Inclusive frankincense value chain development in Ethiopia

A historical perspective on forest governance and reforms for better livelihoods and conservation outcomes

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Pastoral & Environmental Network in the Horn of Africa

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PENHA is a regional NGO, combining grassroots project implementation with research and policy analysis, focusing on rangelands and dry forests, governance and gender. The team working with TBI is led by Mitiku Haile, Professor at Mekelle University and PENHA senior advisor, alongside PENHA regional programmes coordinator Amsale Shibeshi, and regional policy officer John Livingstone. PENHA was established in 1981 by concerned professionals from Horn countries and is registered in the UK, with offices in Addis Ababa, Hargeisa (Somaliland) and London.

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Summary

Ethiopia witnessed a paradigm shift in forest resource governance: from natural resources governed by a highly centralized system (before 1995) to decentralized governance with natural resources governed by local (regional) governments (1995 to 2011), and finally to a system in which management and use rights are devolved to local communities (since 2012). This study was initiated in order to understand the impact of the change in resource governance on the structure of frankincense value chains, the benefits rural households are generating from the harvest of forest products through fairer distribution of the value added amongst value chain actors, and whether the change in the governance system and the current frankincense value chain is stimulating the sustainability of production systems.

A comprehensive review of previous studies on the frankincense value chain in Ethiopia and elsewhere, field assessments, group discussions with producers, key informant interviews with experts working for governmental organizations (GOs) or NGOs, and a stakeholder workshop, were organized to collect data and understand frankincense production activities and the conservation status of forest resources. Specifically, the study examined whether the efforts of GOs and NGOs are inclusive of smallholders, and if they help to enhance benefits for local people from forest resources, and whether these benefits incentivized them to participate in sustainable forest management.

During the first and second governance periods described above, the prevailing natural resource policy and forest management approaches restricted local communities' access to and user rights over these resources, and this adversely affected forest resources. The government then developed the management and use rights to local people with the assumption that their participation would enable them to derive benefits from forests and trees and incentivize them to become involved in sustainable forest management. Local people organized as a cooperative started to receive benefit and protected forest resources when the pilot projects were active. After they ended, however, the outcome of the policy change varied with the level of management and use rights provided to organized local communities.

In Benishangul-Gumuz where security of tenure has been strengthened (with extended use rights provided at least informally) and relatively better support is provided to local communities, communities receive improved incomes from the forest and have actively participated in forest management. The conservation status of forest resources was also found to have increased. However, in Amhara region where management and use rights were restricted, with limited support provided to local communities, income from forest resources was minimal or insufficient to stimulate sustainable forest management. This situation led local people to go back to their old practices, clearing forests for farming. The absence of adequate support to local institutions and limited access to markets has also resulted in an imbalance of power among the actors involved in marketing frankincense. Producers are always price takers, have never been price makers, and have almost no bargaining power. This suggests that devolution of management and use rights is not adequate by itself to incentivize local people to participate in sustainable management. Rather, the level of management and use rights provided (expanded or restricted)

is equally important, as this determines the amount of income local people can obtain from forests. Unless there are real changes in the livelihoods of communities, devolution will remain insufficient to bring about conservation and livelihood benefits. The alienation of local people from managing and using forests may not necessarily be a driver for deforestation in lowland dryland areas. In fact, an alternative land use, farming, that provides attractive returns in the short term, may be a greater driving force for deforestation and forest degradation.

The volumes of frankincense production and exports at national level were very low during the era of centralized forest governance. Volumes increased under decentralized forest governance that encouraged the involvement of private enterprise, but later declined when forest management and use rights were devolved to local communities. This latter decrease was mainly due to the lower scale of production and difficulties in securing viable markets that left large areas under the management of local people with limited experience and high opportunity costs to produce by themselves. The restrictive forest policy also prohibits them from leasing to concessionaires or hiring skilled labour to exploit the potential and presence of attractive alternative livelihoods from farming.

The present study suggests that for communities to secure a level of benefits from forest resources that exceeds the cost of conservation and that will provide the economic incentives for them to manage frankincense sustainably, it is necessary to develop an inclusive frankincense value chain that involves strengthened cooperatives. An inclusive value chain approach focuses on improving the policy environment (providing expanded rights, rights to exclude livestock from production areas, and providing forest land certificates), supporting cooperatives and local organizations to strengthen their position when it comes to negotiating prices, enabling them to access finance and training, input services and market information, and establishing multistakeholder platforms to connect cooperatives to national markets. All these activities would help cooperatives to produce larger quantities according to set quality standards and correct the imbalance in terms of market power that exists among value chain actors by establishing fair market connections. The concept of fairness, while not necessarily easy to define, is an important one here.

The study strongly recommends improving arrangements for community involvement in forest management, shifting from the current collaborative forest management of state owned forests, to community owned and managed forests at village or kebele levels.. This would help local communities to enjoy expanded bundles of use and management rights provided for community forestry under the 2018 Forest Proclamation.

Given this assumption that strengthened community rights can provide the incentives for sustainable management, there are two distinct options. One is a change in the ownership of forests, and the other is an expansion of rights over forest management and the use of state forests. The latter involves improving and strengthening the current participatory forest management (PFM) modality, while the former involves a radical shift to community ownership and entails fundamental change in legal frameworks governing ownership of natural forests.

