

Original article

## Towards Green Gum Arabic Production in Sudan

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### Abstract

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The rural population of Sudan, and much of its urban population, depends on forests. Trees are the main source of energy and provide timber for roofing and building. The extensive benefits derived from forests include grazing, hunting, shade, forest foods in the form of tree leaves, wild fruits, nuts, tubers and herbs, tree bark for medicinal purposes, and non-wood products such as honey and gum Arabic. In addition, the commercial lumber industry is a small but growing source of employment. This paper aims at identifying the threats facing sustainable gum Arabic production.

Gum Arabic production and marketing in Sudan is witnessing many constraints which can be summarized as follow: expansion of mechanized rain fed agricultural schemes on natural forests, commercial fuel wood and charcoal making activities, late tapping, infestation of pests such as desert locusts and *Quealia quealia Ethiopica* birds, nomadic pastoralists. Furthermore, pricing policies of Gum Arabic Company limited financial budgets allocated for buying the gum from the, the importers of gum Arabic indirectly encourage the farmers to plant Taleh (*Acaciya seyal*) by claiming Taleh gum rather than gum from Hashab (*Acacia Senegal*), adverse climatic conditions. However, Sudanese gum Arabic in the international markets faces a lot of constraints viz. western and eastern African countries became more aware of the importance of this commodity, smuggling of Sudanese gum Arabic. They impose no taxes or fees on gum Arabic commodity, very limited domestic consumption, presence of synthetic compounds substituting it in foodstuff \manufacturing industries, limited international demand. Sustainable gum Arabic production can achieved through tapping at the optimum time, scheduling reforestation programmes and revising gum Arabic pricing policies and allotting sufficient fund encourage the gum Arabic producers.

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### Introduction

A wide range of forests and related vegetation types is found in Sudan due to regional variations in soil and rainfall. The most important types are listed as follows: desert and semi-desert trees and shrubs; riverine forests; low rainfall woodland savannah; high rainfall woodland savannah; montane and gallery forests; tropical forests; and plantations.

Most trees in Sudan grow in open to semi-closed woodlands with numerous under-storey of grasses and shrubs. Fully closed forests are only found in a few of the most humid areas in the south. This complicates attempts to quantify the extent of forests and deforestation in the drier regions, as there is rarely a clear deforestation or ecosystem boundary, but rather

a gradual thinning out of trees over a large areas.

According to FAO, the forestry sector contributes as much as 13 percent to the gross domestic product of Sudan. This valuable resource is threatened, however, by deforestation driven principally by energy needs and u clearance. Moreover, the unbalanced distribution of forests in Sudan – most of the remaining forests are found in the south, while the demand for forest products is highest in the north – presents a potential threat for north south peace, but also a significant opportunity for sustainable north-south trade development. The objectives of this paper are to identify the constraints of sustainable gum Arabic production and marketing.

### Methods

Data collection through using three methods:

- A-secondary data by reviewing the available literature
- B- interviewing of the producers using questionnaires and
- C- open interviewing the local officials and key informants

### Background to research problem

Desert vegetation in the northern states (Northern, Northern Darfur, Northern Kordofan, Kassala and Red Sea) is limited to xerophytic (drought resistant) shrubs, such as *Acacia ehrenbergiana*, *Capparis decidua*, *Fagonia cretica* and *Leptodemia pirotechnica*. Scrub formations occur in the semi-desert zone (the northern half of Kordofan and Blue Nile states, all of Khartoum state, most of Red Sea state, and some parts of Darfur). The vegetation is a varying mixture of grasses and herbs with widely scattered shrubs. Forest resources in the desert and semi-desert northern states are extremely limited and are continuously declining. Riverine forests are a critical resource for the northern states. They occupy the lands that are flooded when rivers rise in the latter part of the wet season. *Acacia nilotica* – the dominant species – is found as pure dense stands over large areas from the Egyptian border in the north to as far south as Jebelein on the White Nile, and Roseires on the Blue Nile. The species also occurs along the Dinder and Rahad rivers. In less frequently

flooded basins along the Atbara River and in some inland sites, *Acacia nilotica* is replaced by *Hyphaene thebaica* (Dom palm) forests.

The low rainfall woodland savannah region lies in the centre and south of the country, with the exclusion of the flood region. Rainfall is confined to a few months of the year (March or April to July), and is followed by a long hot dry season. The vegetation is composed of mixed grass types with bushes and trees, but species distribution within the low rainfall savannah zone varies with rainfall and soil type.

