Gums and resins production and trade in Kenya

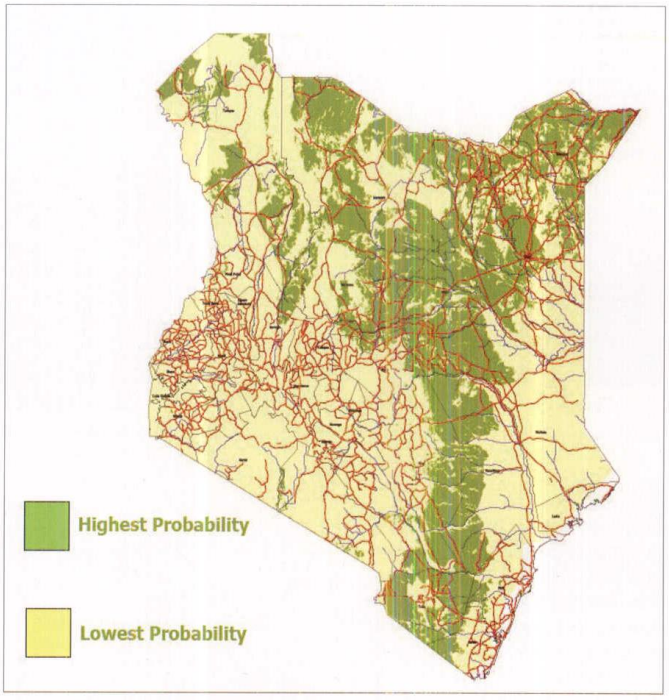
BY MESHACK MUGA AND CHIKAMAI, B.N

Gums and resins from the drylands of Kenya can be sustainably exploited for household income and foreign exchange earnings. These resources include gum arabic from *Acacia senegal* or *Acacia seyal* and commercial gum resins such as myrrh from *Commiphora myrrha,* Opoponax (hagar), *Commiphora holtziana* and Frankincense (olibanium) from *Boswellia neglecta* (Figure 1). Gum arabic is used in the food industry, pharmaceutical industry and technical areas such as printing, ceramics and textile industries (Chikamai and Odera, 2002). The gum resins are mainly processed for the extraction of essential oils, used in cosmetics, flavours, perfumery and pharmaceutical industries.

Gums and resins are produced mainly in 7 ASAL counties namely: Marsabit, Wajir, Garissa, Mandera, Turkana, Samburu and Isiolo. However, Kitui, Mwingi and Meru counties also have these resources. The probability distribution of these resources in the country is illustrated in Figure 2.

The gums and resins value chain places collectors who harvest the gums and resins from the trees in their natural stands at the primary level. These collectors sell the gum to the local agents of major exporters and few wholesalers in the major towns who export the commodities to overseas markets. An example of value chain map of gum resins for Wajir County is shown in Figure 3. Government agencies such as The Kenya Forestry Research Institute (KEFRI), Kenya Forest Service (KFS) and Kenya Plant health inspectorate Service (KEPHIS) provide various services. KFS through the support of the *Miti Mingi Maisha Bora* programme is finalising rules and regulations for the sub-sector.

There are about 80 producer groups, 3 cooperative societies, 1 national association (Gum Arabic and Resins Association of Kenya (GARA), and 8 exporters (Elegant Trading Company Limited, Gums and Resins Kenya Limited, Arid Lands Resources Ltd, Lubanchem Limited, Northern Gums Limited, Arbor Oils of Africa Ltd, Kenya gums resins Ltd and Kennect) who are involved in the gums and resins trade.



Map of Kenya with distribution probabilities of gums & resins (KEFRI)

