EVALUATING MARKETING EFFICIENCY OF SELECTED CASSAVA BASED PRODUCTS IN SIERRA LEONE

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ABSTRACT
This study evaluates the marketing margin and efficiency of key cassava-based products (Roots, Gari, Flour and Leaves) in Sierra Leone. Multistage random sampling was used to select 275 cassava marketers, using structured questionnaire to collect data on the quantity and the cost of marketing each product. The data was analysed using descriptive and inferential statistics. The study revealed that; majority of respondents were within the age bracket of 31 years, about 52.7% of respondents were male with 62.2% illiterate. Also, majority were single (72.4%) and most of them interviewed (94.2%) were the owner of the business. The marketing margin of an average cassava gari, cassava flour, cassava root and cassava leaves marketers in the study area is 22%; 36%; 69% per 50kilogram and 17% per dozen of product respectively. This means that, SLL1 sale of each product results to a spread of Le0.22; Le0.36; Le0.69 and Le0.17 respectively in the marketing of those products. Those entire four products benefit cost ratio is greater than one, which means marketing business of those products is profitable but trading in roots (SSL2.05) and flour (SSL1.36) is more profitable venture than the others. Cassava root (1.05) has a higher marketing efficiency than the other products. The Cassava flour (0.36) rank second followed gari (0.06) and cassava leaves (0.02). Therefore, cassava root traders run marketing activities more efficient than other cassava product traders. This study recommends the need to increase the marketing efficiency of products (Flour and Gari) through reducing marketing costs and encourage investment.

Keywords: Benefit cost ratio and Profitability, Cassava products, Marketing efficiency, Marketing margins.

1.0 INTRODUCTION

Cassava is the main source of food energy diet for the majority of the people living in the lowland tropics, and much of the sub-humid tropics of West and Central Africa (Tsegia *et al*, 2002). Therefore, its production and utilization must be given greater attention in food policy. Even though farmers have not yet attained the desired technical efficiency in cassava production as a result of weak access to external inputs like fertilizers and herbicides (Ezedinma *et al*, 2006), the wide scale adoption of high yielding varieties and the resulting increase in yield have shifted the problem of the cassava sector from supply (production) to demand issues, such as finding new uses and markets for cassava.

Evidence has shown that cassava production has been increased from 1999 to date (FMARD 2004), however, post-harvest systems such as processing, packaging, marketing storage distribution and transportation have constrained sustainable cassava production in recent times (RUSEP 2002). This has resulted into substantial losses, which complicate food insecurity status in terms of available calorie dietary consumption. Studies have shown that efficient marketing system stimulates agricultural production (Awoyinka and Ikpi 2005; Adesope et al, 2005).

According to FAO (2011), cassava importance is not only limited to as a food crop but as a major source of cash income for producing households. As a cash crop, cassava generates cash income for the largest number of households, in comparison with other staples, contributing positively to poverty alleviation with other staples, contributing positively to poverty alleviation (Rural Sector Enhancement Programme 2002). Hence, efficiency in cassava and cassava products marketing is an important determinant of both consumers' living cost and producers' income and the potentials of cassava marketing to agricultural and overall economic development cannot be over-emphasized (Obisesan,2012). Women play a central role in cassava production, processing and marketing, they are almost entirely responsible for processing and marketing of cassava and its products (E.g. Gari and flour) which enhance additional income-earning opportunity as well as enhancing its ability to contribute to household food security (FMANR 2006).

Even though there are large demands for cassava and its products in large quantities, some of the products in the area are not yielding desired economic benefits. The reasons for this could be partly attributed to inadequate or faulty marketing systems and strategies and probably the exploitative tendencies of middlemen who seem to be more actively involved in marketing cassava and cassava products in the study area. Consequently, one of the key priorities for any government especially the less developed countries should be how to secure efficient food supply for its populace because many are still food insecure. The problem of food insecurity becomes apparent when the markets are not efficient especially for agricultural commodities/products. The distribution of these products to final consumers will be inadequate and very expensive if its products markets are not efficient. Therefore, evaluating marketing efficiency of selected cassava-based products in Sierra Leone is a fundamental need to ensure effective food supply and to recommend possible intervention on how to reduce the costs of marketing those products.