1. Introduction

Ethiopia is a tropical country with vast areas of land (> 50%) that are arid to semi-arid, and have marginal or almost no agricultural potential (NCSS, 1993; Tamire, 1997). The arid and semi-arid agroecological zones of the country are home to diverse dry forests that comprise the largest proportion of forest resources (WBISPP, 2004) and 45.7% of the total carbon stock according to Moges et al. (2010) or 59% according to Atmadja et al. (2019). Dry forests also host the largest plant and animal diversity in Ethiopia (Gemedo, 2004; Vollesen, 1989). Such huge biological diversity is the basic asset and pillar on which the livelihoods of millions of rural communities depend. This is because dry forests are valuable sources of food, feed, energy, wood, medicine, shelter, cultural values that enable rural households to generate a diversified income from the production and marketing of a variety of dry forest products (Eshete et al., 2005; Gemedo et al., 2005; Lulekal et al. 2011; Mulugeta and Demel, 2004; Worku et al., 2014; Yirgu et al., 2019).

Frankincense is the most important dry forest product exported, accounting for over 90% of export volume of all gums and resins (Feleke and Melaku, 2011; Kassa et al., 2011). The main sources of frankincense are tree or shrub species of the genus *Boswellia* which comprises 20 species, of which six are found in Ethiopia (Vollesen, 1989). Frankincense is collected from five of the six species, namely *B. papyrifera, B. neglecta, B. revea, B. microphylla* and *B. ogadensis* (Lemenih, 2005). Of these five, *B. papyrifera* contributes the largest share of the volume exported. The production and marketing of frankincense is an age-old traditional activity in Ethiopia and elsewhere that makes frankincense one of the world's oldest internationally traded commodities (Hull, 2008; Langenheim, 2003).

Production of frankincense from *B. papyrifera* is labour intensive, that involves making small cuts into the tree bark, scraping off the exuded resin after a week or two, and re-opening the wound and preparing it for another harvest cycle. Production of frankincense from the other four species involves mainly collections of naturally exuding frankincense. The production and marketing of frankincense creates thousands of jobs annually and supports the incomes of smallholders living in the dryland areas of Ethiopia (Abtew et al., 2014; Eshete et al., 2005). At household level, frankincense together with other gum and myrrh products, is estimated to contribute up to 30% to the total household income that are used as sources for running a local cash economy and ranked second or third after crop and/or livestock production (Berhanu et al, 2021; Lemenih, 2003). The trade of frankincense also provides national foreign exchange earnings. The contribution of gums and resins to Ethiopia's overall annual exports accounts for about or just less than 1% of Ethiopia's total 2016 export value (GIZ, 2020). Moreover, the trees that produce gums and resins also have environmental importance as they serve as buffers against soil erosion and desertification, help improve soil fertility, retain soil moisture, regulate water flow, and sequester carbon (Lemenih and Kassa 2011; Sutcliffe et al. 2012).

Despite such enormous economic, ecological, and social importance, dry forest resources in general and Boswellia dominated woodlands in particular are under heavy human pressure (FDRE, 2017). The main reasons are expansion of subsistence and commercial farming, recurrent fire, illegal harvesting of wood and overgrazing. The underlying factors for the driving causes are lack of capacity in governance, management and commodity development, lack of clear tenure over forests, lack of investment in the forestry sector, and strong demand for small and large-scale agricultural lands (FDRE, 2017).

Resource governance influences the behaviour of resource users. In general, we would expect stronger ownership rights to provide incentives to both conserve and invest. Until 1991, ownership and management of natural forest resources were vested in the state. In lowland areas where most dry forests are found, traditional institutions played the lead role in governing access to and use of these forests, whereas in highland areas most forests were managed by the state. Since 1991, with a shift towards free(r) market economic policies in Ethiopia, and the enactment of the 2007 Forest Policy, the private sector and community organizations were granted forest access and use rights, with the expectation that improving forest resource governance would enable and incentivize the private sector and local communities to protect and utilize forest products sustainably (Bradstock et al. 2007; Winberg 2010). Here, we should note that access for communities came under participatory forest management (PFM), while the private sector gained access under concessions, often given only for short periods, creating fertile ground for over-exploitation.

Moreover, the paradigm shift in resource governance away from state control and towards enhanced private and community participation has not always led to increased incomes for rural households, nor stimulated the sustainable management of forest resources. Local communities will actively engage in sustainable management practices when their income from the production and marketing of forest products covers both the cost of product extraction and the costs of sustainable management (Holopainen and Wit, 2008). People participate in PFM, it appears, principally because they calculate that in the long run they will acquire enhanced use rights or ownership over the resources. If this is not the case, PFM benefits may not cover the costs of forest protection. (Communities as a whole incur substantial costs in terms of forgone incomes from the exploitation of forest resources. Yet only a subset of community members benefit, to some degree, from restricted exploitation under PFM. Still, community members at large back PFM, it appears, because they think that PFM will ultimately lead to full ownership rights.) So, it appears that finance for sustainable forest management cannot be obtained only through a change in forest resource governance. Incomes of rural households could increase and finance for sustainable forest management might be obtained if arrangements are introduced that provide for fair payments for forest products, covering both the cost of harvesting and the cost of sustainable resource management by local actors (Poschen et al., 2014). Ensuring this fair payment requires upgrading forest-based value chains, which in turn requires basic transformations from production at the lowest quality level to diversified qualities as requested by clients, optimization of supplier–buyer coordination, producer empowerment and increased entrepreneurial competencies (Auch and Pretzsch, 2020).