Sandy soils dominate in the west and central regions, and clay soils are prevalent in the east and south. In the drier parts, trees are nearly all thorny and low in stature, with a predominance of species of acacia. Broadleaved deciduous trees become prevalent in the wetter parts, but there is not as great a variety of species as in the high rainfall woodland savannah, and thorn trees are usually present. The gum Arabic belt lies within this zone. The belt occupies an area of 520,000 km<sup>2</sup> between the latitudes of 10° and 14° N, accounting for one-fifth of the total area of the country. Its importance is reflected in the fact that it accommodates approximately one-fifth of the population of Sudan and two-thirds of its livestock, and that it acts as a natural barrier to protect more than 40 percent of the total area of Sudan from desert encroachment. The density and variety of tree cover increases further south. Mountains in Sudan are characterized by higher rainfall, resulting in different and more robust woodlands than in the surrounding areas. The Jebel Marra plateau in Darfur is the most important ecosystem of this type in the drier parts of Sudan.

Plantations were first established in Sudan by the Anglo-Egyptian administration. This process was continued by the government forestry administration, and by the mid-1970s, plantations totaled some 16,000 additional hectares of hardwoods and 500 to 600 hectares of softwoods. Nowadays plantations are comprised of riverine *Acacia nilotica* forests, *Acacia senegal* plantations in abandoned mechanized farms, inside forest reserves, in private gum orchards, and in isolated

shelter belts planted in Northern Kordofan and other central states, pine and eucalyptus plantations in the Jebel Marra region in Darfur, and eucalyptus in the irrigated agricultural areas. There are several underlying causes of deforestation in Sudan; these are cumulative in nature and vary considerably from region to region: fuel wood and charcoal extraction; mechanized agriculture; traditional rain-fed and shifting agriculture; drought and climate change; over browsing and fires; direct conflict impacts; commercial lumber and export industry (not a major factor); and traditional construction.

## Results and Discussion

### Causes of non sustainable gum Arabic Production and Marketing

After post field survey the following constraints, facing gum Arabic production and marketing, had been identified:

- a) Expansion of mechanized farming schemes at the expense of natural forests,
- b) wood and charcoal production
- c) Fierce attack of natural forests by nomadic pastoralists
- d) Pricing policy of Gum Arabic company
- e) The negative relation between gum from hashab and gum from Talih. The importing countries encourage the producers to plant *Acacia melifera* Kitir instead of *Acacia senegal* by claiming Talha gum rather than gum Arabic
- f) Late announcement gum arabic prices by the company
- g) International conspiracy against Sudan
- h) Adverse climatic conditions

### Expansion of mechanized farming schemes at the expense of natural forests,

Dali schemes replaced 205,000 feddans of natural forests. This reduction in areas previously occupied by natural forests was directly reflected on gum Arabic production. This expansion was attributed to Sudan government

policy towards food security. Clearance of forests for cultivation since at late fifties and early sixties times the cost was rather low as well as that productivity was high. At present the area under this sector has reached 662,000 feddans which were occupied in the past of natural forests.

- Large scale commercial fuel wood and charcoal production. Despite the fact that local forestry authority gives annual permission for fuel wood and charcoal producers yet, some traders are practicing illegal removal of forests. Not only that they exceed the areas devoted to them by the authority.



Figure 1. A charcoal market in Khartoum

- For building houses (Red Brick Industry)

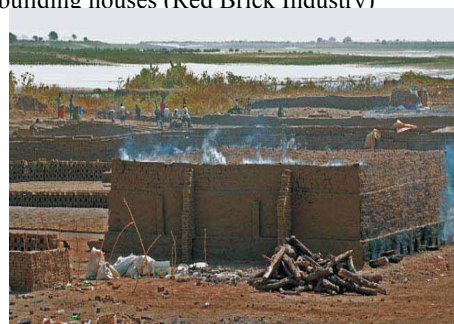


Fig. 2 Brick kilns on the banks of the Blue Nile, in El Gezira state.

The brick-making industry is a major market for fuel wood.

### Pricing policies of Gum Arabic Company:

The local traders are essential elements of the local gum Arabic markets because they have great experience and influence in buying, cleaning and assorting the gum higher prices. These prices experience continuous increase every

season.

### **Constraints of Sudanese gum Arabic in the international markets:**

According to Gum Arabic Company (1995) these constraints could be summed up in the followings:

- Western and eastern Africa countries lie in the gum Arabic belt (viz. Nigeria, Chad, Mali, Niger, Mauritania, Senegal and Ethiopia), became aware of the importance of this commodity. As result they increased the forested with Hashab and look for support from consumers' countries such as France with Chad. USAID conducted seminars and workshops in these countries for improving and increasing their gum Arabic production. The above mentioned competing countries produce about 10,000 tons/ annum.

No taxes and fees taken or imposed on Gum Arabic commodity in these competing countries in contrary to Sudan where heavy taxes and fees are taken from it as they appeared below:

- |                                     |              |
|-------------------------------------|--------------|
| • Ushor and Gebana                  | 8%           |
| • Agricultural production taxes     | 2%           |
| • Zaka                              | 10%          |
| • Support to the producing states   | 5%           |
| • Forestry corporation              | 5 %          |
| • Road fees                         | 20%          |
| • Support to gum producer union fee | Ls. 5/kantar |

### **Late announcement of Gum Arabic prices**

It is very crucial to mention that the competing countries are used to announce their prices after Sudan. This delay enables them to reduce their prices to the extent that they can sell their whole production at rather lower prices.

