

## **POLICY NOTE**

### **Export Marketing of Gum Arabic from Sudan**

**March 2007**

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## **Summary**

Sudan is the world's largest producer of gum arabic, which is one of the four important agricultural export commodities from Sudan, along with livestock, cotton and sesame. Over the last 20 years, gum arabic export value amounted on average to \$US 40 million annually. While there has been government intervention in the marketing of all agricultural exports in the past, gum arabic is the only one for which government controls remain.

Gum arabic is mostly produced by small-scale farmers in traditional rainfed farming areas. They represent up to 20 percent of Sudan's population and are among the poorest. The impact of the current gum arabic marketing policy has not been beneficial to this group. This has led to reduced production and consequently exports, declining for the past forty years at an average rate of 2.2 percent per annum.

One of the key commitments made by the Government of National Unity under the Joint Assessment Mission framework was to "abolish the export monopoly" over raw gum arabic. This commitment has not been implemented.

The development of the processing industry over the last three years has resulted in increased domestic competition for raw gum, and in turn better prices paid to farmers as well as more value added captured in Sudan. This positive development comes at a propitious time as increased consumption of soft drinks and confectionary products, as well as rapid development of health and dietetic products is boosting the world demand for gum arabic.

This paper suggests that decontrol of the gum arabic export market could increase export revenues for Sudan and raise significantly the income of small scale farmers.

## **Objectives**

The objective of this policy note is twofold:

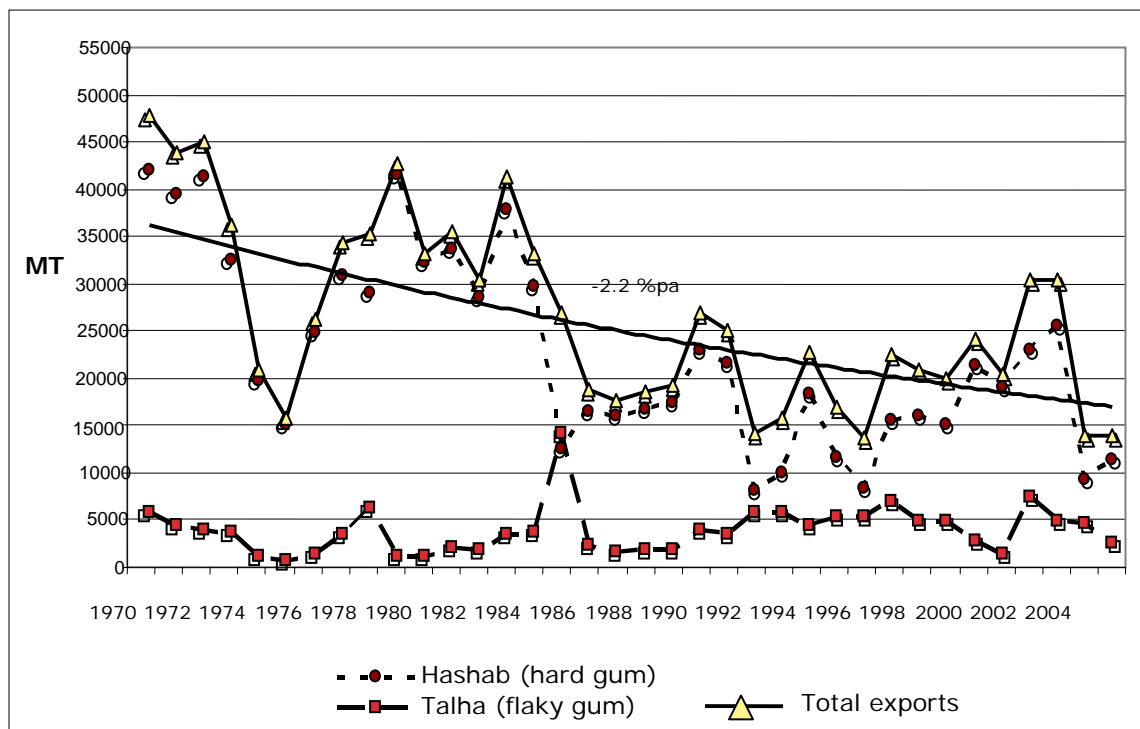
- (a) to assess the impact of the Government policy for the export marketing of gum arabic,
- (b) to identify options for changing the current marketing arrangements in order to increase and stabilize gum exports, capture more value added in Sudan and provide producers with a larger share of export prices.

## A. Importance of Gum Arabic / Background

1. Gum arabic is the dried exudate produced from the trunk and branches of the *Acacia senegal* tree, known as hashab or hard gum, and the *Acacia seyal* tree, known as talha or flaky gum<sup>1</sup>. Gum arabic is a pale white to orange brown solid which breaks with a glassy fracture. If stored properly, it stays unaltered for decades. Gum arabic is a complex polysaccharide that has food, pharmaceutical and technical applications; its known uses go back about 5,000 years.

2. Sudan is the world's largest producer of gum arabic. It produces mostly hashab<sup>2</sup>, principally in the traditional rainfed areas of western and central Sudan (see Annex 1). Gum arabic is produced across sub-Saharan Africa, from Senegal, Mali and Nigeria to Ethiopia and North of Kenya.

Figure 1: Gum Arabic Exports from Sudan (1970 to 2005)



Source: Gum Arabic Company

3. The supplementary revenues generated by gum arabic are crucial to the livelihoods of about 6 million people in Sudan who live in traditional rainfed farming areas, where the incidence of rural poverty is in the range of 65 to 90 percent.

4. Gum arabic is primarily produced by small-scale farmers<sup>3</sup> who give priority to food crop production (usually sorghum or millet) to secure family nutritional needs but

<sup>1</sup> Talha is more brittle than hashab.

<sup>2</sup> From *Acacia senegal* var. *Senegal*.

<sup>3</sup> Large gum plantations represent less than 5 percent of the total production.

seek other sources of income to meet the household's basic needs other than grains. They harvest gum arabic because this activity constitutes a crop diversification strategy to mitigate crop failure. In addition, the acacia tree's long lateral root system reduces soil and wind erosion. It has a regenerating impact on the land<sup>4</sup>. However, gum arabic production does compete with food and cash crops for labor resources and land allocation (see Annex 1).