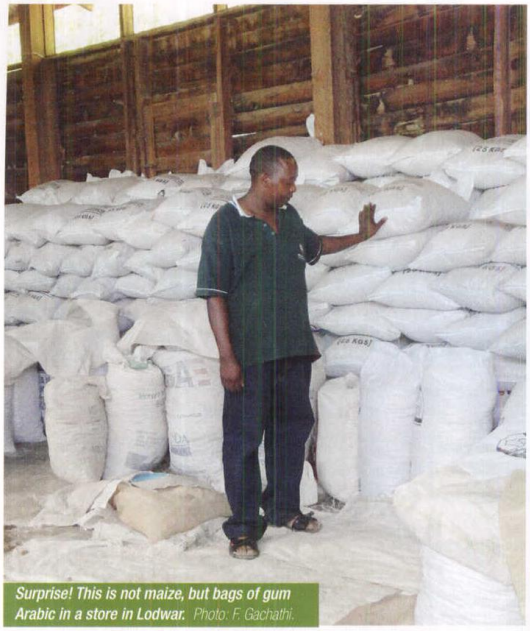
Harvesting and post-harvest handling

Harvesting and Potential Production

Hagar, frankincense and gum arabic are from wild harvests collected from exudations caused by insects, animal damage or naturally , while myrrh is mainly tapped. Wild harvests which are richer in essential oils are more preferred. Tapping is done using a special axe in the dry seasons (three weeks after the rains) mainly in May – October and occasionally in January-March. A small area of bark about 3 cm wide and 10 cm long is removed from the tree stem starting from the base. The tapped area is cleaned three times (at seven days interval) and a first collection made after 21 days. An average of 5-6 kg of gum/resins is collected per person per day. Based on the estimated area under the resources in the country, the potential for gum arabic production in Kenya is about 10,000 metric tons (MT) while that for resins (myrrh, Opoponax, frankincense) is about 8,000 MT (Muga et al., 2014).

Post-Harvest Handling

Harvested gums and resins are collected in a jerry-can or gallon in the field and transferred to clean sisal or polythene gunny bags at the camp site or in the homestead (manyatta). Though there are a number of storage facilities in the counties, there is inadequate use of these facilities by the producer groups. Resins



Surprise! This is not maize, but bags of gum Arabic in a store in Lodwar. Photo: F. Gachathi.

Hagar for sale in Garba Tula Photo: F. Gachathi.

Wild population of Acacia senegal or kerensis growing in Eastern Mwingi. Photo: BGF

need to be stored separately in a different store to avoid mixing with gum arabic, but sometimes these are stored together. Most of the gums and resins are sold without sorting.

Exporters carry out some cleaning and sorting based on their requirements but no established criterion exists. It involves removal of bark and any observable foreign matter (e.g. stones, insects or separation of nodules/lumps that are distinctly different from the rest). In the case of hagar, post-harvest losses can be to the tune of 30% in the form of bark, insects or adulterants. However, in Ethiopia, myrrh and olibanum are sorted and graded on the basis of particle size and colour and in Sudan there are established grades for gum arabic. Packaging is done according to the importers requirements. Powdered gum arabic for example is packed in 50 kgs net weight bags while first grade lumps are packed in 25kgs net wt bags.

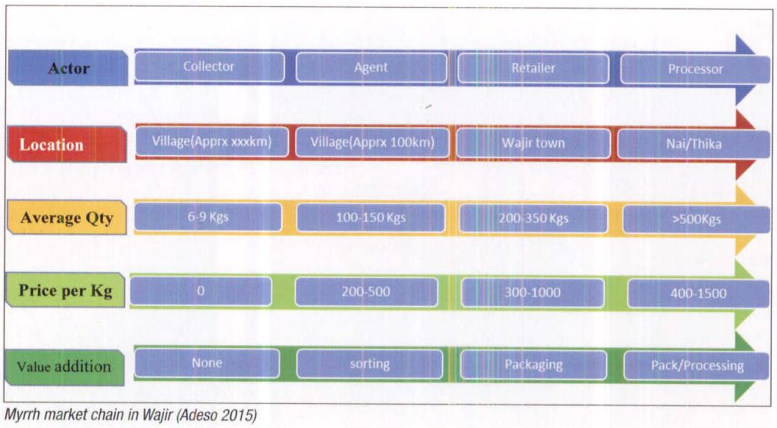
Valued Added Processing

Only a small quantity of the gums and resins produced in Kenya is processed for essential oils. The rest is exported in raw form. There are currently three processors of gum resins in Kenya - Lubanchem Limited, Northern Gums Limited, and Arbor Oils of Africa Ltd. The firms extract essential oils from myrrh, Olibanum (Frankincense) and Opoponax (Hagar) through a steam distillation process. The yield of essential oils at 70% efficiency level is 5% for myrrh and 6% for Olibanum and Hagar. For gum arabic, it is only Arid Land Resources Limited (ALRL) that carries out value addition to gum arabic by grinding the product and grading it before exporting.

Trade and marketing

The current annual world demand for gum arabic is about 100,000 MT against a supply of about 70,000 MT which is projected to

reach 150,000 MT by 2020 (Muller and Okoro, 2004). The annual world demand for gum resins is estimated at around 6000 MT. Globally, the resource potential of gums and resins far exceeds current levels of production. Apparently, the exports of gum arabic from Kenya are still very small relative to the resource potential. Annual exports of gum arabic have been only a few 58.8 MT which reached a peak of 165 MT in 2008 valued at US $ 151,715.8 (Export Promotion Council, 2014) due to both the intrinsic properties of the gums as well as issues related to handling and post harvest processing. However, there now exists niche markets for gum arabic from Kenya that is expected to scale up the production and export volumes.



