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Full Length Research Paper

Factors influencing profitability among gum Arabic marketers in Jalingo, Taraba State, Nigeria

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Gum arabic is an economic tree crop commonly found in Sahelian and Savannah of tropical zones. There are over 1100 different species of the plant. Three of these are of economic value due to the role they play in manufacturing industries worldwide. The study analysed the factors influencing revenue generation from gum arabic among its marketers in Jalingo Local Government of Taraba state, Nigeria. Sixty respondents were randomly interviewed using structured questionnaire, out of which 50 was used for this study. There are about 11 states in the Nigeria where gum arabic is abundantly grown wild with some on established farms. The produce is used in the manufacture of many industrial goods like ink, pharmaceuticals, paint, textiles, papers etc. Both descriptive and inferential statistical models were used for the analyses. The results revealed that $R^2 = 0.692$, implying that 69.2% of the independent variables used in the study jointly explained the variation in the output. Age, education, operating cost and fixed cost had negative coefficients while family size, purchasing cost, volume of gum arabic sold; labour cost and gum Arabic marketing experience had positive coefficients. These imply that an increase on those variables with negative coefficients will decrease revenue generation in the sales of gum arabic in the area; while an increase in those variables with positive coefficients will lead to increase in the revenue generation in gum arabic marketing in the study area. The economic advice was that gum arabic marketers should reduce allocation of resources with negative coefficients and increase allocation of the variables with positive coefficients in order to be more efficient in the gum arabic business in the area.

Keywords: Gum arabic, Marketing, Profitability, Revenue generation, Jalingo

INTRODUCTION

Gum arabic is an economic tree crop commonly found in sahelian and savanna zones. There are over 1100 different species of the plant. Three of these are of economic value due to the role they play in manufacturing industries worldwide (Umar, 2006). Taraba state is blessed with abundant human and natural resources. It is unfortunate that the discovery of oil in

Nigeria seemed to have trifle the agricultural sector as it was allocating only 3% of the annual budget in the 1970s, which dropped to just 1% in the late 1980s (Oyedipe, 2001). The budget allocation only rose to 4% in 2011 despite the strategic significance of agriculture in the socio – economic development of every nation, especially the developing ones like Nigeria. This created laziness, dependence on foreign imports and poverty among Nigerians especially the rural people (Umar, 2006).

Taraba state in trying to revamp agricultural production and marketing to arrest poverty, keyed into the

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programmes of the Federal Government of Nigeria, such as the "Vision 20 2020", and the National Economic Empowerment and Development Strategies (NEEDS). The cardinal principle of the Programmes was identification of crops with high economic potentials to improve their production and marketing status that will stimulate increase in income per capita of farmers and marketers in Nigeria.

In this vein, *Acacia species* known as gum arabic was one of the tree crops selected. There are over 1000 species of *Acacia* grown in Nigeria, out of which *Acacia senegal* (grade 1), *Acacia sayel* (grade 2) and *Acacia saberina* (grade 3) were found to be of higher economic value and are demanded worldwide for industrial uses. The tree is a perennial plant, mostly grows wild with only few domesticated (established Gum arabic farms) in northern Nigeria. It takes 4-5 years to mature after planting (Nigeria Export Promotion Council, 1999). The high demand for the products necessitated the Federal Government of Nigeria emphasis for its development especially grade 1 and 2 gum arabic (Giroh, Moses, Joyce and Umar, 2007).

Taraba state Government has established about 30 hectares of gum arabic government owned farm in addition to over 20,000 hectares covered with wild gum arabic. (Bello, 1998, Baseline Survey, 2002). Many farmers have also adopted the technology of gum arabic intercropping technique with arable crops. This is expected to enhance the socio-economic status of farmers and marketers of gum arabic in the state as Zendillo (2008), opined that in every case where a poor nation has significantly overcome its poverty, has achieved so while engaging in production for export market and opening up itself to the influx of foreign goods. In the same vein, Joachim (2003) stated that the stunted growth of the less developed countries was consequent of export instability.

The study thus analysed factors influencing profitability of gum arabic marketing in Jalingo metropolis among the despondences in order to examine the possibility of it as a source of poverty alleviation in the area.