5. Agricultural operations, including gum arabic harvesting, are primarily financed by village traders using the *sheil* system. Typically, the traders provide cash, seeds, tools but also basic commodities (water, sugar, tea...) for the households to get by during the "hunger gap". Farmers pay back in kind at prices determined early in the season and usually integrating important credit charges.

#### *World trade of gum arabic*<sup>5</sup>

6. All the gum arabic produced in Sudan, mostly hashab, is exported. Sudan has always been the largest world producer and exporter of gum. From the 50's to the early 90's, Sudanese gum accounted for 80 percent of the global gum trade<sup>6</sup>.

7. However, considerable year-to-year variations and overall declining gum exports from Sudan - consequences of two severe Sahalian droughts (mid-70s and mid-80s), political unrest and inadequate marketing arrangements - have resulted in the emergence of new gum producing countries, chiefly Chad and Nigeria, which produce mostly talha. Over the last 15 years, Sudan's share in the world markets has declined sharply and is now below 50 percent. World exports of talha are almost on par with exports of hashab (see Annex 1).

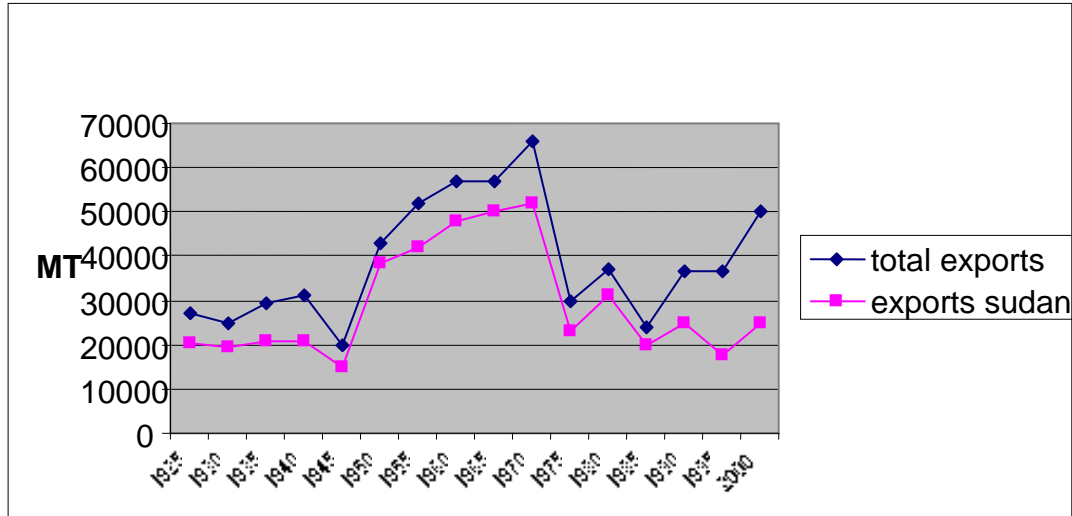
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<sup>4</sup> As a leguminous tree, acacia fixes nitrogen which improves soil fertility. Sorghum grown on former acacia gardens gives high yields.

<sup>5</sup> There are no official statistics on the production or exports of gum arabic currently available. Reliance has to be made on customs statistics, different experts' reports and partial statistics.

<sup>6</sup> From 50,000 tons per annum in the 50's and 60's, Sudan's gum exports declined to around 25,000 tons in the late 80's. Since then, Sudanese exports have been at an average of 25,000 tons. World exports of gum gradually fell from over 60,000 MT in the mid 60's/early 70's to around 30,000 MT in the 80's to mid 90's. They then rose from 30,000 MT in the mid-90s to 50,000 MT in 2000 and have remained fairly stable since then.

**Figure 2. World Trade of Raw Gum Arabic**



Source: Macrae, J. and Merlin, G - WB

### World Demand for Gum Arabic

8. Gum Arabic is used for its properties as an emulsifier, thickener, binder, stabilizer and adhesive. It is believed that soft drinks and confectionary represent 70 percent of the demand for gum arabic.

9. Gum arabic is generally used as an additive which represents a small portion of the cost of the finished product. It is regarded by end users as having technical advantages which makes it difficult to replace completely in many applications<sup>7</sup>. This makes demand for gum quite price inelastic; supply is the key factor on the demand side.

10. In the 70s and 80's, because of reduced supply from Sudan, end-users started to integrate substitutes (principally starches). However, since the 90's, with the emergence of Chad and Nigeria as gum talha producers, use of substitutes has reduced sharply<sup>8</sup>.

11. Talha has become hashab's main competitor<sup>9</sup>. Talha gum is substantially cheaper than hashab because it has inferior technical properties for some of gum arabic's important uses such as in the soft drinks industry but has the same chemical composition (see Annex 1).

12. Demand for gum arabic is driven up by the increasing world consumption of soft drinks and sweets. It is reinforced by the attention given by consumers to food products'

<sup>7</sup> In confectionery, for example, starches - the main substitute for gum arabic - do not retain the flavour as well as gum arabic; in cola-type soft drinks, use of substitutes can adversely affect shelf life (FAO Coppen, 1999).

<sup>8</sup> Reverting to gum arabic was also encouraged by the sharp decline in raw gum arabic export prices that started in the mid-90's. Though demand for gum is quite price inelastic, it would be relevant to study price substitutability by assessing some evidence on starch prices (or other substitutes) relative to processed gum arabic prices. This is quite a complex task as substitutes do not have the same technical properties as gum, so volumes required are different and can vary strongly according to applications and products.

<sup>9</sup> In 1998, the Joint FAO/WHO Expert Committee on Food Additives (JECFA) specification for gum arabic for food use, which hitherto only included hashab, was modified to also include talha.

quality and naturalness. Because of its high fiber content, gum arabic has recently found a new range of applications in the dietetic food and health sub-sectors<sup>10</sup>.

13. Four processors account for about 70 percent of the world trade of raw gum. Based in Europe and the USA, they buy raw gum for further transformation and re-sale as additive for the industry. The USA is the largest single market for gum arabic, accounting for approximately 30 percent of the total trade. Europe is around 20 percent of the world trade. Confectionary represents the major use for gum in Europe while soft drinks production is the largest in the USA. Japan accounts for a little less than 10 percent of world trade. India, South Korea and China are emerging markets; it is believed that the demand from these countries is mainly for talha.

