. The null hypothesis that adoption does not significantly increase production of cassava by farmers was rejected, while the alternative hypothesis was accepted.

Key words: Evaluation, extension delivery, cassava production.

INTRODUCTION

Cassava is widely grown in the tropical areas of the world. In Nigeria, it is a staple food and improvement in the yield of the crop is vigorously pursued through the development of improved varieties by the National Root Crops Research Institute, Umudike-Umuahia and the International Institute of Tropical Agriculture (IITA), Ibadan, as well as through agricultural extension.

The yield of crops is influenced by quality of planting material and management practices (Agbarevo, 2003). Similarly, Okeke and Eke-Okoro (2006) reported high cassava yield from use of improved Nigerian cultivars. But better yields are obtained when improved cassava genotypes are used with suitable cultural practices (Udealor and Asiegbu, 2006). While the quality of planting material is reflected in the freshness, shape, vigour/vitality, genetic potential, absence of weeds, parasites, pathogens, among others; management includes all cultural and agronomic practices used. The development of improved quality planting materials and management practices are essentially the responsibility of research, while getting farmers to adopt them is that of agricultural extension.

Adoption of extension recommendations by farmers leads to improved yields of crops. Studies (African Rice Centre, 2007; FAO, 2007; Kaine, 2004; Emeson, 2006; and Owusu, 2001) have shown positive correlation between adoption of extension recommendations by farmers and crop yields, which translate into increased income and improved quality of life of farmers. Similarly, Emenyonu *et al.* (2005) reported significant difference between cassava yield of farmers adopting improved cassava production technologies and those not adopting the recommendations in Delta State.

Research in cassava has witnessed tremendous progress with the development of improved varieties of the crop and the accompanying improved management recommendations by IITA, Ibadan and NRCRI,

Umudike-Umuahia. Some of the improved varieties developed and released include: TMS 90257, TMS 84537, TMS 82/00058, TMS 50395, TMS 30001, TMS 30555, TMS 30572, NR 41044, NR 83107, NR 8083, NR 8212, among others (Tables 1 & 2; Udealor, 2006).

The need to improve yield is, even, further made imperative by the global demand for the crop for industrial purposes. This makes the crop a potential foreign exchange earner with maximization of production. Cassava is processed into many products, which include: garri, meal or retted cassava, flour, chips, starch, fried balls, tapioca, among others. Oti and Aniedu (2006) reported that the crop is processed into the following value added products: cake, biscuits, chin-chin, salad cream, bread, etc. It is equally used in the production of ethanol.

While tremendous progress has been made in the development of improved cassava production technologies, the same cannot be said regarding increase in the production of the crop. Statistics show that the annual growth rate in production is 1.3% with a current production level of about 38, 000 metric tones and a projection of 43, 000,000 metric tones by the year 2014 (Alabi and Oviasogie, 2005; FAO, 2004). This poor growth rate of production level should be a matter of concern to Nigeria, considering the fact that the crop has the potential of becoming the largest foreign exchange earner after petroleum. Studies have shown that adoption of improved cassava technologies is low in Bendel State and Nigeria in general (Obinne, 1991; and IITA, 1998).

The average yield of cassava in Nigeria by 2005 was 9271/kg/ha (FAO, 2005). If the current slow growth rate continues, production will only rise to 1169/kg/ha by 2020 giving total production of 54,350,000 metric tonnes. (Alabi and Oviasogie, 2005). However, Nigeria's population growth has continued to soar, with a current estimate of 140 million (NPC, 2006) and a projected figure of 260 million by he year 2044 (National Population Commission, 1997). The United Nations Fund for Population Activity UNFPA in Amalu (1998) has put the population growth rate in Nigeria at 3.5% with an urban growth rate of 4.6%.

were selected from each zone (third stratum) with the selection of two cells from each block, giving a total of 18 cells. Ten farmers were selected from each cell giving a sample size of 180 farmers. The state was divided into the 3 ADP zones before sampling to obtain a representative sample from all segments of the population.

The instrument used for data collection was a structured questionnaire. The questionnaire contained the following extension recommendations for adoption by cassava farmers. SPAT for improved cassava cultivars interplanted with melon and maize; cassava interplanted with cowpea; crop rotation; inclusion of legumes in rotation, use of melon as cover crops, use of neem leaves and yam bean for pest control; use of organic manure, use of inorganic manure; application of herbicides; chemical pest/disease control. The copies of the questionnaire were administered with the assistance of extension agents and enumerators. The data collected were analysed using simple correlation and regression analyses. To obtain adoption index, three levels of adoption for each of the ADP's recommendations were assigned numerical scores (1 never adopted, 2 adopted and stopped, 3 always and still adopting innovation). The mean was computed and used as the adoption index. The null hypothesis was tested at 5% level of significance, using simple correlation and regression analyses.

