Field Appraisal on the state of knowledge on *Boswellia* species and commercialization of frankincense in Kenya: Report of Field visit to North Eastern Province

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1. Introduction

The *Boswellia* species is found in rocky and red loam or clay soils with 220 – 1350 metres above sea level and 250 – 600mm rainfall. *Boswelia* species mostly grow in k1 floral area. *B.catteri* that grows in Somalia has the most valued frankincense attracting Ksh. 800/kg. The most valued species in Kenya is *B. rivea*.

The main species for olibanum in Kenya is *B. neglecta*, which grows throughout the northern Kenya. It produces olibanum with fresh fragrance that is less valuable and has only a small market compared to olibanum from the Somalia and Ethiopian species. The most fragrant incense in Kenya comes from *B. rivae* that is found on the Ethiopian border near Mandera. The third species, *B. Micropylla* occurs in Wajir and Mandera disricts. There are four species of *Commiphora* and one composite herb that produce resins resembling olibanum but with less attractive fragrance and which can be mixed with commercial olibanum.

B. neglecta is found in Northern and Eastern Uganda, Northern Tanzania, E. Ethiopia, Somali and most drier parts of Kenya including S. TurkanaMutha (Kitui), NE province, Dandu, Meru National park, N. Baringo in Acacia commiphora bushland chiefly in rocky and red loam or clay soils. Altitude 2120 – 1350 m. Rainfall 250 – 600m. Zones v - vi.

Boswellia microphylla – **MUGLI (Somalia)**
An Ethiopian and Somali species that is also found in East of Wajir, Moyale and Mandera. Grows intermingled with B. neglecta which it closely resembles except that the compound leaves have fewer leaflets and bark is harder and not wrinkled. Local people prefer the fragrance of the incense from B. neglecta but prefer to chew the resin from B. microphylla.

Boswellia rivea – **Mudufur Ade (Somali)**

Ethiopian and Somali species found on the hills bordering Ethiopia from Ramu East towards Mandera town (Banissa, Ramu, Mandera). Distinct from other branches in that the bark is white not grey and the lower branches run horizontally to the ground rooting where they touch the soil giving rise to new trees. The species is found in dry land ecosystem on open Acacia bushland and on limestone hill with 220mm rainfall. Found on dryland ecosystem on open acacia commiphora bushland and on limestone hill with 220 mm pa. It produces the most fragrant incense in Kenya and people in this area who have access to all prefer this resin for chewing.

