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Stimulating rural employment and income for cassava *(Manihot sp.)* processing farming households in Oyo State, Nigeria through policy initiatives

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Smallholder agriculture is characterized by underemployment during off seasons, low-income earnings and severe post harvest losses. The study thus analyzed the economics of cassava processing by rural farm households to establish the socio-economic and policy strategies required to stimulate rural enterprise. Multistage sampling technique was used to collect data from 150 respondents using structured questionnaire. Descriptive statistics, budgetary analysis and the Cobb Douglas regression function were used to analyze the collected data. Results revealed that women constituted 90% of processors and had a mean age of 36 years. Family sizes averaged 9 while the level of education among the processors was low (e.g. more than 80% did not read beyond primary school level). The initial capital invested in the enterprise averaged ₦10,106.80 ($80.85) and came mostly from personal savings. The gross margin and net income were ₦329,178.00 and ₦68,119.00 respectively. The internal rate of return to cassava enterprise was 1.84 while the benefit-cost ratio was 1.17. The regression analyses showed that age, experience and size of enterprise were significant determinants of the profitability of cassava processing enterprises while age, experience, level of education and initial capital outlay were significant determinants of the size of enterprise. Policy efforts should be geared towards accessing processors with locally fabricated machines while policy, research and extension regarding food processing at the rural farm-gate should be tailored to meet the needs and constraints of women.

Key words: Appropriate technology, income generation, off-season, processing, up scaling, rural, underemployment.

INTRODUCTION

Smallholder agricultural systems in Nigeria, like most developing nations, are characterized by a number of drawbacks including technical, financial, institutional and infrastructural support, which adversely affects the economic wellbeing of farm families and results in the continued marginalization of the rural space in which farming takes place. Major constraints to smallholder agriculture are the paucity of affordable and environmentally appropriate technology (Okuneye, 2004; UNS, 2001; Akande, 1998: Oluwasola and Adewusi, 2008); absence of infrastructural support facilities, especially roads (UNS, 2001), and a development policy that pays lip service to up-scaling the agricultural production process through the development of farm-gate processing enterprises. These constraints have negatively impacted on the employment generation and income earning potentials of the agricltu-

ral sector as well as the sector's capacity to serve as the pivot for the drive to reduce poverty in the land. More importantly, the capacity of the sector to continue to meet the food needs of the nation in the form that the people require is also seriously questioned.

The paucity of appropriate technology makes the smallholder farmers to depend mainly on natural systems for sustenance. In the sub- tropical region where Nigeria is located, the availability of rain is thus critical to farming operations, continued employment and income genera-tion among farm families. Consequently, farmers tend to be unemployed during the dry season when there is generally no rainfall. The off season period varies from three to nine months as one moves from the Southern humid tropics to the Semi-arid North. This period tend to be very critical in the lives of most agricultural households

since little or no income is earned and the farm-family of need has to call on their reserved food and savings for family upkeep. This has the implications of reinforcing underemployment and poverty among farm-families and has thus resulted in farmers been the poorest economic group in the country (Aigbokhan, 2000).

As at 2006, 30.3 millio results in or 59% of the 52.3 million working population were engaged in agriculture (National Bureau of Statistics, 2006) and were operating over a landmass of 94 million km^2. The atomization of smallholder farmers in Nigeria, where poor road network precludes effective rural-urban linkage (Oluwasola et. al., 2008; Abumere and Oluwasola, 2001), makes the farmer a prey to the sharp practices of middle-men and deprives him of higher product prices even when the prevailing prices of food products in the cities are relatively high. Furthermore, poor storage facilities also exacerbates food losses as it has been estimated that at least 25% of food outputs in the country are lost during post harvest period (FMAWR, 2008; Okuneye, 2004) before they ever get into the food distribution system. This further heigh-tens the food insecurity problem in the country especially among the small-scale rural farming households.