2.0 MATERIALS AND METHODS

2.1 Method of Data Collection:

Data was collected for the realization of the above objective and depends mainly on primary data, while secondary ones were also collected. The primary data were obtained through the use of a structured questionnaire, copies of which were administered to the 480 marketers selected for the study. However, only 275 questionnaires were returned of which Eastern Region (41), Northern Region (97), Southern Region (82) and Western Area (55). While the latter was collected from sources related to topics of the study.

2.2 Data Analysis:

Data from the interview was coded and entered using CSPro 6.3 package was used to design the data entry template and SAS 9.3, IBM SPSS Statistics 21 software were used to carry out the analysis. Data collected from marketers were analysed using both descriptive and inferential statistics. Descriptive statistics include frequency distribution and percentages while inferential statistics comprised marketing margin analysis (MMA), marketing efficiency (ME), benefit cost ratio (BCR) and profitability (π).

2.2.1 Descriptive Statistics:

Descriptive statistic such as the frequency count, percentages, means and standard deviations were used to analyse the data gathered on the socio-economic characteristics of cassava and cassava products marketers in the study area.

2.2.2 Marketing Margin Analysis:

Marketing margin which was a dependent variable in the analysis was used to determine the marketing margin of cassava and cassava products marketing in the study area. The market margin or the farm-to-retail price spread is the difference between the farm value and the retail price. It represents payments for all assembling, processing, transporting, and retailing charges added to farm products (Elitzak,1996). Marketing margin model can be computed using the formula below:

Marketing Margin (MM) =

$$\frac{Selling\ Price - Supply\ Price}{Selling\ Price} X \frac{100}{1}$$

Where,
Selling price is the retail price at the consumer end
Supply price is the farm price at the producer end

Marketing Efficiency (ME) using Shepherd formula technique =

$$\frac{Consumer\ Price}{Total\ Marketing\ Cost} - 1$$

Benefit Cost Ration (BCR) =

$$\frac{Total\ Revenue\ (TR)}{Total\ Cost\ (TC)}$$

The profitability was also represented by:

Profit (π) = Total Revenue (TR) – Total Cost (TC)

Profitability Ration (PR) = $\frac{Profit\ (\pi)}{Total\ Cost\ (TC)}$

3.0 RESULTS AND DISCUSSIONS

3.1 Socioeconomic Characteristics of Marketers

From result in Table 1 above, shows that majority of the cassava and cassava product marketers (37.5%) are within the age range of 31 to 40 years while 26.2% fall between the age ranges of 21 to 30 years. This trend is the same for all the four regions which clearly support that, the active marketing population for cassava and cassava products falls within the youth bracket (21 – 40 years). This result is in agreement with the findings of Goreux (2003) which stated that younger farmers tends to be more willing to participate and adopt than their older counterparts. Also, the result revealed that 52.7% of the respondents are male. But this is only supported by two regions, that is the North and the South whiles the East and the West suggest females. This suggests that cassava and cassava products markets is a male dominated activity.

For educational level, about 62.2%, 18.2%, 14.9%, 3.3% and 1.5% were represented illiterate, primary, secondary, non-formal and university education level for marketers, respectively. This reveals that, majority of the traders in cassava and cassava products are illiterate which is supported by all the four regions. From table 1 above 72.4% of the respondents are single, 14.2% married, 10.6% divorced or separated and 2.9% are widow or widower, indicating that majority of the traders interviewed were single. This single trend for marketers' cuts across all the four regions.

Furthermore, the results above from table 1 shows that 78.2% of the respondents are Muslims and the remaining 21.8% are Christians. This is also supported by all the four regions. This implies that majority of the cassava and cassava products traders are Muslims. In addition, the results above also reveal that, 94.2% respondents interviewed were the owner on the business with only 5.8% are not the head of the business. This also cut across for the four regions validating the true nature of the cassava and cassava products trend within the country.