B. Papyrifera – n U1/K2 boarder . Found in Turkana district at the Sudan/Uganda boarder

Figure 1: Distribution of *B. neglecta* by Districts in Kenya

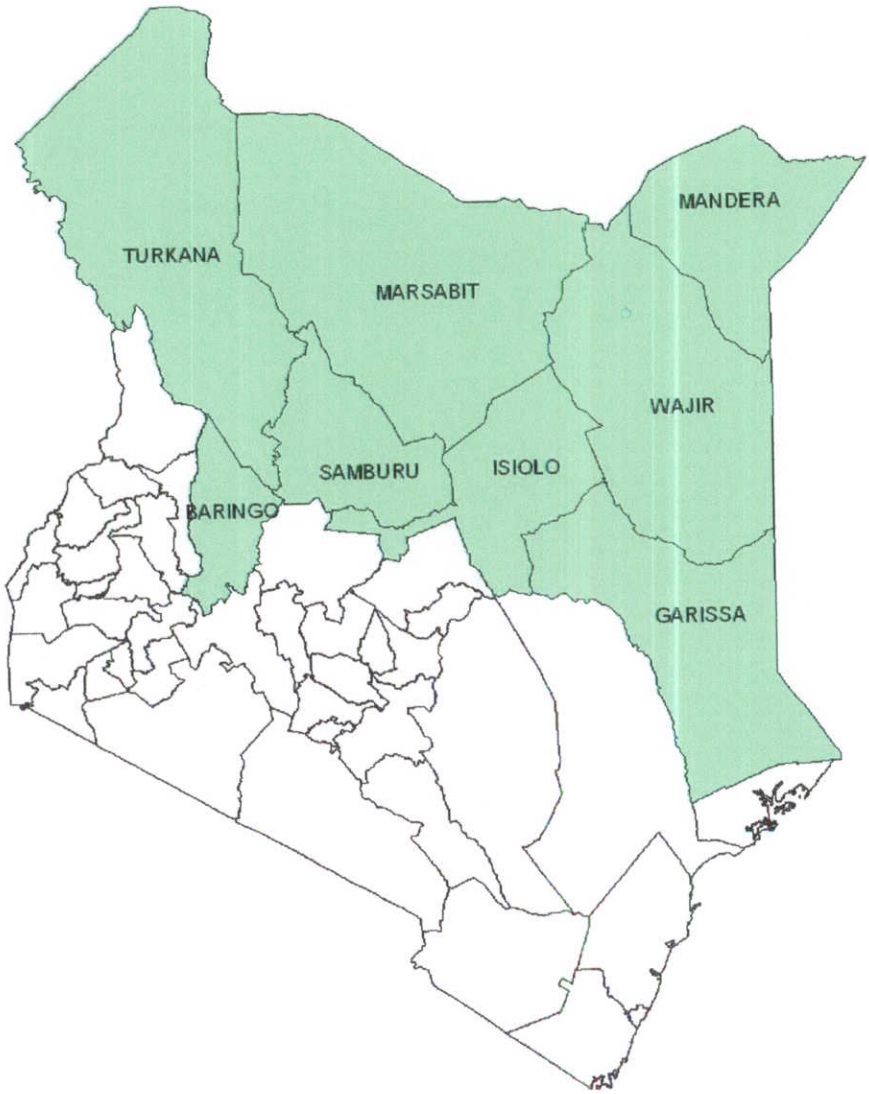
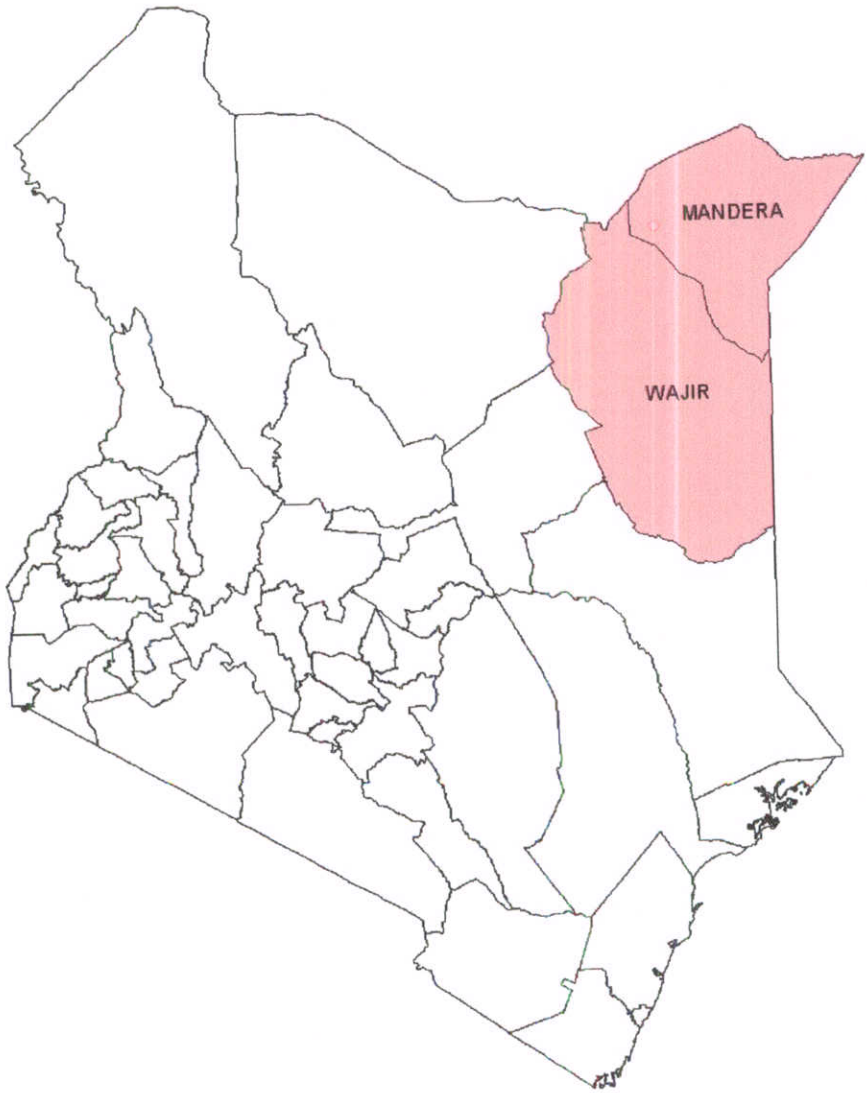