The forgoing should be of major concern to policy makers and development experts for a number of reasons. First, with 65% of Nigeria's 140 million people living in the Rural areas (translating into 91 million) (NPC, 2006) and nearly 60% of Nigeria's labour force being directly engaged in agriculture, an under-employed labour force is not healthy for the socio-economic deve-lopment of the country. Second, high post harvest losses and a farming population that is disillusioned are not sustainable for a country whose population is growing at 3.0% and urbanizing at 5.5% annually (National Population Commission, 2006). It is thus, crucial to make deliberate attempt to develop strategies that will add value to the farm products to increase their shelve lives, reduce post-harvest losses and shore up the national capacity to meet the food needs of the Nigerian people. In addition, such strategies should be able to access farm families to alternative and/or complementary employment opportunities especially during the off-season period. The promotion of enterprises that can process food products at the farm -gate is thus a crucial policy instrument for solving the problems of rural unemployment/underem-ployment, income poverty among farm families as well as reducing food shortages in the nation.

Objectives

The main objective of the study is to evaluate the economic potentials of cassava (Manihot sp.) processing enterprises in the rural areas of Oyo State to determine the socio-economic and policy support necessary to increase the viability of the process. Specifically, the study:

i. Analyzed cost and returns of cassava processing enterprises.
ii. Determined the factors affecting the profitability of enterprises.
iii. Examined the socio-economic and policy constraints to cassava processing enterprises.

Conceptual and policy framework

In Nigeria, where the number of the population living below poverty line far exceeds 50% with high rate of unemployment, the importance of small-scale enterprises in tackling the twin problem of unemployment and poverty cannot be over-emphasized. Employment creation can be made in both the agricultural and non-agricultural sectors of the national economy. Employment in the agricultural sector is generally rural and land based crop farming, animal husbandry, fish culture and related em-ployment generated through marketing and processing of agricultural products. On the other hand, non-agricultural employment tends to be Urban based and includes the service subsector employment, formal and informal manufacturing and large-scale enterprises. In Nigeria, like most other developing nations, cities are generally traditional and combine both modern urban sectors with agriculturally based enclaves. Such agro-based processing enterprises that are normal features of rural areas could be critical in providing employment to poor Urban households. Thus, small-scale agricultural based enterprises are important sources of potential employ-ment (Hobbs, 2000). The importance of food processing in national development is underscored by the new national policy on agriculture, which assigns two major goals for agricultural commodity processing (Mangyong, 2004):

i. Processing commodities and accelerating the growth of the agricultural sector.
ii. Preservation of commodities to reduce waste and seasonal price fluctuations.

The main policy strategies stipulated in the policy document include: promotion of Small and Medium Scale Enterprises (SMEs), increased participation of commer-cial banks and improvement in the quality, packaging and preservation of processed commodities.

According to FAO (2008), the development and growth of small-scale enterprises are based on the existence of some level of entrepreneurial climate or enterprise culture amongst the people. Such skills and motivations should be supported by a well-defined institutional structure that includes formal rights and protections to physical and other properties and is understood by the participants. Access to resources in the form of capital, labour and infrastructure in an agricultural economy will then lead to the development of small enterprises participating in the processing of farm products. As Reardon et al. (2001)

pointed out, household members will redirect their labour away from land-based activities because of the existence of:

i. Pull factors such as higher incomes in the non-farm sector relative to the farm sector.
ii. Push factors such as increase in agricultural risk (farming that cannot ensure year-round income and consumption).

With increasing population, urbanization, growth in the economy and rise in income, Nigerians continue to demand for food in various forms. The implication of this for Nigeria is that as demand for food increases and the farm sector become modernized, a transformation of the smallholder farming system also takes place. Not only are farms larger, but the modern farmer becomes an expert involved with the crop cultivation and animal breeding operations, thus transferring the functions of storing, processing and distribution of farm products as well as the supply of input and production factors to other organizations (Wilk and Fensterseifer, 2003). However, the marginalization of the rural landscape has adversely affected the attraction of entrepreneurs from outside the rural areas to invest in the downstream sector of the farm business. Consequently, the farm families act both as producers and processors of the farm products with specialization along gender lines. While men are mostly involved in production, the women concentrated on processing and marketing of the farm produce.