## **B. Gum Arabic Marketing in Sudan**

14. Export marketing of gum arabic for Sudan has been characterized by the monopoly of the Gum Arabic Company over export of raw gum arabic and, over the last fifteen years, by the assumed strong influence GAC's main four international agents have had on GAC export prices. This cartel situation has translated into low prices paid to farmers, and in turn declining gum production and exports. However, since the recent development of the Sudanese processing industry, farmers have started to receive better prices, thus stimulating production, and more value added has been captured in Sudan.

### *The Gum Arabic Company*

15. In 1969, the Minister of Supply and Internal Trade granted the Gum Arabic Company (GAC), a public company incorporated under the Companies Ordinance of 1925, an exclusive concession to export raw gum arabic. The Grant of Concession Act stipulates that GAC is empowered to buy from licensed local dealers and "*is obliged to pay special attention to the quality, shipments schedules and any other aspect that may promote the export of gum*".

16. Granting GAC an exclusive concession over raw gum arabic export<sup>11</sup> had one main objective: to exercise market power at the international level (i.e. to regulate exports to achieve advantages in price) in order to support the country's export revenues in foreign currency. This was justified by Sudan's large share of the world market. Two other objectives were: (a) to guarantee production and protect producers through the provision of a minimum price policy (floor price) and the implementation of gum production development programs (through provision of water, seedlings, research services...)<sup>12</sup>, and (b) to protect the environment because of the expectation that the policy would encourage the maintenance of gum arabic trees.

17. The involvement of the Sudanese government in GAC management is very strong: the board of the Gum Arabic Company is chaired by the Under Secretary of the Ministry

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<sup>10</sup> This application would concern primarily talha, which has a nutritional value similar to hashab.

<sup>11</sup> In theory, investors and/or land owners with more than 5000 feddans (around 2000 hectares) planted with Acacia trees also have the right to export raw gum arabic. It is also possible for companies to export processed gum providing they obtain a license.

<sup>12</sup> Responsibility for technical support to producers was later transferred to the National Forestry Corporation of the Ministry of Agriculture.



of Trade, and comprises the General Manager of the National Forest Corporation, the Governor of the Central Bank of Sudan, in addition to representatives of the Sudan Farmers Union.

*Main features and impact of the GAC exclusive concession*

18. Every year, two months before tapping starts, the GAC announces the export price (fob Port Sudan). It is set based on the marketing strategy of GAC which takes into consideration information on world demand provided by GAC's agents overseas, the anticipated availability of gum production, and stocks. The export price is used as the starting point for the calculation of a floor price<sup>13</sup>. It is also used as a benchmark by exporters in other countries, i.e Chad and Nigeria for setting the price for their gum arabic.

19. GAC enforces the announced floor price at auction markets<sup>14</sup>, where raw gum arabic is purchased by independent buyers<sup>15</sup> who clean, grade and sell their gum to the GAC or processors. If gum arabic is not bought or not offered the floor price at auction, GAC has the obligation to procure at the floor price.

20. Taxes are levied at locality level<sup>16</sup>; they represent currently between \$200 to \$400/MT (*see Annex 2*). Additional taxes are collected from transport operators by localities on the way to Khartoum and Port Sudan where GAC and processors have their stores and processing facilities; processors and transporters claim that some of these taxes are illegal.

21. Box 1 describes the four grades of gum arabic currently exported, namely (a) hand picked selected (HPS); (b) kibbled (including the *cleaned* grade); (c) mechanical powder; and (d) spray dried powder.

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<sup>13</sup> Estimated costs for cleaning, handling and preparing the gum for export, transport to Port Sudan as well as domestic taxes, export duty and taxes, insurance and other financial charges, and GAC profits are deducted from the export price to set the floor price.

<sup>14</sup> El Obeid is by far the largest auction markets in Sudan, other important markets are in Damazine and Kosti.

<sup>15</sup> Until 2002, GAC had its own network of domestic agents.

<sup>16</sup> In 2001, the Government of Sudan abolished the State agricultural commodity tax. A federal fund was established to compensate losses to States.

### Box 1: The Four Grades of Gum Arabic Exported from Sudan

Hand Picked Selected (HPS) is raw globules of clean gum arabic specially sorted and graded. It represents 10 percent of export which goes mostly to Japan for further processing into powder.

Kibbling is a process that involves breaking down gum lumps with hammer mills to produce smaller and more uniform granules. The Sudanese Standard and Metrology Office (SSMO) has established two specifications for kibbled gum: (a) *kibbled grade*: granules with a maximum size of 14 mm and a minimum size of 3mm and a maximum range of 8mm; and (b) the *cleaned grade*: gum lumps broken manually, with no limit on the granule size. The clean grade is considered raw gum by buyers; it constitutes GAC's main export.

Spray drying is a process by which raw gum is dissolved in water, centrifuged to remove impurities, pasteurized and sprayed in hot air to evaporate water. Spray drying produces free-flowing powder with high solubility. Spray drying process is similar to milk powder production; the same production technology is used.

Mechanical powdering consists of crushing raw gum until free-flowing powder is obtained. It is less energy consuming than spray drying, therefore cheaper to produce and less subject to bacterial contamination

