

Gum and resin resources and their economic contributions in Liban, Southeast Ethiopia

Background

Non-timber forest products (NTFPs) are well known worldwide in their contributions to national and local economies. For instance, in India over 50% of forest revenues and 70% of forest export income comes from NTFPs (Shiva, 1993). Vegetations in the dry lands of Africa are well known for their valuable NTFPs principally, oleo-gum resins such as gum acacia, frankincense, myrrh since ancient time. These products are widely used in unprocessed form for fragrance and in folk medicines as well as as raw materials in several multibillion-dollar industries around the world. They have been used in a number of medicinal contexts since long time and still today in several countries across Europe, India, Africa, China and Middle East. Furthermore, they continued to find modern pharmacological applications most of them as claimed by traditional therapies. Recently it was known that two compounds of myrrh, furanoeudesma-1, 3-diene and curzarene, had indeed pronounced pain relieving (analgesic) properties as claimed by traditional therapies (Archaeology, 1996). The anti-inflammatory, antipyretic and antihistaminic effects of *Commiphora myrrha* (Tariq et al., 1985), *hypolipidemic* (Malhotra et al., 1977), hypocholesteremic, antiatherosclerotic (Lata et al., 1991), antiarthritic potential (Dowiejua et al., 1993), antigastric ulcer and cytoprotective effect (Al-Harbi et al., 1997), anti-tumour potential (Qureshi et al., 1993), smooth muscle relaxing effect of *C. guidottii* Chiov. (Claeson et al., 1991), anti-inflammatory effect of *C. mukul* (Kook.) Engl. and *C. incisa* (Dowiejua et al., 1993), anti-ulcer effect (Al-Harbi et al., 1997); anti-schistosomiasis (Massound et al., 1998), anti-fascioliasis (Massound et al., 2001), reduction of cholesterol and triglycerides (Michie and Cooper, 1991), hypolipidemic (Malhotra et al., 1977), hypocholesteremic and antiatherosclerotic (Lata et al., 1991), pediatric and blood lipid remedies in Children (Michie and Cooper, 1991), and without toxicity side effects (Massoud et al., 2001) were verified. Myrrh also has astringent properties and has a soothing effect on inflamed tissues in the mouth and throat. Studies continue on the potential anticancer actions of myrrh resin (Dolara et al., 1996). In addition to its antiseptic & expectorant abilities, myrrh destroys putrefaction in the intestines and prevents the absorption of toxins in the blood; it stimulates blood flow to the capillaries and promotes menstruation (Frawley and Lad, 1986).

Ethiopia is one of the countries well endowed with various species of *Acacia*, *Boswellia* and *Commiphora* that are known to produce gum arabic, frankincense and myrrh. Ethiopia has been also earning considerable foreign currency from the export of oleo-gum resins since ancient time. However, few studies have been made to document the status of the vegetation resources that provide oleo-gum resins and on their economic contributions to rural households in Ethiopia. The

objectives of this survey were to 1) assessing the existing potential in oleo-gum resin resources, and 2) estimating the current economic contribution of these oleo-gum resins resources to rural households in Liban, an area in southeastern Ethiopia know to have large oleo-gum resin resources.

Location of the study site

Liban, one of the administrative zones in the Ethiopian Somali National Regional State (ESNRS), is located approximately at longitude 39-41°E and latitude 3-4 °N in south eastern Ethiopia. It is an area bordered by the Ganale river to the north and east and the Dawa river to the west and south. About 19,145 km², corresponding to approx. 95 % of the area of Liban, was covered by this reconnaissance survey. Generally Liban falls within the arid to semi-arid lowlands (areas below 1500 m a.s.l.) of the country (NCSS, 1993), with an altitude ranging from 200 to 1100 m a.s.l. The rainfall is bimodal and occurs from October - November and March-April with two distinct dry periods separating the two rainy seasons. Mean annual rainfall in Liban ranges from 28 - 820 mm, and annual potential evapo-transpiration rates range from 1630 – 2832 mm (Hawando, 1997). Mean temperature ranges from 18 °C for the coldest months to over 27 °C during the hottest months. Population density is generally low, less than 10 persons per km². It is one of the least populated areas in Ethiopia (NCSS, 1993). The vegetation in Liban belongs to the Somali-Masai *Acacia-Commiphora* deciduous wood-and bushland formations. Grazing land and vegetation resources in Liban are communal.