Figure 2 :Distribution of *B. rivea* and *B. microphylla* by districts



2.1 Discussion with Mr. Quaresh, proprietor, Elegant Trading Company Limited.

Elegant Trading Company is a private trading company based in Nairobi and registered in 1995. The proprietor serves as the Managing Director though he is also having formal employment in the public sector where he serves as General Manager of a Parastatal. A supervisor for general administration assisted by a clerk who handles stores and documentation runs the day-to-day activities of his company. The company employs 20 workers who are paid a monthly salary. The company is registered to trade in all gum and gum resin commodities but is at present specializing in hagar and opoponax. In fact it is at the present moment leading in the export of hagar and opoponax in the country. On the production side, it has established a strong network of buyers at the level of wholesalers who are paid competitive prices on the understanding that they pay a reasonable amount to the suppliers (collectors and duka owners).

The following issues emerged from discussions with Mr. Quresh

- Olibanum production is low in Kenya due to lack of good commercial outlets. Low commercial outlets are due to low quality of the product which is as a result of inadequate quality control.
- Local people in North Eastern province are knowledgeable on uses of olibanum.
- Resource grows in the wild where its neither planted nor tended. It is not in abundant supply. The resource is communal owned. Experience has shown that once the commercial value of a resource improves, it leads to clear ownership.
- There is potential for plantation establishment since land is available and weather conducive. There is no myth against tree planting.
- Main constraints for commercialisation in olibanum is poor marketing of the resource, low quality control systems and harsh/difficult terrain where resource is collected
- Main opportunities for commercialisation are availability of land, conducive weather, people knowledgeable on its uses, people poor and so consider it as an alternative income generating activity, infrastructure for marketing available especially the air strip in Wajir
- Production process – Olibanum collected from trees by collectors who sell to hawkers who in turn sell to merchants. No much care is taken for the product. The product is commercially viable if some cleaning is done especially removal of impurities that stick to the gum.
- Price for olibanum is subdued at all levels. Due to lack of market outlets, some merchants buy it for speculative purposes
- Marketing of the resource should be fronted by NGOs in collaboration with government agencies. A private investor may not be able to undertake marketing on its own due to high cost involved and long time taken before returns can be achieved.

2.2 Garissa District

Maalim Salim is the only main dealer in gums .He used to sell 3 – 4 tons of olibanum to Mombasa every month. The buyer has since relocated to London and so has not sold since year 2000. The sources of gums are Barabara, Shibilia, Modogashi and Bangal. Merchant gives orders to the pastoralist. The shop was not having any olibanum at the time. The consumers prefer white type of olibanum to the black type. The gums are packed in sisal bags. Price of white olibanum per kilogram is 35 to 40 while black one goes for 30. The production is done during the dry season September to December. Olibanum is available at Modogashi, Barabara, Riboi and Shimbiri. The markets for Olibanum are erratic. The pastoralists in Garissa have no interest in gum collection unlike their colleagues in Wajir and Madera.

The olibanum in the market is mainly from Ethiopia which comes to Garissa through Moyale. Most Somalis believe that the quality of smell of Olibanum that is found locally is low. However the poor families burn the local Olibanum since they cannot afford the exported one.

2.3 Wajir District

There are 5 main merchants in Wajir who mainly trade in Malmal and Hagar. The traders in order of importance are:

- Sharif Ali
- Abdi Wei
- Ado Yusuf
- Dagana Abire
- Abire Muhhamed

The main trader, Sharif Ali, buys 150 tons of gums per month, which he sells, to Nairobi and Mombasa. Main products bought are hagar and malmal that is bought at 50 and 85-100 per kg respectively. The production areas for hagar and malmal are Tarbaj, Dambas, Salaman, duunto, and Mbutehero divisions.