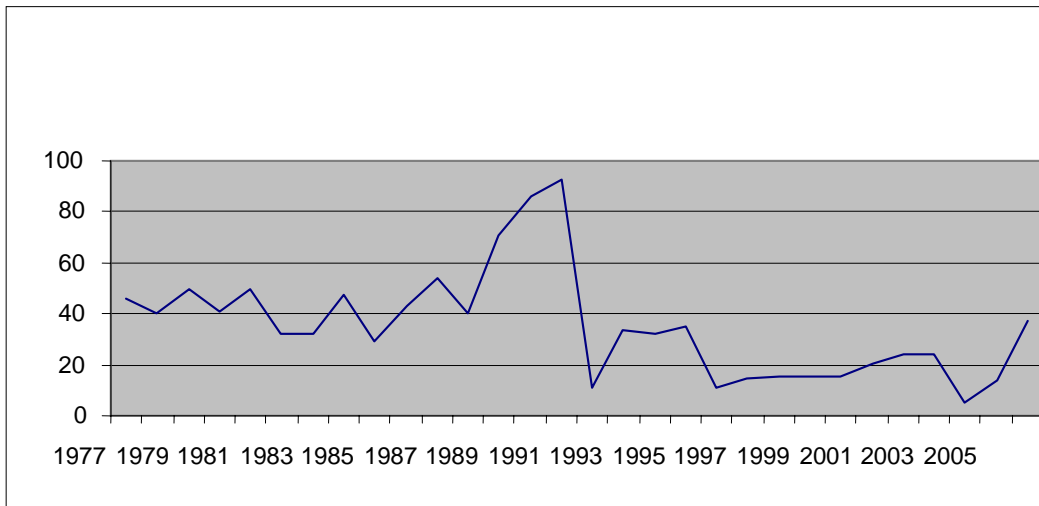
Until the recent development of processing in Sudan, all the gum arabic from Sudan was exported by GAC in raw form. A few facts have accumulated on the marketing and amounts of gum arabic exported by GAC:

- The cleaned grade, which constitutes the bulk of GAC's exports, is exported mostly via the GAC "international agents"<sup>17</sup>: international companies which are GAC marketing agents with exclusive rights. Four of these international agents buy an estimated 70 percent of the GAC's exports<sup>18</sup>; they have their own processing capacity, and sell processed gum (usually powder or spray dried) to large confectionary and soft drinks manufacturers in Europe and the USA.
- Two major European confectionary manufacturers buy up to 5,000 metric ton per year of cleaned grade directly from GAC.
- All HPS from Sudan is sold by GAC; it is purchased mainly by Japanese traders who account for about 10 percent of total gum arabic exports from Sudan.

<sup>17</sup> It is understood that there are 8 companies registered as GAC international agents. It seems there are no transparent criteria to select and appoint GAC agents.

<sup>18</sup> One of these four companies has 50 percent share of the world market for processed gum arabic and is said to buy around 40 percent of GAC's exports.

**Figure 3: Floor Price as a percentage of Export Price - Hashab gum – Sudan 1977 to 2006**



Source: GAC

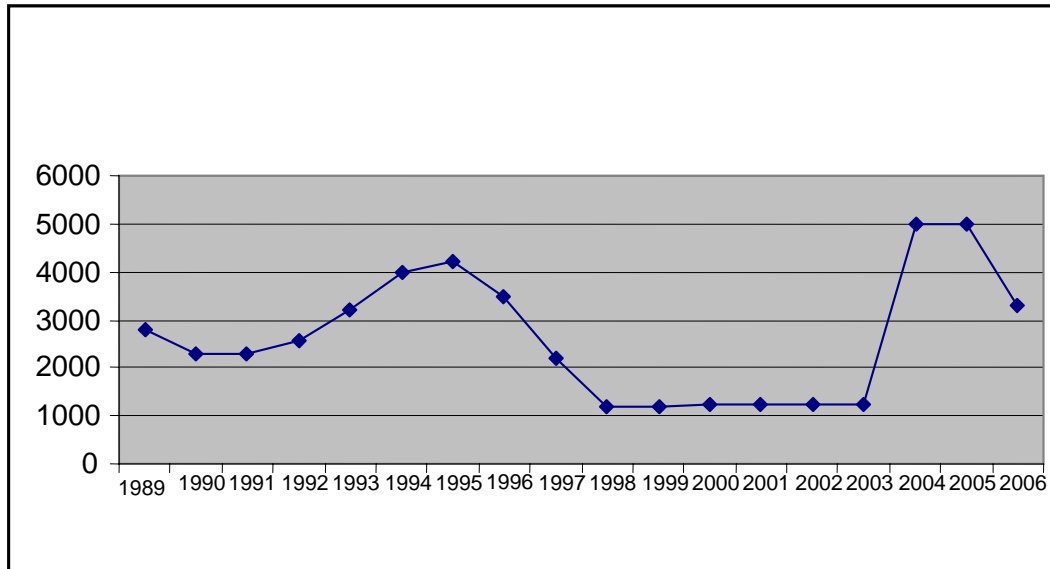
22. The gum marketing arrangements have provided producers with only a small share of export prices; from 1993 to 2005, the average floor price/export price was 21 percent.

(Figure 3.) It has to be made clear that producers usually get substantially less than the floor price because they rarely access auction markets directly: the gum is handled by the village merchant and sometimes an additional intermediary before it reaches the auction market. From 1998 until 2003, GAC export prices and therefore floor prices were exceptionally low. (Figure 4.) This had a depressing impact on production.<sup>19</sup> Because the export price is determined by GAC in close consultation with its international agents, disclosure of financial statements of the four main GAC international agents who process raw gum and sell it to end users would be desirable to provide transparent information on profits<sup>20</sup>.

<sup>19</sup> In 2000, hashab production in Sudan reached an all time low level of 3,500 tons. With very low floor price, producers did not have incentives to tap acacia trees, an activity competing with harvesting of food and cash crops. In some areas, farmers even resorted to fell acacia trees to plant more crops. Exports were constituted of GAC stocks accumulated since the mid 90's.

<sup>20</sup> The GAC export price from 1998 to 2003 was around 10 percent of the estimated price for processed hashab, and even lower than raw talha gum (of inferior quality) exported by Chad and Nigeria.

Figure 4: Export Price of Gum Arabic - (Fob Port Sudan \$US/MT)



Source: GAC

#### *Impact of the development of the Sudanese processing industry*

23. The impact of key policy changes on the sector over the last fifteen years are:

- From 1990 to 1992, the GAC concession was withdrawn. During this short period, traders and banks bought gum arabic from auction markets, domestic demand was high, and producers received a high share of export prices. At the end of 1992, the exclusive GAC concession was reintroduced.
- In 2002, a presidential decree was passed to withdraw the concession from GAC with the objective to allowing more firms to trade in raw gum arabic in order to revive gum production. Three months later, the Parliament refused to endorse this decree.
- In 2003 and 2004, the Ministry of Investment granted 12 licenses to gum processors<sup>21</sup>, including the four main GAC international agents who established processing facilities (crushing facilities to make “cleaned grade”) in Sudan in order to ensure improved supply of gum for their processing lines in Europe or America<sup>22</sup>. This had the following impact:
  - Increased competition for domestic gum between GAC, its international agents and other processors pushed up prices paid to producers and export prices<sup>23</sup>;

<sup>21</sup> Export licenses are granted by the Ministry of Foreign Trade, which also chairs the GAC board.

