Effect of Cassava Value Addition on the Income Generation of Farm Households in Etinam Local Government Area of Akwa Ibom State, Nigeria

Umeh G. N.

Department of Agricultural Economics, Management and Extension, Ebonyi State University, P.M.B. 053 Abakaliki, Nigeria

Abstract: *The study was conducted on the effect of cassava value addition on the income generation of households in Etinam Local Government Area of Akwa Ibom State, Nigeria. A total of 120 respondents were sampled through multi-stage random sampling technique. Primary data were collected from the respondents with structured questionnaire. Data generated were analyzed with descriptive and inferential statistics such as percentage, frequency counts and factor analysis. The result showed the major cassava value addition activities and the value added products of the farm households to include garri (100%), fufu (100%), cassava flour (80%), livestock feed (60%) and tapioca (54.17%). Value added products of the industrial use processed by cassava value addition were ethanol (26.67%), starch (36.67%) glucose syrup (13.33%) and cassava adhesive (15%). Result on income differentials due to value addition showed that equal quantities of raw cassava tubers processed to garri yielded ₦5,000 gain as a return to value addition; ₦3,500 for fufu; ₦7,700 for cassava flour and ₦4,150 for ethanol, etc. However, the major constraints to cassava value addition in the area were categorized into market and information, institutional and economic, and infrastructural and labour factors. It was concluded that cassava value addition has positive influence on the income generation of farm households in the study area. Domestically, cassava value added food products yielded higher income to the households than industrial cassava value added products due to their over reliance on local markets for the marketing of the products. It was recommended among others, that producers should be linked to efficient marketing information systems suitable for their value addition activities.*

Keywords: cassava, value addition, income generation, farm households, effect.

1. Introduction

Cassava (*Manihot spp*) is one of the most important root and tuber crops grown in Nigeria and most other countries of low land and humid tropics. It is a preferred stable food that is highly cherished by many people in Nigeria because of its attributes. It is within the reach of rural people, tolerant to certain diseases, adapts to poor soil on which many other crops fail and is relatively high yielding. Moreover it is easily propagated by stem cuttings and resist drought, making it a famine-reserve crop. It can be planted any time of the year, provided there is enough moisture for stem cuttings to take root. Nigeria is the largest cassava producing country in the world with an annual estimate of 39 million metric tonnes (CBN, 2003). Among the starchy staples, cassava gives carbohydrate production which is about 40% higher than rice and 25% more than maize. Cassava is the cheapest source of calories for both human nutrition and animal feeding (Tolukari, 2004). Cassava is amenable to various processing forms (IITA, 2004).

The concept of cassava processing entails the special treatment of the cassava root carried out before it is consumed to make it last longer. The roots are produced and processed for home consumption and sometimes for sale in village and urban markets. In recent times small scale producers in Nigeria have increased production of cassava as a cash crop primarily for urban markets. The shift from production for local consumption to production for urban consumers, livestock and industrial uses can be described as a transformation in cassava production. Under the transformation regime, high yield cassava varieties have been developed to increase yields while labour saving and improved processing technologies have been put in place thus reducing the cost of producing and processing cassava products.

The cassava transformation encompasses four stages which indicate specific importance: famine –reserve, rural food staple, livestock and industrial materials, and urban food stable. Beyond these cassava occupies prominent position in foreign exchange earning following The residential Cassava Initiative of the Federal Government of Nigeria (FGN, 2006). The status has been changed and more values added to the produce. The various industrial uses of cassava and the high demand internationally for the products have made cassava production and processing a means of improving farmers' income and exit route from the vicious cycle of rural poverty. Value chain addition concept provides the frame for capturing and theoretically link key issues. According to United Nations Industrial Development Organization (UNIDO, 2009), the concept of value chain addition is defined as the full range of activities which are required to bring a product or service from conception through intermediary phases of production (involving a combination of a physical transformation and the input of various producers services), and delivery to final consumers and final disposal after use. A value chain exists when all of the actors in the chain operate in a way that maximizes the generation of value along the chain.