Recent developments have underlined the need to understand the impact of the change in resource governance on the structure of frankincense value chains, the benefits rural households are generating from the harvesting of forest products through fair distribution of the value added amongst the chain actors, and whether changes in the governance system and the current frankincense value chain is stimulating the sustainability of production systems. This study provides information on how frankincense value chains have changed through time in connection with the change in resource governance, the association with changes in incomes from frankincense, and whether current ‘conservation-through-use’ programs provide financial incentives that are adequate to protect the harvested species’ population base

2. Methods

A mixed-methods approach was used, consisting of a systematic literature review, focus group discussions (FGDs) with diverse local groups, key informant interviews (KIIs) with experts, field visits, and a consultative workshop. Local consultations and field work drew on research outputs and work conducted in previous studies for the Catalyzing Forest Sector Development in Ethiopia project between October 2020 and February 2021, for which consent was obtained from the research coordination unit. Three FGDs were held, two in Jawi district and one in the Metema district, both in Amhara Regional State, where members of frankincense producing cooperatives participated. FGD participants were selected for their ability to provide useful information about trends in frankincense production and marketing, as well as the status of frankincense resource conservation in forest areas managed by cooperatives. Key informant interviews were held in three frankincense-producing districts (Assosa, Jawi and Metema) with forestry experts that are responsible for providing support and supervision to frankincense producing cooperatives, as well as monitoring and evaluating the performance of cooperatives and conservation status of frankincense resources.

The FGDs and KIIs were guided by a checklist of questions aimed at understanding what motivated producers to participate in frankincense production, trends in the volume of production and in incomes obtained from the sale of frankincense, market structure and value chains, and the major actors in the value chains, as well as the conservation status of the forest resources, and the challenges faced in efforts to establish sustainable frankincense production. Field visits were also conducted to two frankincense production areas to observe the status of frankincense resources and frankincense production activities. The available studies, project and government reports and related records were systematically reviewed. More than 80 publications and reports were reviewed.

A national-level consultative workshop with forestry experts, the cooperatives association, private sector and civil society organizations, jointly organized by the PENHA-TBI program and CIFOR, was held in September 2021, in Addis Ababa. This aimed to (i) exchange information on trends, new developments and activities across regional states, (ii) assess the effectiveness of the PFM approach in terms of sustainable frankincense production and enhancing socio-economic benefits derived by local communities from forest resources and (iii) recommend interventions that might incentivize local communities to invest in the conservation of frankincense resources.

The workshop involved (i) regional presentations on the performance of frankincense producing cooperatives, trends in the volume of frankincense production and exports, market structure and value chain of frankincense, the conservation status of frankincense resources, the major drivers of deforestation and challenges in sustainable frankincense production (ii) presentations from federal institutions and exporter/trader organizations on their activities related to frankincense production (iii) wide-ranging group discussions on important features of frankincense production in Ethiopia.

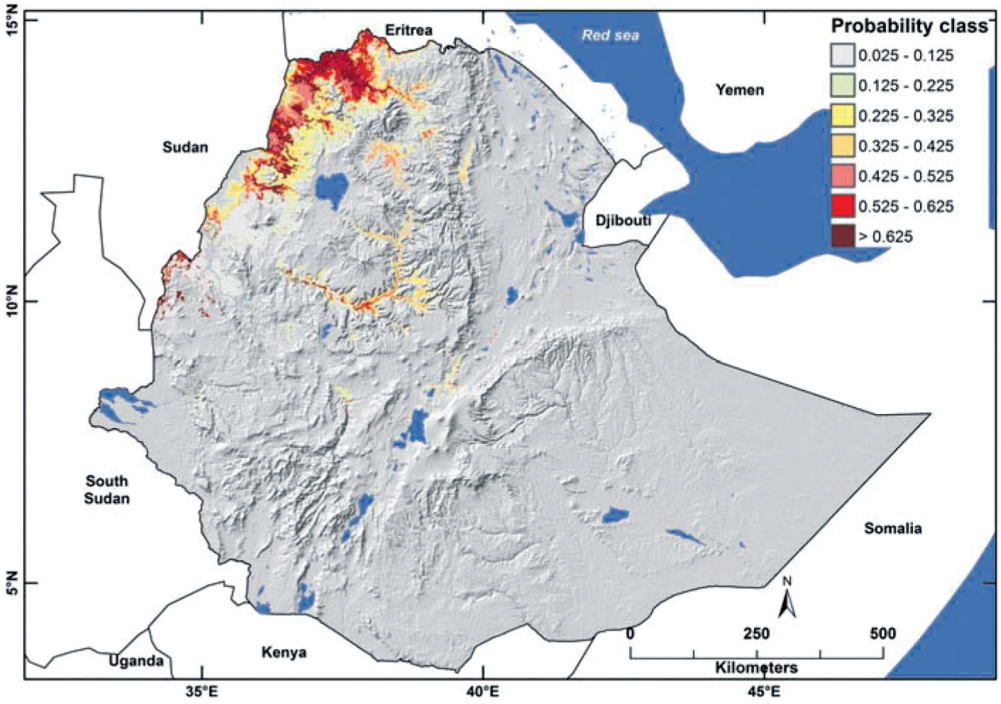
In addition to gathering relevant information, the workshop helped us to verify and update the information collected through the literature review, local-level consultations and fieldwork.

3. Frankincense production systems in Ethiopia

3.1 Frankincense production in lowland dryland mixed-farming systems

In north and the northwestern Ethiopia, with a unimodal rainfall pattern, the harvesting of frankincense takes place once a year during the dry season, October to June, from only one species, *Boswellia papyrifera*. Frankincense is produced by tapping the trees, starting from the end of the rainy season, mainly in the first week of October, up to the first week of June. Each harvesting season or production period lasts for about 8 to 9 months. In each harvesting season, the tapping of frankincense is conducted over 8-12 successive rounds, using a tool locally known as a *mingaff*, with a time interval between two successive rounds ranges from 3 to 4 weeks for the first three tapping rounds and, starting from the fourth tapping round, the interval is one to two weeks.