<sup>22</sup> Processors also include 8 national processors, out of which two are contracted by an Irish dairy company. In 1994, a first license was granted to Gum Arabic Processing Company (GAPC). It was sold to GAC in 1998. Export licenses are granted by the Ministry of Foreign Trade.

<sup>23</sup> In 2004, while floor price was set at SD 3000/ kintar <sup>23</sup>prices at auction markets<sup>23</sup> went from around SD8,000/kintar (first tapping) to SD16,000 / kintar (second tapping).<sup>23</sup> In 2005, with a floor price around SD7,500 SD, price paid at

- GAC purchased too much gum - at a very high price - that it cannot export
- because of lower actual purchases by its usual clients: GAC main international agents now have their own processing facilities in Sudan; and the two European confectionary factories traditionally buying from GAC have started to source kibbled gum from Sudanese processors.

24. Three years after licenses were given to processors, they now represent 30 percent of all gum exports from Sudan. Current estimates for GAC stocks are between 15,000 to 20,000 MT. Accrued in two years, these stocks represent a real threat to the company's financial stability<sup>24</sup>. This underlines GAC weak marketing capacity.

25. Another consequence of the development of the processing industry is that farmers have received better prices, which had a positive impact on gum production. Prices they obtained were 4 of 5 times the 1998-2002 average producer price<sup>25</sup>. In 2006, it is estimated that gum arabic sales represented close to 20 percent of the household total annual income in some areas of North Kordofan and Blue Nile (see Box 2).

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auction markets was around SD20,000 at the opening of the season; and rose to an unprecedented SD 40,000 at the second tapping.<sup>23</sup> In 2006, prices were a bit above the high floor price set at SD12,000/kintar. Export prices (fob Port Sudan) for 2004 and 2005 were at an unprecedented high price of \$ 5,000 / MT (f.o.b. Port Sudan). In 2006, export price was around \$3,300 /MT.

<sup>24</sup> GAC stocks are primarily made of gum arabic bought in 2004 and 2005, when prices paid at auction markets were \$500 to \$1000 higher than the 2006 export price.

<sup>25</sup> Though farmers obtained less than auction prices (because of intermediaries), they received up to SD 13.000 /kintar in 2006, against SD 2000/kintar in 2000 and SD 3000 in 2003 (based on interviews in North Kordofan).

## Box 2: Impact of higher gum arabic farm gate price on the household

In Western and Central Sudan, staple food is sorghum (millet in certain areas of Darfur). Sorghum harvested is usually not enough to cover the household's food requirements until the next harvest. Cash crops and livestock are crucial to ensure the family's food security, as well as to finance water and basic social service costs, like schooling and health.

Revenue estimates are calculated for a household of 6 in Kordofan, cultivating 10 feddans of sorghum, 8.5 feddans of cash crops, tending a 10-feddan acacia garden and owning 10 head of sheep.

	Area cultivated (feddan)	Labor required (hours)	Yield (kilos per feddan)	Farm gate price (Sd / kilo)	Total value (Sd)
Sesame	3	410	290	150	130,500
Groundnuts	4	690	585	95	222,300
Roselle (Hibiscus)	1.5	175	260	220	171,600
<b>Gum arabic (2002)</b>	10	530	60	<b>70</b>	<b>42,000</b>
<b>Gum Arabic (2006)</b>	10	530	60	<b>250</b>	<b>150,000</b>
Sheep	NA		NA	NA	12,000 (2 head sold per year)
Casual labor	NA	NA	NA	NA	60,000
Total income (with 2002 gum price)					638,400 (*)
Total income (with 2006 gum price)					746,400 (**)
% income from gum arabic (2002)					<b>6,5</b>
% income from gum arabic (2006)					<b>20</b>

\*US\$ 3114, per household per year, around \$519 per capita (\$1.42/day)

\*\*US\$ 3645, per household per year, around \$ 607 per capita

- Prices for sesame, groundnuts and roselle are 2002 average farm gate prices for 20 Kordofan villages. The price for roselle is subject to a great year-to-year variation,
- Gum arabic revenue estimates calculated on a base of 150 trees per feddan, with 400 grams per tree,
- Two producer prices for gum arabic were used: a/estimate for 2002 farm gate price in Kordofan (around US\$ 280/MT, or 20 percent of the export price, at \$1400/MT); b/ estimate for 2006 farmer price in Kordofan (at \$1250/MT, or 37 percent of the export price, at \$3400/MT).

Under 2002 conditions, with a very low price paid to farmers, the contribution of gum arabic to the total household income is small (around 6.5 percent), which in views of the labor required does not make gum arabic cultivation profitable. If producer price is higher, like in 2006, gum sales can represent a substantial 20 percent of the household total income.

**Providing farmers with a better share of the export price would increase cash revenues and in turn the food security level of 6 million individuals, who are among the poorest groups in Sudan.**

Data from "Economic Analysis of Deforestation: the Case of the Gum Arabic Belt in Sudan"  
PhD-thesis Wageningen University (2006) – Rahim A.H

### **C. Recent Government Decisions Concerning Exports of Gum Arabic**

26. The contradictory recent decisions by various arms of the Government presented below illustrate the difficulty faced by the sector but also its economic, social and political importance.

27. The Council of Ministers Resolution No. 118 (September 3, 2005) stated that the monopoly on raw gum arabic should be lifted. Following this resolution, the Ministry of Finance and National Economy commissioned a study to assess the impact of the monopoly on the sector, and propose alternative marketing arrangements. This report has not yet been made public.

28. On August 9, 2006 the Minister of Foreign Trade signed a ministerial order (No 7/2006) stipulating that “*except for the Gum Arabic Company, all permits for the export of gum arabic in all its forms are hereby suspended until further notice*”. This order, which undermines the profitability of local processing, had a detrimental effect on the reputation of the Sudanese gum industry in international markets.

