JOURNAL OF AGRICULTURE & SOCIAL SCIENCES
ISSN Print: 1813–2235; ISSN Online: 1814–960X
08–056/AWB/2009/5–1–2–43–45
http://www.fspublishers.org

Full Length Article

Market Structure of *Acacia* Species (Gum Arabic) in Borno State, Nigeria

H.Y. UMAR, C.S. MESIKE[1], B.N. AGBONKPOLOR AND C.O.A. UGWUMBA†
Rubber Research Institute of Nigeria, P.M.B. 1049, Benin City, Edo State, Nigeria
†*Department of Agricultural Economics and Extension, Anambra State University, Nigeria*
[1]Corresponding author's e-mail: sammesike@yahoo.ca

ABSTRACT

The study utilized the data collected from 100 gum arabic marketers in 4 local government areas of Borno state through the use of structured questionnaire to examine the income distribution among *Acacia* spp. (gum Arabic) marketers. Descriptive statistics, Gini-coefficient and regression models were used to analyse the data collected. The result of the analysis revealed that 71% of the marketers were also farmers of some arable crops and 64% of them had 15 years and above experience in the gum arabic marketing. The Gini-coefficient result showed that the gum arabic market in the state was concentrated and there was high inequality in the income distribution among the gum arabic marketers. The rate of return to scale (RTS) was 1.061, which implied that gum arabic marketing in the study area was in stage 1 of the production function. This means that allocation of resources for the marketing of gum arabic in the state was irrational.

Key Words: *Acacia* species; Market structure; Gini-coefficient; Return to scale

INTRODUCTION

Acacia species commonly known as gum arabic is the exudates obtained from the various species of the genus *Acacia*. There are about 1100 species distributed over tropical and sub-tropical areas of Africa, India, Australia and America. However, only *Acacia senegal* (grade 1) and *Acacia seyal* (grade 2) yield gum at economic significance (Sean, 1997). The optimum conditions for the growth and performance of the plant are excessive heat, high elevation, sandy soils with scarcity of moisture.

The term 'gum arabic' was named by the Europeans for the Sudanese gums, because it was initially obtained at the Arabian points, such as Jeddah and Alexandria over many years ago (Sa'ad, 1996). The commercial use of gum arabic can be traced back to the year 2000 BC, when the Egyptians used it in foods, adhesive and paint industries (Abdul, 2002). Presently, Nigeria is second to Sudan in the world production of gum arabic. The production of gum arabic from the plants is done by wounding it deliberately or accidentally. The gum oozes out and becomes ready for collection after 3-4 weeks. Subsequent collections can be done bi-weekly two to three times from the same wound (Abdul, 2002; Abdullahi, 2004). Production of gum Arabic in Nigeria is largely form the wild (Olegbe, 1998; Abdullahi, 2004), however many efforts are made in the gum arabic growing states in the country to establish gum arabic plantation at large scale. The states include Borno, Yobe, Jigawa, Taraba, Adamawa, Zamfara, Kebbi, Gombe and Bauchi. The plant matures and is ready for tapping four years after planting. There was a total of 1,625.75 ha private owned gum arabic plantation, 9,766.5 ha private owned and about 2,449,000 ha of gum arabic forest reserve in Nigeria (NAGAPPEN, 2004). The demand for gum arabic is on the tremendous increase world wide due to rapid industrial growth in the world. Of course, the major determinant of the production of any industrial crop is its demand and the revenue derived from it. Thus better the market situation of a crop, the more the desire for higher production among farmers. This paper therefore seeks to examine the market structure of acacia species in Borno state with reference to product concentration in the market, income distribution and return to scale on gum arabic marketing.

MATERIALS AND METHODS

Four Local Government Areas (LGAs) in Borno State were purposively sampled for survey to examine the gum arabic market structure. These were Maiduguri, Bama, Gwoza and Konduga LGAs. Data were collected through the use of structured questionnaire. One hundred and twenty copies of questionnaire were randomly administered on gum arabic marketers in the four LGAs, out of which one hundred were retrieved and used for this study. A total of 30 gum arabic marketers each from Maiduguri and Bama that were randomly interviewed were considered; while 28 and 12 were also filled correctly and considered from Konduga and Gwoza LGAs, respectively. The data were analyzed using descriptive statistics, Gini-coefficient and regression models.

To cite this paper: Umar, H.Y., C.S. Mesike, B.N. Agbonkpolor and C.O.A. Ugwumba, 2009. Market structure of *Acacia* species (gum Arabic) in Borno State, Nigeria. *J. Agric. Soc. Sci.,* 5: 43–45

RESULTS AND DISCUSSION

Age distribution of the respondents. The result showed that people between the ages of 31-50 years participated more in the marketing of gum arabic in the state by 70% (Table I). The least participants were those between the ages of 30 years and below as well as those above 60 years at 6% level of participation of each group. This implied that people within the ages of 31-50 years were more dynamic and willing to take risks associated with gum arabic marketing in the state.