It is in recognition of this that the Nigeria's National Food Security Programme has taken into consideration the issue of food processing as a major part of its component. FMAWR (2008) recognized the role of food processing in ensuring the availability food and price stability to achieve food security. The policy drive is to mobilize the Federal and State governments to establish modern and properly equipped agro-industrial processing parks with the financial support of banks and micro-finance institutions. In addition, government owned processing companies requiring rehabilitation are to be overhauled while financial support is to be provided small-scale processors in partnership with the financial institutions to import necessary processing machines and technologies (FMAWR, 2008). The overall aim of the strategy is to improve the processing capacity of the nation towards achieving self-sufficiency in food output. However, while the new policy direction on farm product processing is tilted towards medium to large-scale enterprises operating in the formal sector, it clearly excludes the small- scale operators in the informal sectors out of the scheme of government. This is because the scale of operation of the latter at the farm-gate does not warrant the importation of machines, yet, they constitute the main suppliers of processed food products in the local food markets. It is, therefore, important to understand the small-scale informal sector, rural based food processing enterprises and their impact on the economic wellbeing of

farming households to determine the policy measures required to enhance their productivity, generate higher income and employment and contribute to the national drive to achieve food security.

METHODOLOGY

Sampling procedure and data collection

The study was carried out in Oyo State, located in the Southwest geopolitical zone of Nigeria. The State lies between longitude 3 and 5° E and latitude7 and 8° N and covers an area of approximately 26,500 km^2. The State enjoys a tropical humid climate with two climatic seasons, the rainy season that prevails from April to October and the dry season that lasts from November to March. The Southern part of the State is dominated by the tropical rainforest while the guinea savannah belt dominates the remaining parts (Agboola, 1979).

Multi-stage random sampling technique was used to select respondents for the study. First, the State was purposively selected because the major non - farm occupation by agricultural households in the Rural areas is food processing. Second, six local government areas were also purposively selected because they constitute the nucleus of cassava processing enterprises in the State. In each of the six local government areas, five villages were randomly selected and in each village, five cassava processing households were also randomly selected for the study. In all, 150 respondents were sampled. Data were collected from the respon-dents using pre-tested questionnaire. Variables tested include the socio-economic characteristics of cassava processors like age, number of years spent in schools, family size and marital status. Others include amount invested in the enterprise, source of such funds, current value of enterprise, revenue and cost of operations.

Data analyses

Data were analyzed using descriptive statistics, budgetary and regression analyses. Descriptive statistics, including frequency counts, percentages and means, were used to analyze the socio-economic characteristics of the respondents while budgetary analysis was carried out to determine the profitability of the cassava processing enterprise. The gross margin was estimated as the difference between total revenue and total variable cost in cassava processing operations as stated in equation (1):

$$\pi_i = P_i Q_i - TCi \dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where;

π_i = Gross margin (₦) per enterprise.

P_i = Price per unit of output.

Q_i = Output of individual enterprise (in Kg).

TCi = Total costs of production (fixed cost {FC} plus variable cost {VC}) (₦)

Ratio measures were computed to assess the performance of the enterprise during the survey period.

Two regression models were estimated to establish relationships between factors affecting profitability and enterprise size. The model on enterprise profitability as given by the net income was specified as:

$$Y_1 = F(X_1, X_2, X_3, X_4, X_5, X_6, U) \dots\dots\dots\dots\dots\dots\dots\dots (2)$$

Where;
Y_1 = Net income (₦).
X_1 = Age of respondent (in years).
X_2 = Experience in business (years).
X_3 = Size of enterprise (₦).
X_4 = Production cost (₦).
X_5 = Number of labour employed.
X_6 = Number of years spent in formal education (years).
U = Error term.
F = The functional relationship.

A priorily, all the variables were expected to be positively correlated with net income except X_4 which was expected to be negatively correlated.
The model on enterprise size was also specified as:

$$Y_2 = F(X_1, X_2, X_6, X_7, X_8, U) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where;
Y_2 = Size of enterprise (₦).
X_7 = Initial capital outlay (₦).
X_8 = Family size.
X_1, X_2, X_6, U and F are as previously defined.

A priori expectation for the variables were for X_1, X_2, X_6 and X_7 to be positively correlated to size of enterprise while X_8 was expected to be either positively or negatively correlated depending on whether the family is a production or consumption unit respectively.

Three functional forms (the double logarithm, semi-log and linear) of the regression analysis were fitted for the models. However, only the models that provided the best fit were discussed.