The first three tappings are meant to stimulate the tree to produce frankincense, while the collection of frankincense starts after the fourth tapping. An increase in the volume of frankincense per tapping round is normally expected up to the eighth round. However, if tapping goes beyond this, the volume of production per tapping round per tree starts to decline (Eshete et al., 2011). After five years of production, a given production area is expected to have a resting period of 2-3 years. Allowing a resting period gives tapped trees a chance to recover from their wounds and this can keep them productive for many additional years. However, there is little or no monitoring to ensure that tappers follow these recommendations.



Source; Girma et al., 2015

Figure 1: Distribution map of *B. papyrifera* in Ethiopia overlaid on an SRTM DEM-derived hillshade map. The species has a high (probability of) occurrence in the north and northwestern part of Ethiopia.

3.2 Frankincense production in pastoral and agropastoral areas

In south and southeastern Ethiopia, with a bimodal rainfall pattern, the harvesting of frankincense takes place twice a year during the two dry seasons, between December and February, as well as between June and August, when the trees shed their leaves. Frankincense that exudes naturally from the trees is harvested from *B. neglecta, B. reave, B. mycrophy* and *B. ogadensis.*

4. Frankincense resource governance

Forest resource management in Ethiopia has undergone a series of reforms, evolving over the course of different interventions and policy changes, each with their own motivations. Three major forest governance regimes are identified: centralized governance (1976–1995), decentralized governance (1996–2011) and devolution (since 2012). Similarly, the exploitation of frankincense resources in lowland dry forests followed the path from a centralized, top-to down approach (before 1995), to decentralized (with local regional states responsible for management, between 1995–2011), and finally to devolution of responsibilities for dry forest management to local communities under the PFM approach (especially since 2012).

A brief note on terminology is in order. Here, the terms 'decentralization' (less control by the central state) and 'devolution' (even less control by the central state) are used to describe the degree of the shift away from central state control. It is recognized that these terms have specific meanings in the political science literature. Decentralization refers to the relocation of administrative functions away from the centre, while devolution describes the relocation of power and decision making authority away from the centre. Devolution involves the statutory delegation of powers by the central government to a sub-national entity, thus granting a higher level of autonomy than is the case with decentralization. For the purposes of this study, these terms are not used to describe the nature of the political structures that exist in Ethiopia, but rather to describe the resource governance regime, and the loosening of central state control over forest resources.

Specific features of each of the three resource governance regimes are described below.

4.1 Frankincense governance over 1976–1995 – the era of centralized governance

The period from 1976 to 1995 in Ethiopia was the Derg era in which almost all natural resources were under government control (state ownership). Derg is an Amharic term for the Provisional Military Administrative Council that came to power in Ethiopia in 1974. During the Derg era, the state protected forest resources by restricting or prohibiting their utilization by the private sector and the surrounding communities (Dessalegn, 2001). According to Eshetu (2014), forest management during the Derg period was focused on forest protection. The commercial production of frankincense was undertaken by a state-owned enterprise (SOE), the Natural Gum Producing and Marketing Enterprise (NGPME), managing and utilizing dry forests.

Despite the emphasis on forest protection, the state encouraged communities to have their own plantations, and was also engaged in establishing fuelwood and industrial plantations in response to shortages of fuel, timber and construction materials. The state established national parks, rehabilitated degraded lands through the introduction of various physical soil and water conservation structures supported with vegetation, and designated areas to be allowed to rest with the establishment of exclosures. Plantations established during this time were mainly for fuelwood and also for commercial timber, sawn wood and for poles (Million, 2011). Most of these initiatives however were undertaken with little or no consent of local people, neglecting their rights on the use of natural resources in and around them (Pankhurst, 2001). Again, the denial of use rights greatly diminished communities' incentives to conserve.

The Natural Gum Processing and Marketing Enterprise was the first state-owned enterprise (SOE), established in 1976 by nationalizing TAIDL (the Tigray Agricultural and Industrial Development Limited company) with an objective and responsibility of producing, processing and marketing gums and resins (*https://naturalgum.diytrade.com/sdp/110440/4/home/0.html*, see also Seyoum et al., 2015). The state-owned company NGPME had free access to production sites in north and northwestern Ethiopia where the formal sector was dominant and there was little or no community-level production. No private enterprise was involved in the production and marketing of frankincense between 1975 and the early 1990s. The allocation of woodlands to the SOE for frankincense production sites was undertaken without the consent of locals and deprived people of their rights to use the natural resources on state forests, harvesting grasses, collecting fruits, maintaining bee hives, collecting fallen wood and herbs, in conformity with the forest management plans developed by the appropriate regional body (Pankhurst, 2001). Local communities were also deprived of their right to produce frankincense themselves, only able to participate if they were employed by the enterprise as labourers for tapping, transporting the product, or guarding the SOE's stores. Naturally, this kind of exclusion and denial of rights discouraged local communities from investing in resource conservation.

It should be noted here that Tigray is somewhat exceptional. It was also the case that in other regions, people were not significantly involved in the collection and sale of frankincense, which had never really been part of the culture or livelihood system. In any case, there were no developed markets that would encourage them to take up these activities.

Production sites in south and southeastern Ethiopia are communally owned and managed under the traditional system, where leaders are elected to positions of authority, with the acceptance and participation of the community. Here, the role of the SOE was limited to buying natural gums from pastoralists and agropastoralists or from village traders who collected and bulked up products from producers.