RESEARCH METHODOLOGY

The study area

The study was carried out in Taraba State, North-Eastern Nigeria. Geographically, the state is in Semi-Arid zone with a mean annual rain fall of 160.2 mm, and temperature fluctuating between 14°C to about 44°C (Taraba State Diary, 2000). These conditions promote the production of gum arabic (Aghughu, 2004). The state is located on 80000° N and 10.5000° E on the globe. It shares borders with Adamawa in the north, Benue state in the south, Gombe in the east and Cameroon Republic in the west. The land area is 54,473Km², with total

population of 2,688,944 people. The people are predominantly farmers and marketers of agricultural produce. The GDP is \$ 3.4 billion and income per capita of \$ 1.446 (NPC, 2006). Their major crops include coffee, tea, groundnuts, sugar cane, cotton, rice, maize, mango, guava, orange, cocoyam, sorghum millet, cassava, tea, yam and gum arabic.

Data Source and Sampling Techniques

Jalingo Local Government Area was purposive selected for the study being the major gum arabic market area in the state. Primary data were collected through the use of structured questionnaire administered randomly in 3 communities on 20 Gum arabic marketers from each of the three selected communities. This gave a total of 60 respondents (marketers) out of the list of 80 gum arabic marketers obtained from the Ministries of Agriculture and Environment of the state.

Methods of Data Analyses

Descriptive statistics such as mean, percentages and frequency distribution were used in analyzing the socio economic variables of the marketers; while Gross Margin and regression techniques using Ordinary Least Square (OLS) method were used to determine the profitability and factors that influenced revenue generation in gum arabic marketing among the respondents in the study area.

Gross margin

Model was used to determine the profitability of Gum arabic marketing among the respondents. The gross margin formula is expressed as follows:

$$GM = TR - TVC \text{ ----- (1)}$$

$$GM_{fk} = (TR - TVC)/N \text{ ----- (2)}$$

$$GM_{kg} = (TR - TVC)/kg \text{ ----- (3)}$$

$$NP = GM - TFC \text{ -- ----- (4)}$$

Where:

GM = Gross margin for gum arabic marketing (₦)

TR = total revenue realized from gum arabic marketing (₦)

TVC = total variable cost incurred in gum arabic marketing (₦)

GM_{fk} = gross margin per marketers of gum arabic (₦)

GM_{kg} = gross margin per kilogramme of gum arabic sold in the study area (₦)

Kg = total quantity of gum arabic sold in the study area (Kg)

N = total number of respondents

NP = net profit for gum arabic marketing of the respondents (₦)

TFC = total fixed cost incurred during gum arabic marketing (₦)

Table: 1. Age distribution of the Respondents

Age (Years)	Frequency	Percentage (%)
≤ 20	2	4.00
21 – 30	4	8.00
31 -40	2	4.00
41 -50	12	24.00
51 – 60	14	28.00
61 - 70	13	26.00
71 and above	3	6.00
Total	50	100.00
Mean	53 (years)	

Source: Field survey, 2012.

Depreciation on fixed cost items were computed using straight line method for easy computation and accurate values for the items used.

The regression model is explicitly expressed as:

$$Y = f(x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, x_9, \mu) \text{ -----}$$

----- (5)

Where:

Y = revenue generated from sales of gum arabic (₦)

X₁ = age of marketer (years)

X₂ = marketing experience (years)

X₃ = Labour cost (₦)

X₄ = Cost of fixed inputs (calculated by straight line depreciation method) (₦)

X₅ = Purchasing cost of the produce (gum arabic) (₦)

X₆ = Quantity of gum arabic sold (Kg)

X₇ = Family size (in number)

X₈ = Operating/ Variable cost (₦)

X₉ = Educational level (formal school)

μ_i = error term.

Three functional models (linear, Semi- log and Cobb - Douglas) were tried. Using the economic theory, statistical criteria and coefficient of multiple determinations (R²), the regression result with the best line of fit was selected for interpretation of the study as adopted by Maiangwa (2007) and Mesike, Agbonkolor, Umar and Giroh (2007). The functional models are:

$$\text{Linear: } Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \dots + b_nX_n + e \text{ ----- (6)}$$

$$\text{Semi - log } Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + \dots + b_nX_n + e \text{ ----- (7)}$$

$$\text{Cob - Douglas: } \log Y = b_0 + b_1\log X_1 + b_2\log X_2 + b_3\log X_3 + b_4\log X_4 + \dots + b_n\log X_n + e \text{ -----(8)}$$

Where:

b₀ = constant,

b₁ – b_n = coefficients,

Y = dependent variables,

X₁ – X_n = independent variables, and

e = error term.

RESULT AND DISCUSSION

Age

The age distribution of the respondents is presented in Table 1. The result shows that only 4% of the gum arabic marketers were either 20 years or less than. Those with ages of 41 - 60 years constituted 52% of the total respondents.