Value addition develop rural-urban linkages through which agricultural production in the rural areas provide the growing cities with affordable and quality food and raw materials for the industry (Adrin, 2008). When cassava is processed, value has been added to the produce. Some of the value added products are garri, fufu, tapioca, ethanol, starch, cassava flour, cassava chips, glucose syrup, livestock feed,

cassava- based adhesive, etc. Akwa Ibom is one of the states in south-south Nigeria. It is renowned for cassava production because of her fertile soil that is supported by all year rainfall. The inhabitants especially the rural dwellers, depend on farming of crops such as cassava as a means of income generation for their livelihood. This has necessitated the need to explore the various value additions to cassava and effects on income generation of the farming households in Etinam Local Government Area of Akwa Ibom State Nigeria.

1.1 Problem Statement

Cassava production in Nigeria is increasing at 3 percent every year but Nigeria continues to import starch, flour, sweeteners that can be made from cassava. In Nigeria, the demand for industrial cassava-based products such as glucose, dextrose and starch is rising. For instance, about 121,000 metric tonnes of glucose and dextrose was imported in 2008, which was about three times more than imports in 2002 (Ayodele et al., 2011). The bulk of this demand was met by importation arising from inadequate local production of starch and glucose syrup. This paradox is due to inadequacy in cassava production, processing and marketing. Cassava is produced largely at subsistence in the country. The sub-sector is characterized by long chain of pre-modern intermediate processes which have generated successions of low value additions. In addition, high input prices in post farm production process due to market imperfections or infrastructural deficiencies have led to increase in the price of the final product rendering the product non-competitive.

To fully exploit cassava immense potential, especially as a replacement for imported raw materials and as an export commodity, state and federal government have placed emphasis on changing the production technology and trading pattern through various growth enhancement supports. Despite the huge market potentials of cassava and its products at national and international levels, and government interventions, there seems to be no existing empirically tested knowledge on the income generation capacity and constraints of cassava value addition among farm households in Etinam Local Government Area of Akwa Ibom state Nigeria.

1.2 Objective of the Study

The broad objective of the study is to analyze the effect of cassava value addition on income generation of farm households in Etinam L.G.A of Akwa Ibom State, Nigeria. Specifically, the objectives are to:
i. identify the various types of cassava value additions and cassava value added products in the area;
ii. determine the income differentials of the farmers due to cassava value additions in the area;
iii. analyze constraints to cassava value additions in the study area

2. Methodology

The study was conducted in Etinam Local Government Area (LGA) of Akwa Ibom State. The LGA is located on latitude

$4^{o}321$ and $5^{o}331$ N and longitude $7^{o}254$ in South South geographical zone of Nigeria. A multistage random sampling technique was used to select one hundred and twenty (120) farm households for the study. Stage one involved the three (3) communities that make up the LGA. In stage two, four (4) villages from each of the three (3) communities were randomly selected to make up of total twelve (12) villages. Finally ten (10) farm households involved in cassava production were randomly drawn from each of the twelve (12) villages to give a total of one hundred and twenty (120) respondents. A well structured questionnaire was used to collect primary data the for study. Both descriptive and inferential statistics were employed in data analysis. Descriptive statistical tools such as percentages and frequency counts were used to analyze objective i and ii. Objective iii was actualized with principal factor analysis.

3. Results and Discussion

3.1 Types of Cassava Value Addition and Cassava Value Added Products

The analysis of various types of cassava value additions and value added products was conducted and the result presented in Table1.

Table 1: Frequency Distribution of the Respondents Based on Their Cassava Added Products

Cassava Value Added Products	Frequency (n=120)	Percentage
Garri	120	100
Fufu	120	100
Tapioca	65	54.17
Ethanol	32	26.67
Starch	44	36.67
Cassava Flour	96	80
Cassava Chips	46	38.33
Glucose Syrups	16	13.33
Livestock Feed	72	60
Cassava Adhesive	18	15

*multiple response recorded.
Source: Field Survey, 2015.