4.2. Frankincense governance between the mid-1990s and 2011 – decentralized governance and devolved authority to state and private enterprises

The period between mid-1990s and early 2010s in Ethiopia was that of the EPRDF (the Ethiopian Peoples' Revolutionary Democratic Front) where land and natural resources continued to be under state ownership. But there was political decentralization that involved a shift of authority away from central government to regional states in a new federal political structure, together with adopting free market economy that opened up to private enterprises. Accordingly, the power to manage forest resources in this period was devolved to Regional States. Two important forest proclamations were enacted (in 1994 and 2007) that emphasized the economic and environmental outcomes of forest resource management. According to Eshetu (2014), the forest management system during this period was of a "resource management and environmental protection type". Forest policy encouraged the management of forest resources for the sustainable supply of forest products, in order to satisfy demand and wider societal needs, while contributing to the development of the national economy, without affecting environmental and social amenities derived from the forests (Sisay, 2008).

In addition to the change in the resource governance system, the government also enacted free(r) market policies that encouraged the role of the private sector in the national economy. A partial liberalization left in place pervasive controls on economic activity and a complex system of licensing, favouring the politically connected. Still, the Soviet-allied communism of the Derg government was gone. Following this shift in the direction of free market economic policy, several private enterprises became involved in the production, processing and marketing of gum and resin products. According to Kassa et al. (2011), about 34 private companies were engaged in the production and/or trade of gums and incenses at various sites throughout the country. Local communities in the north and northwest were still, however, restricted or prohibited from collecting frankincense from forests for sale (Eshete et al., 2005; Lemenih, 2007).

During this period of frankincense resource governance, the state owned the forest but private enterprises could access frankincense production areas through concessions from local bureaus of agriculture, generally for a period of one year. Private enterprises were expected to renew the leases every year or two, although there was no guaranty of getting the same production site for the next production season. This was yet another system that did not incentivize sound forest management and responsible tapping. And again, local communities living in and around production areas in the north and northwest were not benefiting from frankincense production and marketing.

The SOE, and privately owned enterprises producing frankincense from production areas allocated to them, were responsible for the management of forests. However, over exploitation and degradation of production areas were reportedly happening especially under private enterprises. This could have been expected, given the nature of governance (a 1-2 year lease system), absence of community participation in forest management, and the lack of benefits going to the communities (Tolera et al., 2015). A one-year or two-year lease system gave enterprises the incentive to maximize short-term exploitation of frankincense producing trees through improper tapping that significantly damages trees (Kebede, 2010). A one-year lease system neither secured the enterprises nor promoted the sustainable utilization of the frankincense resources, since the enterprises were not motivated to invest in and ensure responsible use of the resource base (Lemenih, 2007).

During this period, private enterprises also started to be involved in exporting frankincense, alongside the state owned company. This led to increases in volumes and export earnings from frankincense. Increased involvement of private enterprises in the collection of frankincense did not worked well, however, especially in terms of social welfare and ecological outcomes as it reportedly aggravated resource degradation.

Before moving to the third and final governance era, it is worth noting that distinctions can be made both between and within the different eras, with transitional periods and some overlap between eras. This paper looks at broad changes across governance systems, from the mid-1970s to mid-1990s (Derg era), mid-1990s to early 2010s (EPRDF era), and then the current regime, especially since 2018. And in what follows, it should be noted that the shift in forest governance towards participatory management began in the mid-1990s, supported by the 2007

Forest Law. And the EPRDF's political regime continued until 2018, encompassing the third era described below. The new 2018 Forest Law might herald yet another era, with many calling for the transfer of (qualified) ownership rights to communities.

4.3. Frankincense governance since 2012 – diminished state control over dry forests and product markets: a state-owned enterprise and private enterprises, and organized community user groups

The period after 2012 and up to 2018 was still part of the EPRDF (the Ethiopian Peoples' Revolutionary Democratic Front) era, in that the EPRDF was still in power and almost all natural resources were still under government control (state ownership). The authority to manage forest resources was devolved to Regional States, and forest management was further devolved to organized community user groups (Ameha et al., 2014; Kassa et al., 2017). The devolution of management and use responsibility to local communities for high forests actually started in the 1990s under pilot projects supported by NGOs. During this period, a paradigm shift in forest resource governance was witnessed, with the widespread adoption of participatory forest management (PFM), a new forest management approach that gives local communities the responsibility to manage forest resources and certain rights to use forest resources (Tesfaye et al., 2015) as per a management plan approved by forest authorities. The new governance system attempted to establish a degree of fairness in forest management, with 'conservation-through-use' programs in which all potential stakeholders could be involved in forest conservation, development and use (Ameha et al., 2014).

Following this, under the supervision of state forestry agencies, qualified responsibility for management of natural and plantation forests in highland pilot areas was allocated to communities that live in or close to the forests, and local people were organized into forest user groups (FUGs), that later became PFM cooperatives. According to Ameha (2014), Melaku et al. (2013) and Tesfaye (2011), forests under PFM schemes showed an improvement in condition, the rate of forest degradation declined, forests started to regenerate; and local communities started to exploit the forests legally. The positive outcomes of pilot projects helped to increase the number of organizations interested in PFM, including local NGOs and government agencies (Winberg, 2010).

