

Gums and Resins

NTFP Unexplored

Avinash Upadhayay

Gums and resins are perhaps the most widely used and traded non-wood forest products other than items consumed directly as food, fodder and medicine. Human beings have been using gums and resins in various forms for ages. The history of Gum arabic, long recognised as an ideal adhesive, stretches back 2000 years. In modern times, gums and resins have been used the world over as embalming chemicals, incense, medicines (mainly anti-septic properties and balms), cosmetics in paints and for waterproofing and caulking ships.

Use of gums and resins for domestic consumption and for sale to earn some cash is very common among the forest dwelling communities, particularly tribals, in India. Thousands of forest dwellers in the central and western Indian states depend on gums and resins as a viable income source. However, if we go through the statistics, the developments are not encouraging, as the market for local gums and resins at the national level has largely remained stagnant or has decreased over years. This development has made an adverse effect on the gum dependant communities. This article is a step towards taking the stock of the situation of the product group in the country and visualise the possible intervention for development.

Introduction & Classification

The difference between the terms 'gums' and 'resins' is not easy to pinpoint in a precise manner. The two are used interchangeably in everyday language. Both terms refer to sticky, smooth and elastic plant exudations. However, experts differentiate between the two terms on the basis of some distinctive characteristics. Ac-

ording to them, some plants only yield gum, others only resins and yet others both gum and resins.

Gums:

Gums are plant exudations, partly as a natural phenomenon (as part of the normal metabolism of plants) and partly as a result of injury to the bark or stem (due to fungal or bacterial attack). Mostly gums are exuded by the stem, only a few gums are obtained from roots, leaves and other parts of the plant. Gums are primarily formed by the disintegration of internal plant

MARKET FACTS

- A total of 30 types of gums are traded in India at varying levels
- 3% of traded medicinal plants are gums
- 2% of gum usage is medicinal in nature
- Gums like canarium strictum and sterculia urens have been given vulnerable status by IUCN.
- Gum karaya contributes 2% of the revenue from the medicinal plant exports from India

tissue through a process known as gummosis. The process breaks down the cellulose and haemicellulose, both of which are complex carbohydrates located in the cell walls of plants. Gums are comprised of carbon, hydrogen, oxygen and are found in a large number of families. Notable among them are *leguminosae* and *Sterculiaceae*. Other important gum yielding families

are *Anacardiaceae*, *Combretaceae*, *Meliaceae*, *Rosaceae* and *Rutaceae*

¹Inherent characteristic of gums

- Gums can be divided into three types: soluble, insoluble and semi soluble. Soluble gums dissolve in water or form more or less transparent, viscous and adhesive solutions as in Indian gum Arabic. Insoluble gum often swells with the addition of water forming gels like the gum karaya. While the semi-soluble gums decompose completely without melting on heating.
- Gum is edible
- It is not fragrant
- It does not burn

Resins

Resins have certain properties in common and form a distinct group of plant products easily recognizable in practice. These are oxidation products of various essential oils. Resins are complex in nature with varied chemical composition. They usually occur as derivatives of starch and are mixture of volatile and non-volatile compounds. All the natural resins are vegetable in origin with the exemption of lac (it is a natural resin and comes from an insect *laccifer lacca*). Resins can be classified into three categories. The first one is the **Dammers**, which are hard and transparent resins containing a small amount of essential oils. The important commercial species under this category are Canarium, vateria and shorea, Copals & shellac. The second one is **Myrrh**, aromatic oleoresins containing considerable amount of essential oils, mainly from genus *commiphora*. The third category is **Frankincense** that is gum resin

¹ Inherent characteristics are not applicable to all gums or resins, as the product groups are overlapping in their characteristics. However, more than 90% of the characteristics are applicable to a single group.