29. In September 2006, the Economic Committee of the Council of Ministers recommended to the Council that a decree be passed to cancel the order promulgated by the Ministry of Trade to suspend export licenses granted to gum processors. The Council of Ministers did not endorse this recommendation. In December 2006, the Minister of Trade annulled the order issued five months earlier and allowed 14 licensed processors<sup>26</sup> to restart exports of processed gum arabic.

### **D. Conclusions on the Impact of the Marketing Arrangements**

30. An analysis of the performance of current marketing arrangements for gum arabic since 1969 leads to the following conclusions:

- Sudan’s share of the world market has declined from 80 to about 50 percent, This share has been lost to new producing countries which do not control exports of gum,
- Prices paid to producers were for many years typically about 10 to 15 percent of the fob price,
- Taxes of various kinds during marketing have further depressed prices received by farmers from village merchants, and reduced competitiveness of gum on export markets
- Low prices received by farmers for gum arabic lead them to favor crop cultivation over acacia trees, which has a negative impact on environment,
- GAC marketing strategy has resulted in high stocks (estimated at 20,000 MT, about one year’s production), which represent a contingent liability to the Government.

31. It is evident that despite many years of operations, the GAC has not been able to provide the benefits anticipated when its concession as the sole exporter of raw gum

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<sup>26</sup> Two newly established processors were about to start their activities when the order No 7/2006 was passed by the Minister of Trade.

arabic was assigned. Instead, Sudan's effort to manage exports through GAC led to results observed in other such efforts: the entry of new less regulated international competitors and erosion of global share, lack of transparency in accounting for impact of export regulation, appropriation of gains by actors other than small-scale producers, and in turn erosion in incentives for primary producers<sup>27</sup>. This paper concludes that therefore the exclusive concession should be removed.

32. There is a vast gum production base in Sudan which could be easily revived. The very recent expansion of domestic processing has resulted in increased domestic competition for raw gum, and better prices paid to farmers. This positive development comes at a propitious time, since increased consumption of soft drinks and confectionary products, as well as development of health and dietetic products are expected to keep the demand for gum high. Changes in the industry within Sudan could position the country to benefit from these favorable circumstances.

#### **E. Proposed Changes in the Gum Arabic Marketing Arrangements**

33. Changes in rules governing marketing and export of gum Arabic could improve the livelihoods of the small-scale gum arabic producers, the quality of the environment and Sudan's export trade balance. Such changes should aim to (a) achieve higher producer prices to stimulate production and boost producer incomes; (b) increase the level of domestic value-added through processing.

34. The following actions are envisaged as a package of integrated measures to achieve a more efficient gum arabic production, and marketing system with benefits to most stakeholders in the sector:

Concerning the GAC:

- Additional concessions for export of raw gum are tendered out,
- If GAC is bankrupt, its stock could be transferred to a liquidating institution independent of the government that would auction them in a manner that would not deter gum producers.

To support the processing industry:

- Provide a transparent business environment, i.e. removal of barriers to entry by granting gum processing and export licenses based on transparent requirements applying to all investors, avoid policy decisions that would reintroduce restrictions on the processors' ability to operate.
- Support research into global market opportunities, understand changing structure on the demand side, monitoring breakthroughs in substitute development,
- Bring taxation on gum at the same level as other agricultural commodities and enforce legislation against illegal taxation.

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<sup>27</sup> In April 2006 Sudan agreed with Nigeria and Chad to set up a joint task force to monitor, supervise and report on the activities leading to the establishment of a gum arabic security (buffer) stock in the three countries. One of the purposes of such a buffer stock would be to stabilize supplies on world markets. It is interesting to see that the GAC's current stock is apparently incapable of providing supply stability because the stock was purchased at high prices and international traders are not buying the stock but instead presumably waiting for the price of the stock to be discounted.



35. In order to oversee the implementation of the measures listed above, a gum arabic marketing governance structure independent from the government could be created. It would oversee the tendering of raw gum export concessions, and sponsor market research. It could also act as the liquidating institution responsible for auctioning GAC stocks.

To increase incomes of small-scale producers:

- Support voluntary producers' organizations. Forming producers' organizations or cooperatives<sup>28</sup> and helping them access new technologies to increase yields and tapping, and credit would enable producers to fetch higher prices at auction markets or to negotiate direct contracts with processors/exporters,

36. In addition to providing up to 6 million individuals with substantially increased incomes, setting a transparent and enabling business environment for private processors could result in gum arabic export value amounting to around \$US 150 million annually (see box 3).

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<sup>28</sup> The National Forest Corporation (Ministry of Agriculture and Forestry) has supported the development of such cooperatives but absence of credit to finance production and marketing operations impedes their development.

**Box 3: An Exercise: Estimating Potential Exports of Gum Arabic from Sudan under an Improved Policy Environment**

Assumptions made:

- Additional raw gum export concessions are granted,
- Government provides a transparent and enabling business environment for domestic processors to develop,
- Producers' voluntary organizations are formed and have access to improved technology, and credit
- World market for gum arabic is around 60.000 MT per annum, distributed equally between hashab - produced by Sudan - and talha,

As a result:

- Sudan exports primarily HPS/kibbled to major confectionary manufacturers and Japan (traditional importing country), and processed gum; the cleaned grade is not exported anymore,

Market perspectives for Sudan can then be estimated as follows:

- export of HPS/kibbled from Sudan =11,000 MT, at US\$ 3000 / MT, or US\$ 33 Million annually,
- export of processed gum from Sudan = 19000 MT at US \$ 6000 / MT (\*), or US\$ 114 Million annually

Gum arabic export value could amount on average to around **\$US 150 million annually**.

This does not take into consideration the possibility for Sudan to manufacture and sell gum-based dietetic and health products.

(\*) this is a rather conservative price assumption (In Oct. 2006, price comparison between processed gum arabic and a corn-based substitute puts the market value of powdered gum arabic between \$6,600 to \$13,200 per MT).

Based on Comtrade data and foodnavigator.com

## **Annex 1. Additional Facts about Gum Arabic**

### **A. Production Areas in Sudan**

1. The Gum arabic belt spans over 12 states of Sudan (around one fifth of the country's total surface or 500.000 km<sup>2</sup>), principally in the traditional rainfed areas of western and central Sudan. It is estimated that 6 to 8 % of the gum belt is under acacia tree cover. The Kordofan region produces more than half of the Sudanese gum. Darfur, with around 20 percent of the national production (and most of Sudanese talha), is also an important gum producing region. However, Darfur's gum production potential, comparable with Kordofan, is limited by its remoteness and the current conflict.