Following the enactment of the 2007 Forest Policy, which recognized the PFM approach, scaling up began across Ethiopia, particularly from 2010 (MoARD, 2010). The PFM approach was introduced in frankincense production areas in 2012 (Kebede, 2010; Tolera et al., 2015), with local communities living in and around frankincense production being organized as forest user groups (FUGs). FUGs were formed and registered as legally recognized cooperatives, and most of them in frankincense production area were registered as 'natural gum development and marketing cooperatives'. Once recognized legally, cooperatives took over responsibility for management together with qualified use rights from district forest or agriculture offices – state agencies in charge of managing natural forests. Cooperatives are given management and use rights over forests, provided that they respect forest management plans. But ownership of forests rests with the state. If the state agency at district level feels that management plans are not

being respected, cooperatives lose their management and use rights over the forest. Most management plans showed sustainable production of frankincense with proper harvesting techniques that also allow local people to collect dried wood for firewood, edible and medicinal plants, and allow free grazing of animals and collection of grass for livestock. The communities were also granted the right to harvest wood for house construction with a permit from the cooperative leaders. These provisions enhanced the benefits local communities can derive from forests and encouraged people to commit to forest management.

Cooperative members are responsible for frankincense collection, bulking, and in some cases processing, such as drying. The frankincense is sold to traders or exporters often at the production site. Cooperatives however, focus mainly on production of frankincense from *Boswellia papyrifera* and were/are technically supported by experts from agriculture offices and NGOs. In addition to technical training, some NGOs have financially supported cooperatives by, for example, constructing temporary stores, providing production inputs, and linking them to markets (Kebede, 2010). The scaling up of PFM schemes in frankincense production areas was similar to that under the previously established PFM programs in highland forest areas, as described in guidelines developed by Temesgen and Lemenih (2011).

Still, it is important to emphasize that there has not been any change in the forest law with respect to ownership and use rights of forests in state forests, nor with respect to the role of communities in managing state forests. Thus, these categorizations of governance regimes need to be understood as being broad, with an element of continuity across periods. Most importantly, community ownership rights over state forests have never been established. Ownership of natural forests has remained under the state since 1975. What has happened since the mid-1990s is that community members organized under PFM have been allowed to be involved in the management of forests, with certain use rights in relation to particular products as per approved forest management plans. Thus, there has been no devolution of power, as such. Communities cannot, for example, decide on how to use the forest. Only responsibility for forest management was shared, while decision making power remains with the state agencies responsible for managing forests.

Nevertheless, there have been very significant changes in resource governance and practices over the three eras identified here. And these changes have had significant implications and impacts in terms of outcomes both in responsible forest management and in ensuring the sustainable supply of forest products.

5. Comparison of frankincense production and export volumes over three governance periods

A comparison of the volume of frankincense production and exports over the three governance periods is important, enabling an analysis of how volumes were affected by the different systems, and the major actors involved that differed in each era. In the first era, the state was the sole actor. In the second era, there were two major actors – the state and a set of privately owned enterprises. The third era brought in a third actor – local communities, alongside the state and private enterprises. It should be noted here that communities in southern Ethiopia have always been involved in the collection and marketing of gums and resins, conflicting with the stratification proposed here, which applies more to the specific circumstances of northern and western Ethiopia where the largest share of frankincense exported is produced. Nevertheless, the gradual shift towards greater private sector involvement and community management of forests applies across the board. It was not possible to obtain data on national production from private enterprises and cooperatives, and so all data presented for production represents only that of the state owned NGPME. [This is one limitation of this study. Ideally, national data should account for other exporters, though it is important to note that NGPME also buys from communities.]

The figure below shows the volume of production and export for all gums and resins produced and exported from Ethiopia over the three periods considered.