Production areas for lubadini are Danaba location bordering Mandera on the Ethiopian boarder. Lubadini is only sold on order

Retailers exchange the gums with money, clothes, shoes, sugar, tea leaves, pesticides, wormicide. Sugar is most preferred. Almost every shop in the rural areas has retail inlet for gums. Retailers buy at 35 per kg while the main merchant in Wajir buys at 50 per kg. Retailers check the gum for quality before purchase and then pack them in bags. They then hire vehicle jointly, which transport the gums to Wajir. In case the gums do not fill up the vehicle they carry hides and skins. The main merchants in Wajir weighs the product on arrival, check for quality by opening the bags to remove wastes and then weigh again. The gum is later repacked in new bags for sale in Nairobi. Loaders repack into new bags at a price of Ksh. 10 – 15 per bag

Lubadini price is low compared to labour involved. A collector can collect only 2kg from morning to lunchtime.

Count council charge Ksh. 800 per ton or 80 per bag for every gum sold.

Photo 1: *Boswellia rivae* **in Madera District**

Photo 2: *Boswellia neglecta* **in Madera district**

2.3 Mandera District

Haji Gaiye
Buys gum from middlemen and directly from collectors. Initially he could buy 5 to 10 tons of boswellia per month but cannot buy such quantity now due to lack of funds. Used to buy from neighbouring Somali. Buys large quantities of Hagar and malmal. Purchase depends on orders but on average buy 10 tons per month, which he sells to Nairobi and Mombasa
Merchants in Mandera felt that FD and other agencies have not assisted the gum industry. They requested to be assisted in getting market outlets of the products

Second merchant – Bario
Combines hides and skins business with gum
Buys lubani at 40 to 45 per kg and sells at 65 to 70 per kg in Nairobi

Table 1 : Kenya commercial gums and resins

Commercial name	*Local name*	*Scientific name*	*Distribution of trees in Kenya*	*World distribution of species*	*Other exporting countries*
Myrrh	Malmal (Somali)	Commiphora myrrha	Wajir &Mandera	Somali, eastern Ethiopia, S.W. Arabia, N.E. Kenya	Ethiopia Somali
Hagar opoponax	Hagar (Somali) Hagarsu (Borana)	Commiphora holtziana subspp. holtziana	N.E. Kenya, eastern Isiolo	Kenya, Uganda, Tanzania, Ethiopia, Somali	Somali
Olibanum frankincense	Madful (Somalia), Dakara (Borana)	Boswellia neglecta	Northern Kenya	Kenya, E. Ethiopia, Somali, Uganda & Tanzania	Somali, Ethiopia, India
Gum arabic	Ada (Somalia)	Accia Senegal var kerensis	Northern kenya	Ethiopia, Somali, Kenya, Uganda & Tanzania	Sudan, Niger, Chad

3 .Uses of Olibanum

3.1 Household

- Used to improve scent of drinking water
- Used by maternal mothers when they give birth to their first child
- Smell repellent and used to chase away evil spirit
- Chewed by pregnant women
- Local people know of only local uses of olibanum. But do not know of other uses it can be used – Need to sensitise on potential uses
- Good scent in houses

Kenya
4. Sources in N. E. province

4.1 Garissa District

Banane, Danyere/Mbalambala divisions, the highest concentration is area between the two divisions

4.2 Wajir district

Met 20 community members from Danawa located 220 Km from Wajir who had come to sell their product in Wajir. They identified Boswellia with the local name Mirafur. It produces Lubadini which is of two types, white and black. The product is in large quantities in this area but since the price is low, it is not considered as an

important product. The price of Lubadini is 10 per kg compared to 52 per kg for Hagar.