The respondents' mean age was 53 years. This indicates that gum arabic marketing in the study area was dominated by middle age people. The reason may be due to the laborious nature of the processes involved in gum arabic marketing such as moving from village to village searching for the produce, careful sorting according to grades, shade drying of the produce and bagging. The youths or the old people usually don't have the patience to undergo these processes, which agrees with the findings of Adigun, Awoyemi and Omonona (2011) who said that older/Middle Age persons usually have higher ability of patience, and patience in business influences higher gains for the entrepreneur. The result can also infer that the middle age people in the study area were willing to bear the possible risk in the business, while the young ones were of risk averters in the business. This is in line with the finding of Giroh, Umar and Yakub,(2010) who reported that middle age people have relatively higher degree of risk bearing than the young people in agricultural business.

Gum Arabic Marketing Experience

Table 2 depicts the years of experiences of the respondents' in gum arabic marketing. Most of the respondents (40.00%) indicated that they have been in the business for twenty one years and above. Only 6% of the respondents were new in the business of gum arabic (1 – 5 years). The gum arabic marketers were thus

Table 2. Distribution of Experience in Marketing of gum arabic by the Respondents

Marketing Experience (Years)	Frequency	Percentage (%)
1 – 5	3	6.00
6 – 10	7	14.00
11 – 15	9	18.00
16 – 20	11	22.00
21 and above	20	40.00
TOTAL	50	100.00
Mean	18 (years)	

Source: Field survey, 2012.

Table 3. Educational Distribution of the Respondents

No. of years spent in Formal school	Frequency	Percentage (%)
(0)	27	54.00
(1 – 6)	14	28.00
(7 - 12)	7	14.00
(13 - 17)	2	4.00
Total	50	100.00
Mean (Years)	8.8	

Source: Field survey, 2012.

expected to be efficient based on their long stay in the business as opined by Wood, (2008) stated in his study on measuring experience that the greater impacts of marketing objectives are gained through experiences.

Thus experience may serve as a useful factor in determining the effectiveness of marketing events among marketers (Wood, 2008). This is due to the fact that experience creates behavioural confidence in the business and increases buyers – sellers' engagement and stronger relationship.

Educational status

The educational status of the respondents (Table 3) revealed that most of the marketers (54.00%) did not have formal education. There was only 4.00% had tertiary education. The average age spent in formal school by the respondents was 8.8. This does not cover up to completion of secondary education. It thus indicates a high level of illiteracy among the gum arabic marketers. This conforms to the findings of Eboh (2006) who said that literacy rates have deteriorated to about 30 % in Nigeria since 1991.

The implication of this high illiteracy among the respondents to gum arabic business in the area would be poor management of the businesses as education is a crucial factor to the quality and performance of entrepreneurship. This explains the fact that despite the

abundance of gum arabic in the area as well as its high demand worldwide, poverty prevails in the area as the larger population (70%) in North – Eastern Nigeria are below the poverty line (Eboh, *et al.* 2006).

Household Size

The household size distribution of the respondents (Table 4) revealed that majority of them (38.00%) lies within the household size of 6 – 10 people. Those with household size of 21 and above had 8.00% of the total respondents. The mean household size of the study was 12. This implies that most of respondents' household size is large. This may be due to the polygamous system of marriage commonly practiced in the study area.

Table 5 depicts the profitability analysis of gum arabic marketing in the study area using Gross Margin model (GM). The result indicates a total of 208,821.67 Kg of gum arabic was sold by the 60 respondents; and generated a total revenue of ₦ 872,732.51. The total gross margin was ₦ 782,153.67; and the gross margin per marketer was ₦ 13,035.90; while the GM per kilogramme of gum arabic sold was calculated as ₦ 3.75.

On the other hand, the total net profit calculated was ₦ 780,566.27, and the net profit per marketer was ₦13,009.44. This implies that gum arabic marketing was highly profitable in the study area as the respondents made net profit of ₦ 780,566.27 each, giving a profit per

Table 4. Household size Distribution of the Respondents

Household size	Frequency	Percentage (%)
1 -5	5	10.00
6 -10	19	38.00
11 – 15	12	24.00
16 – 20	10	20.00
21 and above	4	8.00
Total	50	100.00
Mean:	12 (people)	

Source: Field survey, 2012.