Table 1: Socioeconomic Characteristics of Marketers

Characteristics	Eastern		Northern		Southern		Western		Total	
	Frequency	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
Age										
<= 20	4	1.5	1	0.4	2	0.7	2	0.7	9	3.3
21 – 30	9	3.3	20	7.3	28	10.2	15	5.5	72	26.2
31 – 40	16	**5.8**	38	**13.8**	27	**9.8**	22	**8.0**	103	**37.5**
41 – 50	10	3.6	25	9.1	16	5.8	9	3.3	60	21.8
>= 50	2	0.7	11	4.0	9	3.3	9	3.3	31	11.3
Sex										
Male	17	6.2	58	**21.1**	45	**16.4**	25	9.1	145	**52.7**
Female	24	**8.7**	39	14.2	37	13.5	30	**10.9**	130	47.3
Education										
Non-formal	1	0.4	2	0.7	6	2.2	0	0.0	9	3.3
None	22	**8.0**	62	**22.6**	51	**18.6**	36	**13.1**	171	**62.2**
Primary	10	3.6	16	5.8	15	5.5	9	3.3	50	18.2
Secondary	8	2.9	15	5.5	8	2.9	10	3.6	41	14.9
University	0	0.0	2	0.7	2	0.7	0	0.0	4	1.5
Marital Status										
Divorced /Separated	6	2.2	6	2.2	8	2.9	9	3.3	29	10.6
Married	9	3.3	12	4.4	11	4.0	7	2.6	39	14.2
Single	23	**8.4**	78	**28.4**	63	**22.9**	35	**12.7**	199	**72.4**
Widow/Widower	3	1.1	1	0.4	0	0.0	4	1.5	8	2.9
Religion										
Christian	15	5.5	12	4.4	18	6.6	15	5.5	60	21.8
Muslim	26	**9.5**	85	**30.9**	64	**23.3**	40	**14.6**	215	**78.2**
Owner of Business										
No	5	1.8	7	2.6	3	1.1	1	0.4	16	5.8
Yes	36	**13.1**	90	**32.7**	79	**28.7**	54	**19.6**	259	**94.2**

Source: *Field Survey Data, 2013*

3.2 Determine Profitability and Market Margins of the Four (4) Cassava/Cassava Products

Table 2 shows that the total revenue (TR) generated from gari, cassava flour, cassava roots Leones per 50Kg and cassava leaves Leones per dozen of ties marketing are Le100,000; Le125,000; Le85,000 and Le12,000 respectively. While their total cost (TC) are Le94,500/50kg; Le91,750/50kg; Le41,500/50Kg and Le11,800/dozen respectively. In spite of the fact that cassava root marketers got lower marketing costs of Le41,500/50Kg they showed higher profit of (Le43,500/50Kg) than the other three products of which Flour is next to roots with Le33,250 followed by gari (le5,500). Cassava leaves is with the lowest profit (Le200/Dozen). The higher profit of cassava root may be due the fact that traders got lower prices due to their benefit of economies of scale.

Table 2 below also presents the marketing margin of an average cassava and cassava products marketer in the study area. The result showed that marketing margin of an average cassava gari, cassava flour, cassava root and cassava leaves marketer in the study area is 22%; 36%; 69% per 50kilogram and 17% per dozen of product respectively. This implies that 100% sales of gari, flour, root and leaves result in the marketing margin of 22%, 36%, 69% and17% respectively. This means that Le1 sale of each product results to a spread of 0.22; 0.36; 0.69 and 0.17 respectively in the marketing of those products in the study area.

From table 2 below since each of those four cassava and cassava products benefit cost ratio is greater than one, cassava and cassava products marketing business is profitable with about 6% (Gari); 36% (Flour); 105% (roots) and 2% leaves profit on investment for each of those products. Therefore, it's revealed that for every Le1.00 invested on gari, flour, root and leaves will yield a return of Le1.06 (gari); Le1.36 (flour); Le2.05 (root) and Le1.02 leaves with a gain of Le0.06 (gari); Le0.36 (flour); Le1.05 (root) and Le0.02. Therefore, the marketing of cassava and cassava products is a profitable venture.

