

Economic Analysis of Gum Arabic Production in Jigawa State, Nigeria

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ABSTRACT: The study examined the profitability of gum arabic production in Jigawa State. Data were collected using structured questionnaire supplemented with oral interview among 150 respondents in four Local Government Areas selected in the State. The data were analyzed using descriptive and inferential statistics. The results indicated that majority of the respondents (47.33%) were civil servants and 70.66% had gum arabic farm size of 1 – 4 hectares. The profitability analysis revealed that US\$254,860.00 was realized as total revenue and the gross margin (GM) was US\$243,557.46 which gives GM/ha/ year of US\$344.68. The mean profit per respondent was US\$1,581.34. Also, the analysis of revenue distribution among the respondents as calculated using Gini coefficient showed that there was high level of inequality distribution of revenue among the respondents. The study identified some constraints facing the gum arabic farmers in the study area and recommendations were made to overcome them.

[H.Y. UMAR; S. I. AUDU AND Y. WAIZAH. **Economic Analysis of Gum Arabic Production in Jigawa State, Nigeria.** New York Science Journal 2011;4(4):45-49]. (ISSN: 1554-0200). <http://www.sciencepub.net/newyork>.

Key Words: Gum arabic, profitability, Gini coefficient, budgetary technique

INTRODUCTION

Agriculture for majority Nigerians is more than a profession, rather a way of life. The country is known to be an agrarian economy since 1953 when the World Bank sent its first mission to study the country's basic economy. In the past, there were emphases on agricultural development by Federal Government through farm settlement schemes, supply of improved farm implements, cooperative plantation and expanded agricultural extension services. The plan improved agricultural sector in the country then, as available data showed that in 1960, the contribution of agriculture to Gross Domestic Product (GDP) was 61%. The discovery of crude oil however, distracted Government attention from agriculture which consequently led to decline of the contribution of the sector to GDP from 61% to only 7% in the 1980s (Oyedipe, 2001). The repercussion of the neglect shown to agricultural sector laid down the roots for laziness, poverty, dependence and accelerated corruption in the country. There was also an instant imbalance between population growth rate and food production in the country as statistical report indicated that population growth rate was 3.2% while food production growth rate was 1.2% and food demand growth rate was 3.2% since 1980 (Enwere, 1991). The Federal Office of Statistic and the United Nation also reported the implication of the decline in agricultural production that in the 1960s, poverty condition in Nigeria was 22%, but in 1985, it increased to 35% and to 45% in 1991. By 1996, the poverty incidence was 50% and quickly rose to about 80% in 1998 (Oyedipe, 2001). Agriculture's share in the total export earnings fell from 75% in 1960s to just

about 3% currently (Ruma, 2008). Ruma (2008) was also of the opinion that the migration of youths from rural areas to urban centres affected agricultural production output in Nigeria. The situation became alarming which drew government attention to her policies and programmes reform on agriculture. The new policies, tagged - 'vision 2020' – food sufficiency and poverty alleviation have agricultural development in focus which involved identification of some agricultural crops for elaborate production and marketing. Some of these crops are oil palm, natural rubber, gum arabic, cocoa, cassava, rice, cotton, cashew, maize and groundnut. Agricultural production can be referred to as the act of input – output relation of farm resources with the aim of maximizing profit or cost minimization to a farmer (Hill & Ray, 1987). Production of any agricultural produce is highly influenced by its demand. The demand and supply on the other hand are influenced by set of measures which include Government policies on production and marketing, and this directly affects the socioeconomic and physical characteristics of the citizenry. Gum arabic (*Acacia spp*) is a desert thriving plant. There are over 1100 species found grown wild in sub – Saharan Africa; especially in northern Nigeria where the climatic conditions are favourable for the plant's growth. However, only three of this species are known to be of economic importance, namely *Acacia senegal*, *Acacia seyal* and *Acacia seberina* (Bello, 1998). They are otherwise called grade 1, grade 2 and grade 3 gum arabic, respectively. The high demand of gum arabic Worldwide is connected with its strong binding and quality storage ability of substances (Abdul, 2002),

