

Research Article

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Value Chain Analysis of Frankincense in Hammer and Benna-Tsemay Districts of the South Omo Zone, South Western Ethiopia



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Abstract

A study was conducted in Hamer and Benna-Tsemay districts of the South Omo zone of Ethiopia, with the objectives of identifying and mapping the market chain and its functions, providing the picture of supply and use patterns, identifying and suggesting possible intervention of value additive techniques, identifying potential opportunities and constraints in the production, processing and marketing of Frankincense. Two-stage sampling strategy used to select Frankincense collectors for the study the producers/collectors and traders within society as well nearby marketing systems were studied through group discussion, personal observation, and using a structured questionnaire where each household was taken as a unit of analysis (45 households from Hammer, 15 from Benna-Tsemay). Simple descriptive statistical tools were used for the analysis. Observation among value chain were summarized using Strength, Weakness, Opportunity and Treat (SWOT) analysis and software called Statistical Package for Social Science (SPSS) were also used for the analysis. Survey results show that almost all of the respondents confirmed that the incense products potentially collected from the natural forest found far away from their villages. Currently the marketing of Frankincense both at Hammer and Benatsemay Woreda of south Omo zone in general is not well developed and there is no established market in place. To advance the value chain of Frankincense and sustainably contribute to the income of pastoral communities formation of collector groups, associations or cooperatives is needed to foster cooperation and coordination of the collection and marketing of Frankincense.

Keywords: Frankincense; Marketing; Value Added; Value Chain

Abbreviations: SWOT: Strength Weakness Opportunity Treat; SPSS: software called Statistical Package for Social Science; NTFP: Non-Timber Forest Products; PNRM: Participatory Natural Resource Mapping

Introduction

In rural Ethiopia, a majority of the households make use of non-timber forest products (NTFPs) for different purposes, ranging from food, feed, energy, and medicine to income generation and cultural practices [1,2]. As provided by among the range of NTFPs, gums and resins are important trade commodities with a potential for spurring economic and social developments both at rural and urban areas in Ethiopia [3-5]. Commercial gums and resins are produced in rural (remote) areas, traded in urban centers, and consumed by western countries and, hence, touch wide ranges of human lives and cross-sections [6-8]. However, recent studies revealed poor linkage of rural producers to the market niches and, hence, lack of proper producers' marketing system [5]. Sound development of the value chain of Frankincense will, thus, have a massive impact on the larger population, especially the vulnerable rural poor dependent upon natural resources in the country [9,10]. Moreover, in the south Omo zone, value chain of the Frankincense starting from inception to consumption among major actors (producers//collectors, processors, traders, middlemen, and commission agents and consumers) are not

yet studied and documented. Thus, the value chain analysis of Frankincense is carried out with the following objectives:

- To identify and map the market chain of Frankincense and its functions
- To provide the picture of supply and use patterns of Frankincense
- To identify and suggest possible intervention of value additive techniques of Frankincense
- To identify potential opportunities and constraints in the production, processing and marketing of Frankincense

Methods

Description of the study area

The study was conducted in Hamer and Benna-Tsemay districts of south omo zone found in the Southern Nations, Nationalities, and People's Regional State of Ethiopia. The two districts have a total land area of 9,496 km² (Hamer = 5,742 km² and Benna-Tsemay = 3,754 Km²). The districts are located 4^o

27°-5° 39' north and 35° 23'- 37° 49' east, bordering Kenya to south; Bako gazer district to the north; Borana zone and Konso district to the east, and Kuraze and Selamago districts to the west. The study districts, Benna-Tsemay (Key Afer) and Hamer (Dimeka), are located at about 739 and 839 km from the capital city Addis Ababa, respectively. Furthermore, Key Afer and Dimeka are located 402 and 602 km from Hawassa, respectively [11]. The study area is characterized by semi arid and arid climatic conditions, with mean annual rainfall increasing from the extreme south lower part, with some 350 mm, to the upper part where it ranges to 838 mm. The rainfall is bimodal, with the long rain season from March to June and the small rain. Forest composition of districts are a mixture of Acacia, Boswellia and Commiphora woody species and short grasses type with varying density of woody vegetation (woreda classification). The arid and semi-arid zones are the preferred sites for Boswellia and Commiphora species (in altitude less than 1250 m.a.s.l). Acacia nilotica is the dominant woody plant in altitude ranging from 1,250 m.a.s.l to 1,600 m.a.s.l. Agro-mountain broad leaf wood plants with floristic elements of the Ethiopia highland is the typical vegetation in

altitude above 1,600 m.a.s.l. [11]. The pastoralists in the study districts raise cattle, goats, sheep and chicken as well they harvest honey from traditional hives and wild honey from the inside holes of trees and between rocks.