Photo: CSVA Maharashtra

Gum is Oozing out of the tree

from species *Boswellia*. Major resins available in India are Sal (*Shorea robusta*), Vellapine (*Vateria indica*), *Canarium strictum*, Chir pine (*Pinus Roxburgii*), Gurjan (*Dipterocarpus terbinatus*), Indian Gamboge tree (*Garcinia morella*). The major resin producing states are Uttar Pradesh, Himachal Pradesh, Jammu & Kashmir, Madhya Pradesh and Orissa. Resins are found in a large number of families. Notable among them are *Pinaceae*, *Fabaceae*, *Burseraceae*, *Dipterocarpaceae*.

Inherent characteristic of Resins

- Resins are not edible
- Resins are aromatic
- Resins are inflammable
- They are insoluble in water but usually dissolve readily in alcohol, ether and certain other solvents.

Important Gums and Resins available in India

Though there are more than 30 commercially important gum and resin species available in India, the number of important trees with substantial production is rather small. Among the various kinds of gums, the important species are Gum karaya (*Sterculia Urens*), Gum Dhawara (*Anogeissus Latifolia*), Gum Kumta (*Gum Acacia or arabic*). Among resins, the important ones are Sal resin (*Shorea Robusta*), Salai (*Boswellia Serrata*), Frankin-

cense, Black Dammer (*Canarium Strictum*) and Guggul (*Commiphora mukul*)

Physical properties of Gums & Resins

The physical properties of gums and resins are of utmost importance in determining their uses and their commercial value. Not only do they vary considerably among gums & resins of different botanical origins. There are also noticeable differences even within the same species when gums are collected from plants growing under different climatic conditions and even the same plant in different seasons of the year. The major physical properties of gums & resins are colour and form, taste and smell, hardness and density, solubility, viscosity and colloidal nature.

Production and consumption

The bulk of commercially important gums in the country comes from the central Indian forests, consisting of states like Madhya Pradesh, Chattisgarh, Andhra Pradesh, Orissa, Jharkhand and Bihar while Gujarat and Rajasthan contribute a small portion of it. The rest of India produces a very small quantity. The gum producing areas are mostly around the Western Ghats and the Eastern Ghats and surrounding areas. More than 90% of gums produced in India come from just four states: Madhya Pradesh, Chattisgarh, Andhra Pradesh and Orissa.

Most important Indian gums like gum karaya, dhawara gum and salai are exported to Europe and America, where they are processed and value added. The local use of these gums and resins is as little as less than 5% - most of it by pharmaceutical industries. In northern India, it is also used in food items. They are commonly marketed and used in the preparation of "laddu" and various other kinds of health drinks like sherbet and lassi. Other gums, which are found in smaller quantities, also find their way to either the pharma industries or confectionaries.

Policies, laws and rules guiding Gums and Resins

Indian gums and resins have been in demand in the international market for centuries and have always fetched high prices. But it has been a double-edged sword. On the one hand, it has provided livelihood to millions of people. On the other, there has been rampant, unsustainable tapping and exploitation for quick money. The 80's, in particular, saw large scale over-exploitation leading to severe damage and death of trees. Chastened by the experience, many gum-producing states in the country have restricted their extraction and have adopted control measures for protection of livelihoods as well as to stop abrupt rise in demand. The policies of major states are as follows:

Andhra Pradesh

Five major types of gum are available in Andhra Pradesh. They are; gum karaya, gum thiruman (Dhawara), gum Olibanum (Salai), Gum kondagogu (*Cochlospermum gossypium*) and gum Dikmali (*Gardenia Gummifera*). All the gums in the state are under a specified list with restrictions. The gums are collected by GCC (Girijan Co-operative Corporation). GCC pays a royalty to the Forest Department to secure collection rights and market monopoly. In the scheduled areas, the tribals have the right to collect gums from the forests. For this, GCC issues a "Giricard" to the identified gum picker, which legitimises access to forests for gum collection and also sale in the