hence it is used in many manufacturing industries such as pharmaceutical, cosmetic, lithography, textile and pottery industries, and it happens to be one of the major export crops in some African countries like Sudan, Chad and Mali. Nigeria also earns some reasonable foreign exchange from gum arabic export (Umar, 2006). In fact the product is as precious as gold since time immemorial because it is reported that when Jesus was born "the three wise men that came from the East offered him *Frankincense, Myrrh and Gold*". *Frankincense* and *Myrrh* are refined and unrefined gum Arabic respectively (www. NGARA.com). it is also extensively used among Muslims as ink in writing Quranic verses. However, available record indicated that there is inadequate exploitation of the crop in spite of its strong production and marketing potentials in Nigeria. The plant is only susceptible to weeds attack at seedling stage but a necessary factor (weeds stress) for optimum gum production at maturity. There are eleven gum arabic production states in Nigeria and the six major ones include Jigawa, Yobe, Borno, Kebbi, Sokoto and Katsina States. Jigawa state was purposively selected for the studies due to her elaborate production scheme on gum arabic. Available data shows that Jigawa state have over 800 hectare of land cultivated under *Acacia senegal* (Jigawa Ministry of Gum Arabic; 2005). There are five zonal offices, namely Maigatari, Ringim, Dutse, Gumel and Gagarawa zones and one processing company (JIGACO) located at Maigatari, Free boarder zone. Production of gum arabic from nursery to processing stage is carried out in the state. The study therefore examined the socioeconomic characteristics of the respondents and the prospects of gum arabic production in the state.

MATERIALS AND METHODS

The Study area: Jigawa State is located in the North – West of Nigeria, sharing border with Kaduna State in the south, Kano State in the west, Bauchi State in the east and Yobe State in the north. The state is a semi – Sahara area. The climatic condition is harsh – high temperature fluctuating between 18 °C - 44°C and a mean rainfall of about 150 mm per annum (Jigawa Ministry of Gum Arabic; 2005). The dominant tribes are Hausa and Fulani. Their major occupations are farming and marketing. Among the popular cash crops grown in the State are gum arabic, groundnut, onion, cotton, and tomatoes. Other crops commonly grown in the State include millet, guinea corn, maize, rice, beans and sesame.

Data collection techniques: Multi- stage sampling techniques was used in the data collection. The first stage was a purposive sampling of four predominantly gum arabic production areas in the state,

namely Gumel, Maigatari, Ringim and Mallam Maidori ; while the second stage was a random sampling of gum Arabic farmers in these areas for administering of structured questionnaire and oral interview. A total of 200 copies of the questionnaire were administered among farmers, out of which 150 were correctly filled and used for the analysis of this study.

Analytical technique used: The data were analyzed using descriptive and inferential statistics. The descriptive statistics such as means, percentage and frequency tables were used to analyse the socioeconomic characteristics of the respondents; while inferential statistics such as budgetary analysis and Gini –coefficient were employed to analyse the profitability and income distribution respectively among the respondents of gum arabic farmers in the state.

Model specifications:

(i) **Budgeting/profitability analysis;** the formula is expressed as;

$$(a) GM = TR - TVC$$

Where;

GM = gross margin (N)

TR = total revenue (N)

TVC = total variable cost (N)

$$(b) NP = TR - TC.$$

Where;

NP = net profit

TR = total revenue

TC = total cost

(ii) **Gini- coefficient:** the formula is expressed as

$$GC = 1 - \sum XY.$$

Where: GC = Gini- coefficient, X = percentage of producers in the category,

Y = cumulative proportion of total production, and

= summation sign

RESULTS AND DISCUSSION

Socio- economic Distribution of Respondents:

