

FACTORS AFFECTING THE MARKETING MARGIN OF IMPROVED COWPEA SEEDS' PRODUCERS IN KARAYE LOCAL GOVERNMENT AREA OF KANO STATE, NIGERIA

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ABSTRACT

This paper examines the factors that influenced the marketing margin of improved cowpea seeds' producers in Karaye Local Government Area (LGA) of Kano State, Nigeria. Data were collected from 125 producers in Karaye LGA of Kano State using snowballing sampling technique. The descriptive statistics result revealed that the respondents were active, mostly males and were mostly literate. The result revealed that the cowpea enterprise was productive and profitable and its marketing was efficient. Age, access to input, access to extension agent and access to credit were the factors that influenced the net marketing margin to producers of improved cowpea seeds. The study therefore recommends that the government should not relent in her effort in ensuring that inputs as well as credits are available and accessible to producers as this will assist them make better profit.

Keywords: Improved Seeds, Cowpea, Production, Marketing, Kano State

INTRODUCTION

Grain legumes such as cowpea play important roles in smallholder farmers' livelihood. These legumes are regarded as the cheapest sources of protein and provide the needed mineral and vitamin requirements of the poverty-ridden populace of sub-Saharan Africa (SSA) countries (Nigeria inclusive) (Joshi *et al.*, 2000; Mhango, 2011). Among these legumes, cowpea (*Vigna unguiculata*, L.) has shown several agronomic, environmental and economic advantages as well as contributing to improving the diets and incomes of peasant farmers across Africa, Asia and South America (Hall, 2012; Maziya-Dixon *et al.*, 2004; Phillips *et al.*, 2003; Singh, 2014). It is one of the most economically and nutritionally important indigenous African grain legumes produced throughout the tropical and subtropical areas of the world (Adekunle and Momoh, 2016).

In Nigeria, cowpea provides a cheap and nutritious food for relatively poor urban communities and is a source of income generation to many farmers – this is because these farmers after harvesting, sell their produce to those interested in purchasing them. Moreover, the integration of cowpea in the farm not only enhances soil fertility, but also broadens the amount and stability of farming households' income streams (Joshi *et al.*, 2000; Mhango, 2011). This ensures an improvement in the income and standard of living of these producers. In addition, cowpea, popularly referred to as beans in Nigeria, is consumed in most household diet in various forms such as bean cake, bean pudding, bean soup, boiled beans, mashed beans mixed with maize or yam. Similarly, due to the expensiveness of animal proteins, many Nigerian households depend on legumes like cowpea for much of their protein requirement (Ondoma, 2006).

Although Nigeria is the largest producer of cowpea (2,100,000 metric tons) in the world producing about 58 per cent of the world's production and 61 per cent of the total Africa's production (FAO, 2017). However, with increasing population over the years which is estimated at over 180 million people at an average growth rate of 2.47 per cent per annum, the demand (about 4,200,000 metric tons) for the crop had gone up and is still rising but the production has not increased significantly (Nigeria Bureau of Statistics [NBS], 2018). This implies that Nigeria has a deficit averaging 2,100,000 metric tons, hence the continued importation of cowpea from other neighboring countries (Saka *et al.*, 2018). Similarly, the Food and Agriculture Organization (FAO), (2011) submitted that despite the importance of cowpea in human nutrition and the role they play in the sustainability of agricultural production systems, their yields are low and unstable across seasons and environments. Several reasons have been adduced to these, which include: low productivity associated with farmers' production systems as well as the types of varieties cultivated (Coulibaly and Lowenberg-Deboer, 2000; Ondoma, 2006).

Furthermore, literature has shown that improved varieties with high yield potentials have been developed to increase agricultural output and improve producers' income (Ajeigbe *et al.*, 2009), however it is disheartening that most smallholder farmers in most SSA countries, including Nigeria still grow recycled traditional varieties which, though, having most of the desired attributes, are low yielding, late maturing and susceptible to diseases compared to these genetically improved varieties. Several studies have thus adduced the non-use or rejection of these improved varieties to farmers' socioeconomic characteristics such as: small farm size, unavailability of seeds, household inaccessibility to assets/capital, low education, lack of experience and unavailability of labour amongst others (Andrew, 2014; Ondoma, 2006).