Table 5. Gross Margin and Profitability Analysis of Gum arabic Marketing

Variables (Items/Activities)	Total Value (₦)/Marketer
(A) Depreciated Fixed cost:	
(i)Scales	1,104.113
(ii)Head pans	405.443
(iii)Mudus (Measures)	77.78
Total fixed cost	1,587.33
(B)Variable cost:	
(i)Labour cost	1,987.63
(ii)Operating cost	1,303.39
(iii) Purchasing cost	87,287.89
Total variable cost:	90,578.91
(C) Total cost	92,166.24
(D)Total revenue (TR)	872,732.51
(E)Gross margin (GM) (D - B)	782,153.67
Gm/Kg (E/H)	3.75
(F) Net profit (NP) (D - C)	780,566.27
NP/Kg (F/H)	3.74
(G)Total respondents	60
(H)Total Quantity of gum arabic sold	208,821.67 Kg

Source: Calculated from Data collected on field survey, 2012.

kilogramme of gum arabic sold of ₦ 3.74. This conformed to the earlier studies conducted by Umar; Abolagba; Giroh and Lalabe (2011).

Regression Analysis of Factors Influencing the Profitability of Gum Arabic Marketing

Three regression models (Linear, Semi – log and Double - logs or Cobb -Douglas) were ran, and the results are presented in Table 6. Base on the statistical significance of their coefficient of multiple determinations (R^2), the magnitude of the standard errors, and the coefficients signs and levels significance, the Semi – log functional model happened to be the lead equation among the three functional forms, having the best fit. It has a coefficient of multiple determinant (R^2) value of 0.692, highest F – ratio

(22.583) and lowest standard errors. The result of the model was thus chosen for interpretation of the study.

The (R^2) value of 0.692 implies that 69.2% of the variation in the output (Revenue generated) was jointly explained by the independent variables used in the regression analysis while the remaining 30.8% (100 – 69.2%) could be due to non inclusion of some important independent/explanatory variables in the model and/or error in the estimation.

The result for age (X_1), has negative coefficient and not significant. This implies that age has inverse relationship with the revenue generated from sales of gum arabic in the area. That is, with increase in age of the respondents the revenue declines. This agrees with the findings of Mbah, (2011) who reported in his study on the 'effects of socio – economic characteristics on farmers' output in Ishiagu, Ebonyi state, Nigeria'. The study also revealed

Table 6. Regression Analysis

Variable	Linear		Semi log		Double log	
Variable name	Coefficient	t-Value	Coefficient	t-Value	Coefficient	t-Value
Onstant	-1.395 ⁻⁸	- 0.220	-10.657	19.531**	10.490	6.931**
Age (X ₁)	- 1.137 ⁻⁷	- 0.976	- 0.004	- 0.437	- 0.18	- 0.62
Education (X ₂)	- 1.137 ⁻⁷	- 0.976	- 0.004	- 0.437	- 0.18	- 0.62
Family size (X ₃)	-326.412	- 0.910	0.020	1.121*	0.101	2.429*
Purchasing cost(X ₄)	489.641	4.305**	1.2005 ⁻⁴	4.308**	1.993 ⁻⁶	7.270**
Quantity of G.A. sold(X ₅)	9668.48	- 0.997	4.227 ⁻⁵	2.451**	5.626 ⁻⁵	4.221**
Operating cost (X ₆)	-2464.96	-4.247**	-1.240	-0.432	5.514 ⁻⁶	0.633
Labour cost(X ₇)	1.320	0.772	2.066 ⁻⁵	6.968**	1.044 ⁻⁵	1.565*
G.A.Mrkt Exp.(X ₈)	2.423	1.255*	0.027	2.712**	0.026	1.024
Fixed cost(X ₉)	572.108	1.756*	-1.149	-0.522	-0.043	-0.885
R²	0.567		0.692		0.828	
F – Value	4.216		22.583		13.397	

** = significant at 1% level,

* = significant at 5% level,

Dependent variable = Revenue, G.A. Mrkt.Exp = Gum arabic marketing experience

Source: Data Analysis from Field Survey, 2012.

the mean age of the respondents to be 53 years; it implies that the effect of diminishing return on output base on age factor has set in as it has negative coefficient of -0.004 indicating that it is in stage iii of production function – stage of diminishing return. The statistical implication of this is that, an increase in the ages of marketers will lead to decrease in revenue generation by ₦0.004.