The dependent variables were selected based on the assumption that in rural based non-farm enterprises while producing families aim at satisfying family food needs, they often produce marketable surplus so long as the net income is positive, that is, if incomes generated by the enterprise exceeds the cost of production (Chanayov, 1966; Olayide and Heady, 1982). Since small holder farm and non-farm enterprises tend to be labour intensive, the size of the enterprise is often positively related to income. It also shows whether it will be able to take advantage of modern technology (Adesinmi, 1988). It was also assumed that age of the farmer, experience in enterprise, number of years spent in formal education and initial capital outlay are crucial to achieving enhanced net income and larger enterprise sizes while hired labour and high cost of production will help limit these variables (Ayanwale and Oluwasola, 2008; Aihonsu, 2002).

RESULTS AND DISCUSSIONS

Socio-economic characteristics of cassava processors

Table 1 shows the age distribution of respondents. Majority of the respondents (54%) were within the age range of 30 – 39 years while 20% were even younger. A total of 92.7% of the respondents were thus aged below 50 years. The mean age was 36.1 years. This indicates that most of the cassava processors were young and in their prime age in terms of productivity. Hence, given the necessary resources, these sets of respondents have high potentials to attain a high level of productivity. The relatively young age of the respondents should, all things being equal, have positive impacts on enterprise size, earnings, the ability to take risks and adopt modern inno-

vations within the context of a familiar and clearly understood technological terrain. Only 10% of the processors were male while the remaining 90% were females. This is because the men mostly operated the mills while the women performed such tasks as peeling, sieving and frying the cassava product.

This confirms the view that processing is predominantly a female enterprise in Nigeria and indeed, most African societies (Ajayi, 1995; Lewis, 1984) . This implies that agricultural research and extension as well as policy efforts aimed at enhancing food processing in Nigeria should be tailored to meet the needs and constraints of women. These constraints will include the ability of women to call on investment funds required to purchase new technology and the compatibility of the technology to women's physiological conditions. This is particularly important if post harvest food losses must be minimized through adding value to the food crops especially at the farm gate level (Oluwasola and Adewusi, 2008).

Only 7.3% of the respondents had a family size of between 1 and 5. About 70% of the respondents had a family size of between 6 and 10 while the remaining had more than 10. The average family size in the study area was 9.1, which compares with similar findings from other studies conducted in the Southwestern region of Nigeria (Oluwasola and Alimi, 2007; Aihonsu, 2002). The large family size is typical of most rural farming communities in Nigeria where household labour is the most dependable source of farm labour. About 19.3% of the respondents did not go to school at all, 64% had only primary education, 14.7% completed secondary education while 2% attended tertiary institutions.

Clearly, the level of education among respondents was very low. In traditional societies as typified by rural areas, the education of the female gender is not a major family priority and this was clearly manifested in the study area. This has serious implications for the development of small-scale farm based enterprises in the rural areas. The low level of education among the respondents could have serious implications on their ability to access information, use new technological innovations and even access or procure credit from formal financial institutions. The tendency is to operate the processing business using traditional methods as was done in the study area.

Hence, while attempts need to be made to access the processors to modern machines to enhance their output, it should be done within the context of familiar, clearly understood and tested technological environment. In other words, locally fabricated technology will serve a better purpose than imported exotic ones as a result of their scale of operation and level of education.

Eleven (7.3%) respondents were new entrants in the cassava processing business as they had spent only between 1 and 5 years while 70% had been in the business for between 6 and 10 years. The others have been involved in cassava processing for more than 10 years. The mean experience of processors was 7.3 years. The experience of the respondents in cassava processing is

Table 1. Socio-economic Characteristics of Respondents.

Socio-economic characteristics	Frequency	Percent	Cumulative percentage
Age of respondents (Years):			
<30	30	20.0	20.0
30-39	81	54.0	74.0
40-49	28	18.7	92.7
50-59	8	5.3	98.0
>59	3	2.0	100.0
Mean = 36.1			
Gender distribution of respondents:			
Male	15	10.0	10.0
Female	135	90.0	100.0
Family size of respondents:	11	7.3	7.3
1 – 5 members	105	70.0	77.3
6–10 "	28	18.7	96.0
11–15 "	4	2.7	98.7
16–20 "	2	1.3	100.0
>20 "			
Mean = 9.1			
Level of education of respondents:			
No formal Education	29	19.3	19.3
Completed up to primary school	96	64.0	83.3
Completed up to secondary school	22	14.7	98.0
Completed up to tertiary Institution	3	2.0	100.0
Experience of respondents in cassava processing (Years):			
1 – 5			
6–10	11	7.3	7.3
11–15	105	70.0	77.3
16–20	28	18.7	96.0
>20	5	3.3	99.3
Mean = 7.1	1	0.7	100.0
Source of take-off capital			
Own savings	129	86.0	
Credit	13	8.7	
Inheritance	41	27.3	
Gifts/donations from family/friends	27	18.0	
Amount invested at take-off			
<₦ 10,000	84	56.0	56.0
₦ 10,000 – 20,000	63	42.0	98.0
>₦ 20,000	3	2.0	100.0
Mean = ₦10,106.80			