Data source and sampling techniques

This study used primary and secondary data sources. The secondary sources included Agriculture and rural development offices and development agents. primary data collected through focus group discussions with development agents, elders' women, young's, men and kebele administrative: key informant interviews with key person in the area: field observations and over viewing marketing system (Figure 1).

Field observations: They collect the exudates (ooze) from a standing tree by climbing on it to nearest branches by their own bare hands and sometimes they use sharp local materials such as knife and stone. Children and elders are the main collectors while chasing after group of goats and cattle who has been responsible for brought into the natural pasture and permanent water sources (Figure 2).



Figure 1: Wound trees ooze the incense and tapping technique.



Figure 2: Marketing system.

Passengers purchase at the road side: Two-stage sampling strategy used to select Frankincense collectors for the study: Stage 1: purposive sampling to select the districts and kebeles. Stage 2: random sampling to select individual households for survey. Three pastoralist kebeles from Hammer district (Marsha kelema, bita gelefa and gembela) and two pastoralist kebeles from Benatsemay district (luka and ufo) were selected. And a

structured and pretested questionnaire was administered to sixty(60) households in the Hammer and Benatsemay Woreda. The questionnaire was designed in such a way that it enables to collect data on the demographic and socio-economic characteristics of households, potential opportunities and constraints in production ,production and use pattern , picture of supply ,market chain and marketing of incense in the study area.

Data analysis

Simple descriptive statistical tools were used for the analysis. Observation among value chain were summarized using Strength, Weakness, Opportunity and Treat (SWOT) analysis and software called Statistical Package for Social Science (SPSS) were also used the analysis.

Results and Discussion

This chapter deals with the analysis of the survey data and interpretation of the analytic finding.

Demographic and Socio-economic Characteristics

A majority of the respondent households are between 20 and 55 years old and male-headed (Table 1). In rural Ethiopia, due to cultural influence, it is common to find few female-headed households. Illiteracy is prevalent and only 20% of the respondent households completed primary school. In contrast to government reports that indicate significant improvement in educational access for children and youth, none of the family heads below 20 years of age had completed even primary school [12]. Almost 50% of the family sizes of the respondents are above 5. This shows that family planning in the area is poor. The major occupation the respondents in the area is livestock and crop production, Frankincense collection, honey/bee farming.

Table 1: Demographic characteristics of household respondents involved in gums and resins collection in Hammer and Benatsemay of south Omo Zone (N= 60).

Age of household head	Gender			Level of education			Family size			
	Male	Female	Total	illiterate	primary	Total	≤ 5	5-8	≥ 9	total
< 20	2	0	2	0	2	2	2	0	0	2
20-35	20	0	20	11	9	20	11	8	1	20
36-45	12	1	13	10	3	13	6	6	1	13
46-55	12	3	15	15	0	15	5	8	2	15
> 55	9	1	10	10	0	10	2	7	1	10
Total	55	5	60	46	14	60	26	29	5	60

Production and use pattern of Frankincense

Survey results show that almost all of the respondents confirmed that the incense products potentially collected from the natural forest found far away from their villages. As revealed by Woreda agricultural development office and development agents the annual production potential of Frankincense from natural forest at both Hammer and Benatsemay district were on average 500-600kg/year and 720-840kg/year respectively. Most of the studied households are engaging in Frankincense activities, i.e. either in tapping/collection, marketing, or both

activities to generate cash income. Income generated from sale of Frankincense helps in meeting household needs, purchasing food and supporting livestock keeping activities. Annual income from Frankincense sales in the agro pastoralist kebeles of Luka, Ufo, Marsha Kelema, Bita Gelefa and Gembela mostly ranged from 3,000 to 9,000 birr (Table 2). The average cash income from Frankincense sales among the 60 surveyed households was about 5312.7 birr/ year during the survey period. Total annual income from Frankincense sales for all surveyed households is: 5312.7 birr* 60 households = 318,762 birr.

