THE EFFECT OF ADOPTION OF CASSAVA VALUE ADDED TECHNOLOGIES ON FARMERS' PRODUCTION IN ABIA STATE, NIGERIA

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ABSTRACT

The adoption of cassava value added technologies by farmers and non-farmers is expected to increase the demand for cassava with the concomitant increase in production to meet such demand. But whether this expectation has been met is unclear. The study was, therefore, conducted to determine the effect of adoption of cassava value added technologies on farmers' output or production. The population of the study consisted all cassava farmers participating in the training programmes on cassava value added technologies in Abia State. The sample size of 144 farmers comprised farmers randomly selected through multistage random sampling technique. The data collected with the aid of a structured questionnaire was analyzed using descriptive statistics, such as mean, frequency. Correlation and regression analysis was the inferential statistic used to test the hypothesis. The results of data analyses showed that odourless fufu recorded the highest adoption level followed by tapioca, cassava cake, with cassava salad cream having the least adoption score. The relationship between adoption and production was positive (r=0.168). The coefficient of determination (R^2) of 0.028 with F-value of 4.146 was significant at 1% level. Hence, the null hypothesis, which stated that there is no significant relationship between adoption of cassava value added technologies and farmers' level of production was rejected, while the alternative hypothesis was accepted. The study recommended among others, that organizers of the training programmes should create more awareness on cassava value added technologies and their attendant benefits to increase participation, and consequently the adoption of the technologies that recorded low adoption. This would not only increase production but also income and standard of living of the farmers.

Keywords: Effect, adoption, cassava, value added, technologies, production.

INTRODUCTION

Cassava *(manihot esculanta)* is one of the world's most important food crops. In Nigeria, as in most developing countries, it is one of the most important carbohydrate sources. Although cassava leaves are, sometimes, consumed, the only harvested part is the tuber, which is actually a swollen root. According to Tonukari (2004), cassava ranks very high among crops that use solar energy to produce the greatest amount of carbohydrate per unit area. Cassava gives a carbohydrate production, which is about 40% higher than rice, and 25% more than maize, with the result that cassava is the cheapest source of calories for both human and animal nutrition. A typical analysis of cassava root shows it has 70% moisture, 24% starch, 2% fiber, 1% protein and other substances including minerals, 3%. A major limitation of cassava production is the rapid post harvest deterioration of its roots, which usually prevents their storage in fresh state for more than a few days (Nneoyi *et al*., 2008).

The demand for cassava products in Nigeria and beyond has put a lot of pressure on cassava farmers. The Federal Government of Nigeria constituted the Committee on Presidential

Initiative on Cassava Production to take the level of cassava production to 150 million tonnes by the end of 2010. The programme was also expected to assist the country realize an income of $5.00 US billion per annum from the export of 37.6million tonnes of dry cassava products, such as starch, cassava chips, adhesive and other derivatives. Apart from local demand, there is a high demand for cassava based products in foreign countries (FAO, 2005).

Cassava has been described as a miracle crop because of the numerous products and by-products which add value to it. Every part of the tuber is useful for one purpose or the other. While the peel can be used as feed for livestock, the rest of the root can be processed into various products such as gari, fufu, tapioca, starch, chips, flour, fried balls, among others (Agbarevo and Obinne, 2008). It is equally used for the production of ethanol (Oti and Aniedu cited in Agabrevo and Obinne, 2008). The value added products and technologies which have been packaged to farmers for adoption include: cassava cake, biscuits, chin-chin, salad cream, bread, etc). The demand for cassava value added products is expected create market for farmers to market their cassava. This is expected to lead to an increase in farmers' income ,which would help to improve their standard of living, and help in reducing poverty among cassava farmers and processors.

Value added technologies are the processes of changing or transforming a product from its original state to a more valuable state. Cassava roots are transformed into various forms in order to increase the shelf life because they cannot be stored for too long as they rot within 3-4 days of harvest. It helps to reduce bulk and improve product quality. It also facilitates transportation and marketing, reduce cyanide content and improve the product palatability (Odebode, 2008). Value added technologies also tend to increase the usability and digestibility of cassava root.

The need to improve cassava production is made more imperative by the global demand for the tuber and its by-products, which competes with local demand. The adoption of the value added technologies by farmers is designed not only to improve the value chain but also increase production and income of farmers from the crop, create jobs, etc., but the extent of adoption of value added technologies and the resultant effect on farmers level of production is apparently unknown. It is in this regard that the study was conceptualized. It is the objective of the study to find out the effect of adoption of cassava value added technologies on farmers' production in Abia State, Nigeria. The paper hypothesizes that there is no significant relationship between the adoption of cassava value added technologies and farmers' level of production.

MATERIALS AND METHODS

Abia State is located in the South-East Region of Nigeria. It lies within approximately latitude 4° 40^1 and 6° 14^1 North and longitude 7° 10^1 and 8° East. It covers an area of about 5, 243, 75 square kilometres. The state has a heavy rainfall of about 2,400 millimetres per year, which is intense between the months of April and October. The population of the study consisted all the cassava farmers participating in the cassava value added technologies training programmes in the State. The sample size comprised 144 farmers randomly selected through multi-stage technique. In doing this, the state was divided into the three extension zones. In the first stage, 2 blocks were selected from each zone, giving a total of 6 blocks. Six circles were selected from each block, giving a total of 36 circles in the second stage. In the third stage, four farmers were selected from each circle, giving a total of 144 farmers as the sample size. The data for the study was collected with the aid of a structured questionnaire covering the research variables. The researchers were assisted by the extension agents and enumerators in collecting the data. The instrument used for data collection was a 4 point Likert scale to rate the level of adoption of each value added technology, thus: always adopts, often adopts, seldom adopts, rarely adopts, to which numerical values 4, 3, 2, 1 were assigned respectively. For the dependent variable, the farmers estimated their yield in kilogrammes with the assistance of the extension agents who work with them.