Vegetation and socio-economic survey were carried out in the summer of 1997-98. Socio-economic survey was performed using structured questionnaire, which was conducted in local language.

Results

Six different vegetation types were identified in Liban. In all of the vegetation types identified oleo-gum resin producing species comprised over 60 % of their total stem density. This shows that oleo-gum resin producing species are dominant in the vegetation of Liban.

Eight species of trees/shrubs belonging to two families *Mimosaceae* and *Burseraceae* were designated by informants to yield currently traded oleo-gum resins in the vegetations of Liban. The identified species include: *Acacia senegal*, *A. seyal*, *Boswellia neglecta*, *B. ogadensis*, *Commiphora myrrh* (syn. *C. molmol*), *C. truncata*, *C. africana*, and *C. borensis*. Particularly, *A. senegal* and *C. myrrha* are the dominant species among the oleo-gum resin producing species in most of the mixed vegetation types. At present five types of oleo-gum resins are collected from these identified species for commerce. These are gum arabic obtained from *Acacia senegal*, gum

talha obtained from *A. seyal*, frankincense obtained from *Boswellia neglecta* and *B. ogadensis*, myrrh obtained from *Commiphora myrrha* (syn. *C. molmol*), *C. truncata* and *C. borensis* and hagar obtained from *Commiphora africana*.

A total of 903 tons of oleo-gum resins is estimated to be collected each year from the vegetation in Liban. Out of this, 209 tons is gum arabic, 266 tons is frankincense, 187 tons is myrrh, 33 tons is gum talha and 208 tons is hagar. Information obtained from the survey indicated that the quality of gums and resins at lower altitude, with drier climate, was generally higher than at the relatively wetter higher altitudes.

The average annual cash income generated per household from collection and sale of oleo-gum resin was estimated to be US\$ 80.00. This income contributes to 32.6% of annual household subsistence, and ranks second after livestock in the overall household livelihood. The contribution from crop farming was estimated to be 12%, which is about one third of the contribution from oleo-gum resins. These results show that oleo-gum resins obtained from the vegetation resources play a significant role in the economy of rural households in Liban. The vegetation resources and their oleo-gum resins also provide various goods and services for the rural households in Liban. Fodder for livestock, traditional medicines for human and livestock disease treatments, incense for fumigation, cultural and religious rituals, and emergency foods during droughts are among the most common.

Conclusion

There are several obvious reasons to develop these resources. First, the vegetation resources and their oleo-gum resins provide multiple goods and services to households living in semi-arid and arid lands like Liban. Livestock production, which supplies the major needs of the pastoral families in Liban, is heavily dependent on the plant biomass for fodder provision. Particularly in dry season as well as during droughts, the trees and shrubs are the only source of fodder for the livestock. Second, they also provide income mainly during dry seasons when households often fall short of subsistence. Third, they also provide emergency food during drought and famine. Fourth, the wide industrial potential the resources possess would mean that they could be developed and thus provide employment opportunity for the local people and economic development for the nation at large. Fifth, if properly utilized, they also provide significant ecological advantage. The non-destructive extraction of oleo-gum resins means conservation of the vegetation resources, which is useful in protecting desert encroachment and hence desertification control. Particularly, in connection to forecasted climate change related aridity in most dry lands of Africa, the *Acacia*, *Boswellia* and *Commiphora spp*, might be potential resources for the use of our vast dry land resources in the future.

References

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Notes: for further readings

1. The major report of the study in Liban is in press in the *Journal of Arid Environments* (status accepted)
2. Other two review papers on frankincense and myrrh resources of Ethiopia are also in press in *SINET* (status accepted)

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