
Full Length Research Paper

Cost-return analysis of cocoyam marketing in Nsukka agricultural zone of Enugu State, Nigeria

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This research was carried out to ascertain the cost-return of cocoyam marketing in Nsukka Agricultural Zone, Enugu State. Primary and secondary data were collected. Primary data were collected with the use of structured questionnaire from sixty (60) respondents. Data obtained were analysed using appropriate economic and statistical tools. Other analytical tools used were gross margin and benefit cost ratio. From the result obtained, female dominate males in cocoyam marketing and are people within the age range of 41 - 50 years. The results also shows that 80% of the respondents had their formal education and have 5 years and above of experience in the marketing system. The research further discovered that there are four different market channels of distribution of cocoyam from the producers to the consumers in the marketing system. It was also found that the highest annual income generated is within the range of ₦21, 000 – ₦ 25,000 in the study area. The results also show those cocoyam marketers were in union which comprises both wholesalers and retailers and they do not fix the price but influence the price of cocoyam. The results from the gross margin and benefit cost ratio shows that the enterprise is profitable. The study showed that small-holder cocoyam enterprise is profitable by returning 1.1 for every ₦1.0 spent. The research also identified that the major problem encountered in cocoyam marketing were lack of credit facilities, high transportation cost, lack of storage facilities, poor handling, and high market charges, among others. The researcher recommends among others that these are need for stakeholders to come up with the best storage facilities for the cocoyam producers. There is need for credit assistance for the cocoyam marketers without high collateral. There is need for good road network in the rural areas and minimization of market charges.

Key words: Marketing, cocoyam, cost-return, gross margin.

INTRODUCTION

Half of people in developing countries like Nigeria live in rural areas; 2.1 billion people live on less than 2 US dollars a day and 880 million on less than 1 US dollar a day (Chinaka et al., 2013). Majority of these people considered poor depend on agriculture either directly or indirectly for their livelihoods (World Bank, 2007). The 2008 World Development Report (WDR) stresses the important role agriculture and even cocoyam as one of its products can play in achieving the first Millennium Development Goal (MDG) of reducing by halve the number of people suffering from extreme poverty and hunger.

In agriculture-based economies like Nigeria and even Nsukka agricultural zone of Enugu State, agriculture generates an average of 29% of the Gross Domestic products (GDP) and employs 65% of the labour force (Dimelu et al 2012 and Ubulua and Chukwu 2008).

Cocoyam (*Colocasia and Xanthosoma*) is one of the major agricultural commodities in Nsukka agricultural Zone, Enugu State, Nigeria. In comparison to other crops, cocoyams are usually considerable distance from the trading centres (Sagoe et al., 2010). This means that for cocoyam to reach the consumers there must be efficient market distribution channel. Marketing of agricultural products such as cocoyam is said to involve everything that happens between the farm gate and the consumer such as buying, selling, processing, storing,

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transporting, advertising and promoting the goods (Sagoe et al 2010 and Onyenweaku and Ezeh, 2012). Despite the importance of cocoyam, more research attention has been given to cassava and yam. This made Chukwu et al. (2012) to observe that research on cocoyam has trailed behind that of other staple food in Nigeria and other countries.

In the main time, the wide gap between rural and urban prices of any agricultural products including that of cocoyam weakens the farmer's morale thereby reducing productivity; and even in some cases leads to complete stoppage of production. In other words, to increase food production there is need to develop a more efficient marketing system. Based on the enumerated challenges of cocoyam availability and its constraints, there is need to carryout study on the economic analysis of cocoyam marketing in Nsukka agricultural zone. This will enable us to identify the relationships among the socio-economic characteristics of marketing channels in the study area.

The broad objective of the study is to analyse cocoyam marketing in Nsukka Agricultural Zone, Enugu State, Nigeria. The specific objectives are to; describe the socio-economic characteristics of cocoyam marketers in Nsukka Agricultural Zone, identify the marketing channels available, their sources of fund and their annual income generated, identify influence of cocoyam marketing union, estimate the price spread, gross margin and benefit cost ratio of the cocoyam marketing, determine the effect of some variables on income generation in cocoyam marketing and identify the problems encountered in cocoyam marketing.

