GUM ARABIC (*Acacia senegal* (L.) WILLD.) PRODUCTION AND MARKETING PRACTICES IN SOME STATES OF NORTH-WESTERN NIGERIA

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ABSTRACT

A base-line study was conducted to assess farmers' practices on gum Arabic production in North Western states of Kebbi, Sokoto and Zamfara. A complete enumeration of gum Arabic farmers was carried out. Descriptive statistics using frequencies and percentages were used to analyse the data collected. Twenty one farms, equivalent to 577ha, of gum Arabic and other gum producing species were found across the three states. About 81% of the farmers purchased their planting stock. Establishment operations including spacing, pruning, weeding, irrigation and fertilizer application were carried out by 100%, 71.4%, 47.6% and 19% farmers, respectively. Majority (66.7%) of the farmers collect the gum from the natural exudates and 80.9% of them sell at the local market and at an average value of ₦850/kg for *Acacia senegal*. Majority of the farmers (85.7%) indicated low yield of gum as the most serious problem of gum Arabic production. Provision of certified planting materials, extension services and efficient post harvest operations could enhance gum Arabic production and marketing in the area.

Keywords: *Acacia senegal*, production practices; Harvesting and Marketing.

INTRODUCTION

Acacia Senegal is a multipurpose, highly commercial (Anderson, 1978a; Duke, 1981a; NAS, 1983) African tree belonging to the leguminous family and can survive and produce under difficult environmental condition (Yitebitu, 2004; ISC, 2005). The tree crop performes better around the 'gum belt' between latitudes 11°N and 14°N spanning across Borno, Yobe, Bauchi, Jigawa, Kano, Katsina, Sokoto and Kebbi States (NFTA, 1991; Bababe 2002). Acacia tree species in the hot and dry region of Nigeria are useful in the afforestation of arid tracts, soil reclamation and windbreaks, young leaves and the buds make good forage, the white wood is used for tool handles and black heartwood for furniture and the exudates called the gum [(188-2856g in the young and 379 to 6754 g in the old trees (Duke, 1981; Morton 1997)] are extensively used in foods and pharmaceutical preparations and in making pills and masking agent for acid testing substance. To enhance better production of the gum from *Acacia senegal* and other related gum producing species like *Combretum nigricans,* and *Acacia seyel*, important management practices like irrigation, fertilization, weeding and pruning (Nwoboshi, 1982; NAERLS, 1996), timing of harvest (Duke, 1983; Abdul Nour, 1997) and the use of appropriate tapping implement and techniques are very essential. Statistics on the local production, management and marketing

are hard to obtain, as a result it is difficult to predict market situations of gum in Nigeria particularly in the Northern parts of the country. Even with the introduction of National Accelerated Industrial Crops Production Programme, by the Federal Government to boost production of the gum Arabic, there is still a yawning gap between supply and demand of gum Arabic in the country, and there is lack of or inadequate dissemination of research information on gum Arabic production. More worrisome is the fact that most of the gum trees in the three north western states do not produce enough gum to justify expenditure on the farms and most farms had mixed stands of *A.senegal*, *A. nilotica* etc. which results in low yield of better grade gum.

The paper investigated the gum arabic plantation management practices, harvesting methods and marketing as practiced by the farmers in Kebbi, Sokoto and Zamfara States with a view to making suggestions for improvement and for economic advancement of people in the area.

MATERIALS AND METHODS

Study Area

The study was conducted in the North Western Nigeria comprising Kebbi, Sokoto and Zamfara States. The area is in the 'gum belt' of Nigeria between Latitudes 11°N and 14°N and Longitude $3.75^0 – 6.9^0$ E (Bashir, 1989). It is characterized by two prominent wet and dry seasons, rainfall ranges of 500-1000mm per annum, mean dry temperature ranges of 28°C in January to over 40°C in March/April, Humidity ranges between 40% in the dry season and 70% during the wet season (Kowal and Kassam, 1978).

Data Collection

A contact was made with the state Forestry Departments and Forestry (II) Project Units to ascertain the number of practicing gum Arabic farmers and their locations in each of the three states. There were twenty one gum Arabic farmers in the three states, ten (10) in Sokoto State, six (6) in Zamfara State and five (5) in Kebbi State.

Open ended questionnaires were used for the base-line survey and questionnaires were administered by personal contact. The gum Arabic farmers in all the three states were few, thus a complete enumeration was carried out. The data collected were analysed using frequencies and percentages.

RESULTS AND DISCUSSION

Table 1 showed that, Sokoto State has the highest number of 10 gum Arabic plantations equivalent to 130 ha owned by individuals and/or government. Kebbi State has the least number of 5 farms but accounted for highest farm size of 352 ha. The number of farms in Zamfara State stood at six (6) with a total of 95 ha. Average farm sizes were 13, 70.4 and 15.8 ha for Sokoto, Kebbi and Zamfara States respectively.

Table 1: Distribution and quality of gum arabic plantations in the study area

States	Type of stand	Number of farms	Total hectares	Average hectares	Species involved
Kebbi	Pure	3			*Acacia senegal*
	Mixed	2	352	70.4	*A. senegal, A. nilotica, A. seyel* and *Combretum nigricans*
Sokoto	Pure	5			*Same*
	Mixed	5	130	13.0	*Same*
Zamfara	Pure	4			*Same*
	Mixed	2	95	15.8	Same

2006 survey

The table also indicates the type and composition of the farms, pure stand involving only *A. senegal* and mixed stand made up of *A. senegal* mixed with other gum producing tree species of *Combretum nigricans A. seyel* and *A. nilotica*. An interview with farmers revealed that the mixed farms produced inferior quality gum as noted by Sanusi and Okali (1995).