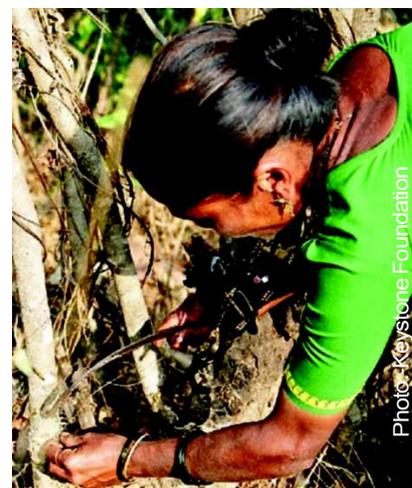


Photo: Keystone Foundation

Making a blaze

Gums and Resins	Expected trade volume & use	Available areas
Gum Karaya	The annual production of Gum karaya is about 1500 MT and 90% of it is exported to Europe and US. The quantum of local use not known very clearly. Andhra Pradesh produces more than half the production in the country.	India has a monopoly in production and exports of this gum; production centers are Andhra Pradesh, Orissa, Madhya Pradesh and Maharashtra. Previously, a large amount of the production was from the Aravali region of Rajasthan. But the government has banned it due to over exploitation.
Dhawara gum (in trade parlance known as ² ghatti gum)	The annual production of Gum ghatti is about 1200 MT in India; over 90% of it is exported to Europe and US, where it is processed. In North India, it is used as a health drink, particularly for carrying or lactating mothers.	India and Srilanka control the market of Gum ghatti. The tree grows extensively all over the country, particularly in the Western Ghats and the dry plateaus of the Vindhyachal, Satpura and Western Ghats range of mountains, extending in Maharashtra, M.P. Chhatisgarh, Bihar and Orissa.
Salai gum	The annual production of Salai Gum is about 200 MTs. Most of it is exported after mixing with other gums.	Mainly in the central Indian states, particularly in the states of Madhya Pradesh and Chattisgarh.
Gum Arabic or gum acacia	The annual production of Gum arabic is about 400 MT in India; More than 80% of it is exported. At the same time, it is also imported in huge quantities. Primarily used by pharma companies as a binding and coating agent.	World production is more than 50,000 MTs. Available in desert and arid regions of Rajasthan and adjoining areas of MP, Gujarat, Haryana and Punjab.

market. Giricards contain information about the number of gum trees and transaction details. After collection of gums, GCC sales the produce through tender. If the purchaser is an exporter, it has to submit the 'H' form. No other tax or cess is levied on the produce. Recently, Andhra Pradesh Govt. made a provision under which gums and resins will not be calculated under VAT (value added tax).

Madhya Pradesh

Kullu or Karaya, dhawra, khair (*Acacia Katechu*), babul (*Acacia Nilotica*) and salai gums were notified in MP as "specified forest produce" under the MP Van Upaj (Vyapar Viniyam) Act, 1969. Under the Act, only the state gov-

ernment or an agent appointed by the state government could collect these gums. Dhawra, Babul and Khair gums are grouped together as class-II gums to distinguish them from Kullu and salai gums. These gums were taken out of the list of specified produce in June 2003. Till that time, the federation had carried out trade in the specified gums as an agent of the state government through primary forest produce co-operative societies and district unions. The collected quantity is sold through open tenders/ auctions. 2% forest development tax is charged on the bid amount.

Due to over exploitation of karaya and Salai trees for their valuable gums, the

Madhya Pradesh Government had banned the extraction of these gums in year 1982 and 1992 respectively. In 1995, the state government relaxed the ban on extraction of Gum Karaya in Morena, Bastar and Khandwa districts. Since then, its extraction has been carried out through primary co-operative societies. In 1992, the state government lifted the ban on extraction of Salai Gum in Gwalior, Shivpuri, Ujjain and Khandwa circles.