METHODOLOGY

The study was carried out in Nsukka Agricultural Zone of Enugu State. Nsukka Agricultural Zone is made up of seven (7) Local Governments with many major markets. Nsukka Agricultural Zone is situated on gentle slope with hills and valleys and located between latitude $7^{\circ} 21' S$ and $7^{\circ} 36' E$ and longitude $6^{\circ} 45'$ and 7° North (Ezike, 1998). It has total population of 1,117,570 out of 3,257,298 of the total population of Enugu State (NPC, 2006). Rainfall distribution is between 168mm - 1700mm. The area has tropical climates marked by two distinct seasons. The vegetation is of derived savannah and people in this area are predominately farmers; farming constitutes their major economic activity. However, some of the urban areas like Nsukka town have more civil servants and petty traders. There predominate crops includes cassava, maize, cocoyam, yam, vegetables and economic fruits. These farmers' practices shifting cultivation, crop rotation and mixed cropping on scattered farm lands mainly inheritance, family labour occasionally is carried out, in some areas. Hired labour constitutes another source of labour in the area.

Random sampling techniques were adopted for the study. Out of seven Local Governments Areas with many major markets in Nsukka Agricultural Zone, three local governments with four major markets were randomly selected. Finally, 15 respondents made up of male and female cocoyam marketers from each market were interviewed. This gave 60 respondents. Primary and secondary data were used. Primary data were obtained through the use of structured questionnaires, personal observation and oral interview. But secondary data were obtained from published and unpublished literatures. Data obtained from the field were analysed using descriptive statistics and gross margin.

RESULTS AND DISCUSSION

Socio-economic profile of the respondents

The socioeconomic profile of the respondents is presented in Table 1 and shows that a majority 80% of the cocoyam marketers were female while 20% were male. Thus, justifying who deduced that cocoyam marketing has been regarded as female product both in its production and marketing as noted in a project on marketing of yam by Nzeh, 2007 and Tambe, 2010.

Table 4.1 also revealed that most 36.67% of the respondents were within the age range of 41 -50 years, 30% fall within the age bracket of 31 - 40 years; 21.67% within 21 - 30 years, 10% are within the age range of 51 - 60 years while 1.66 % are within 10 - 20 years. The mean age was approximately 38.65 years. This implies that the cocoyam marketers were relatively medium adults.

The result also reveals that a greater percentage 55% of the respondents were married, 23.3% were widowed, 11.67% were single, while 10% have separated. The dominance of married households implies that the cocoyam marketers are likely to be proactive in their cocoyam marketing because of its immense benefits in ensuring appropriate distribution of produce to the area most need to ensure food security, income generation, create employment opportunity and reduced vulnerability with the household.

The results also revealed that 33.3% of the respondents were traders; 30% were trading and farming; 23.3% were farmers while 13.3% were civil servants. This implies that trading and farming constitutes their major farming. From the result, most respondent's 63.3% had a household size of 6 - 10 persons, 36.67% had 1 - 5. The mean household size was 6.1. Large household size is a characteristic of many rural settings especially where large family size is one of the determinants of the wealth and easier availability of labour as observed by (Hateegoah et al., 2010). Also Obetta, (2012) stated that large family size is an obvious advantage in terms of farm labour supply.

Table 1. Distribution of the Respondents according to socio economic characteristics (n=60).

Variables	Frequency	Percentage	Mean
Gender			
Male	12	20	
Female	48	80	
Age (years)			
10-20	1	1.667	
21-30	13	21.66	
31-40	18	36.67	38.6
41-50	22	30	
51-60	6	10	
Marital Status			
Single	7	11.67	
Married	33	55	
Widowed	14	23.3	
Separated	6	10	
Occupation			
Trading	20	33.33	
Trading and Farming	18	30	
Farming	14	23.3	
Civil servant	8	13.3	
Household size			
1-5	22	36.67	
6-10	38	63.33	6.1
Educational status			
No formal	12	20	
Adult education	10	16.67	
FSLC	8	13.3	
SSCE	18	30	
NCE	2	3.3	
OND	3	5	
HND	2	3.3	
Degree	5	8.3	
Experience			
1-5	8	13.3	
6-10	28	46.67	10.4
11-15	13	21.67	
16-20	7	11.67	
21 and above	4	6.67	

Source: Field Survey, 2014.