Result in Table 1 indicates that the major value addition activities of the producers in the study area were concentrated around value added convenient food products such as garri (100%), fufu (100%) and the cassava flour (80%). Other notable value added products among the households include cassava livestock feed (60%), tapioca (54.17%) and cassava chips (38.33%). Unfortunately, the level of value addition activities of the respondents in industrial raw materials derivable from cassava remained very low. These products were cassava starch (36.67%), ethanol (26.67%), cassava adhesive (15%) and glucose syrup (13.33%). Incidentally, cassava added industrial products portend higher income generation capacity than food products. This result supports the finding of Philip et al. (2006) that estimated over 90% of cassava production in Nigeria is processed into food. They also indicated that a significant industrial demand exists for cassava, primarily as substitution for imported raw materials and semi-finished products.

3.2 Household Income Differentials From Value Addition

The analysis of income differential due to value addition was carried-out with frequency counts and percentages and the result obtained is hereby presented.

Table 2: Frequency Distribution of the Respondents Base on Income Differential from Value Added Cassava Products

Raw cassava tuber (RCT)	Cost of RCT	Value created	Quantity (kg)	Amount (₦)	Frequency	Percentage (%)	Return to value
150kg	2500	Garri	50	7500	120	100	5000
150kg	2800	Cassava flour	50	10500	96	80	7700
150kg	3000	Fufu	50	6500	120	100	3500
150kg	2500	Cassava starch	25	4500	44	36.67	2000
150kg	2850	Tapioca	50	5000	65	54.17	2150
150kg	2250	Ethanol	25	6700	32	26.67	4150
150kg	3000	Cassava Chip	50	4700	46	38.33	1700
150kg	2500	Adhesive	25	4300	18	15	1800
Grand Total	₦21,700						₦28,000

Source: Field Survey, 2015.

Varying proportion of the respondents produced eight cassava added products using 150kg raw cassava tubers for each product. It was shown that 100 percent of the respondent s gained ₦5,000 and N3,500 as return to value addition from garri and fufu respectively. Moreso, 50 percent of them realized ₦7,700 as return to value addition from sale of cassava flour, 54.17 percent obtained ₦2,150 from tapioca and 38.33 percent realized ₦1,700 from cassava chips. About 37 Percent of the respondents also obtained about ₦2,000 from cassava starch. About 27 percent realized ₦4,150 from processed ethanol while 15 percent gained N1,800 from sale of cassava adhesives as return to value addition. The overall gain from ₦21,700 worth of raw cassava tubers as a result of value added products stood at ₦28,000. This result, however, revealed that some cassava value added products have greater income generation advantage over other domestically. However, it is apparent that the local producers lacks the capacity and information to explore relevant market outlets for industrial value added products, hence the abysmal economic performance of the products. Nevertheless, this result is in tandem with the opinion of Adrien (2008) who asserted that cassava value chain addition provides substantial benefits such as increase in income to rural producers and desired satisfaction to urban consumers.

3.3 Constraints to Cassava Value Addition

Constraints to cassava value addition among farm households in the study area were determined by application of factor analysis. Variable loading high were used in naming each extracted factor. Kaiser (1958) developed a simple rule of thumb; that variable s with coefficient of 0.40 and above have high loading and may be used in naming a factor.

Table 3: Varimax Rotated Components Matrix on Value Addition

Variable Symbol	Variable Names	Factor 1 Market and Information Factor	Factor 2 Labour and Infrastructural Factor	Factor 3 Institutional and Economics Factor
V1	Poor price for cassava products	0.583	0.032	-0.127
V2	Government policy inconsistency	0.004	0.041	0.792
V3	Lack of modern processing facilities	0.049	0.041	0.792
V4	Poor Transportation networks	0.325	0.720	0.052
V5	Lack of marketing facilities	0.551	-0.120	0.52
V6	Lack of technical know how	0.854	0.068	0.039
V7	Lack of storage facilities	0.325	0.559	0.122
V8	Poor extension service	0.325	0.051	0.875
V9	Lack of Marketing information	0.536	0.338	0.011
V10	Lack of access to Credit facilities	0.089	-0.072	0.787
V11	Inadequate cassava production	0.261	-0.050	0.500
V12	High cost of labour	0.107	0.774	0.239

Source: Computed from Field Survey, 2015.