Table 2: Pastoralists' annual income from sale of gum and incense, by kebele.

Income range (birr)	Benatsemay				Hammer					
	Luka (N=10)		Ufo (N=5)		Marsha kelema (N=15)		Bita gelefa (N=16)		Gembela (N=14)	
	N	%	N	%	N	%	N	%	N	%
3000-4000	2	20	1	20	3	20	2	12.5	3	21.43
4001-5000	1	10	2	40	5	33.33	2	12.5	4	28.57
5001-6000	5	50	1	20	3	20	6	37.5	3	21.43
6001-7000	1	10	1	20	2	13.33	4	25	3	21.43
7001-8000	1	10			1	6.67	1	6.25	1	7.14
8001-9000					1	6.67	1	6.25		

Source: own survey (2005/6 E.C)

Market chain of Frankincense

Currently the marketing in Frankincense both Hammer and Benatsemay Woreda of south Omo zone in general is not well developed and there is no established market in place. Buying and selling is done at many levels ranging from the collection point up

to marketing centres in small towns (Turmi-for Hammers; Luka, Woito and keyafer for Benatsemays). As respondents stated that still now they do not have permanent customers to sell the incense. But mostly passengers and town dwellers purchase from small town marketing centre and at the road side. Also they revealed

that it takes a long time to market Frankincense and collectors lack sound market information to guide them on opportunities, trends and price mechanisms. The price of the Frankincense increases as the commodity heads to the end of the value chain. The number of traders buying Frankincense are few, mostly based in marketing centers that buy at collection points or small centers and in return sell to them. However, there is an emerging trend where traders are going around and buying incense directly from collectors.

As it is well understood from the group discussion respondents confirmed that during different occasion of time the incense production and marketing cooperatives have been formulated with ultimate support and initiatives of two different NGO's (Farm

Africa-Hammer and Benatsemay, and AFD-Hammer). Moreover, different trainings concerning tapping and handling of incense products have been organized by pastoral and agro-pastoral development office of the two discrete wore das. However, none of the cooperatives have been functional due to lack of continuous follow up and support. Collectors are paid 12-14birr per kg for black and 40-50birr per kg white incense by both middlemen and local traders. Middlemen and local traders mostly sell at 16-20birr per kg black and 50-60birr per kg white incense to town dwellers and passengers. However there is no trader who transports the Frankincense to exporters. According to collectors, in recent years the price of Frankincense has improved (Tables 3 & 4).

Table 3: Shows price and quantity relationships of incense product in local market (2001-2006 E.C).

Years (E.C)	White		Black	
	Quantity (kg)	Unit price (ETB)	Quantity (kg)	Unit price (ETB)
2006	1	50	1	20
2005	1	44	1	20
2004	1	35	1	15
2003	1	30	1	10
2002	1	20	1	5
2001	Bartering		Exchange of goods for other goods	

Source: Survey data (2005/2006).

Table 4: Swot analysis.

Swot analysis	Description
Strength	starting production i.e. early no or low production
Weakness	Lack of tapping experience, Poor handling and storing practices, Lack of value additive activities, Non functionality of cooperatives due to lack of continues follow-ups and support.
Opportunities	Initiative from governmental and nongovernmental organization to organize trainings (on processing & marketing) for different cooperatives so as to provide quality product, More production if there were organized team or cooperatives with legal binding of rules and regulation.
Treats	Deforestation is the most problem that has been hampering the sustainable production of gum by non stopping encroachment of tree species for purpose of farm land expansion and farm implements, Price deflation and decreasing demand for the product due to poor Infrastructure and market access. Decreasing number of potential gum bearing tree species.

From the above table in the years (2001-2003) it was so cheap. But recently, its value increased. As quantity increase, the prices also increase in consecutive years (2004-2006) of production and this shows that trends in production increase due to increase in price. There are a number of reasons that trigger the demand and price of incense products. According to respondents, the most reason is the season of production. Dry season is the potential period of incense production and consequently high production of incense has been collected by the community. However, during this period the price of incense has been dropped due to equilibrium of the market and the reverse is true for rainy season (Figure 3). Hence, the major steps in the collection and marketing value chain of Frankincense can be tapping (collection) -- Processing -- local market/passengers. As the collected Frankincense move through this chain in both districts of the study area.