With regard to education majority 80% of the respondents had their basic education while 20% of the respondents had no education. Okoye et al. (2009) asserted that education increases the adoption of improved agricultural technology and the application of agricultural innovation. The data also indicate that a majority 46.67% had 6 - 10 years of experience; 21.67 % had 11 - 15 years of experience; 13.3% 1-5 year of experience, 11.67 % had 16-20 years of experience while 6.67% had 21 years and above experience in cocoyam marketing. This implies that cocoyam marketers have acquired sufficient relevant marketing experience to effective steps that would increase efficiency of marketing business.

Cocoyam marketing channel, their sources of fund and annual income generated

Table 2 shows that 14.8% are producers who produce and sale to the wholesalers, retailers and final consumers, 25.9% of respondents are wholesaler and buy cocoyam from producers and sales to retailers and final consumers, 22.2% are retailers that buy cocoyam from either producers or wholesalers and sale to final consumers, 40.7% are consumers who buy cocoyam from either the producers, wholesalers and retailers for their home and other uses. This shows that wholesalers are more involved in cocoyam marketing than others and they influence the price of the cocoyam.

Table 2. Distribution of the Respondents according to cocoyam marketing channel, sources of fund and their annual income generated. (n =60).

Cocoyam marketing channel	Frequency	Percentage	Mean
Variables			
Whom and where you sales cocoyam			
Producers	20	14.8	
Wholesalers	35	25.9	
Retailer	30	22.2	
Consumers	55	40.7	
<i>*multiple responses were recorded</i>			
Sources of fund			
Personal income	52	86.67	
Relatives and friends	8	13.3	
Credit accessibility			
Accessible	10	16.67	
Not accessible	42	70	
No responses	8	13.3	
Annual income generated			
6000-10,000	5	8.3	
11,000-15,000	8	13.3	
16,000-20,000	6	10	
21,000- 25,000	22	36.67	21,950
26,000-30,000	10	16.67	
31,000 and above	9	15	
Equipments			
50kg bag	12	20	
Local basket	30	50	
Bucket Painter	18	30	
Transportation means			
Car	48	80	
Wheelbarrow	12	20	

Source: Field Survey, 2014.

Table 2, displays that 86.67% of the respondents got credit from their personal savings, whereas, 13.33% of the same respondents had access to credit through their friends and relatives and none got any credit from bank, government, market union, co-operative society, clubs etc. This implies that majority of people involved in marketing cocoyam uses their personal savings and money gotten from friends and relatives which are not enough for them to buy produce in large quantity. This confirms the findings of Von Braun, (2009) that the major reasons why some agricultural goods are sold costly is because of adequate capitals from the rural famers to embark in greater productivity of the produce and products.

Furthermore, Table 2, shows that 70% of respondents do not have access to credit, 16.67% have access and 13.3% have no response at all. This implies that people involved in cocoyam marketing need credit facilities but most of them do not have access to it. Therefore, we may force to say that more credit accessible might bring about marketing efficient.

Critical analysis of Table 2 shows that 36.67% of respondents has an annual income of between N21000 - N25000 from the marketing of cocoyam, as only 16.67%

of the respondents agreed that they has an annual income of N26000 - N30000. Also, Table 2 indicated that 15% of the respondents in the study area reported that they have an annual income of N31, 000 and above as they engage in marketing of cocoyam. From the results in table 4.2 above, it implies that N21, 000.00 to N25, 000.00 were the trend of highest annual income generation in the cocoyam marketing in Nsukka Agricultural Zone as nobody marketing the product in the study has income generation less than N5, 000.00.