Major occupational distribution of the respondents. About 71% of the respondents were gum arabic marketers as well as farmers (Table I). Only 14% was reported to be gum arabic marketers; while 12% were marketers of gum arabic and other items. It is also indicated that 3% of the gum arabic marketers were civil servants. Majority of the respondents were marketers of gum arabic as well as farmers of arable crops. This implied that marketing of gum arabic is seasonal and the peak of it does not coincide with farming season in the state. Farmers of arable crops complete the regular farming operations between September and October each year, while the peak of gum arabic marketing starts from December to March each year. This translates to higher income and hence enhances their standard of living. These findings agreed with Usman (2007) that as individuals within a society become more specialized in their economic activities, they rely on others to supply at least some of the product which they needed.

Gum arabic marketing experience. The study revealed that 64% of the marketers had 15 years and above marketing experience, while 24% lie within 10-14 years of experience. The remaining 12% of the respondents had between 1-9 years experience of the gum arabic marketing (Table II). This implied that marketing of gum arabic has long been in practice in the state and ought to be source of income to many families.

Source of capital of the respondents. The source of capital for the gum arabic marketers is presented in Table III. The result showed that only 4% of the respondents got their capital through formal source, while the majority (96%) got their capital through informal sources. This indicated that the major sources of capital for gum arabic marketers in Borno State were from associations and friends/relatives. This further indicated that banks and government are not giving adequate support to gum arabic marketers despite high revenue generation obtain from the crop in the state. This might be due to low rates of loan recovery by banks and other government agencies as indicated by Onyebinama (2007) that loan recovery was less than 40% in Nigeria banks and other government financial agencies in Nigeria.

Gum arabic marketing out let in Borno State. Table III also presents the marketing out let of gum arabic in the state. The result indicates that cooperative buyers dominated the gum arabic market by 80%, while 20% of the marketers were independent buyers of gum arabic. This showed that certain group of dealers and companies that monopolized the market of gum arabic in the state. Consequently, this imposed a danger to easy entry into the gum arabic market in the state. Most of these companies dominating gum arabic market were foreign companies who exported un-processed gum. This implied that the indigenous companies were deprived of sufficient raw materials. Also, the country is deprived of value added after processing of the gum, leading to lesser revenue generation.

Market structure analysis of gum arabic in Borno State. Table IV presents the g market structure analysis of gum arabic in Borno state. Marketers within the sales range of N1.00–N200, 000 constituted 63% of the total marketers and this accounted for only 15.3% proportion of the total sales of gum arabic in the state. The marketers within the sales range of N200, 001–N400, 000 was 7% and they contributed 5% proportion on the total sales of gum arabic in the state (Table IV). Those that had the sales of N800, 000–N1 million constituted 18% of the marketer s' population; and their contribution to the total sales was 45%. There were also 12% of the marketers that had the sales range of greater than N1 million; and their impact on total sales of gum arabic in the state was 35%. The study thus revealed that majority of the marketers (63%) had little capital for running the gum arabic business, who could only show an impact of 15.3% proportion on the total sales of gum arabic in the state; while marketers of 18% with sales range of N800, 000 m- N1 dominated the gum arabic market in the state by 45% proportion of the total quantity of gum arabic sold in the state. The Gini-coefficient was 0.652 revealed that there was inequality of income distribution among the gum arabic marketers in Borno State.

Table I. Age and occupational distribution of the gum Arabic marketers in Borno State

Age (year)	%	Major occupation	%
30 and below	6.00	Gum Arabic marketing only	14.00
31 – 50	70.00	Gum Arabic marketing + Farming	71.00
51 – 60	18.00	Gum Arabic marketing + other items	12.00
Above 60	6.00	Civil Servant	3.00
Total	100.00	Total	100.00

Table II. Gum Arabic marketing experience of the marketers in Borno State

Years of experience	%
1 – 9	12
10 – 14	24
15 and above	64
Total	100

Table III. Source of capital of the gum Arabic marketer and the marketing out let in Borno State

Source of Capital		Marketing out let	
Types	%	Mode of operation	%
Formal	4	Independent marketer	20
Informal	96	Cooperative marketer	80
Total	100	Total	100

Table IV. Market Structure analysis of gum Arabic in Borno State

Sales (N)	No of sellers	Proportion of sales (X)	Cumulative Proportion of sellers	Total value of sales (₦)	Proportion of total sales	Cumulative proportion of total sales (Y)	XY
1 – 200,000	63	0.63	0.63	5491486	0.153	0.153	0.096
200,001– 400,000	7	0.07	0.70	1804614	0.050	0.203	0.014
800,000 – 1M	18	0.18	0.88	1614191	0.450	0.653	0.118
> 1M	12	0.12	1.00	12523109	0.350	1.000	0.120
Total	100.00	1.00	1.00	35,960,500	1.000	1.000	0.348