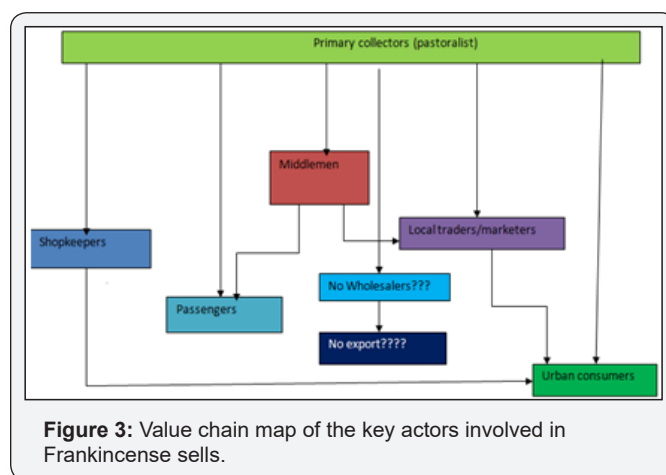


Figure 3: Value chain map of the key actors involved in Frankincense sells.

Value adding system

The ways of Frankincense collection/tapping systems at the study areas are wounding the tree stem and expanding the wound periodically and collect from natural oozing of trees. As shown in Figure 1 due to lack of appropriate tapping skill it causes damage to incense bearing species. Studies advocate existing tapping techniques are either ineffective (e.g., damage the tree) or improper for the various Frankincense bearing species. Until recently, there is no suitable tapping technique to tap gum- and resin-bearing species except *B papyrifera*. Hence, searching for best techniques to optimize harvesting of quality product from different species, product processing, and value addition to the final product (e.g., grading based on chemical composition and oil extraction) are critical [13].

Potentials and constraints in production and marketing

Potentials

- a) Availability of resource to engage in production and gain benefits from the resource
- b) High demand for incense in the local market

Constraints

- a) Lack of experience and poor working culture of the local people to harvest incense
- b) Lack of warehouse and technical problems during tapping.
- c) Seasonality in production and low unit price,
- d) Lack of tenure by the local community resulting in degradation of incense trees,
- e) Lack of experience in establishing incense plantation,
- f) high temperature during collection seasons and distance,
- g) Lack of market information Absence of permanently established cooperatives. Tapping the scattered gum and markets is not an easy matter [14]. Local communities should be organized into functioning, but also proactive, cooperatives or unions and other means of social organizations.

Conclusion

- a) Survey results show that exploitation of Frankincense is one of the complementary activities next to livestock herding undertaken by pastoralists to supplement their income. Income generated from sale of Frankincense helps in meeting household, purchasing food and supporting livestock keeping activities. Two different NGO's (Farm Africa-Hammer and Benatsemay, and AFD-Hammer) formulated the incense production and marketing cooperatives with ultimate support, initiatives and given different trainings concerning tapping and handling of incense products.
- b) However, none of the cooperatives have been functional due to lack of continuous follow up and support. Market structures for selling Frankincense are not well structured.

c) And although households depend on collection of Frankincense, are particularly disadvantaged in the trade due to lack of market information.

d) Frankincense collectors are not equipped to do effective collection due to lack of basic skills and equipment. There is no established market chain of the Frankincense i.e. simply producer to consumer (local market, passengers).

e) No organized team or cooperatives with legal binding of rules and regulation.

Recommendation

To move ahead the value chain the of Frankincense and sustainably contribute to the income of pastoral communities, a number of interventions are required:

Production

- a) Performing Participatory Natural Resource Mapping (PNRM) to identify the existing and
- b) Potential incense tree.
- c) Spread out the plant population through plantation;
- d) Boost community awareness and introduce bylaws to protect the incense trees;
- e) Build up community action plan to manage and benefit from incense plants.

Marketing

- a) skilfulness building in incense tree management and harvesting;
- b) Formation of collector groups, associations or cooperatives is needed to foster cooperation and coordination of the collection and marketing of incense.
- c) Setting specific market regulation policy that will govern access to resources, markets, technologies, producer s value chain of Frankincense resources.
- d) Establishing market chain (up to export) and linkage.

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