From Table 2 it shows that 25% of the respondents use 50kg bags to sale cocoyam, 45 percent used local basket and 30 uses paint. This implies that local basket is the main equipment used in cocoyam selling and is mainly for the intermediaries.

Table 2 shows that 73% of the respondents transported their cocoyam by car, while 27% transport by wheelbarrow. This indicates that majority of people that are involved in cocoyam marketing transport their commodity to the market by car. Notwithstanding that cost of using car to transport cocoyam in the rural area of Nsukka agricultural zone will be high; its use (car) will assist in reducing the rate of riots that will be associated with cocoyam if other means of transportation like use of

Table 3. Distribution of the Respondents according to cocoyam marketing union and their influence.

Variables	Frequency	Percentage
Membership		
Member	34	56.67
Non member	26	43.3
Composition of cocoyam marketing union		
Both wholesaler and retailer	60	100
Availability of marketing information and sources		
Fellow marketers	40	66.67
Agent	20	33.3

Source: Field Survey, 2014.

wheel barrow is used especially for large quantities.

Cocoyam marketing union and their influence

Table 3 shows that 56.67% of the respondents belong to the union while 43.33% of the respondent did not belong. This indicates that majority of people that are involved in cocoyam marketing belong to the union and fixed the price of the product that suits them and make more gained than the producers.

Further analysis of Table 3 indicated that both wholesalers and retailers constitute a union and that no individual can stand without the other in the union. Also, Table 3 shows that 66.67% of the members get information while 33.33% did not get any information. This implies that members get information on marketing situation more than the non-members.

Finally, from Table 3 one can see that 66.67% of the respondents identified their fellow marketers as their source of information but, only 33.33% of the respondents got their information from agents. This implies that the major sources of information to cocoyam marketers are through fellow marketers.

Estimated price spread, gross margin and benefit cost ratio of the cocoyam marketing

Marketing margin represents the difference between what the consumer pays for a commodity and what the farmer gets. It is also the difference between the purchase price and the selling price.

Table 4 shows that one 50 kg bag of cocoyam of producers selling price of N5000 and of consumers purchase price of N6000. The wholesaler bought from the producer at N5000 per a 50kg bag of cocoyam and incurred some handling cost and market charges of N220.00. Analysis of the foregoing shows that the individual sold to retailer at N5500.00 has a margin of N280.00 of the consumer's naira.

The retailer bought from the wholesaler at 5500 per a 50 kg bag of cocoyam and incurred some costs such as transportation cost, storage cost, handling cost and market charges of N280.00. He/she then sold to consumer at N6000.00 making a margin of N220.00 of the consumer's naira.

It is obvious from the above analysis that the difference between the producers price and consumer's price N6000 - N5000 = N1000.

The N1000.00 is made of both the middlemen's margin and handling costs. This implies that the difference between the producer's price and consumer's price is the sum of margins of the middlemen involved in marketing and the cost they incurred in the course of marketing their commodity.

The formula for percentage share of consumer's naira.

$$\frac{\text{Market margin} / \text{producer's price} \times 100}{\text{Consumer's purchase price}}$$

$$\text{Producer's percentage share: } \frac{500}{6000} \times 100 = 8.3\%$$

$$\text{Wholesaler's percentage share: } \frac{260}{6000} \times 100 = 4.3\%$$

$$\text{Retailer's percentage share: } \frac{290}{6000} \times 100 = 4.8\%$$

From the calculation above, it shows that the producer has the highest share of 8.3% of the consumer's naira excluding the production cost. This was followed by the wholesaler share of 4.3% of the consumer's naira while the retailer's share is 4.8% of consumer's naira. This is to say that the producer has the highest share of consumer's naira but the production cost is excluded and did not considered because if the production cost should be added the margin will be small and the cost will be higher. The aggregate share of the middlemen 9.1% (i.e. for wholesalers and retailer) of the consumer's naira and that of the producer was 83.3%. The producers share is

Table 4. Market margin and price spread analysis for cocoyam per (50kg bag) in Nsukka Agricultural Zone.