Moreover, in spite of efforts by various research institutes such as The International Institute of Tropical Agriculture (IITA), The Institutes for Agricultural Research, (IAR) Samaru, Zaria, National Agricultural Extension Research and Liaisons Services (NAERLS) and International Crop Research Institutes for Semi-Arid Tropics (ICRISAT), etc. in undertaking research on various aspects of production and improvement of cowpea seeds, farmers still use traditional cultivars making yields low and consequently a decline in the profit accruable to them (Ibrahim *et al.*, 2013). Hence, farmers' use of indigenous and archaic knowledge in the production of cowpeas for immediate economic returns and continuous revenue generation calls for critical evaluation (Toluwase and Abdu-raheem, 2013).

This study was aimed at understanding the reason for producers' use or non-use of the improved cultivars of improved seed by studying their margins of profit after they had harvested their produce and the different factors that influence this margin with a view to ascertaining their behavior and proffering the suitable policy measures that could better enhance the production of cowpea seeds in Kano State as a case study and Nigeria as a whole. It is against this backdrop that this study evaluated the marketing margin of improved cowpea seeds production and estimated the factors affecting the marketing margin to improved cowpea seeds producers in Karaye LGA of Kano State, Nigeria.

METHODOLOGY

The study was carried out in Karaye Local Government Area (LGA) of Kano State, Nigeria. The selection of Kano State for the study was based on the prevalence of legume production. The State lies in the semi-arid zone of Nigeria, around latitude 11°34'N and longitude 8°44'E. The ecology is characterized by a growing period of about 100 to 150 days. Annual rainfall of between 500mm and 1000mm is erratic and restricted to four months. A multi-stage sampling procedure was employed for the study. The first stage involved a purposively selection of Karaye LGA because of the then International Institute of tropical Agriculture (IITA) projects in Kano State. Thereafter, a purposive selection of five communities was made from the LGA. Finally, 25 producers of improved cowpea seeds were selected through snowballing from each of the communities using the services of some enumerators provided by IITA, Kano. Thus, a total of 125 producers were sampled.

Various analytical tools and procedures were employed for this study. Descriptive statistics such as percentages, frequencies and means were employed to explain the socio-economic characteristics of the respondents. Budgetary analysis was used to determine the marketing margin of improved cowpea seeds enterprise and Ordinary Linear Regression (OLS) was used to determine the factors influencing marketing margin of the cowpea seeds' producers.

Budgetary technique

Budgetary technique was employed to determine the marketing margin of improved cowpea seeds enterprise. The various types of seeds, input used and their costs were identified. Gross marketing margin measures the difference between selling price and purchased price. The selling price was obtained by multiplying the unit price of each seed by the quantity sold while the purchased price was obtained by multiplying the cost of seed by the quantity used in production. The variable costs are those costs that vary with the total level of output and they include the cost on land clearing, weeding, fertilizer, pesticides, harvesting/transportation.

The addition of total variable costs and total fixed costs gives the overall costs incurred in production. Using the straight line method, the depreciation expenses were calculated on the fixed items (such as: hoe, axe, cutlass, and wheel barrow which were assumed for a lifespan of 3 years), which were then used in the analysis.

The equations are:

$$SP = P_i \times Q_i \quad (1)$$

$$PP = C_i \times Q_i \quad (2)$$

$$MC = TVC + TFC \quad (3)$$

$$GMM = SP - PP \quad (4)$$

$$NMM = GMM - MC \quad (5)$$

Where: NMM is Net Marketing Margin, GMM is Gross Marketing Margin, TMC is the Total Marketing Cost, TVC is total variable cost, TFC is the total fixed cost, SP is the Selling Price, PP is the Purchased Price, C_i is the cost of seed, P_i is the price of improved cowpea seeds and Q_i is the quantity of improved cowpea seeds sold.

Marketing efficiency can be defined as the maximization of the ratio of output to input in Marketing (Olukosi *et al.*, 2004). Efficiency can be expressed in physical or monetary terms, if monetary terms are used, efficiency concept becomes a ratio of benefits to cost or if in physical, it becomes a ratio of output to input used. In an attempt to examine the marketing efficiency of improved cowpea seed in Kano State, the following formula was adopted:

$$\text{Marketing efficiency} = \frac{\text{Value added by marketing service}}{\text{Marketing Cost}} \times 100 \quad (6)$$

$$\text{Marketing efficiency} = \frac{\text{Selling price} - \text{Purchased price}}{\text{Marketing Cost}} \times 100 \quad (7)$$

Value added by an average producer was calculated as the difference between the selling price and the purchased price; when marketing efficiency = 100%, it implies that the producer just recovered the cost incurred in carrying out the marketing services. This is break-even point for the producer. If marketing efficiency > 100%, it implies that the producer covered the cost of marketing and made a margin above 100%. This is point of the market being efficient. If marketing efficiency < 100%, it implies that the market is inefficient.