The trade in Malmal and Hagar is commercialised in Wajir. There are six merchants in town each with about 200 bags of stock. Each merchant sells 14 tons of the products to Nairobi every two weeks. The main form of trade in gums is barter trade. The collectors exchange the gum with sugar, tea, clothes and shoes

4.3 Mandera District

Lubadini found in the following divisions; Rhamu, Hareria, Bambu, Kumbiso, Sala, Rhamu Dimtu, ola, Malkamari, Kokai, Ashabito. There are large quantities of Boswellia in Mandera district

Malmal and Hagar in less quantities. Commiphora found in the following divisions; Fino, Lafey, Elwak, wargadud, Shimbir Fatuma, Damasa, Katulo and Barisa

5.0 Production

- Herders collect Olibanum as a secondary activity when they are looking after the livestock. Men, women and children do collection. They collect the droppings on the ground though in some cases they pick the mature gum from the tree. In Garissa, Wajir and Mandera, the tree is not tapped for gum production. In some cases Somali women remove the bark of the tree that is used for tanning leather, dying wooden containers and making strings for traditional house frames. This result to injury to the tree that produces gum though the intention is not to injure the tree.

- Gum naturally oozes from the tree. No tapping done. Collected by hand from the tree or on the base of the tree where it drops
- Bark of the tree used as a relaxative medicine by pregnant mothers. Bark also used as dye for decorating houses. As a result of these two uses tree is injures while removing bark leading to production of gum
- Production in Wajir and Mandera was introduced by Arab traders. These had no influence in Garissa
- Hagar and malmal produced in September to November while Lubadini is produced throughout the year but mainly during dry season.
- Collectors move in groups of 3-4 persons but each person collects own gum
- One collector gets 5 kg per day but can collect 0.5 kg if the area is not virgin. Well-experienced collectors can attain 10 kg per day in a virgin area
- Best time for collecting is during the dry season (August to November). Rains spoils malmal, hagar and gum arabicthe product. Better quality of product is obtained in the gums comes out on its own without tapping

Most gum dealers combine trade of gums and selling of hides and skins. The trade in hides and skins supplement gum trade since in cash and transportation

5.1 Production quantities

Production quantities were assessed through records of revenue returns from county councils. The councils charge Ksh. 80 for every bag

Mandera

In the period July 2000 to June 2001, Ksh. 70,460 (880 bags) was collected
From July 2001 to March 2002, Ksh. 75,730 (946 bags) was collected.

The amount collected is just about 1/3 of the total since most of the gums end up being sold without council knowing. The council have no machinery to enforce payment

Table 2: Wajir: records were obtained for financial year 2000/2001

Month	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Marc.	Apr.	May	June	Total
Revenue	18220	64240	8240	-	-	51000	12000	1320	18680	10400	10400	42000	236500

Each bag contains a 100 kg and is charged Ksh. 80. Hence the total revenue collected is for 2957 bags

6.0 Markets

Olibalinum collected from trees is sold to local merchants in rural areas. There is mainly a merchant in every shopping center. The main products bought by these merchants are gum from *commiphora* species. Barter trade is the main mode of trade in which merchants exchange gum with household items like sugar, tea, clothes and shoes. The local merchants sell the gum to merchants in big towns like Mandera, Wajir who in turn sell to merchants in Nairobi and Mombasa.. There is no stable and continuous market for gums. Lubadini has no market in Wajir. It is sold to Ethiopia at Ksh. 50 per kg and used to be sold in Somalia when there was a government. . Ethiopians also do collect Lubadini in Kenya. Lubadini has high market in Ethiopia where they buy at 50 –55 and sells at 70-80 per kg. The Somali government used to assist its people to perfect trade in Boswellia through training them in sorting and opening up markets

Barter trade used in Wajir and Elwak and Lafey divisions of Mandera district. In other parts of Mandera trade is by cash exchange

Photo 3: Hagar and Malmal trade is commercialised in Wajir and Madera: Packed in bags ready for market

6.1 Prices

- Prices of livestock are predictable; they rise immediately after the rains and goes down during drought. On the other hand the potential for olibanum production is high during drought and so can act as an important alternative livelihood support
- Price of malmal in Madera is Ksh. 150 –160 for high quality and Ksh. 80 – 120 for low quality
- Price of hagar in Madera is Ksh. 50 – 70 per kg for best grade
- Price of lubadini is Ksh. 80 in local market and 130 in Mombasa. Lubadini price is low since buyers dictate the price
- Price in Mandera
    - Malmal - 80 during low season and and 100-120 during good season. The merchant pays Ksh 5per kg to county council, 5/kg for transportation, 1.50/kg for loading, 1.50 for sack and sisal and then sells the product in Nairobi at 150 – 160 per kg. Graded products is bought at 100 for first grade and 80-85 for second grade
    - Hagar bought at 45- 50 per kg and sells at 70/kg