Chattisgarh

All the major gums in the state are nationalized and are categorized as Grade I and Grade II gums. Kullu gum is in Grade I while dhawra, babool and khair are grade II gums. The collec-

²Ghatti gum is a loosely used term for a class of gum with high viscosity. Gums from 4-5 botanical origins are mixed with each other with dhawara gum as its parent ingredient. This group of gum is second only to gum karaya in quantity.

tion of Kullu gum is prohibited in the state except in Bastar, Kanker and Jagdalpur districts. The entire area of collection is divided into different units. These units are sold in advance through tenders and auctions by MFP federation. The purchaser is required to deposit 10% of the sale value, calculated on the basis of notified quantity in the tender notice, as security deposit. After making payment to the collectors and the differential amount between the sale rate and the collection rate to the district union, the purchaser is allowed to transport the collected gum wherever S/he desires. The purchaser of gums and resins is supposed to pay various taxes like 3% Forest development cess, 4% commercial tax on sale value, 15% surcharge on commercial tax, 2.5 % income tax and a certain amount of surcharge on income tax.

Orissa

All the gums and resins were under State monopoly till March 2000, when state-owned corporations like TDCC (Tribal Development Cooperative Corporation) and OFDC (Orissa Forest Development Corporation) were given collection and sale responsibilities. All the gums from then till date are under specified forest produces or lease bar items. However, there has been no marketing activity since September 2005. Marketing of resins are completely banned in the state.

External policies guiding the trade of Gum Karaya

Gum Karaya is the only gum-based produce that comes under the purview of the country's export policy. It is what is known as a "canalized" product. Canalisation significantly restricts foreign wholesaling activities. The basic objective behind canalization is to ensure that the tribals, who are the main "producers" of gum karaya, receive a fair price for their labour. In 1986, gum karaya was canalized for the first time and NAFED, which was under the Commerce ministry at the time, was appointed as the agent. Later, considering its importance to the livelihoods of tribals, TRIFED, an organization under the Ministry of Tribal Affairs, was

appointed as the canalizing agent. Initially, it used to take a 20% commission on the product, which was later reduced to 3%. During the early 90's, TRIFED banned the export by traders so that it can export exclusively and fetch more income. However, this experiment failed as most of the importers told TRIFED to come through the exporters. Needless to say the decision was largely a result of lobbying by exporters with foreign importers. During this period, many traders changed their supply routes as well as export strategies; they now started exporting from African countries like Senegal. The impact of this was disastrous on TRIFED. Gums in huge quantities piled up in its godowns as it could not sell any of it, resulting in losses to the tune of several crores of rupees. Following the disaster, the policy had to be changed. The canalisation process started, in which a "No Objection Certificate" (NOC) is issued by TRIFED for export of gum karaya to the traders for which they have to pay a three percent commission on invoice value to TRIFED. TRIFED issues the NOC after assessing the supply source of gum karaya.

Market

India has always been an important trade center for high quality natural gums and resins. Some 20-30 years back, Mumbai used to be the most important center in India for trade in gums - both for exports and internal trade. Gums from all over India used to reach Mumbai for export to other countries. Besides, gums imported other countries too were exported from here. A place called "Danabunda," a locality near Mandvi, used to be a big jamboeree of gum merchants, while Samuel Street, where the Bombay Gum Merchants' Association office was situated, used to be the other major rendezvous.

But things have changed beyond recognition now. The number of traders has reduced tremendously due to change in profession and other factors. Twenty years ago, there were more than 20 gum exporters in the country. There are only four now. Though the volume of trade and the

number of actors have reduced, the importance of Indian gums and resins is still intact. It is now operating on a much smaller scale and is a clear-cut supplier and exporter relationship without many intermediaries.

On the supply side, state level forest corporations or tribal development corporations like the GCC in Andhra Pradesh, Gujarat forest department in Gujarat, Madhya Pradesh MFP Federation and Chattisgarh MFP Federation control more than half the production of gums and resins in the country. The rest of the trade is normally carried out in an informal way by itinerant traders. While it is a very lucrative proposition for those engaged in the trade, the collectors often receive a pittance for gums sold this way.