Regression model

To identify the factors influencing the marketing margin to the producers of improved cowpea seeds, a multiple regression was used. The dependent variable was the computed net marketing margin for each producer. A number of explanatory variables were identified and included in the model. The implicit function is given as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, e)$$

Where;

Y = Net Marketing Margin;

X₁ = Age of producer (Years);

X₂ = Years of education (Years);

X₃ = Household size (Number);

X₄ = Farm experience (Years);

X₅ = Farm size (Ha);

X₆ = Gender (1 = male, 0 = female);

X₇ = Extension visit (1 = yes, 0 = no);

X₈ = Member of social organization (1 = yes, 0 = no);

X₉ = Access to credit (1 = yes, 0 = no);

X₁₀ = Access to input (1 = yes, 0 = no);

e = Error term.

Different regression functions like linear, exponential, semi-log and Cobb Douglas were used to analyse the farmers' socio-economic characteristics on net marketing margin. Out of the regression functions used, the exponential regression function was adopted as the lead equation based on the highest coefficient of determination (R^2), with the highest F-statistics, number of significant variables and the signs of the estimated coefficients.

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

The result from Table 1 indicated that the mean age of producers in Karaye LGA was approximately 44 years with a standard deviation of ± 12.174 years. This shows that most of the producers of improved cowpea seeds in the study area were in their active years and more likely to demand improved seed technology. Improved cowpea seed production in the study area was seen to be gender-biased as almost all (99.2%) of the producers interviewed were male. This implies that male producers were more active and likely to be more involved when it comes to using improved seeds. This also could be ascribed to the land tenure system practiced as well as the gender-based division of labour.

Generally, majority (80.0%) of the producers are literate and could either read or write. The mean years of farming experience of the producers was approximately 28 years with majority (73.6%) of them cultivating a mean farm size of 4 hectares. This study agrees with Rahman *et al.* (2002) and Ajewole (2010) that quantum of experience could assert exert an influence on farmers' readiness to adopt improved technologies different from what they have been practicing over the years. It was revealed that majority (64.0%) of the producers in the LGA purchased their seeds from the market. Also, 98.4% of the producers had access to modern farm inputs, 47.2% are members of different cooperative societies while 81.6% of the respondents had access to extension agents.

Marketing Margin of the Farm Enterprise

The items of cost were classified into fixed and variable cost while the return or revenue was realized from the sales of improved cowpea seeds by individual producer. The fixed cost items were depreciated over time while the variable cost items were determined by each producer based on the quantity used for improved cowpea seeds production at a particular price. The marketing margin of improved cowpea seeds production was examined for producer in the LGA and is presented in Table 2.

Table 1: Socio-economic characteristics of respondents

Socio-economic characteristics	Frequency	Percentages
Age (Years)		
≤ 30	17	13.6
31 – 40	47	37.6
41 – 50	31	24.8
51 – 60	21	16.8
Above 60	9	7.2
Mean	43.5 (11.574)	
Gender		
Male	124	99.2
Female	1	0.8
Education		
No formal education	25	20.0
Primary certificate	58	46.4
Secondary certificate	26	20.8
Tertiary	16	12.8
Farming experience (Years)		
1 – 10	8	6.4
11 – 20	38	30.4
21 – 30	41	32.8
31 – 40	19	15.2
Above 40	19	15.2
Mean	27.55 (12.735)	
Household size		
1 – 10	79	
11 -20	41	63.2
21 – 30	5	32.8
Mean	9.96 (5.6887)	4.0
Farm size (Hectares)		
1 – 5	105	84.0
6 – 10	17	13.6
11 – 15	3	2.4
Mean	4.293 (2.9161)	
Access to modern farm inputs		
Yes	123	98.4
No	2	1.6
Access to credit		
Yes	24	19.2
No	101	80.8
Membership of cooperative society		
Yes	59	47.2
No	66	52.8
Source of seeds		
Extension agents	3	2.4
Previously harvested seeds	42	33.6
Market	80	64.0
Access to extension agents		
Yes	102	81.6
No	23	18.4

Source: Data Analysis, 2018

Note: Figures in parenthesis represents the Standard Deviations

Table 2: Marketing Margin per Hectare per Producer of Improved Cowpea Seeds for 2015 Production Season