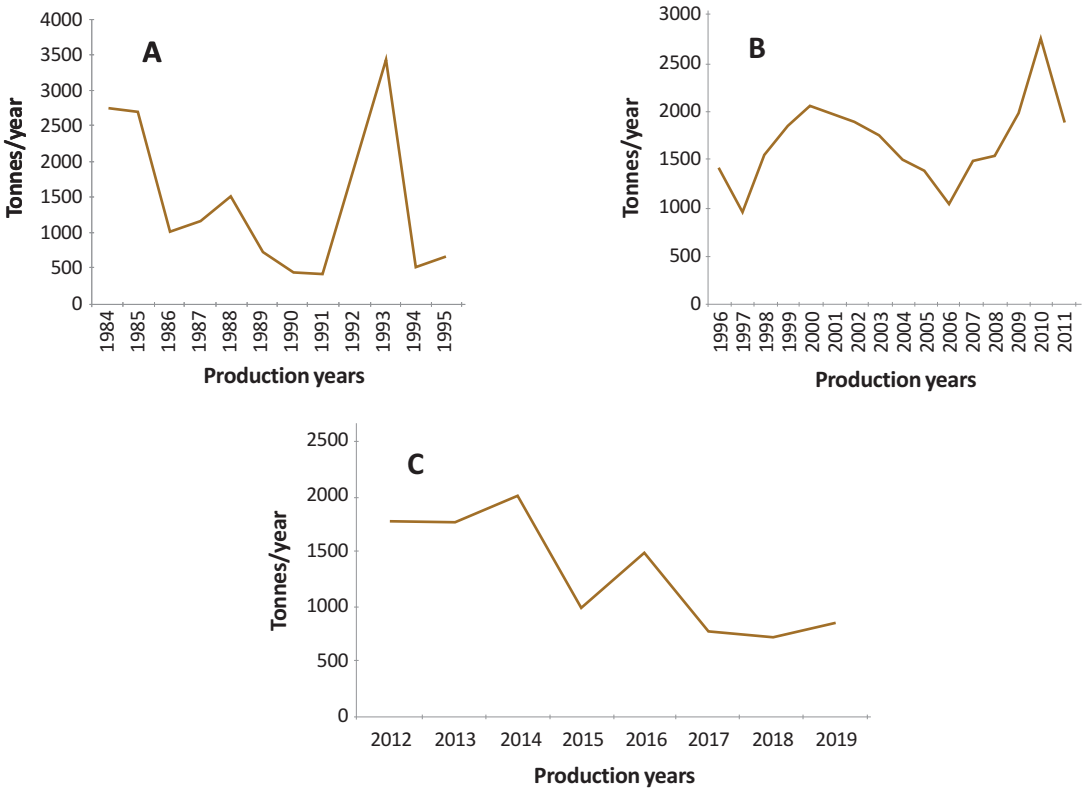


Figure 2: Volume of all gum and resin production by NGPME in the first (A), second (B) and third (C) governance eras [Sources: (A) and (B) adapted from Kassa et al., 2011, (C) based on data compiled by the authors].

The first era between 1984 and 1995 saw the state-owned enterprise (NGMPE) as the sole producer and exporter of gums and resins. The data shown is for all gum and resin products in Ethiopia, but as stated above, frankincense accounts for more than 90% of the volume of production and exports of all gums and resins in Ethiopia.

Although NGPME was established in 1976, it proved difficult to obtain data on the volume of gum and resin production and exports from 1976 to 1984. However, the volume of production since 1984 was obtained from previously published reports (Kassa et al., 2011) and from NGPME. Data on the volume of exports collected for 2000 to 2019 indicates national export volume unless otherwise specified. According to Kassa et al. (2011), the export volume of gums and resins by NGPME amounts to 24% to 42% of the total export volume for the country, with an average of 35% during the second era of frankincense governance (1995–2011).

The volume of frankincense production by NGPME in the first governance era (1984 to 1995) ranged from 400 tonnes in 1991 to 3,450 tonnes in 1993, with an average of 1,438 tonnes per year (Fig. 2.). Production was characterized by a degree of inconsistency, but one can observe a general declining trend. NGPME was the only company in the country exporting oleo-gum resins to the international market. The main reason for the declining production trend was political unrest characterized by the frequent war in the north of Ethiopia, a major gum and resin production area.

The volume of production in the second era (1996–2011) ranged from 950 to 2,775 tonnes with an average of 1,683 tonnes per year (Fig. 2.). The volume of national exports ranged from 1,650 tonnes in 2000 to 4,600 tonnes in 2008, with an average of 3,045 tonnes per year (Fig. 3). The production and export volumes showed an increasing trend (Fig. 2 & 3), although there is still a degree of inconsistency. The increase in the production and export volumes was associated with an increase in the number of private enterprises engaged in production and export of frankincense. The infrastructure and security conditions of production areas also improved significantly, contributing to the increase in the volume of frankincense production.

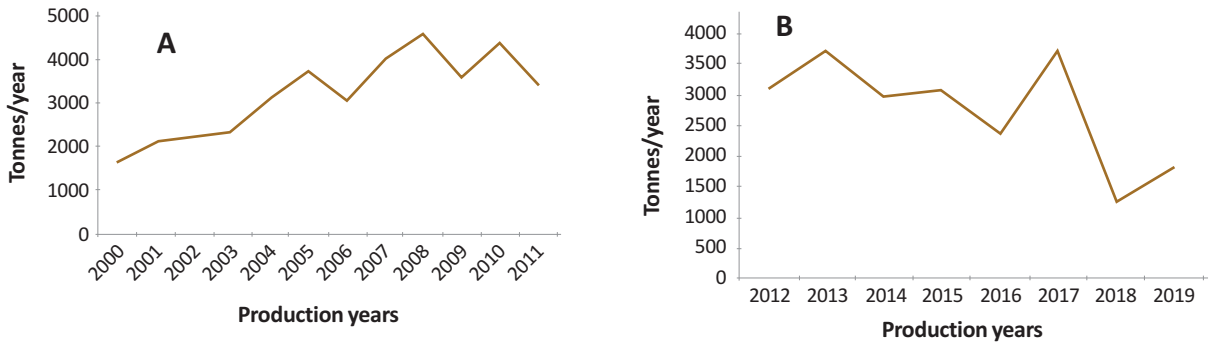


Figure 3: Volume of national exports of gums and resins in the second (left) and third (right) governance era [Sources - Left: adapted from Kassa et al., 2011. Right based on data compiled by the authors.].

The volume of production in the third era (2011–2019) ranged from 722 to 2,023 tonnes, with an average of 1,302 tonnes per year (Fig. 2). The volume of national exports ranged from 1,260 tonnes in 2018 to 3,730 tonnes in 2017, with an average of 2,709 tonnes per year (Fig. 3). The production and export volumes in this era showed a very sharp declining trend, associated with the decrease in the production area managed by the state and private actors, following the engagement of communities in dry forest management through PFM cooperatives. Most production areas of the two main actors were handed over to cooperatives, with the primary objective of enhancing the participation of local communities in the management of the declining resource.