Source: Field survey, 2007.

processing is sufficient for a thorough understanding of the technical procedures of doing the business profitably. The main source of take-off capital for the business for 86% of the respondents was personal savings although some of them invested these savings in an inherited enterprise or combined it with gifts from family and friends.

Only 8.7% got credit from cooperative societies. It is very instructive to know that none of the respondents obtained credit from either formal or microcredit banks. The take-off capital is quite low as shown in Table 1. Fifty six percent of the respondents invested less than ₦10,000 ($80) while another 42% invested between ₦10,000 and ₦20,000 ($80 and $160). Only 2% invested more than ₦20,000 ($160). The mean amount invested as start up capital was ₦10,106.80 ($80.85). Clearly, the investment capital is very small but typical of investment operations in the informal sector of the national economy. While such operators could have problems being serviced by commercial banks, micro-credit banks could readily assist them with funds if they are readily accessible.

Table 2 shows that the gross margin to enterprise is ₦329,178.00 while the net profit was ₦68.119.00. The rate of return to enterprise was 1.84 and indicates an increasing return to scale with every ₦100 invested returning ₦184. The Benefit-Cost Ratio of 1.17 indicates that cassava processing is profitable in the study area as every ₦100 invested in the enterprise yields additional ₦17 over and above the amount invested.

"Factors affecting the profitability of cassava processing enterprises"

$$\ln Y_1 = 17.333 - 3.061^*\ln X_1 \ (1.468) + 1.422\ln^*X_2(0.485) - 2.151\ln^*X_3(1.030) - 1.557\ln X_4 \ (1.485) + 0.491\ln X_5(0.263) + 0.295\ln X_6 \ (0.576)\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4)$$

$R^2 = 0.792$; adj$R^2 = 0.695$; F-ratio $= 4.439$

(Figures in parenthesis are the standard errors)

NB: * significant at 0.05 level

Equation (4) shows the factors affecting profitability of cassava processing enterprises. The model shows that in conformity with *a priori* expectations, experience of respondents in processing enterprises (X_2), the number of labour employed (X_5) and the level of education of respondents (X_6) were positively correlated with net income. However, contrary to *a priori* expectations, the age of the respondent (X_1) and size of enterprise (X_3) were negatively correlated to net income. The cost of production (X_4) was also negatively correlated with net income in conformity with *a priori* expectations. Three of the variables, age of respondents (X_1), experience of respondents in cassava processing enterprises (X_2) and size of enterprise (X_3) were statistically significant.

Equation (4) shows that the age of respondents is negatively correlated with net income from cassava processing enterprises. A unit increase in age will reduce net income by 306%. The operation of cassava processing plant is labour intensive and laborious hence, as processors age, their strength wanes and net income falls. The variable is statistically significant. This suggests that improved labour saving processing machines are required to keep women in processing business and pro-

Table 2. Analysis of costs and returns to cassava processing.

Item	Amount (₦)
Total revenue	471,900.00
Total variable cost	329,178.00
Gross margin	329,178.00
Total fixed cost	74,603.00
Net profit	68,119.00
Benefit-Cost Ratio (TR/TC)	1.17
Rate of return	1.84

Source: Field survey, 2007.

fitably too especially, as they grow older. The level of experience of cassava processors in the business is critical for an enhanced net income and is statistically significant. As shown, a unit increase in the level of experience in cassava processing will increase net income by 142%. The model also shows that a unit increase in the size of enterprise will reduce net income by 215% as the variable is negatively correlated and statistically signifi-cant. The cost of production is also negatively correlated with net income. A unit increase in the cost of production will reduce net income by 166 percent although the variable was not statistically significant. This implies that processors will have to make use of self and family labour to keep the cost of production down. This has the implication of keeping the size of enterprise small. Labour utilization in cassava processing enterprise was positively correlated to net income. As shown, a unit increase in the number of labour in the processing enterprise will increase net income by 49% although the variable was not statistically significant. Finally, although not significant, a unit increase in the level of education of respondents will increase net income by 29.5%.

