Assessment of the Performance of Sweet Potato Marketing System in South East Agro Ecological Zone, Nigeria

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ABSTRACT

\textbf{Aims:} To determine the sweet potato marketing channel, gross marketing margin and returns, marketing efficiency and state the policy implications of the study.

\textbf{Study design:} Cross sectional study

\textbf{Place and Duration of study:} South east agro ecological zone of Nigeria, between January 2010- December 2010

\textbf{Methodology:} A multistage randomized sampling procedure was used in selecting 120 wholesalers, 240 retailers age range 35-45 and then 24 markets respectively. Structured questionnaire was used to collect information from the respondents. Information collected bordered on volume and value of sales, cost of transportation and channel of distribution. Data were analyzed using marketing margin and Net-return analyses, Efficiency ratio, Chi square and Duncan multiple range tests.

\textbf{Results:} The study showed that sweetpotato marketing is not efficient but lucrative. This is as depicted by the results. Net margins realized were N14,632, N24,100, N24,600 and N28,603 on the wholesalers sector while N3,256, N5728, N5775 and N10,000 were realized on the retailers sector. Efficiency results revealed that none of the states/sectors had efficiency of 100%.The efficiencies range (20-80%). There were significant differences in marketing efficiencies in the markets across the states studied.

\textbf{Conclusion:} Lack of infrastructural facilities is the main problem militating against efficient marketing system in the zone under study. It is therefore, recommended that infrastructural facilities should be provided for the marketers to reduce spoilage and distressed sales. This will improve marketing efficiency.

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1. INTRODUCTION

Sweet potato (Ipomoea batata (L) Lam) is an important tropical root crop. It belongs to the morning-glory family known as convolulaceae and is originated from Latin America (Low et al., 2009). It ranks second after cassava among the tropical root crops. The crop can be considered promoting nutritional security particularly in agriculturally backward areas. Besides carbohydrates, it is a rich source of protein, lipid, calcium and carotene.

In view of the nutritional quality of sweetpotato, the crop constitutes a significant part of the diets of large number of people in the areas of production. It has been used in Africa to combat a widespread vitamin A deficiency that results in blindness and even death for 25,000-500,000 children a year (CIP, 2003).

Despite the demographic pressure on land, there has been an increase in the production of sweetpotato in Nigeria. Sweetpotato production rose from 2.516 million metric tones in 2006 to 3.4 million metric tones in 2007 (Akoroda, 2009, Srinivas, 2009). These increases were attributed to improved technological inputs, International and National research efforts.

Tewe et al. (2003) asserted that an increased sweetpotato production that is not marched by adequate promotion and marketing to absorb surpluses from increased yield has been detrimental to the sustainability of sweetpotato production in Nigeria.

Sweetpotato is seasonal and does not store for a long time. Poor storability of sweetpotato is mainly due to sprouting, dehydration and attack by pathogenic organisms (Ukpabi, 2004). These storage problems and others have led to losses by marketers in the course of performing their marketing functions.

In most cases, poor storability and seasonality lead to market variations in quantity and quality of roots and its associated price swings (Low et al., 2009). The rising consumer price for sweetpotato may be an indication of market inefficiency.

Marketing in developing countries such as Nigeria is beset with a lot of problems, which constitute a bottleneck to the flow of goods and services. Such problems include seasonal variations, transportation of harvested produce, storage, processing, grading and communication (Ikechi et al., 2006). These problems notwithstanding, sweetpotato production has been found to be profitable (Ogbonna et al., 2007).

Considering the increases experienced in sweetpotato production and the inability of the increases to be absorbed in the marketing system as stated earlier, Low et al. (2009) attributed the inefficiencies in the marketing system of sweetpotato to inadequacies of storage, processing, transportation and perishability. According to Onabanjo (2008) lack of good processing technology is one of the greatest problems militating against efficient sweetpotato marketing system. This is due to lack of diversification of the uses. On the basis of these problems, a variety of policy recommendations were made by Tewe et al., (2003). Notable among these were, provision of adequate storage, processing, marketing and transportation facilities. The question to be addressed is how efficient is the sweetpotato marketing system? or how well is the sweetpotato marketing system performing?. According
to Arene (1999) efficiency is used to evaluate marketing performance. Performance can be achieved using the following approaches—marketing margin, Net-returns and marketing efficiency ratios. Therefore, there is the need to assess the performance of the market to determine the efficiency of the sweetpotato marketing system in south east agro ecological zone of Nigeria.