The data collected was analyzed using descriptive statistics such as mean, frequency. The inferential statistic used was correlation and regression analysis. The mean was used to determine level of adoption or how regularly a farmer practised each of the nine technologies involved in the study. In doing this, the four point Likert rating scale was modified thus : 4, 3, 2, 1 add up to 10, which gives a mean of 2.5 when divided by 4. The mean adoption score was computed for each of the technologies, and scaled thus: > 3.50 (very high), 2.50-3.49 (moderately high), 1..50-2.49 (low) , and < 1.50 (very low). Correlation and regression analysis was computed and used to reject or accept the null hypothesis. The regression equation is given by : $y = a + bx$
Where:
y = Output in kilogrammes (dependent variable)
a = intercept
b = slope
x = mean adoption scores of technologies (independent variable)

Results

Table 1 shows the following mean adoption scores of various forms of value added products adopted by the respondents: odourless fufu, 3.61; cassava chips, 1.43; starch, 1.74; cassava bread, 1.29; cassava salad cream, 1.14; tapioca, 2.83; biscuits, 1.50; and cake, 1.97. The results show that odourless fufu has the highest mean, while salad cream has the lowest adoption mean. This means that odourless fufu was the most adopted technology.

Table 2 shows the result of estimated linear regression of the relationship between adoption of cassava value added technologies and farmers' level of production. The analysis shows that there is a positive relationship between adoption and production although the "r" value of 0.168 shows a weak relationship. This could be explained by the fact that other factors outside adoption influence production. The co-efficient of determination (R^2) of 0.028 with F-value of 4.146 is however significant at 1% level. Hence, the F-test rejects the null hypothesis that, there is no significant relationship between the adoption of cassava value added technologies and farmers' level of production, while the alternative hypothesis is accepted.

DISCUSSION

The findings of the study show that odourless fufu recorded the highest adoption, followed by tapioca, cassava cake, with cassava salad cream having the least adoption score. The order reflects the importance the participants attach to the various technologies. In this regard, Agbarevo (2012) observed that farmers' ascribed relevance of a technology to their felt needs determined whether a technology was adopted or not, as well as the extent of adoption. Odourless fufu, which has the highest adoption score is the most widely consumed value added product. This is because the benefits accruing from it outweigh others relative to what the farmers consider to be their felt needs. Resource poor farmers are conscious of their needs and constraints associated with their farming environments in their efforts to realize their goals of production, income, security and conservation of their resource base. Therefore, they weigh the expected benefits of any recommendation from extension against these variables to determine their sustainability or otherwise before adoption. Only recommendations that give the highest promise of meeting such needs are adopted.

The increase in farmers' production as found by the study arising from adoption of cassava value added technologies is in line with the findings of Nwosu (2005), and Okunade, Olaniyi and Ogunleye (2005) who reported increase in farmers' yield leading to increased income as a result of adoption of improved agricultural practices. Increase in farmers' output as a result of application of better technologies can be used to measure the success of an agricultural development programme, or project because increase in production translates into increased income, which further translates into improved standard of living (Agbarevo, 2010).

CONCLUSION

Cassava has a lot of potentials which could be harnessed to reduce rural poverty, being the most widely grown crop in Southern Nigeria. No effort should be spared in optimizing its benefits through getting farmers/rural people to adopt technologies along the value chain. The study has shown that rural farmers can add more cassava products to what they offer to the market in order to make more money viz-a-viz cassava value added products. The increase in production arising from adoption of some of the value added technologies shows that with greater adoption of the technologies, more could be achieved. The paper, therefore, recommends that more effort should be geared towards increasing the adoption rate and level of the various value added technologies by farmers and non-farmers to increase not only the production of the crop but also income of the people. It further recommends that rural farmers could be encouraged to form cooperatives to raise capital to establish cassava value chain cottage industries with the assistance of government. Some products that are in low demand in the rural areas can be transported to cities by the cooperatives for marketing. This would help to optimize the benefits derivable from cassava value chain, create jobs for the youth and increase the rural income with the concomitant increase in the standard of living of the people.

Table 1: Level of adoption of various forms of cassava value added products

S/N	Technologies Adopted	Rarely Adopts	Seldom Adopts	Often Adopts	Always Adopts	∑fx	Mean
1	Odourless fufu	04	16	84	416	520	3.61**
2	Lafun	85	24	33	28	170	1.18
3	Cassava chips	106	18	51	32	207	1.43
4	Starch	77	54	72	48	251	1.74
5	Cassava bread	108	22	48	8	186	1.29
6	Salad cream	86	24	39	16	165	1.14
7	Tapioca	5	6	57	340	408	2.83*
8	Biscuit	99	20	30	68	217	1.50
9	Cake	79	18	27	160	284	1.97

**** Very high adoption**
***Moderately high adoption**
Source: Field survey, 2014.

Table 2: Estimated linear regression on the effect of adoption of cassava added technologies on farmers' level of production.

Variable	Coefficient (B)	Standard error	t-value.
Constant	58651.961	24471.732	2.397
Adoption	-5944.196	2919.434	-2.036
R	0.168		
R^2	0.028		
Adjusted R^2	0.022		
F-ratio	4.147**		
Sample size	144		

** significant at 1% level

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