Table 2: Marketing Margins and BCR for Traders of Flour, Gari, Roots and Leaves

	Cassava/Cassava Products			
Variables/Items	**Cassava Gari (Le/50kg)**	**Cassava Flour (Le/50kg)**	**Cassava Root (Le/50kg)**	**Cassava Leaves (Le/per dozen)**
Marketing Cost (MC)	**16,500**	**11,750**	**15,500**	**1,800**
Farm Gate Price/Supplier	**78,000**	**80,000**	**26,000**	**10,000**
Transportation and Handling	10,000	5,000	6,500	_
Market Dues	500	500	500	300
Rent/Storage	1,000	1,000	1,000	_
Plastic and Packaging	3,000	3,000	3,000	1,000
Labour for Selling	2,000	2,250	4,500	500
Total Cost (TC)	**94,500**	**91,750**	**41,500**	**11,800**
Revenue®				
Average Selling Price/Consumer Price	2,000	2,500	1,700	1,000
Average Quantity of Product Sold	50	50	50	12
Total Revenue (TR)	**100,000**	**125,000**	**85,000**	**12,000**
Profit (π)	5,500	33,250	43,500	200
Marketing Margin (MM) %	22	36	69	17
Benefits Cost Ratio (BCR)	1.06	1.36	2.05	1.02

Source: *Field Survey Data, 2013 & 2016*

3.3 Estimation of Marketing Efficiency

Marketing efficiency: A market that is efficient does not only bring sellers and buyers together, it enables entrepreneurs to take advantage of opportunities, to innovate and improve in response to demand and price changes (Fakayode *et al.*, 2010). This result indicated that cassava root (1.05) got a higher marketing efficiency than the other three cassava products. Cassava flour (0.36) rank second, gari (0.06) rank third followed by cassava leaves (0.02). That means cassava root traders run marketing activities more efficient than other cassava products traders.

Table 3: Estimation of Marketing Efficiency-Shepherds Formula Technique

	Cassava/Cassava Products			
variables/items	**Cassava Gari (50kg/Le)**	**Cassava Flour (50kg/Le)**	**Cassava Root (50kg/Le)**	**Cassava Leaves (per dozen/Le)**
consumer price	100,000	125,000	85,000	12,000
marketing cost	16,500	11,750	15,500	1,800
purchase price	78,000	80,000	26,000	10,000
Total marketing cost	94,500	91,750	41,500	11,800
Marketing Efficiency (Shepherds Formula)	**0.06**	**0.36**	**1.05**	**0.02**

Source: *Field Survey Data, 2013 & 2016*

3.4 Analysis of the Constraints and Opportunities for Cassava and Cassava Products Marketers

The Kendall's coefficient of concordance indicates a very low degree of agreement among the cassava traders as to the ranking of their constraints and solutions even though P values in the test statistics were highly significant (**Table 4**).

Table 4: Analysis of the constraints and opportunities for marketers

Constraints	Freq. (%)	§Rank	**Solutions**	**Freq. (%)**	**§Rank**
* Poor and high transportation cost	24.6	1	* Provision of good storage facilities	23.5	1
* Poor storage facilities	21.8	2	* Access to cheap transport facilities	23.1	2
* Lack of market facilities and linkages	19.9	3	* Access to market and linkages	20.1	3
Limited processing centres and equipment	10.0	4	Access to processing centres, techniques and equipment	10.3	4
Poor road networks	8.5	5	Provision of good road networks	7.3	5
Low level of technologies and inputs	3.8	6	Access to improve technologies and inputs	5.1	6
Prince instability	3.8	7	Provision of credit facilities and subsidies	4.7	7
Lack of subsidies and credit facilities	3.8	8	Products price policies	3.8	8
Pest and diseases infestation	2.4	9	Low market dues or rates	1.7	9
High market dues/rates	0.9	10	Forming farmer's and traders' cooperatives/groups	0.4	10
Poor farmer's and traders' cooperatives/groups	0.5	11			
Kendall's W	***0.067***		***Kendall's W***	***0.067***	
P-value	***<0.001***		***P-value***	***<0.001***	

Source: Field survey 2013 &2016

Freq.: Frequency count *§Rank: Kendall's ranking*
**: Test statistics not significant (P > 0.05)* *Kendall's W: Kendall's coefficient of concordance*

The major constraints faced by the cassava traders were poor and high transportation cost, poor storage facilities and lack of market facilities and linkages. The major solutions to these constraints were provision of good storage facilities, access to cheap transport facilities and access to market and linkages.