Result obtained from the computation of field survey data categorized the constraints to cassava value addition into three major factors or components. The components were market and information factor, labour and infrastructural factor and institutional and economics factor. These components were categorized based on the variable that loaded high under each column in the matrix. For the market and information component, the variables that loaded high and used in naming the factor include poor price for cassava products (0.588), lack of marketing facilities (0.551), lack of technical know-how (0.854) and lack of marketing information (0.536). This finding supports the report of Nguven (2009) that cassava value chain in developing countries is characterized by low level of upgrading and relevant information in both production and processing. Hence, efficiency was not achieved and farmers received lower price. Similarly the infrastructural and labour component extracts include lack of modern processing facilities (0.86), poor transportation networks (0.720), lack of storage facilities (0.559) and high cost of labour (0.774).

This collaborates the opinion of Ayodele *et al.*, (2011) who stated that cassava value chain addition is characterized by long chains of pre-modern intermediate processes and infrastructural deficiencies which have generated successions of low value addition. Lastly, institutional and economic components as extracted were poor extension services (0.875), lack of access to credit facilities (0.787), inadequate cassava production and government policy inconsistency (0.792). This finding further validate Nguven (2009) assertion that the availability and accessibility of credit facilities among rural poor cassava processors in Africa has been hampered by numerous challenges ranging from high level of illiteracy to unfavourable government or institutional policies.

4. Conclusion and Recommendations

This study revealed that cassava value addition has positive influence on the income generation of farm household in Etinam L.G.A of Akwa Ibom State, Nigeria. The value added products of cassava prominent among the processors include garri, fufu, tapioca, cassava chips, cassava flour and livestock feeds, as well as ethanol and starch. Domestically, value added food product compete favourably to industrial cassava value added products in terms of economic return to value addition probably due non-exploration of relevant markets for industrial value added product by the local producers. Major constraints to value addition among household in the area include market and information, infrastructure and labour as well as institutional and economic factors. Based on the findings of the study it was recommended that the producers should be linked to the efficient marketing information systems relevant to the value addition activities. Furthermore, infrastructure improvement in the area should be complimented with sustainable institutional framework for the transfer of relevant technologies on cassava value added products among the farm households.

References

[1] Adrien, S. (2008). *Improving Value Chains in Agribusiness by Facilitating Production of Affordable Raw Materials Locally in Desired Quantities*. Burundi Position Paper on the Case of Palm Oil. Federation of Chambers of Commerce and Industry, Burundi.

[2] Ayodele, D. U., Andrew, E., Nnennaya, O. Chijioke, T. Ganiatt and S. Lateel (2011). *A Report on Cassava Value Chain: Analysis in Niger Delta*. Wuse II, Abuja, Nigeria.

[3] Cental Bank of Nigeria (CBN) (2003). Annual Report and Statement of Account. Abuja.

[4] FGN (2006). Support to NEPAD-CAADP implementation, 3(4): 1-20.

[5] International Institute for Tropical Agriculture (IITA) (2004). *Annual Report and Research Highlights*. IITA Ibadan, Nigeria.

[6] Kaiser, H.F. (1958). The Varimax Criterion for Analytical Rotation in Factor Analysis. *Psychometrica*, 23: 187-200

[7] Nguven, D.A.T. (2005). *The participation of the Poor in Agricultural Value Chain: A Case Study of Cassava. Making Market Work Better for the Poor*. Discussion paper prepared for the Asian Development Bank.

[8] Philips, T.P, D.S. Taylor, L. Sanni and M. Akoroda (2006). A Cassava Industrial Revolution in Nigeria, the Potential for a New Crop.

[9] Tolukari, N.J. (2004). Cassava and the Future of Starch. *Electro J. Biotechnology*, 7(1): 15-16.

[10] UNIDO (2009). *Agro-Value Chain Analysis and Development: The UNIDO Approach*. A Staff Working Paper, United Nations Industrial Development Organization, Vienna.