Gini – coefficient = 1 – ∑xy, but ∑xy = 0.348. Gini-coefficient = 1 – 0.348 =0.652

Table V. Coefficient of regression Analysis for determining the gum Arabic marketing performance

Variable names	Coefficient	Standard error	T
1. Constant	-1.076	0.161	-6.669
2. Age of marketing (yrs)	-0.048	0.108	0.442
3. Educational level	0.004	0.023	0.182
4. Household size	-0.019	0.036	-0.518
5. Marketing experience (yrs)	0.003	0.045	0.689
6. Type of marketing operation	0.141	0.055	2.535*
7. Labour cost (₦)	0.050	0.036	-1.390
8. Other operating expenses (₦)	0.612	0.058	1.494*
9. Purchasing cost (₦)	0.418	0.048	8.686*
Elasticity of Production	1.061		

Note: Elasticity of production: Sum of coefficient of variables 2 to 9.

Marketing function analysis. Double log regression analysis was used to determine the marketing performance of gum arabic in the study area. The explicit production function was:

$$Y = -0.048 + 0.004 - 0.019 + 0.003 + 0.141^{*} - 0.050 + 0.612^{*} + 0.148^{*}$$
$$(0.180)\ (0.023)\ (0.036)\ (0.045)\ (0.055)\ (0.056)\ (0.058)\ (0.048)$$

$R^2 = 0.985$ standard error = 0.061 F- value =808.22* * significant at 1%.

The estimated R^2 value of 0.985 implies that the postulated regressors explained 98.5% of the variation in the regressand, while the F-value indicated that all the variables used were involved in the gum arabic marketing. The result also shows that three variables had significant impact on the gum arabic marketing in the state. These factors are type of marketing operation (0.141), purchasing cost (0.612) and other operating expenses (0.418). This implies that a unit increase in each of these variables will lead to an increase in the quantity of gum arabic sold by the value of the coefficient of each variable.

Elasticity of production and returns to scale (RTS). The rate of return to scale (RTS) of the marketing functions was 1.061 (Table V). This implies that marketing of gum arabic in the state was in stage 1 of the marketing function. This revealed that resources allocation were irrational. On the other hand, it implies that adequate allocation of more resources in the marketing of gum arabic in the state will result to an increase in the quantity of gum arabic sold and more revenue in Borno State, Nigeria.

CONCLUSION

The study examined the market structure of gum arabic in Borno State, which indicated that gum arabic marketing in the state has long been practiced as 64% of the respondents had 15 years and above experience in the business. Furthermore, there was high inequality in the income distribution among the gum Arabic marketers in the state. The gum arabic market in Borno State is dominated by cooperative marketers.

Acknowledgement. The authors wish to acknowledge the Executive Director Rubber Research Institute of Nigeria (RRIN) for providing funds for this research work.

REFERENCES

Abdullahi, A., 2004. *Gum Arabic; Maiden Edition: Reports on Survey of Selected Agricultural Raw Materials in Nigeria*. Published by Raw Material Research and Development Council, October, 2004

Abdul, S., 2002. *Production and Commercialization of Gum Arabic in Sudan.* File: //A!/Commercial production of gum. Htm

NAGAPPEN, 2002. *Best Practice, Best Market, Workshop Paper on Training the Nigerian Gum Arabic Producer and Small Trader*. Published by Importer Service Corporation, Jersey City, New Jersey, September 2002 USA

Olegbe, P.E., 1998. Production and management of gum arabic in Sudan and sahelian zones of Nigeria. *J. Agric*., 1: 257–266

Onyebinama, U.A.U., 2007. Determinants of loan recovery In Imo state: Implication for the design of small holders loan schemes. In: *Proc. Nigeria Association of Agricultural Economics (NAAE) Conf. Held in Abubarkar Tafawa Balewa University, Bauchi, Nigeria, 5th-8th November*. Nigeria

Sa'ad, A.B., 1996. *Nigeria Export-Import Bank (NEXIM)*. Paper presented at the international seminar on gum marketing in Africa, Victorial Island Lagos, Nigeria, 27-28 November. Nigeria

Sean, G., 1997. *The Sudan Foundation*. An occasional paper published by the Sudan Foundation 212 London WC IV 9 LD UK

Usman, U., 2007. Role of agricultural marketing in Nigeria. In: *Proc. Nigeria Association of Agricultural Economics (NAAE)* Conference Held in Abubarkar Tafawa Balewa University, 5th-8th November, 2007, Bauchi, Nigeria

(Received 14 October 2008; Accepted 05 March 2009)