Trading center for gums in India can be classified into two types. At the higher level, trade in India is controlled by four traders, who have a more than 90% share of the trade, only through exports. These traders are based in Mumbai (3 numbers) and Hyderabad (1 numbers). Mumbai port is the place from where all export of gum takes place. All gums are cleaned, hand picked and graded here before being exported. Apart from the export trade, there are 8-10 smaller trading centers in India. The small trading centers are Kolkata, Delhi, Chennai, Raipur and Ahmedabad etc. The exporters purchase the raw materials directly either from state corporations or from the next level of traders. However, they get the best quality of gums only from the corporations. GCC is one of the best quality gum sellers in India. The traders directly participate in the auction and purchase the gum.

There is very little evidence of local use of gums and resins. Traders are of the opinion that local consumption of gums and resins in India is declining rapidly. Local supplies are mainly meant for ayurvedic medicine manufacturers. According to industry sources, Indian gum is losing ground rapidly due to increased price and fluctuations in supply. Now, more and more industries depend upon im-

ported varieties of gums or crop varieties, whose production is very high and supply is consistent. Among imported varieties, acacia is the preferred one. Good Acacia variety is available in Mumbai at an average rate of Rs.110, while the same quality of Indian gums in the retail market is priced much higher at Rs. 140-150. Naturally, most medicine manufacturing units prefer to source their raw material from the retailers in Mumbai. Similarly the crop variety of Guar (*Cyamopsis tetragonoloba*) is available at an average of Rs. 40 per kg. No wonder industries, which want regular supplies and lower cost, prefer low-grade materials to high-grade natural gums from India. Only in case of edible items, industries prefer the high-cost natural gums from India.

If what traders in Mumbai say is anything to go by, the gums and resins market in India is going through a very difficult phase characterized by huge demands and low supplies. So bad is the situation that there is no guarantee of stable supply beyond the next five years or so. At present, the only three varieties of gums that have a demand are gum karaya, salai gum and dhawara gum. The market for the rest of the gums is virtually non-existent.

Case of Gum Karaya

The most important gum from India is the dried exudate of the *sterculia Urens*, a large and bushy tree, a species primarily found in India. Its history dates back to the 1920's when the gum used to be sold as an adulterated version of gum tragacanth (*Astragalus Gummifera*), which grows in the middle east in the US. Gum karaya ranks second only to gum Arabic in the world in terms of market share. World production of gum karaya stood at 5500 MT per annum in the 80s and India accounted for roughly 3500 MT out of that (IIFT, 1987). India has a virtual monopoly over production and export of this gum.

In India, organized production of gum karaya is done in only two states of India, i.e Andhra Pradesh and Madhya Pradesh, though it is available and extracted in other states in smaller quantities. GCC, the monopoly rights holder in Andhra Pradesh buys directly from the tribal collectors and is the main supplier of gum karaya in the country. The gum, after drying, is sold in three grades Grade I, II and III based on its appearance and adhering bark. The rates for the three grades are fixed beforehand and usually fetch Rs. 120/-, 90/- and 40/- respectively (approximately). GCC procures the gums through its depots in the villages.

Sometimes, it also opens buying points at the weekly shandies (markets). The gum is subsequently marketed to exporters by GCC through tender-cum-auctions every month. The gum is physically cleaned by the exporters and exported in different grades to various parts of Europe, Japan and US.

If we analyze the overall situation of the gum karaya trade from the GCC's viewpoint (Fig-1), it is anything but encouraging. During the last 20 years, export figures have declined considerably. At the same time, prices have gone through the roofs due to the heavy demand. The quantity procured underwent a steep fall in the beginning of 90s and has never really recovered since then. The rise in prices has gone hand in hand with the fall in procurement. One of the primary reasons cited for the sharp decrease in production of gums is that the number of trees decreased sharply during the early 90s due to unsustainable harvesting methods.