Item	Quantity/Ha/Kg	Price (₦/Kg)	Total (₦)
A. Selling Price (SP)	263.3	375	98,737.5
B. Purchased Price (PP)	3Kg	75	225
C. Marketing Cost (MC)			
(i) Variable Costs			
Land clearing	5 MD	5,000	25,000
Weeding Cost	3 MD	5,000	15,000
Fertilizer Cost	7Kg	3,500	24,500
Pesticide and herbicide Cost	1 litre	950	950
Harvesting and Transportation		1,200	1,200
Total Variable Cost			66,650
(ii) FIXED COST			
Rent on land			15,000
Depreciation cost on tools			1,376.19
D. Total Marketing Cost			83,026.19
E. Gross Marketing Margin (A – B)			98,512.5
F. Net Marketing Margin (E – D)			15,486.31
G. Marketing efficiency $\left(\frac{E}{D}\right)$			1.1865 (118.65%)

Source: Data Analysis, 2018

The result revealed that though an average producer incurred a marketing cost of ₦83,026.19 in the cultivation of improved cowpea seeds, he still had higher revenues of ₦98,737.5 and made a net marketing margin of ₦15,486.31.

Furthermore, as shown in Table 2, the average value added which was calculated as the difference between the selling price and the purchased price, was ₦98,512.5. The marketing efficiency of improved cowpea seeds calculated as the ratio of the value added to marketing cost was 118.65% which shows that in Karaye LGA of Kano State, the marketing of improved cowpea was efficient. The fact that the marketing efficiency was greater than 100% is an indication that the cultivation and marketing of improved cowpea seeds in Kano State is productive and profitable. This result agrees with Nafiu *et al.* (2016) that investing in cowpea is a viable enterprise.

Influence of Demographic Characteristics on Net Marketing Margin

Table 3 presents the results of the OLS regression model. It showed that the computed F value of 379.37 was significant at the 1% level, denoting that the collective influence of the independent variables on net marketing margin was significant. The OLS regression model's result indicated that R^2 was 0.9706 which suggests that the explanatory variables in the model specification were important and they explained about 97.1% variation in the dependent variable (net marketing margin). This shows that the model is of good fit and has a good predictive ability. Out of the ten explanatory variables, four of them namely, age of farmers, access to input, access to extension agent, and access to credit were significant.

The result revealed that coefficient of age had a positive relationship with net marketing margin which means that an increase in age would result in an increase in the net marketing margin. The positive relationship between age and net marketing margin implies that old producers have a better understanding of the market. This could be due to the fact that older producers are not only more conservative than the younger ones in adopting new technology but also have vast knowledge which is needed in the marketing of their output. The coefficient of access to input was also positive which means that the marketing margin of respondents increased as their access to the needed inputs increased. The reason for this could be due to the fact that respondents do not only have access to these inputs but used them in expectation of higher profit. The result also showed that the coefficient of access to extension agent was positive which means that the more the access to extension agent, the higher the net marketing margin obtained. This is because extension agents provide efficient and effective information and alternatives which impacts production and helps producers choose option that suits them best (Baethgen *et al.*, 2003). The coefficient of access to credit was also positive implying that the more the access to credit, the more the net marketing margin. The positive relationship between access to credit and marketing margin is as a result of the fact that producers made use of the credit they had access to.

Table 3: Relationship between producers' demographic characteristics and net marketing margin

Variable	Coefficient	t	P>t
Age	0.020**	2.35	0.020
Gender	0.381	1.34	0.182
Farm experience	-0.005	-0.62	0.537
Level of Education	0.013	1.16	0.249
Household size	0.002	0.14	0.891
Farm size	0.018	0.69	0.495
Access to input	1.294***	4.17	0.000
Membership of Cooperative	-0.004	-0.04	0.971
Access to extension agent	0.286*	1.89	0.062
Access to credit	0.219*	1.79	0.076
R-squared	0.9706		
Adjusted R-squared	0.9680		
F	379.37***		

Source: Data Analysis, 2018

Note: *, **, *** signifies 10%, 5% and 1% level of significance respectively

CONCLUSION AND RECOMMENDATIONS

The study was conducted to determine the factors influencing the marketing margin of improved cowpea seeds production in Karaye Local Government Area (LGA) of Kano State, Nigeria. The results revealed that the cowpea enterprise was productive and profitable and its marketing was efficient. Age, access to input, access to extension agent and access to credit were the factors that influenced the net marketing margin of improved cowpea seeds producers.

The study therefore recommends that the government should not relent in her effort in ensuring that inputs as well as credits are not only available but accessible to cowpea producers; this will assist them make better profit. In addition, producers of improved cowpea seeds should be encouraged and motivated to form or join cooperative organizations.

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