Myrrh market chain in Wajir (Adeso 2015)

Kenya is the third largest exporter of resins (myrrh, hagar and frankincense) after Ethiopia and Somalia. However, the export statistics for gum resins are poorly documented as the trade codes combine resins, gum resins and other natural gums making it difficult to segregate the resins (Chikamai et al, 2002). Export volumes of gum resins averaged 2,361 MT and reached a peak of 3,687 MT valued at US$ 4,010,726.3 and sold mainly to Pakistan, Vietnam, China, Hong Kong and India (Export Promotion Council, 2014).

Germany is the leading destination in Europe with Switzerland emerging as a key destination. A lot of cross border gum resin trade especially through Ethiopia and Somalia goes on unregistered. This is exacerbated by the lack of a strong Traders' Association and insufficient capacity of the various government agencies involved in monitoring trade. Profit margins for agents or local traders are quite low (7. 1 -9.4 %) making them to rely on selling groceries, hides and skins to break-even and explain their low investment in marketing infrastructure (Wekesa *et al* 2013).

Key constraints and gaps on commercialization of gums and resins

The key constraints and gaps in the commercialization of *gums and resins* are summarised below:

Poor quality of the products resulting from adulteration

Poorly developed markets and marketing systems resulting in low prices at the producer level

Destruction of gums and resins producing trees for firewood, fencing and fodder

Insecurity in some of the producing areas interfere with gum collection, storage and trade

Low production of gum arabic due to low adoption of best practices and land and tree tenure issues

Inadequate data on the resources, trade and marketing

Lack of clear policies and strategies on the development of gums and resins at the county and national levels

Inadequate incentives including access to credit by producers and traders

Delays in operationalizing a factory for processing of gum resins at Wajir

Frequent and prolonged droughts affect gum production

Opportunities for Promoting Commercialization of gums and resins

Strengthening GARA by supporting implementation of the 2016-2020 strategic plan would be a starting point in reforming the sub-sector. A strong GARA would lobby the government for enabling policies and assist in the establishment and strengthening of the producer associations

The establishment of producer associations/ cooperative societies would help the local communities' access credit and negotiate for better prices in line with prevailing market prices. Training of the producer associations on sound production and post harvest handling will result in good quality gum resins coming to the market and thereby better prices and increased demand. Value adding through establishing medium processing plants (steam distillation or extraction plants) that will result in export of semi processed products.

County governments should develop a legal framework that will establish a county statutory board with the mandate to oversee investment and development of the gums and resins sub-sector in each producer county. Operationaization of the gums and resins rules, currently under development, would help in streamlining the sub-sector.

REFERENCES AND MATERIALS FOR FURTHER READING

Adeso, 2016. Capturing value through integration of gums and resins products from Wajir with the end markets in Nairobi. Report for REGAL-IR project funded by USAID.

Chikamai B.N. and Odera J.A. eds. 2002. Commercial Plant Gums and Gum Resins in Kenya: Sources of Alternative Livelihood and Economic Development in the Drylands. Executive Printers, Nairobi, Kenya

Chikamai, B.N., E. Casadei (eds). 2005. Production and Marketing of Gum resins: Fankincesnse, Myrrh and Opopoonax. NGARA series 5. 97 pp.

FAO. 2005: Mapping gums and resins in Eastern Africa. TCP/2914 Project Report.

Muga, M, Mutunga, C, Eliezer, P, Oriwo, V. and Chikamai, B. 2014. Sustainable wild harvesting protocols for gums and resins in Isiolo and Samburu counties. A consultancy study for CETRAD

Muller and Okoro, 2004. Production and marketing of Gum acacia. NGARA Publication Series .

Wekesa, C., Luvanda, A.M.,Muga, M.O.,Chikamai, B.N., Makenzi, P.M. 2013. Market Chain Analysis of Gum Arabic Trade in Kenya.Octa Journal of Environmental Research April - June, 2013. International peer-reviewed journal ISSN 2321-3655.Oct. Jour. Env. Res. Vol. 1(2): 93-106. Available online http://www.science beingjournal. com.

Meshack Muga is a Researcher at Kenya Forestry Research Institute KEFRI
Email: meshackmuga@hotmail.com
While Dr. Ben N. Chikamai is the Director KEFRI
Email:benchikamai@gmail.com