Similarly, education(X₂), had negative relationship with the revenue and statistically not significant. This indicates irrationality of education, or there was no educational discrimination in the gum arabic marketing in the study area as per revenue generation. This could also mean that people with higher educational status engage in skilled jobs of their trainings and only few engage in the gum arabic marketing activities and thus earned less (Nwanko and Okolie, 2011).

On the other hand, the coefficient for household size (X₃), in the analysis had positive value of 0.020 and significant at 5% level of probability. This implies that a unit increase in the variable will lead to an increase in the revenue generation by ₦0.020 and vice versa. This also indicates that gum arabic marketers with large household size earned more revenue than those with small household size. This could be attributed to the fact that large households' sizes have more family labour which contributes in enhancing the activities of the gum arabic marketing (Nwanko and Okolie, 2011).

Purchasing cost (X₄), had positive coefficient value of 0.00012 in the result and significant at 1% level of probability. This implies that an increase in the variable will lead to an increase in the revenue generation from gum arabic equal to the magnitude of the coefficient; that

is ₦0.00012 and vice versa. This is in agreement with the a priori expectations; increase in purchasing cost, will lead to more quantity of gum arabic to be purchased and consequent higher revenue from sales of gum arabic.

Quantity of gum arabic sold (X₅) had positive coefficient of 0.00043 and significant at 5% level of probability. This indicates that an increase in the variable will lead to an increase in the revenue generation from gum arabic marketing. This is also in agreement with the a priori expectations that, with increase in quantity of gum arabic purchased will lead to increase in the revenue.

Operating cost(X₆) however indicates a negative relationship with the revenue though statistically not significant. This implies that an increase in operating cost will lead to decrease in the revenue from gum arabic. The operating costs considered in the study were cost incurred on purchasing of bags, thread and other miscellaneous expenditures. The analysis thus infers that these inputs were used to the point of diminishing marginal return to the revenue, or are underutilized. This conforms to the findings of Ndanitsa, *et al.* (2010).

The result for labour cost (X₇) had positive coefficient of 0.000066 and was significant at 1% level of probability. This means that the variable played one of the greatest influences in revenue generation of gum arabic from the area. Statistically, it implies that an increase in the labour cost will translate into higher revenue from sales of gum arabic in the area. This shows the significance of employing more labour in the business. The finding conforms to the study of Giroh, Moses and Umar (2007) in their study on the Analysis of Farmers' Awareness on Gum arabic Production in Selected Local Government Areas of Jigawa state, Nigeria.

Gum arabic marketing experience (X_8) had positive coefficient (0.027) in the analysis and was significant at 1% level of probability. Statistically, it infers that an increase in gum arabic marketing experience will lead to an increase value of ₦ 0.027 in revenue generation from sales of gum arabic. This conforms to the finding of Wood (2008) who reported that experience may serve as a useful factor in determining the effectiveness of marketing events among marketers.

Fixed cost (X_9) had negative relationship with the revenue in the analysis; though not significant. It statistically implies that a unit increase in the variable will lead to decrease in the revenue generation from gum arabic in the study area equal to the coefficient associated with it. The components of fixed cost considered in the study were measuring scales, mudus (local measure), head pans and stores. It was discovered during the study that almost all of the respondents owned these items but only few made regular use of them; hence made the items underutilized, generated unnecessary additional cost at the expense of revenue generation to the owners.

SUMMARY AND CONCLUSION

The study was conducted in Taraba state, Nigeria. The state is blessed abundantly with both human and natural resources, but poverty incidence remains high (70%) among her citizens (Eboh, 2006). Gum arabic marketing is viewed as a possible panacea for the poverty situation in the state. Jalingo, being one of the biggest gum arabic market centres in the state was chosen for the study. Factors influencing revenue generation from gum arabic among the respondents were analysed using descriptive and regression models. The results indicate that most of the respondents (52%) were between the ages of 41 and 60 years. Also, 40% of the marketers had more than 20 years experience in gum arabic marketing. There was high level of illiteracy (54%) among the respondents. The regression results revealed that R^2 as 69.2%. Age, education, operating cost and fixed cost had negative coefficients while family size, purchasing cost, volume of gum arabic sold, labour cost and gum Arabic marketing experience had positive coefficients. The implication of these is that an increase in the variables with negative coefficients will decrease revenue generation in the sales of gum arabic while an increase in the variables with positive coefficients will lead to increase in the revenue generation in gum arabic marketing in the study area. The economic suggestion for the gum arabic marketers is to reduce allocation of resources with negative coefficients and increase allocation of the variables with positive coefficients in order to be more efficient in the gum arabic business in the area.

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