DISCUSSION OF RESULTS

According to the result in table 1. It implies that, cassava marketing in the study area is dominated by young people, this result is in agreement with the findings of Goreux (2003) which stated that younger farmers tend to be more willing to participate and adopt than their older counterparts. This implies that, cassava and cassava products market have a potential in Sierra Leone due to its age category of people involving in the business. Also, the cassava marketing in the study area is dominated by male in the northern and southern regions while female dominated in eastern and western region. The dominance of the females in the business is because males have to go to offices, farms and other places in order to ensure the provision of the capital (money) required for family transactions while the females are engaged in carrying out the marketing of cassava and other domestic activities. From the result, there is high percentage of single people dominated in the study, this give support to the fact that there are more young people who imply that younger people also have the consciousness of the effect of early marriage. Again, the result in the table also revealed that there is higher level of illiteracy in the four regions. This support the fact that education affects the way farm business is managed as well as overall production Nkang et al, (2009). This can have negative effect on cassava products enterprise since the respondents are not educated enough to adopt new innovation or understand information on marketing given to them by extension workers. The high illiteracy rate in the study area might be as a result of taking early responsibilities especially early marriage and teenage pregnancy and above all lack of economic resources. According to the result majority of the cassava marketers where the owner of their businesses, this gives tendency to invest in larger cassava business and avert the risk of business failure in cassava enterprise.

From the table 2: there is high revenue accrued when invested in cassava and their products, among the four products of cassava, cassava roots have the highest profit margin under the fifty-kilogram weight when compare with the garri flour and the price of a dozen of ties of leaves in the Leone currency. This implies that 100% sales of gari, flour, root and leaves result in the marketing margin of 22%, 36%, 69% and17% respectively. This means that Le1 sale of each product results to a spread of 0.22; 0.36; 0.69 and 0.17 respectively in the marketing of those products in the study area. Also since each of those four cassava and cassava products benefit cost ratio is greater than one, cassava and cassava products marketing business is profitable with about 6% (Gari); 36% (Flour); 105% (roots) and 2% leaves profit on investment for each of those products.

According to the result in table 3, there is greater market efficiency of the cassava root than the other cassava products which is the flour, garri and the leaves. An efficient market of the cassava root takes the advantage of improving the product when there is change in demand and price of the products (Fakayode *et al.*, 2010). Cassava

root got market efficiency which is 1.05 greater than the other three products, that means cassava root traders run marketing activities more efficient than other cassava product traders.

According to the result in table 4, there are lot of constraints faced by cassava traders in the study area. Among the ranking of the constraints using the Kendall's coefficient of concordance are; poor and high transportation cost, poor storage facilities, lack of market facilities preceded the other constraints in order of occurrence. This indicates that the high expenditure incurred by the marketers especially due to poor roads, high or multiple taxes during transportation increase the market costs which seriously reduce the market margin coupled with the exploitative activities of the middlemen.

4.0 CONCLUSION AND RECOMMENDATIONS

Conclusively, majority of the cassava and cassava products traders are illiterate but the business enterprise they engaged in is profitable. Increasing marketing efficiency at the cassava storage roots level in Sierra Leone markets through reducing transportation and postharvest loss is important. Therefore, since the cassava root traders run marketing activities more efficient than other cassava product traders. This study recommends the need for government and the private sector to increase the marketing efficiency of products processed (Flour and Gari) in Sierra Leone markets through reducing marketing costs (transportation & handling, packing & other cost items) and encouragement of investment. The establishment of processing centres closer to the markets is also essential to reduce the transportation and the rate of perishability for traders to receive better prices and higher profit margin. Marketing groups should also be established for the traders to take care of their marketing issues and enhance a better price.

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