The regression equation used was

$y = a+bx.$

Where

a	=	intercept (ybx)
b	=	slope (rate increase in y)
x	=	adoption (independent variable)
y	=	yield in kilogrammes

Table 1: List of Improved Cassava Varieties and their Attributes

Varieties	Branching habit	Pest disease tolerance	Fresh root yield tonnes/ha	Dry matter yield (%)	Gari yield (%)	Starch yield (%)
TMS 90257	Profuse	High	43	25	23	23
TMS 84537	Moderate	High	35	28	18	27
TMS 82/00058	Profuse	High	35	28	21	26
26 TMS 82/0061	Profuse	High	39	30	22	26
NR 8212	Profuse	High	27	37	25	21
NR 8082	Profuse	High	32	32	22	18
TMS 50395	Moderate	Moderate	36	29	24	12
TMS 30001	Moderate	Moderate	16	28	23	22
NR 8208	Profuse	Moderate	26	32	25	23
NR 8083	Profuse	High	31	43	36	25
NR 83107	Profuse	High	22	31	22	19
TMS 81/00110	Profuse	High	28	31	24	25
TMS 91934	Moderate	Moderate	32	34	26	21
TMS 30572	Profuse	Moderate	27	34	25	24
TMS 4 (2) 1425	Moderate	Moderate	26	36	25	22
TM 30555	Moderate	Moderate	37	34	25	23
TME 419	Sparse	Moderate	35-45	30-35		15-25
TMS 97/2205	Profuse	Moderate	35-45	30-35		15-25
TMS 98/0510	Profuse	Moderate	35-45	30-35		15-25
TMS 98/0505	Profuse	Moderate	35-45	30-35		15-25
TMS 98/0581	Sparse	Moderate	35-45	30-15		15-25

Source: Udealor, 2006.

Table 2: Cassava Production in 2004 in Nigeria (Metric Tonnes)

Output	38,179,000.00
Area Cultivated (ha)	4,118,000.00
Yield/ha (in tones)	9.271

RESULTS AND DISCUSSION

The results of estimated linear regression the effect of adoption on cassava yield show that each unit increase in adoption would increase yield by 373 kg/ha. However, only about 2.79% yield obtained could be attributed to adoption of recommended practices. This is so because of the low level of adoption and the fact that other variables outside adoption of the recommended practices such as environmental factors influenced yield. The co-efficient of determination (r^2) of 0.028 with F-value of 5.10 is significant at 5% level. Hence, the F-test rejects the null hypothesis that adoption of extension recommendations has no significant effect on cassava yield, while the alternative hypothesis is accepted.

The poor annual growth rate in cassava production is partly attributed to poor adoption of improved cassava production technologies. This suggests that, agricultural extension has not sufficiently increased cassava production because it has failed to bring about high level of adoption.

The low level of adoption of recommended practices by cassava farmers and the poor state of cassava production in Cross River State of Nigeria as found by the study is supported by Agbarevo (2008) who reported low adoption levels of extension of recommendations by male and female farmers in Cross River State. Equally, in support of the poor state of cassava production in Nigeria is FAO (2006) which reported yield was low as 927/kg/ha as against the expected yield of about 35 metric tonnes/ha.
Similarly, Umeh *et al.* (1996) reported that the poor annual growth rate of extension personnel of 0.48-11.6%, which partly led to poor extension services, was largely responsible for low adoption rates by farmers in Nigeria. Equally, in support of the findings of the study are Obinne (1996), Imoh and Essien (2005), who reported low adoption of improved cassava technologies by farmers in Delta, Edo and Akwa Ibom States respectively. Although, adoption positively correlates with yield as found by the study, Table 3 shows that "B" which is the co-efficient in the regression and correlation analyses, that is, the rate of increase in yield of cassava as a result of adoption is only 373.28kg/ha. This is very low considering the fact that optimum yield from use of improved cassava varieties with the accompanying management practices is about 30-35 metric tonnes/ha depending on the variety. However, the fact that a unit increase in adoption increases tuber yield in cassava by 373.28kg/ha is a positive correlation between adoption and yield as shown in Table 3. This means that cassava production would increase if the current level of adoption increased.

Table 3: Correlation and Regression Analysis: the Effect of Adoption on Cassava Yield

Variable	Coefficients (B)	Standard Error	t-value
Constant	140.797	344.192	0.409
Adoption	373.285	165.178	2.260*
R	0.16701		
R^2	0.02789		
F.-Value	5.10713*		
Sample Size	180		

***Significant at 5%** **Ho: Rejected**

This is further supported by Swanson *et al.* (1984) and Nwosu (2005) who reported increase in farm output (yield) as a result of adoption of extension recommendations by farmers. Olayide (1982) equally attributed the poor yield of cassava to low adoption of improved cassava technologies. He observed further that production efficiency would increase by 91% if new production technologies were adopted by farmers. The current average production of about 9 metric tonnes/ha is a far cry from about 35 metric tonnes/ha expected, if all the recommended cassava production technologies were adopted by farmers as obtained on

experimental farms. The implication of this is that, Nigeria's potentials in cassava production have remained largely untapped, mainly due to very poor extension services and its concomitant poor adoption of improved cassava production technologies by Nigerian farmers.

CONCLUSION

Agricultural extension remains a veritable tool towards achieving our goal of improved crop production in cassava in particular and agriculture in general.

The positive correlation found by the study between adoption of improved cassava production technologies packaged by extension to farmers and yield testifies to this fact. Hence, the poor annual growth rate in cassava production is partly the result of poor adoption of improved cassava production technologies.

The Nigerian farmer of today is no longer conservative as erroneously held in some quarters. All that need to be done is to bring farmers into the mainstream of research extension programmes through participatory approaches in order to increase adoption. Such increase in adoption would guarantee increase, not only in cassava yield but other crops too. The training and visit (T & V) system of extension delivery is too bureaucratic and ignores farmers' valuable indigenous knowledge and technology. The extension delivery process should, therefore, be completely overhauled with emphasis on training and deployment of more extension personnel and farming systems research and extension (FSRE), which is a participatory approach to extension delivery (Agbarevo, 2007). This would enhance adoption of recommendations and increase production of cassava for local and export purposes.

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