Age distribution; The age distribution of the respondents indicated that 45.33% of farmers were within the age brackets of 20 – 35 years. Majority of the farmers were within 36 – 55 years (48.66 %), while the least were those within the ages of 56 – 70 years, and this accounted for 5.99% of the total respondents. This implies that most of the gum arabic farmers in the study areas were in their active stage (youths) and their productivity is expected to be high (Table I). This also indicates that the youths willing to learn about new technology, as Aturamu and Daramola (2005) reported that young farmers have been found to be more knowledgeable about new practices and may be willing to bear risk due to their longer planning horizons. This

is contrary to the opinion of Ruma (2008) that youths' migration from rural areas to urban centres has affected the agricultural production output in the country. On the other hand, the high demand for gum arabic worldwide might have encouraged the youths to participate in the gum arabic production, as production of any agricultural produce is highly influenced by its demand (Hill & Ray, 1987).

Occupational distribution of the respondents;

The occupational distribution of the respondents is presented in Table I. The result revealed that 47.33% was civil servants. This was followed by those who combined farming and trading (24.66%), while 23.33% of the respondents claimed to be full time farmers. This indicates that gum arabic business was mostly done by civil servants in the state. This may be due to the fact that the civil servants have easier access to gum arabic production packages more than the non – civil servants in the state. Because domestication and cultivation of gum arabic is a quite new policy by Federal Government of Nigeria to diversify agricultural output for export in order to minimize dependence on oil export as the only major source of revenue to the country. This implies that gum arabic cultivation is in its developmental stage whereby only the elite (educated ones) showed deeper interest in the business and as Aturamu and Daramola (2005) stated that farmers' perception of a specific package is a significant factor in determining the adoption of any technology.

Farm size distribution; The farm size distribution as presented in Table I indicated that majority of the farmers (70.66%) have only 1 – 4.99 hectares of gum arabic farms. Only 9.32% of the respondents have 13 hectares and above of gum arabic farms in the state. This implies that gum arabic farming in the state is mostly in the hands of small scale holders. This may be due lack of available farm land and/or fund to establish large scale of gum arabic farms. This reflects socio – cultural set up of many Nigerian communities who are peasant farmers; and also are mostly owned through inheritance. It may also be due to the fact that majority of the farmers are civil servants, they could not have sufficient time to open large farms. These conditions are unfavourable to large scale farming.

Respondents' constraints distribution; There were seven (7) factors identified as constraints hindering the respondents' maximum production capacity of gum arabic in the state. Four of these were ranked high, namely lack of capital (32 %), lack of technical know – how (21.33 %), lack of land (12.66 %) and poor yield of the crop (12.66 %) (Table I). This

implies that for gum arabic production to develop in the state these problems need to be addressed urgently. This may be done through provision of soft loans to the farmers and also the extension agents to establish stronger contact with the farmers through participatory activities necessary on gum arabic production techniques. There is need also to review the land tenure system of Nigeria that will encourage large scale farming.

Profitability analysis: Gross margin (GM) of budgetary analysis model was used to determine the profitability of gum arabic production in the study areas. The result indicated GM as US\$243,690 (N 36,553,619.00). This gives GM/ha./yr of US\$2344.68 (N51, 702.43). Total net profit (NP) was calculated as US\$237,200.77 (N35, 580, 116.00), which gives an average of US\$1581.34 (N 237,200.77) per respondent (Table II). This implies that gum arabic production in the state was profitable. This needs to be encouraged as Government of Nigeria in her National Economic Empowerment and Development Strategy (NEEDS) Programme targets 10 – 14% overall agricultural growth rate by the year 2011 to march the increasing population. From the result, the product (gum arabic) seems to be a promising one to revitalizing agricultural export from Nigeria which has fallen from 75% in 1960s – just 3% today.