Hypotheses Tested:
1) Sweetpotato marketing system in the zone is efficient
2) The level of marketing efficiency in the markets across the states do not differ significantly

2. METHODOLOGY

The study area was south east agro ecological zone of Nigeria. It consists of nine states namely Abia, Akwa-Ibom, Anambra, Cross River, Enugu, Imo, Rivers, Bayelsa and Ebonyi States. A multistage random sampling method was used in the selection of markets and respondents.

In the first stage, four states Anambra, Cross River, Ebonyi and Enugu were selected randomly out of the nine states. In the second stage, two zones were randomly selected in each of the chosen states; making it a total of eight agricultural zones. In stage three, three (one urban and two rural) markets were drawn from a list of markets in each of the eight selected agricultural zones Ten retailers and five wholesalers were randomly selected in stage four. A total sample size of 240 retailers and 120 wholesalers were drawn respectively.

A well structured questionnaire was used to elicit information from the respondents, information sought bordered on value of monthly purchases and sales, quantity sold and bought, cost of transportation and channels of distribution. Data were analyzed using marketing margin, marketing cost-return and marketing efficiency analyses. Chi square and Duncan multiple tests were used to test for significant differences.

2.1 Marketing Margin (M.M.)

This was calculated for wholesalers, and retailers adopting Mendoza (1995) formula:

\[
\text{Marketing margin} = \frac{\text{Selling price}-\text{supply price}}{\text{Selling price}} \times 100
\]

2.2 Net Returns

According to Scarborough and Kydd (1992) the formula for marketing costs/net returns is mathematically stated as:

\[
\text{NR} = \text{TRS} - \text{TMC}
\]

Where:

- \(\text{NR}\) = Net returns
- \(\text{TRS}\) = Total Revenue (or returns) from sales
- \(\text{TMC}\) = Total Marketing Costs
2.3 Marketing Efficiency

A simplified marketing efficiency ratio evaluation was used to determine the marketing efficiency as applied by Olukosi and Isitor (1990), and Ozougwu (2002)

\[ M.E = \frac{\text{Value added by marketing (net profit)}}{\text{Total marketing costs (TMC)}} \times 100 \]  

Where: M.E. = Marketing Efficiency.

This could be said to mean the percentage ratio of price increase to costs of marketing. According to Scarborough and Kydd (1992), the value of marketing efficiency ranges from 0% to infinity. If marketing efficiency is 100% (unity), it shows that the market is perfectly efficient because price increment is just high enough to cover the cost of marketing such commodity. Whereas marketing efficiency that is greater than 100% indicates excess profit. However, if marketing efficiency less than 100% is an indication of inefficiency.

2.4 Chi Square Test Statistics

It was used to test whether there was a significant difference in marketing efficiency in the four chosen states for wholesalers and retailers separately. Chi square is given by:

\[ X^2 = \sum \frac{(O_i - E_i)^2}{E_i} \text{ with } n-1 \text{ degree of freedom (df)} \]  

Where: \( X^2 \) = Chi square

\( O_i \) = Observed ith value

\( E_i \) = Expected ith value

\( n \) = number of states compared

In this case, four states were compared, thus \( n-1(df) = 3 \) The expected for marketing efficiency was 100%. The null hypothesis was rejected if the Chi-Square computed was greater than the tabulated value at 5%. Duncan’s multiple range tests was also used to confirm differences in efficiencies among the states.

3. RESULTS AND DISCUSSION

3.1 Sweetpotato Marketing Channel

The distribution or marketing of sweetpotato operates through the activities of many middlemen who operate in both rural and urban markets. The marketing channel shows the different (alternate) routes through which sweetpotato passes from the producer to the final consumer. The marketing channel for sweetpotato is shown in Figure 1. The sweetpotato marketing channels in the zone are made up of single and multi-stage channels. The single channel consists of the flow of sweetpotato from the producer to the consumer directly without any intermediary, that is, the producer or the farmer sells directly to the consumer.