Items	Amount (N)
Producers sale price (farm gate price)	5000
Wholesaler's purchases price	5000
Cost incurred by wholesaler:	
Transportation cost	50
Storage cost	100
Handling cost	50
Market charges	20
Sale price of wholesaler	5500
Retailer purchase price	5500
Cost incurred by retailer:	
Transportation cost	30
Storage cost	200
Market charges	50
Retailer's sale price	6000
Consumers purchase's price	6000
Gross margin for wholesaler	
TR = Total revenue	6000
TVC = Total variable cost which includes;	
Purchase price	5000
Transportation cost	50
Storage cost	100
Handling cost and	50
Market charges	20
Total = 6000 - 5000 = 1000	

Source: Field Survey, 2014.

still bigger than the collective share of the middlemen. This implies that the number of people involve in the distribution chain of cocoyam contribute a lot in increase of the price to the consumer.

Benefit cost ratio

Formula

Total Revenue/total cost

Therefore; $6000/5220 = 1.14$ for wholesalers

While $6000/5780 = 1.03$ For retailers.

This implies that the venture is viable and encouraged to continue since the benefit cost ratio is greater than 1 and positive.

Gross Margin or Farm profit/net return = N280 and N220 respectively for wholesalers and retailers.

Benefit cost ratio = 1.14 and 1.03 respectively.

Statistic shows that farm profit was found to be 280 and 220. This was the average profit of cocoyam marketing in the study area. This implies that the venture was very viable, profitable and reliable to embark on, based on the criterion for selection of benefit cost ration if greater than one (>1).

Marketing constraints in cocoyam

There are some constraints in marketing any agricultural commodity, they brings about marketing inefficiency and other problems in marketing. There are some identified constraints in Nsukka Agricultural Zone, Enugu State, Nigeria. They were; inadequate storage facilities, poor feeder roads leading to production and marketing areas, large number of intermediaries, poor handling, high cost of seeds, lack of credit facilities, price fluctuations, poor packaging and processing, lack of uniform standard of weight and measurement, ignorant of cocoyam nutritive value, lack of labour, inadequate marketing information and situation, lack of formal education etc.

From Table 5 it shows that 10.8% of the respondents encountered the problem of storage, whereas 8.9% encountered large number of intermediaries. Critical analysis of the same table 4.6 indicated that as 9.3% encountered the problem of poor road, 6.5% of the respondents stated that they encountered the problems of high cost of cocoyam but only 10.8% of them encountered the problem of credit. Meanwhile, further examination of the above table 4.26 shows that 8.2% of the interviewed respondents in the study area

Table 5. Distribution of the respondents according to constraints in cocoyam marketing.

Problems	Percentage	Rank
Inadequate storage facilities	10.8	1 st
Lack of credit facilities	10.8	1 st
Poor feeder road	9.3	3 rd
Large no of intermediaries	8.9	4 th
Ignorant of cocoyam nutritive value	8.3	5 th
Lack of labour	8.3	5 th
Price fluctuation	8.2	7 th
Perishable nature of cocoyam	7.5	8 th
Poor handling	6.7	9 th
High cost of seed	6.5	10 th
Inadequate market information	6.3	11 th
Poor processing and packaging	2.7	12 th
Lack of grading	1.49	13 th

*Multiple responses were recorded.
Source: Field Survey, 2014.

encountered the problem of price fluctuation, and 6.7% only encountered the problems of handling and 1.5% encountered lack of grading as marketing problems. From this analysis one can see that there are too many problems in cocoyam marketing and it contributes a lot in its price.

Conclusion

The socio-economic contribution of the marketing system cannot be over emphasized especially in cocoyam. Apart from providing people with goods, foods, the system also provides means of livelihood for those engaged in it. However, the attitude of policy makers towards development is an important factor in agricultural sector and this could make cocoyam marketing an opportunity for both the rural and urban farming family households.