2. Generally acacia trees are resistant to periods of low rainfall, however the combination of severe droughts of the mid-seventies and mid-eighties, civil conflict, population movements and change in farming practices have negatively impacted gum arabic production in North Kordofan and North Darfur. As a result, the gum arabic belt is moving south, towards clay soil areas with better rainfall patterns; production in Blue Nile and Upper Nile and the southern parts of Southern Kordofan and South Darfur is increasing.

### **B. Gum Arabic cultivation system**

3. Gum arabic is primarily produced by small-scale farmers in traditional rainfed farming areas; large gum plantations represent less than 5 percent of the total production. It is part of an integrated farming system which is characterized by largely subsistence production and the use of family labour with no modern equipment and inputs. Under this system, crop production (usually sorghum or millet) to secure the food needs of the family is given priority. However, small-scale farmers seek other sources of income to meet the household's basic needs other than grains. In addition to the direct financial returns, they cultivate gum arabic because this activity constitutes a crop diversification strategy to mitigate crop failure, has beneficial environmental impact, and is a source of on-farm supply of fuel wood and fodder. However, gum arabic production does compete with food and cash crops for labor resources and land allocation.

4. Acacia trees are grown following a 'bush fallow' system: agricultural crops are cultivated for 4 to 5 years, when productivity declines, acacia trees are planted. It takes 5 to 7 years before a tree can produce gum arabic and 15 to 20 years for its productivity to start declining. Acacia trees are tapped in November by removing pieces of bark to form wounds in sandy dry areas, and in December and January in the wetter clay zones. The nodules of gum are picked 5 to 6 weeks after the tapping. There is a second tapping in March or April. The average gum yield per tree per season is around 300 grams but production can vary from less than 200 grams to several kilograms. The density of trees in gum tree gardens also varies greatly: from 20 trees per feddan<sup>29</sup> in natural gardens to above 400 in acacia plantations. According to the Agricultural Research Corporation, gum yields could be increased by 47% - 60%, with good management, quality could also be enhanced through improved tapping methods.

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<sup>29</sup> A feddan equals to 4200m<sup>2</sup> or 1.038 acre

### C. Uses of Gum Arabic and Substitutes

5. Gum arabic is multifunctional: it is used as an emulsifier, stabilizer, film-former (it forms an impenetrable film around the flavour particle), texturizer and low-viscosity water binder. In the **soft drink industry**, gum arabic is used as an emulsifier and stabilizer of aromatic emulsions and spray-dried flavors for beverages. In **confectionary**, gum arabic is used to bind water, and prevent sugar crystallization. Its emulsification quality is important to enable fat to be distributed throughout the product and not move to the surface and make the food appear greasy. Gum arabic is also used as a suspending agent in syrups, antiseptic preparations, cosmetics and adhesives. As a suspending agent, it is also used in paints, inks, lithography and textiles. Gum arabic is not chemically modified and qualifies for "natural" labeling or "no artificial additives" claims. It is a high source of fiber - it contains no less than 85% soluble dietary fiber (dry basis) - and has low calorific value.

6. Confectionary and soft drinks represent the core of the demand for gum arabic. The pharmaceutical industry used to integrate a significant portion of gum arabic but is a declining market. Technical applications (printing, glues, ceramics...) constitute a small outlet. Gum arabic has recently found a new range of applications in the dietetic food and health sub-sectors because of its high fiber content.

7. Modified starch is a food additive which is prepared by treating [starch](#) or [starch granules](#). Modified starch is used as a [thickening agent](#), [stabiliser](#), or an [emulsifier](#). Modified starches effectively match the properties of gum arabic in certain processes: apart from food products, it is also found in [pharmaceuticals](#).

8. Food additives manufacturers have tried to develop gum arabic substitutes other than starches (corn-based, celluloses...) but it seems that none has the functionality of gum arabic. In addition to its non toxicity and "naturalness", gum arabic has comparative technical advantages over substitutes: products incorporating gum arabic retain flavor better; their shelf lives is also superior.

9. According to the FAO Coppen Report (1999), the majority of international buyers and end-users perceive gum arabic from Sudan as the best in the world (top quality Hashab gum is referred to as "Kordofan gum" on international markets). In 1998, the Joint FAO/WHO Expert Committee on Food Additives (JECFA) specification for gum arabic for food use, which hitherto only included hashab, was modified to also include talha. Cheaper than hashab, talha has inferior technical properties for some gum arabic's important uses such as in the soft drinks industry<sup>30</sup>. On the other hand its chemical properties are the same and it substitutes well for hashab in the confectionary industry where larger quantities of gum arabic are required in the final products.

### D: Trade in Gum Arabic - Sudan and the World

10. In 1968, Sudanese exports accounted for 52.000 of the 65.000 tons utilized globally. From 50,000 tons per annum in the 50's and 60's, Sudan's gum exports declined to around 25,000 tons in the late 80's. Since then, Sudanese exports have been at an average of 25,000 tons. From the 50's to the early 90's, Sudanese gum accounted for 80 percent of the global gum trade; over the last 15 years, it has declined below 50 percent.

11. World exports of gum gradually fell from over 60,000 MT in the mid 60's/early 70's to between 25,000 MT to 35,000 MT in the 80's to mid 90's. The severe Sahalian droughts of the

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<sup>30</sup> Both Pepsi and Coca cola contain hashab.

mid-70s and mid-80s accelerated this trend. Gum trade volumes rose from 30,000 MT in the mid-90s to 50,000 MT in 2000 and have remained fairly stable since then. The increase in global exports of gum in the recent period is said to be correlated to rising demand for talha, principally sourced from Chad and Nigeria. The 1998 change in the JECFA specification for gum arabic as food additive to include talha has certainly encouraged this trend. Though slightly increasing, exports of Sudanese talha do not exceed 15 percent of total exports from Sudan.

12. In the 70's, three countries were producing most of the world production: Sudan, by far the main producer/exporter, Nigeria and Chad. Since then, fifteen African countries have emerged as gum producing countries. Chad, which produces mostly talha gum, now accounts for a quarter of the global exports, Nigeria's export is around 10 percent.