The impact of GCC as well is clearly reflected (Fig-2) in the total exports of gums and resins from the country. During the last 20 years, exports have come down from 4000 metric tonnes to approximately 1000 tonnes. As per the graph given below, exports are de-

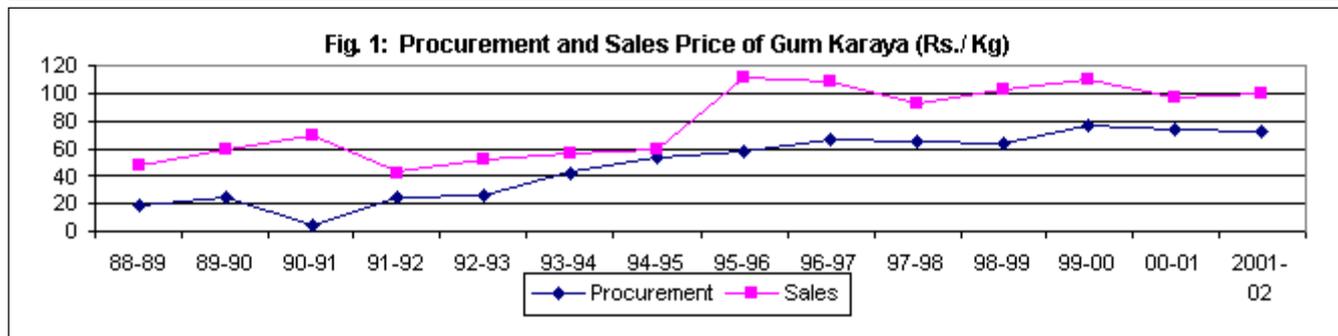
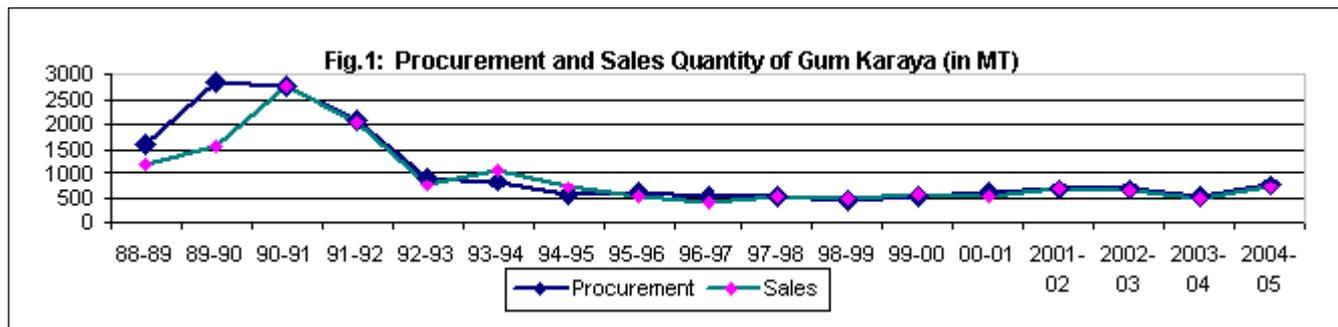


Fig.2: Gum karaya export figures (Quantity in MTS)