The second channel, which is the multistage channel system, consists of middle men, that is, sweetpotato has to pass a number of intermediaries before it gets to the final consumer.

The multistage channel system is made up of the sweetpotato producer/farmer, country assemblers, the urban and rural wholesalers and then the retailers (major links). All these
categories of intermediaries are not exclusive because the producer can decide to sell directly to the wholesalers and retailer (minor flow/links), (Tewe et al., 2003). According to Adekanye (1988), in Nigeria it is difficult to ascertain who is a wholesaler or retailer in the market. This is because some distributors are engaged in both wholesaling and retailing activities at the same time and place. However, categorization of wholesalers and retailers are based on the quantity and more pronounced activity a wholesaler or retailer does. The implication of multiple channel system is that as commodities pass through many intermediaries, it tends to increase marketing costs which will be borne by the consumers.

![Diagram of Sweet Potato Marketing Channels](source: Field Survey data, 2010)

**3.2 Gross Marketing Margin, Returns and Efficiency**

Tables 1 and 2 show the net returns marketing margin and efficiency analyses of wholesalers and retailers, respectively. Table 1 shows that average monthly net returns from sales of the wholesalers in the four states are (₦14,632; (₦24,100; (₦24,600 and (₦28,603 for cross river, Enugu, Ebonyi and Anambra states respectively while the retailers monthly average net returns are shown in table 2. They are as follows (₦ 3, 256; (₦ 5, 728;
The results showed that sweet potato marketing is lucrative.

According to Scaborough and Kydd (1992) five percent and ten percent marketing margins are acceptable for storable and perishable goods. But the results of the Gross marketing margin of both the wholesalers and retailers were high and exceeded the tolerable levels of 10% marketing margin for perishable crops. This is an indication of excess profits.

Table 1: Net – returns, marketing margin and efficiency for wholesalers

| Items                          | Cross River state | Enugu state | Ebonyi state | Anambra state |
|-------------------------------|-------------------|-------------|--------------|---------------|
| Average purchasing price per kg (₦) | 21.68             | 12.41       | 21.35        | 10.49         |
| Average selling price per kg (₦) | 30.24             | 19.00       | 30.45        | 19.21         |
| Gross marketing margin (₦)    | 14.84             | 6.59        | 8.80         | 8.72          |
| Gross marketing margin (%)    | 49.07             | 34.00       | 29.19        | 45.39         |
| Average return from sales (₦) | 58,932            | 74,224      | 90,103       | 83,603        |
| Average marketing costs (₦)   | 44,300            | 50,124      | 65,503       | 55,000        |
| Net returns (₦)               | 14,632            | 24,100      | 24,600       | 28,603        |
| Marketing efficiency (%)      | 33.03             | 48.08       | 37.35        | 52.01         |

Source: Field Survey data, 2010

The exchange rate at the time of the study was $1 = ₦150 (₦ = Naira)

The marketing efficiencies for the wholesalers and retailers were low. Marketing efficiency ranges zero (0) to infinity, 100% indicates perfectly efficient market and marketing efficiency less than 100% is an indication of marketing inefficiency (Scarborough and Kydd, 1992; Olukosi and Isitor 1990; Ozougwu, 2002). The results of the marketing efficiency show that the wholesalers have efficiencies of 33.03%, 48.08%; 37.35%, and 52.01%, respectively while the retailers’ marketing efficiencies are 22.95%, 56.6%, 50.22% and 86.33%, respectively. These figures are all less than 100% and therefore the market is inefficient. But the retailers have better marketing efficiency than the wholesalers.