Analysis of revenue distribution; Gini coefficient model ($GC = 1 - XY$) was used to determine the revenue distribution among the respondents in the state. The revenue generated among the farmers ranged from US\$166.67 – US\$8800 (N 2500–N1, 320,000.00). These were grouped in to five categories in order to determine the revenue distribution among the respondents. The respondents within the sales range of US\$ 0.01 – US\$97.78 (N 1.00 – N 200,000.00) formed the first category and they constituted about 63% of the total respondents which accounted for only 16.40 % of the total revenue generated. The sales category of US\$98.00 – US\$195.56 (N 200,001 – N 400,000.00) were 17.3% of the respondents, and they accounted for about 23.50% of the total revenue generated ; while those within the sales range of US\$196.00 – US\$387.10 (N 400,001 – N 600,000.00) was only 6.7 % which generated a total revenue of 12.20%. It was also indicated that 5.3% of the respondents formed the sales category of US\$388 – US\$533.33 (N 600,001 – N800, 000.00) which generated revenue of 14.40% of the total revenue. Those with sales range of greater than US\$533.33 (N 800,000.00) constituted 8.0% of the total respondents, and they generated about 33.5 % of the total revenue. Using the Gini –coefficient (GC) formula, GC was calculated as 0.678 which tends to unity; 1 (Table III).

This implies that there was high level of inequality in the revenue distribution among the respondents. This calls for provision of adequate incentives for gum arabic production in the study areas in order to

encourage mass production which will reduce inequality in income generation and enhance poverty alleviation among the farmers.

Table I: Socio- economic characteristics of respondents

Variable	Frequency	Percentage
Age		
20- 35	6	45.33
36- 55	73	48.66
56- 70	9	5.99
Occupation		
Farming only	35	23.33
Trading	37	24.66
Civil servants	71	47.33
Others	7	4.66
Farm size (ha)		
1 – 4.99	106	70.66
5 – 8.99	19	12.66
9 – 12.99	11	7.33
13 and above	14	9.32
Production constraints		
Lack of land	19	12.66
Inadequate capital	48	32.00
Lack of technical know- how	32	21.33
Lack of government support	12	8.33
Lack of improved seedlings	6	4.00
Poor market	14	9.33
<u>Poor yield</u>	<u>19</u>	<u>12.66</u>

Source: Survey data in Jigawa State, 2008

Table II: Budgetary/ profitability analysis

Variables	Values (US\$)
Total hectares	707 hectares
Quantity of gum Arabic produced and sold	155,300 kg
Fixed cost	6,490.02
Total variable cost	11,169.21
Total cost	1,769.23
Total revenue	254,860
Gross margin	243,690.79
Gross margin/ha/year	34,468.29
Net profit	237,200.77
<u>Net profit/farmer</u>	<u>1,581.34</u>

Source: Calculated from survey data in Jigawa State, 2008.

Table III: Analysis of revenue distribution

Sales (US\$)	No.of farmers	Prop.of farmers(X)	Cum.prop.of farmers	Total revenue(US\$)	Prop.on total revenue	Cum.Prop.on total revenue(Y)	XY
0.007–1,333.33	94	0.627	0.0627	41,406.67	0.164	0.1640	0.1028
1,334.00–2,666.67	26	0.173	0.800	60,050.00	0.235	0.399	0.0690
2,667.00 – 4000	10	0.067	0.867	31,095.00	0.122	0.521	0.0349
4001 – 5,333.33	8	0.053	0.920	26,823.33	0.144	0.665	0.0352
Above 5,333.33	12	0.080	1.00	85,485.00	0.335	1.00	0.0800
Total	150	1.00	1.00	254,860.00	1.00	1.00	0.322

$$GC = 1 - XY$$

$$= 1 - 0.322$$

$$= \mathbf{0.678}$$

Source: Calculated from survey data in Jigawa State, 2008.

CONCLUSION

The study indicated that gum arabic is a money thriving crop; which can serve as a good source of poverty alleviation among farmers in the state especially when the identified constraints are properly tackled.

RECOMMENDATION

More awareness campaign to extend the production techniques of gum arabic to the majority of the public will aid in a better revenue earning and production encouragement of the crop in the state.

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Date of submission: 10/03/2011.