## Annex 2A. Gum Arabic Value chain Kordofan

Value Chain for Gum Arabic (Acacia Senegal - Hashab)  
(based on information in Um Rwaba Village - North Kordofan at end February, 2006)

	Jan-06		Feb-06	
	Sd/kantar	\$/ MT	Sd/kantar	\$/ MT
Price received by producers from village trader	13,000	1256	17,000	1643
Price received by village trader at Um Rawaba market	13,500	1304	17,500	1691
Costs at Um Rawaba market (flat taxes per kantar)				
Locality tax	200	19	200	19
Zakat	1,300	126	1,300	126
Natl. Forest Corporation levy	600	58	600	58
Wounded soldiers levy	50	5	50	5
Sub-total	2150	208	2150	208
Cleaning and Grading by Um Ruwaba trader				
Labor	100	10	100	10
Management etc	10	1	10	1
Buildings etc	100	10	100	10
Jute bags	75	7	75	7
Sub-total	285	28	285	28
Cost ex trader store per Kantar purchased	15,935	1,540	19,935	1,926
Cost ex trader store (compensated for 25% weight loss)	21,247	2,053	26,580	2,568
Cost ex trader store assuming 15 percent profit	24,434	2,361	30,567	2,953
Transport from Um Ruwaba to GAC in Khartoum	300	29	300	29
Total cost for trader (including profit) in Khartoum	24,734	2,390	30,867	2,982

## Annex 2B Gum Arabic Value Chain Blue Nile

Value Chain for Gum Arabic (Acacia Senegal - Hashab)  
(based on information in Damazine - Blue Nile at end June, 2006)

	Feb-06		May-06	
	Sd/kantar	\$/ MT	Sd/kantar	\$/ MT
Price received by producers from village trader	20,000	2020	18,000	1739
Price received by village trader at Damazine	20,500	2071	18,500	1787
Costs at Damazine market (flat taxes per kantar)				
Locality tax	200	20	200	20
Zakat	1,600	162	1,600	162
NFC levy (50% NFC / 50% State)	1200	121	1200	121
Wounded soldiers levy	125	13	125	13
Gum Arabic Union levy	250	25	250	25
General Tax (GNU 60% and State 40%)	350	35	350	35
Crop Marketing tax (state)	250	25	250	25
Sub-total	3975	402	3975	402
Cleaning and Grading by Damazine trader				
Labor	500	51	500	48
Management etc	10	1	10	1
Buildings etc	100	10	100	10
Jute bags	100	10	100	10
Sub-total	710	72	710	69
Cost ex trader store (without profit) per Kantar purchased	25,185	2,544	23,185	2,258
Cost ex trader store (compensated for 25% weight loss)	33,580	3,392	30,913	3,010
Cost ex trader store assuming 15 percent profit	38,617	3,901	35,550	3,462
Transport from Damazine to GAC in Khartoum	400	40	300	29
Total cost for trader (including profit) in Khartoum	39,017	3,941	35,850	3,491

## REFERENCES

- Abdel Nour, gum arabic in Sudan : production and socio-economic aspects, FAO, Internet reference [fao.org/docrep/x5402e/x5402e12.htm](http://fao.org/docrep/x5402e/x5402e12.htm)
- Abul Gasim Seif el Din and Manar Zarroug, Production and commercialisation of gum arabic in Sudan, FAO, Internet reference [fao.org/docrep/w3735/w3735e22.htm](http://fao.org/docrep/w3735/w3735e22.htm)
- Alstad, G. 1991. *“The Influence of Acacia on Soil in Arid North-eastern Sudan”*. Bergen, Norway: University of Bergen. 79 pp.
- COMTRADE [United Nations Statistics Division]. COMTRADE Database via the homepage <http://unstats.un.org/unsd/databases.htm>
- Coppen, J.W. 1999. *“Gum arabic: its production and marketing opportunities and constraints to their improvement in Sudan”*. FAO document TC:TCP/SUD/7821, Rome.
- El Hag Makki Awouda, Development of Gum Arabic Production and Marketing, Sudan, Part 1 : The National Picture and Recommendations, FAO, 1999
- Exudate gums , Gum Arabic, Gum Talha and other Acacia Gums, Non-Wood forest products for rural income and sustainable forestry, FAO, (Internet reference [fao.org/docrep/v9236e/V9236e05.htm](http://fao.org/docrep/v9236e/V9236e05.htm))
- GAC [Gum Arabic Company]. *“Annual reports for the years 1970-2004”*. GAC research unit, Khartoum, Sudan.
- Institutional Institute for Environment and Development. Spet, 1898. *“Gum Arabic Belt Rehabilitation in the Republic of the Sudan (2 volumes)”* - financed by Federal Ministry of Finance and Economic Planning.
- JECFA [FAO/WHO Expert Committee on Food Additives]. 1999. *“Compendium of Food Additive Specifications”*. Appendum 7, Joint JECFA 53rd session, Rome. 1-10 June 1999. Rome, Italy.
- Macrae, J. and Merlin, G., 2002. *“The prospects and constraints of development of gum arabic in Sub-Saharan Africa”*. Washington, D.C., World Bank.
- Rahim A.H, 2006. *“Economic Analysis of Deforestation: the Case of the Gum Arabic Belt in Sudan”* - PhD thesis, Wageningen University
- Task Force of Raw Materials Research and Development Council of Nigeria, Oct, 2004. *“Report On Survey Of Gum Arabic In Nigeria”*  
<http://www.rmrdc.gov.ng/Surveyreport2005/Gum%20Arabic.pdf>

### Articles consulted and internet references:

- Gum Acacia Market Reports by Agriproducts UK  
<http://www.agriproducts.com/whatsnew/index.html>
- Dispersed raw material sources cushion CNI gum arabic supplies  
<http://www.confectionerynews.com/news/ng.asp?id=56874>
- Corn fibre gum could be effective alternative to gum arabic.  
<http://www.foodnavigator.com/news/ng.asp?id=71278>
- French colloids firm recognised for export expertise  
<http://www.foodnavigator.com/news/ng.asp?id=68601>

### Websites of main gum arabic processors

- <http://www.cniworld.com/>
- <http://www.alwolff.com/>
- <http://www.agriproducts.com/>