Table 2: Net – returns, marketing margin and efficiency for retailers

| Items                          | Cross river state | Enugu state | Ebonyi state | Anambra state |
|-------------------------------|-------------------|-------------|--------------|---------------|
| Average purchasing price per kg (₦) | 30.24             | 19.00       | 30.15        | 19.21         |
| Average selling price per kg (₦) | 37.31             | 24.41       | 36.61        | 29.63         |
| Gross marketing margin (₦)    | 7.07              | 5.41        | 6.46         | 10.42         |
| Gross marketing margin (%)    | 18.91             | 22.00       | 17.65        | 35.17         |
| Average return from sales (₦) | 17,506            | 21,378      | 16,675       | 20,819        |
| Average marketing costs (₦)   | 14,250            | 13,650      | 11,100       | 18,819        |
| Net returns (₦)               | 3,256             | 57.28       | 5,575        | 10,100        |
| Marketing efficiency (%)      | 22.85             | 56.61       | 50.22        | 86.33         |

Source: Field Survey data, 2010

Anambra state has higher marketing margin and efficiency than other states. This is because almost all the Agricultural zones. Anambra state produces sweet potato in large quantities. This induces marketers from neighboring states like Imo, Abia and Enugu states.
to buy sweetpotato from the state. Again, retailers have higher marketing efficiency than wholesalers as depicted from tables 1 and 2 respectively. This is because of reduced marketing costs and profit made per unit product by the retailers. Therefore, since none of the markets (both wholesale and retail) had marketing efficiency of 100%, we reject the null hypothesis which states that sweetpotato market is efficient. The efficiency and net -return results obtained in this study were in agreement with earlier works on some agricultural products like palm oil carried out, Oluwadare and Imoudu (2000). The entire results indicated inefficiency and attainment of high margin.

*The exchange rate at the time of the study was $1=N150 (N=Naira)*

Chi square ($X^2$) test statistic was used to test whether there is significant difference in marketing efficiency in the four states under study. The result is stated as follows:

$X^2$ calculated (for wholesalers) = 134.09

$X^2$ calculated (for retailers) = 105.00

$X^2$ tabulated at 5% = 7.82

Since $X^2$ calculated is higher than $X^2$ tabulated for both the wholesalers and retailers; we reject the null hypothesis which states that the marketing efficiency in the four states is not significantly different and accept the alternate hypothesis of significant difference in the marketing efficiencies in the four states.

Table 3: Duncan’s multiple range test for marketing efficiency (Wholesalers)

| Duncan Grouping | Mean (ME) | N  | States    |
|-----------------|-----------|----|-----------|
| A               | 48.08     | 31 | Enugu     |
| A               | 52.01     | 31 | Anambra   |
| B               | 33.03     | 29 | Cross River |
| B               | 37.35     | 29 | Ebonyi    |

Source: Field Survey data, 2010

ME=Marketing Efficiency

The result was further subjected to analysis of variance (ANOVA) test using Duncan’s multiple range test to confirm the differences in marketing efficiencies among states. These are shown in tables 3 and 4 for wholesalers and retailers respectively. The ANOVA detected differences in marketing efficiency of the wholesalers among the states as shown in table 3. Enugu and Anambra states were in the same group (A), they had close marketing efficiency while Cross River state and Ebonyi states were also in the same group (B). Therefore, conclusion was made that there were differences in marketing efficiencies among the states.

Table 4: Duncan’s multiple range test for marketing efficiency (Retailers)

| Duncan grouping | Mean (ME) | N  | States  |
|-----------------|-----------|----|---------|
| A               | 86.33     | 61 | Anambra |
| B               | 50.22     | 61 | Ebonyi  |
| C               | 22.85     | 62 | Cross River |
| B               | 56.61     | 59 | Enugu   |

Source: Field Survey data, 2010

ME=Marketing Efficiency
For the retailers as shown in table 4, Anambra fell on group (A) and had the highest marketing efficiency while Ebonyi and Enugu states appeared on group B having similar marketing efficiency. Cross River was on a different group (C) and had the lowest marketing efficiency.

This result also confirmed the differences in marketing efficiencies among the states under study. It is concluded that there was significant difference in marketing efficiency among the states – Cross River, Ebonyi, Anambra and Enugu, both on the wholesalers and retailers sectors.

4. CONCLUSION

The results of the study depicted that there are imperfections in the marketing system as revealed by the performance evaluation. It showed that sweetpotato marketing system is not efficient; but lucrative. Then efforts should be made to diversify sweetpotato uses to reduce spoilage, market glut and improve efficiency. Infrastructural facilities should be made available for the marketers.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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