7. Quality control

- No quality control since product is not commercialised and there are no qualified people to control quality
- Sorting of gum labour intensive, have to empty the bags, cut them through to loosen them before sorting

- In Mandera, merchants know the various products. Buyers specify the quality and do sorting when buying. The gums are graded into grade 1 and 2. The seller of the gums has to sort out the products or else will sell the product at a low price

8. Tenure and ownership

- Boswellia species in Kenya grows in the wild environment. The tree regenerates naturally and no evidence was seen on communities planting the tree. The tree is highly valued by the communities. The Somali community in Kenya have no taboo against tree planting.
- Resource located in communally owned land.
- Each community unit has responsibility of managing resources in their vicinity. Each clan in a particular section handles management of resource in their vicinity
- There is clear ownership of land in towns and along the riverbanks where agriculture activities are conducted. The open ownership of land is mainly in livestock grazing areas

9. Socioeconomic indicators

9.1 Gender Roles

- Gums collected by both men and women with men collecting at a large scale while women collect small quantities
- Women are more preferred in sorting out of the gums
- Selling of milk is done by women
- Men controls sale of livestock

9.2 Wealth indicators

The main wealth indicator within the Somali community is the number and type of livestock owned. Most valued livestock are camels followed by cattle and then goats. The second wealth indicator is the size of the family with big families being preferred. The third indicator is extent of crop farming. This used to be considered as poverty indicator but this has changed over time with more community members adopting farming. Collection of gums used to be considered as a poverty indicator especially for the collectors but this is changing as the price of the products improves.

10. Prospects of plantation establishment

- Issue of ownership is a hindrance to plantation establishment. However if the product is commercialised it can lead to redefinition of ownership. This has happened in areas where farming has been introduced especially in riverbanks areas
- Trees planting along Daadab refugee camp have made community realise that indigenous trees can be planted
- Community has no tradition of planting indigenous trees but on the other hand, they have no taboo against planting trees
- Community have been planting ornamental and aesthetic trees in the urban areas

- Livestock grazing/browsing is a major problem to plantation establishment This means fencing is necessary at the initial stages of establishment. For any fencing to be done, the chief and local leaders have to be consulted

11. Areas of assistance

The community identified areas where they need assistance . They include:

Creation of market outlets for the olibanum and other gums

- Establishment of Credit schemes to support the collectors and merchants. It was noted that the merchants are paid three months after delivery and so must have some capital base to pay the collectors as they wait for payment.
- Training/seminars on tapping techniques, tree management, marketing, quality control and entrepreneurship.
- Construction of godown for storing products before marketing
- Area for sorting out the products
- Analysis aimed at improving market outlets
- Tools and equipments for collectors
- Training to mobilize various groups

12. Opportunities and constraints for commercialization

12.1 Opportunities

- Gum producing trees available in large quantities
- There is potential for improvement of marketing channels
- Community take up opportunities very fast
- Community value the trees and are knowledgeable about trees that produce gum and so protects the trees
- Community has diverse use of gum producing trees and have a tradition of using wooden utensils, tools and collects medicine from trees
- Potential for training gum harvesters
- Gum production an important alternative source of income
- Poor households mainly collect Olibanum and so improving production is a good strategy for targeting poor households
- Can provide income during dry season, which can push community to the next season
- The production can increase ten fold if market outlets are created

12.2. Constraints

- The main constraint to commercialisation is the low pricing of olibanum, which is brought about by lack of outlets of the product. A collector of gum from commiphora gets 50 – 100 per kg compared to 10 – 20 per kg of olibanum.
- Trees dispersed
- Lack of markets for the products
- Lack of husbandry techniques to enhance production
- Lack of quality control leading to low quality products
- Adulteration of products
- Germination problems
- Ownership not defined
- Dealers in Nairobi buy at a credit making the merchants hold their capital