There is no doubt that without effective marketing system, marketing efficiency cannot be successfully increased. Based on the above premise and other relevant issues raised in this study, it is therefore considered very necessary that the improvement of the marketing system of cocoyam studied deserves government attention in different areas. This should be by providing the necessary facilities required to enhance the efficiency of the system.

REFERENCES

Chinaka EC, Akinpelu EC, Okoye BC, Asumugha GN (2013). Determinants of Adopt of National Root Crop Research Institute cocoyam production package among small holders women farms in Enugu state. Proceeding of the 43rd Annual Conference of Agricultural Society of Nigeria, Abuja (2009). National Root Crop Research Institute ,Umudike, Abia State.

Chukwu GO, Nwosu KI (2008). Cocoyam Rebirth. The Renaissance of a Gaint Crop. Paper Presented at the 17th Annual Conference of Nigeria Rural Sociological Association, NRCRI Umudike, p 11.

Chukwu GO, Nwosu KI, Onyeke J, Asiedu R (2012). Paper presented at the 1st International Workshop on Cocoyam, IRAD, Ekomna, Cameroon 29-31 October, 2012.

Chukwu GO, Nwosu KI, Madu TU, Chinaka C and Okoye BC (2008). Development of Gocing Storage Method for Cocoyam. Proceeding of the 43rd Annual Conference of Agricultural Society of Nigeria, Abuja (2008). National Root Crop Research Institute ,Umudike, P.M.B 7006, Umuahia, Abia State, Nigeria.

Dimelu MU, Okoye AC, Okoye BC, Agwu AE, Aniedu OC and Akinpelu AO (2012). Determinants of Gender Efficiency of Small – Holder Cocoyam Farmer in Nsukka Agricultural Zones of Enugu state, Nigeria. Sci. Res. and Essay 4 (1): 4.

FAO (2006). Roots Tubers, Plantains and Bananas in Nutrition FAO, Rome, Italy FAO Statistics (2006): Data base Results (website).

Hategoah TC (2010). Advances in cocoyam processing and marketing in Nigeria .International Institute of Tropical Agriculture (IITA) (1996).Annual Report. International institute of Tropical Agriculture, Ibadan Nigeria.

Nzeh CEP (2007). Socio-Economic analysis of marketing of yam in Enugu urban, Enugu State, Nigeria. Book of Proceedings of 9th Annual National Conference of Nigerian Association of Agricultural Economists (NAAE), held at 1000 Seater Theatre Abubakar Tafawa Balewa University (ATBU), Bauchi state, Nigeria, 5-9th November, 2007, 2: 514-524.

Obetta AE (2012). An unpublished M.Sc Seminar proposal on Analysis of Marketing of Plantain in Enugu North of Enugu State, Department of Agricultural Economics, University of Nigeria, Nsukka.

Okoye AC, Dimelu MU, Okoye BC, Agwu AE (2009). Gender constraint in small holder cocoyam production in Enugu North Agricultural zone of Enugu state, Nigeria. Proceeding of the 43rd Annual Conference of Agricultural Society of Nigeria, Abuja (2009).

Onyenweaku CE, Ezech NOA (2012). Trends in Production, Area and pp 94-100 Productivity of cocoyam in Nigeria. International Journal of Agricultural Economics & Rural Development - 4 (2): 2012 © IJAERD, 2012 Produced by IJAERD Press - Nigeria, 2012 Nigeria.

Sagoe R, Marfo KA, Dankyi AA (2001). The Potentials of Cocoyam production in Journal of Agriculture and Veterinary Sciences.

Tambe RE (1995). The economics of cocoyam production by small holder farmers in Many Division, South west province of Cameroun.

Ubulua AO, Chukwu LI (2008). Potential and constraints of cocoyam production in Nigeria (2008) Poc 42nd Ann. Con. Agric. Soc. of Nigeria Ebonyi State University Abakiliki. pp. 298-302.

Von Braun CC (2009). Addressing the Food Crises: Governance Market Functioning and Investment in Public Goods. Food Security: The Science, Sociology and Economics of Food Security: The Science, Sociology and Economics of Food Production Access to Food 1(1), 1-7