Table 2 indicates the farmers' methods of acquisition and/or sources of Gum arabic seedlings and the establishment practices adopted. Seventeen farmers representing 80.9% purchased their seedlings, four farmers (19.1%) raised their own seedlings in private and government nurseries, only one farmer (4.8%) sourced seedlings from the wild, six farmers representing 28.5% got their supplies from Forestry II Project free of charge, one farmer (4.8%) was provided with the seedlings free by IFAD and a total of 13 farmers (61.9%) obtained seedlings from the State Department of Forestry. Establishment of trees involves so many operations ranging from the choice of inter and intra-row spacing to pests and disease control. The responses of the farmers on the different establishment operations adopted are shown in Table 2.

Table 2: Acquisition Methods/Sources of Planting Stock and Establishment Operations

Method of acquisition	Frequency (%)*	Establishment operations	Frequency (%)*
Purchased	17(80.9)	Spacing	21(100)
Raised	4(19.1)	Weeding	10(47.6)
Wild	1(4.8)	Irrigation	4(19)
Source(s)			
Forestry II project	6(28.5)	Fertilization	4(19)
IFAD/ACDP	1(4.8)	Pruning	15(71.4)
State Forestry Dept	13(61.9)	Pests and diseases control	0(00)

2006 survey; *Multiple responses recorded,

Spacing (4 x 4 m, 5 x 5 m and 3 x 3 m) is an important operation commonly practiced by all the farmers interviewed for better tree performance. Irrigation and fertilization were each practiced by 4 farmers, representing only 19% of the total number of

farmers interviewed. The most pronounced practice was pruning with 71.4% of the farmers involved. 4.7% of the farmers practiced weeding especially at the early growth period of the trees to avoid competition with the tree crops. None of the farmers was found making any attempt at pests and diseases control.

Table 3: Harvesting and marketing of gum products

Method of harvesting	Frequency (%)*	Market outlet	Frequency (%)*
Collection from natural exudates	14(66.7)	Marketing board	0(0)
Use of local tools (cutlass, axe)	8(38)	Buying agents	3(14.3)
		Local market	17(80.9)
Use of tapping knife	4(19)	Exporters	1(4.8)

2006 survey; *Multiple responses recorded

Farmers in their own way adopted different methods of harvesting the gum as indicated in Table 3. Fourteen farmers representing 66.7% collect the gum as they see it naturally exudating. Eight and four farmers representing 38% and 19%, respectively, were found using local tools and tapping knife. Improved harvesting devices were not yet in use except the use of tapping knife, because the production of gum Arabic in this part of the country is still at its infancy due to lack of awareness. Seventeen farmers representing 80.9% sell their produce at the local market, 3 farmers (14.3%) sell to the buying agents and one farmer (4.8%) sells to an exporter. Marketing board was not found in the area. The products were mostly in small quantities and taken to local markets state capitals, towns and villages. Few farmers sell to buying agents at agreed centres (example, Daki Takwas for gum producing farmers from Gumi, Bukkuyum and Anka in Zamfara State).

Gum Products Pricing

Gum from many producing species is sold at different prices depending on the grade or quality of the gum.

Table 4: Gum products prices and valuation

Gum producing trees	Price/kg ($ Exchange rate)	Valuation of the gum products by:
Combretum nigricans	200 (1.31)	Buying agents/Local market
Acacia Senegal	850 (5.6)	Exporters/buying agents
Acacia seyel	200 (1.31)	Buying agents/Local market

2006 Survey; Exchange rate N 153 per US Dollar ($) (August 2010)

Table 4 describes the prices at which farmers sell their gum products, but valuation is done by the buying agents and/or exporters. *Acacia senegal* selling at N850/kg attracted the highest price per kilogram and *Acacia seyel* and *Combretum nigricans* were selling each at N220/kg. The price variation was observed to be influenced by the grade of the products.

Problems of Gum Arabic Production

At the gum Arabic farm level, so many problems militate against its successful production in the three states. A range of problems have been outlined by the farmers as shown in Table 5 below.

Table 5: Distribution of respondents based on the problems faced in Gum Arabic Production

Problems	Frequency (%)
Poor soil fertility	5(23.8)
Poor planting materials	13(61.9)
Poor harvesting techniques	11(52.4)
Low yield	18(85.7)
Absence of incentives	7(33.8)
Poor extension services	8(38.1)
Absence of marketing board	5(23.8)
Bush burning	2(9.5)

Survey, 2006

Five farmers representing 23.8% expressed poor soil status as problem militating against gum Arabic production in the area, while 13 farmers (61.9%) indicated poor planting materials as another problem; 11 farmers representing 52.4% mentioned lack of technical know how on tapping as yet another problem., 18 farmers (85.7%) indicated low yield of species used as a problem.Other problems mentioned by the farmers included absence of marketing board, poor extension services and indiscriminate bush burning as a problem of gum Arabic production. These problems could be directly linked to inadequate knowledge of the correct variety and sound silvicultural practices by the farmers in the area and hence lower participation in the business of Gum arabic production.

CONCLUSION

From the survey conducted in the three states, it was revealed that there were both government and privately owned gum Arabic plantations distributed across the states. Some of the plantations were pure (*A. senegal*) while others were mixed with other gum producing trees such as *Combretum nigricans, A. seyel* and *A. nilotica*. It was observed that farmers were prepared to invest substantially in Gum arabic production provided the right package of silvicultural technologies and quality planting materials were available.

Efforts at mitigate problems facing gum arabic production, harvesting and marketing should be abreacted at provision of good planting materials from certified sources, choice of right tapping techniques and application of suitable silvicultural practices in order to improve the yield in farmers' field and natural stands. Other measures should include on the education and training to upgrade the gum arabic farmers and production and postharvest practices and establishment of standard market at state level.

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