### **Smuggling of Sudanese gum to the neighbouring countries:**

It occurs because Gum Arabic Company is monopolizing the market and dominating it.

### **Limited local consumption of gum and demand in the international markets:**

There is a very limited local consumption of gum (since it ranges between 25,000 – 30,000 tons per year, the average exported Sudanese gum Arabic is about 20,000 annually).

Moreover, there are limited trails for the processing of raw gum before exporting it to the international markets. This in turn implied the importance of efficient planning and flexible marketing policies so that added values can be obtained.

### **Availability of synthetic materials**

On the basis of the above mentioned factors Sudanese gum Arabic production and exports are experiencing non-sustainability.

### **The negative role played by Government:**

Although the cost of production of gum Arabic is negligible compared to other agricultural crops, yet the government puts heavy burden on it. Tremendous changes in the international markets since the importing countries s themselves to other substitutes which have lower prices e. g. USD 1400 per ton compared to prices announced by Sudan ( USD 4000 per ton. Moreover, the other negative international market dropped even at lower prices. Despite of this, the government had continued or to impose higher customary rates on this commodity which reached in year 1998 more than 15 billion SDG taken from gum Arabic company alone. Added this, so many taxes under different names e.g. zaka, ushor and gebana. The net result of these pricing is non sustainable return from this commodity

### **The international conspiracy against Sudanese gum Arabic**

There are certain specifications or prerequisites for any commodity to be sold in the international market. With regard to gum Arabic certain definition had been prepared by a group of experts from the international consultants of FAO and WHO in 1978. This definition had been revised during years 1982, 1986, without any change in specification

(personal communication of the author).

The definition of gum Arabic during the period from 1978 – 1986 was that "gum Arabic is the dried exudation obtained from stems and branches of *Acacia senegal (L) wildnew* or closely related species of (*Acacia family leguminase*). It consists mainly of high molecular-weight polysaccharides and their calcium, magnesium and potassium salts, which on hydrolysis yield arabinose, galactose, rhamnose and glucuronic acid.

The article of commerce may be further specified to the viscosity since in 1990 a change in definition took place adding "or the related species of *Acacia*" instead "closely related species. Another two new properties : rotational viscosity (260-340) and nitrogen ( from 0.271 to 0.391) were put under the title identified test".

These two properties did not coincide with all gum but they are confined to gum from Hashab. Not all *Acacia* gum other than hashab can have the same effect of rotational viscosity and nitrogen content. This makes the of addition of words related to other species is redundant.

In 1992 an experts Committee of Food Additive (JECFA) announced but without mentioning the two specifications. As a result of this definition a technical Sudanese Committee said that the definition should be read as follows: "Gum Arabic is the *Acacia Senegal(L) Widely* (family leguminosae". It consists mainly of salts and arabinose. Sudanese mission participated in the meeting launched in Dan Hague (The Netherlands) on March 1998 and Sudan opposed the proposal of changing the definition which stated that:

"Gum Arabic is the dried exudation obtained from stems and branches of *Acacia senegal (L) wildnew* or closely related species of (*Acacia family leguminase*)".

*Acacia seyal* (Talih) is the closely related species. Gum Arabic from *Acacia seyal* (Talih) is sometimes referred to as Talha.

The rotational viscosity was added as follows:

- gum from *Acacia Senegal*: water solutions are levorotatory.
- gum from *Acacia seyal*: water solutions are dexorotatory

without any specification of rotational viscosity is due to big difference

This ambiguous definition leaves the gate open for objection the ne of other *Acacias* gum from other genera in the future. Due to the objection of Sudan, supported e other countries, this standardization returned to FAO food experts committee definition. The existing standardization is that of 1990.

On the other hand the conspiracy against Sudan continued through increasing the export of gum Talh at the expense of gum from Hashab.

According to Dali Gum Arabic production Union, these constraints

- 1- Drought periods lead to felling of trees and reduction in the producing areas
- 2- Gum Arabic marketing policies
- 3- Attack of Hashab trees by nomads

## Conclusions and Recommendations

### Conclusions

The non sustainability of gum Arabic production and marketing was to be caused by :

- 1- late tapping
- 2- insufficient rains
- 3- gum Arabic marketing policy
- 4- gum smuggling to neighbouring countries
- 5- international conspiracy against Sudan
- 6- encroachment of mechanized farming schemes on vast areas of natural Hashab forests

### Recommendations

To attain sustainable gum Arabic production and marketing the following recommendations can be drawn:

- 1- tapping at the optimum time
- 2- scheduling reforestation programmes

- 3- control of pests and diseases
- 4- revising of gum Arabic pricing policy
- 5- Abolition of heavy taxes
- 6- Smuggling combating campaign

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