- No credit for collectors and merchants unlike for gum arabic where credit scheme exist. This makes the merchants hold a lot of money in stock before they can sell the product and so cannot buy large quantities
- Long distance for collectors without food and water
- Collectors not aware of need for quality

13. Recommendations

- Merchants should form an association that can deal with marketing of the products
- Government and other agencies need to come in to assist community in marketing the products
- FD should create a budget line/AIE that can be used to support gum collection and marketing
- Need for training in collection and capacity building in tapping technology
- Need to assist collectors/merchants during dry season when their products cannot sell
- Conduct analysis to determine active ingredients in Olibanum that can be used to market the product
- Assist communities in quality control and value adding of the product
- Establish credit schemes that could assist merchants/hawkers/collectors

14. Contact persons

Nairobi

Hassan Abdikadir and Mwasaro. Phoenix house , Nairobi
QuareshH. Ahmed – General Manager, Bomas of Kenya

Garissa

Mr. Mwanasawe, Provincial Director of Agriculture, N.E. province
Mr. Abdahim Omar, DALEO, Garissa District
Mr. Joseph Kitonyo, DFO Garissa
Mr. Maalim Salim, Merchant Garisaa town
Mr. Idris S. Kelon, MOA, Garissa
Mr. Idris Y. Abass, MOA, Garissa

Wajir

Sharif Ali - Merchant
Abdi Salim Mohammed
Wafula DFO Wajir

Mandera

Abian Osman – DFO Madera
Mohammed Khalif – Merchant
Abdille Sheikh
Billow

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Proceedings from a workshop on gums & resins production and trade, Jan 2000, held in Wajir

Annex 1: Checklist for questionnaire and group discussions

1. Botanical sources
    - Main frankincense producing areas per district. Indicate locality by name and give GPS coordinates, main species available and extent of the resource. Compare this information with literature
    - Develop community maps
    - Methods used in indicating boundaries of the resources; marks used, names

2. Production process, highlight the production process from the tree to the end product
    - Who collects gum and when collected
    - Containers used to collect and store gum
    - Methods used in collection
    - Instruments used in production
    - What else do they do when collecting
    - Who does the sorting and grading
    - Agents dealing with research, production and marketing of gum locally

3. Annual calendar of events
    - Division of labor
    - Prediction of gum production based on rainy season
    - Division of labor by gender

5. Organization of frankincense production
    - Organization/community structures that exist in management of the resource
    - Number of men in a work party
    - How proceeds from the field is shared out
    - Credit schemes in the production
    - Institutions in place to regulate the trade
    - Distribution of frankincense collection points
    - Labour organization

6. Who owns the resource?
    - Individual or a group of families
    - Resource sharing among the group owning the resource
    - Lineage traditions within the community and does frankincense qualify as one of the lineage properties
    - Tradition of renting out the resources

7. How income from gum is used; who controls
8. Social and property value of frankincense
    - Wealth indicators in the community and is resin gum considered as a wealth indicator

9. *Community perspective on domestication of Boswellia species ie plantations,*
    - Community perspective on tree planting especially Boswellia species

- Arguments for and against domestication

10. Quality and quality control
    - Community knowledge of the final usage of the resin gum that they sell out
    - Methods used by the community and agents to control quality
    - Comparison of quality produced by different agents
11. Prices of the resource
    - Is pricing dependant on the quality
    - Price fluctuations within the year
    - Do the community feel exploited
12. Marketing
    - Market channels
    - Main problem in marketing
13. Constraints and opportunities towards development of the subsector
    - Problems encountered in the sector
    - Opportunities for development of the sector

Workplan

1. North Eastern Province – Garissa, Wajir, Mandera

Time Schedule

Date	Venue
11.8.02	Travel to Garissa by Road
12.8.02 – 13.8.02	Survey in Garissa District
14.8.02	Travel to Wajir by Road
15.8.02-16.8.02	Survey in Wajir
17.8.02	Travel to Mandera
18.8.02	Sunday
19.8.02-20.8.02	Survey in Mandera
21.8.02	Fly back to Nairobi

Total number of night outs 10 days