The adjusted coefficient of determination of 0.695 indicates that about 70% of the variability in the factors determining profitability of cassava processing enterprises, as given by the net income realized, is associated with the explanatory variables specified in the model.

Factors affecting size of cassava processing enterprises

$$\ln Y_2 = 9.626 - 0.523^*\ln X_1 \ (0.129) + 0.333\ln^*X_2(0.133) + 0.287^*\ln X_6(0.093) + 0.153^*\ln X_7 \ (0.106) + 1.597\ln X_8 (0.432)\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (5)$$

$R^2 = 0.597$; adj$R^2 = 0.555$; F-ratio $= 13.996$

(Figures in parenthesis are the standard errors)

NB: * significant at 0.05 level

Equation (5) shows the factors determining the size of the cassava processing enterprises as specified in the model.

The model shows that all the variables, in conformity with *a priori* expectations, were positively correlated with size of enterprise except the age of respondent (X_1) which was negatively correlated. In addition, all the variables, with the exception of family size (X_8) were statistically significant.

As shown, the age of respondents is negatively correlated with size of enterprise and a unit increase in age will reduce enterprise size by 52%. The variable is statistically significant. As mentioned, small-scale cassava processing enterprises are laborious and labour intensive hence, aging processors do not have the necessary strength to continue to earn income to plough back in the business. In fact, since most of their children who provide family labour would have left for school, learn trades or establish their own businesses, output and consequently enterprise size, falls. A unit increases in the experience of cassava processors increased enterprise size by 33% while a unit increase in the level of education of respondents will increase enterprise size by 29%. The two variables were statistically significant. The initial capital outlay is critical and significant to the size of the enterprise. A unit increase in the variable will lead to 15% increase in enterprise size.

Finally, a unit increase in family size will lead to about 160% increase in enterprise size. This implies that the contribution of the family is very critical. However, the variable was not statistically significant. The adjusted coefficient of determination of 0.555 indicates that about 56% of the variability in the factors determining size of cassava processing enterprises is associated with the explanatory variables specified in the model. This further shows that, there are other important factors determining enterprise size that was not captured in the model.

Conclusion and Recommendations

The study of cassava processing enterprises in the rural areas of Oyo State yielded results that have policy relevance in the development of the subsector to generate income and employment for farm households, especially during off-season periods. In addition, the study provides the necessary catalyst for the development of farm gate business to reduce post harvest loss, add value to farm products and enhance the food security goal of the nation. The dominance of the industry by women with little education and capital resources however, makes it necessary for research and extension as well as policy measures to be directed at accessing women to familiar technologies that are affordable, tested and trusted. Such machines are better fabricated in the country rather than imported as the policy drive suggests, especially, since there are ample opportunities to access such local fabrications.

The involvement of young females aged 36 years on the average is very significant. It suggests the willingness of young females to take up employment in food process-

ing. Efforts should be made, therefore, to provide all necessary incentives that will encourage more unemployed female youths, especially school leavers, to take up employment in food processing enterprises. This will involve articulating policy strategies within and outside the processing enterprise. Within the processing enterprise, credit and improved technology are crucial while outside it, the infrastructural support for the rural areas in terms of good roads, electricity, health centres and schools are critical in retaining would be processors in the rural areas.

The cassava processing enterprises although profitable, operate on small scales. Not only is credit crucial for modernizing the business but also, the mobilization of savings to enhance entrepreneurial capacity is very important. Clearly, microfinance institutions are best suited for small-scale rural production and processing units with minimal funds hence, policy efforts should be directed at providing necessary infrastructural support that could enhance their location in the rural areas (Oluwasola and Alimi, 2008; Anyanwu, 2004). A major issue of concern is the problem of waste management in cassava processing. While the cassava peels are used to feed ruminants when dried, the disposal of effluents from the enterprise should be carefully looked into by relevant environmental agencies.

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