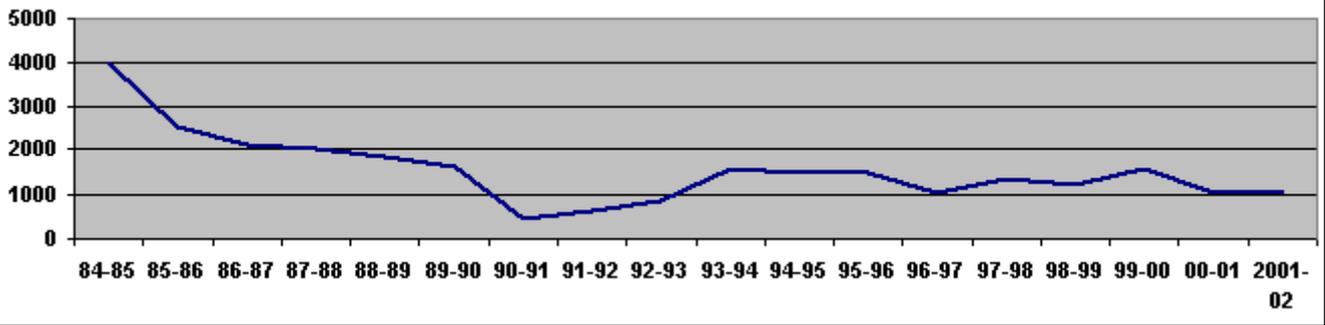
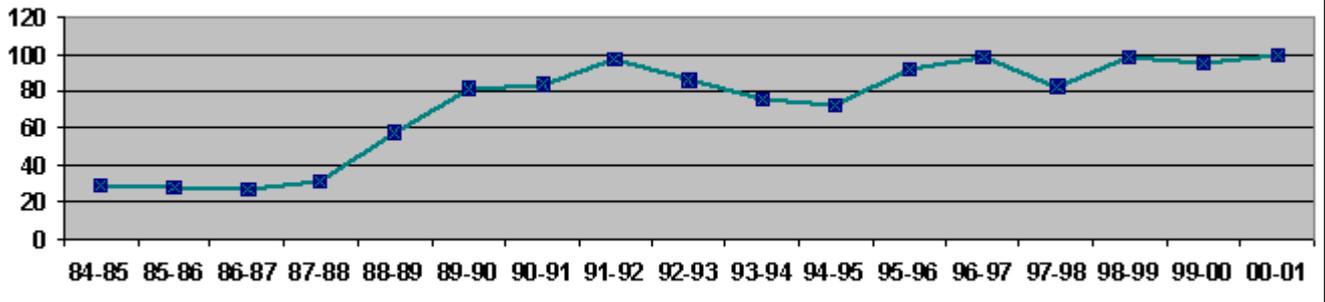


Fig 2: Increase in average price per kg of Gum karaya



clining gradually since 1984-85. At the same time, prices are moving constantly upwards. The reason proffered by the industry for declining production and higher prices is the lower production plenty demand.

Issues need attention.

The problems besetting the gums and resins trade in India are many. First of all, the production base of the produce is going down rapidly due to ruthless tapping and unorganized harvesting approach, when the demand for natural gums and resins continuously increasing in the world market since 90's. Similarly, the quality standards of the product followed in India do not

match international norms. Other than GCC in Andhra Pradesh, no other state corporation produces good quality gums. Due to the low quality standards and the presence of bacterial and pathogenic substances like E. Coli and Salmonella (the terminal treatment of gaseous disinfectants to eliminate the microorganisms was banned in many gum importing countries (Dr. M.V.Rao)) the importance of the gums has been eroding in the international markets. At the same time, there has been no organized effort at the central level for conservation and expansion of the resource base and development of value addition avenues. The latest threat to the Indian market comes from



Photo:-SFRRI Jabalpur

Grading of gums & resins

African countries, which export similar products at a much cheaper rate. Finally, the possibilities of local processing of gums, which would ensure bigger returns, have not been explored fully.

□

Source:

1. Levetin, Macmohan, Gums and Resins
2. Dwivedi, A.P, Forests, The non-wood resources
3. Simpson, Ogorzaly, Gums and Resins
4. Krishnamurthy, T, Minor forest products of India
5. EXIM bank of India, Export potential of Indian medicinal plants
6. International Resource Group, Report of gum karaya sub-sector in Andhra pradesh,
7. Institute of Applied Manpower Research, Pricing of MFPs procured by GCC, March, 98
8. www.frlht.org