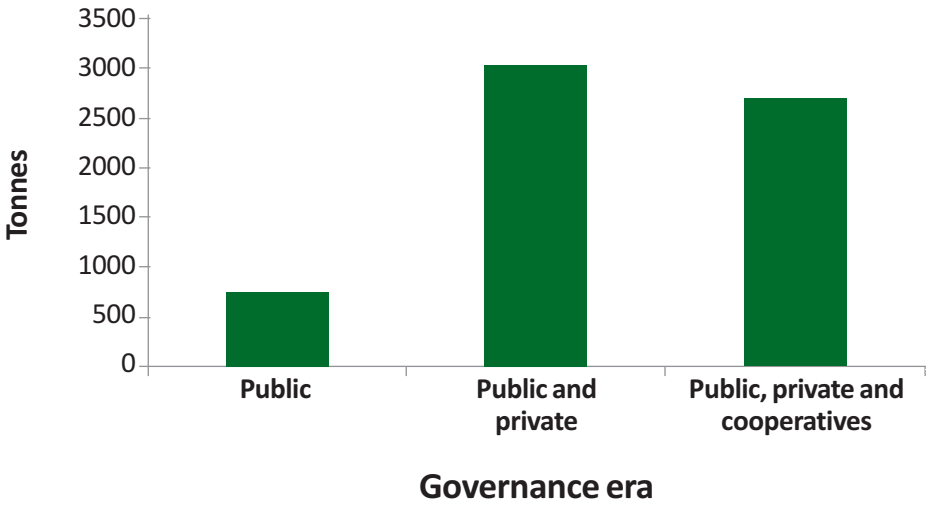


Figure 4: Annual average volume of exports of gums and resins in the first (A), second (B) and third (C) governance era [Sources: Tilahun et al., 2012; Kassa et al., 2011, report of the socioeconomic research team of the Catalyzing Forest Sector Development in Ethiopia project.].

This points to some important questions. Why did bringing in communities end up reducing the volume of exports? What are the missing links? And how can the value chain approach help to address these challenges?

The change in governance from centralized to decentralized, the formulation of free(r) market policies and the improved conditions in terms of infrastructure and security all combined to boost the volumes of production and export. However, the governance change from decentralized to the devolution of management to local communities, which allowed them to share responsibility in managing production, has had a negative impact on volumes of production and exports (Fig. 2, 3 & 4). There are many plausible reasons for this decline, each described below.

(i) Resource use behaviour of local people

The economic benefits derived from forest resources depend on the resource use behaviour of local people and their knowledge about the uses of the tree species that surround them

(Prance, 1986; Thondhlana, et al., 2011; Thondhlana, et al., 2012). Rural communities in northern and northwestern Ethiopia are farmers who practice mixed farming as their main livelihood strategy, producing crops and keeping livestock. For most households, apart from using forest products for household consumption, forest products do not play a major role in the household economy (Eshete et al., 2005; Lemenih, 2007). In addition, markets for frankincense were not developed before the state or privately owned enterprises began engaging in frankincense production and marketing, particularly in Amhara and Benishangul Gumuz regions (Eshete et al., 2005). For sedentary farmers, forest lands are generally seen as potential areas for the expansion of agricultural production and as grazing land (Eshete et al., 2005; Lemenih, 2007).

The recently introduced system of cooperatives, established by groups of individuals within communities that are oriented towards sustainable frankincense production, has produced mixed results. This is due to a number of factors including the resource use behaviour of local people, diverse cultures, norms, traditions, and origins of people before they moved to lowland areas (Kassa, et al., 2011). Most were highlanders who moved to the lowlands in search of agricultural land. The average household land holdings (5-8 hectares) and livestock holdings (10.5 to 14 tropical livestock units) are higher than the national average for the highlands (Bekele, 2003; Lemenih, 2007). In addition to the size of their land holdings and the farming culture of local people, soil fertility and the conducive climate of dry forest areas for cash crop production, including cotton, sesame and sorghum, incentivized them to fully engage in crop production. This crop and livestock production is providing people with higher incomes than they obtain from frankincense production (Eshete et al., 2005; Lemenih 2007). This is a common phenomenon, where farmers with large landholdings and livestock assets are less dependent on incomes from the extraction of non-timber forest products. Thus, local people are less likely to participate in frankincense production consistently. People that are involved in the extraction of forest resources are those that do not have other alternatives to generate income for subsistence (Ros-Tonen, 2000).

(ii) Lack of interest and skills for tapping, and local perceptions

The collection and processing of frankincense is a labour intensive activity that involves a substantial commitment in terms of household investment. Tapping starts at the end of rainy season in September, and ends when the rain starts in the first week of June. The tapping period coincides with some farming activities such as mowing and threshing agricultural products (October to November) and ploughing (May to June). The availability of extra household labour also influences the participation of farmers in frankincense production (Lemenih et al., 2007). As the logic of economics suggests, sedentary farmers, even those with abundant household resources, are not interested in tapping and always prefer farming, devoting their resources to where they can earn the highest returns (Eshete et al., 2005). Other important reasons for the lack of interest among local people in frankincense production are cultural beliefs (e.g. negative perceptions about tapping as a poor man's trade), the delayed payments for frankincense production, and the modest benefits generated in relation to the labour input required (Eshete 2002; Lemenih et al., 2007).

Local people also have limited experience in harvesting frankincense for commercial purposes. Tapping requires a certain degree of technical skill and the lack of this discourages people from engaging in frankincense production.

A skilled tapper is reported to be able to produce 10-15 quintals of frankincense annually (Gebru et al, 2014) [1 quintal = 100 kg]. However, according to participants in the group discussion with producers in Metema, average annual production per producer does not exceed two quintals. Thus, local communities consider (unskilled) tapping to be a waste of time and effort. Culturally, tapping and the collection of resins are considered 'inferior' to farming activities, and seen as a sign of poverty. Due to this and other factors, local communities are hardly involved in frankincense production (Eshete et al, 2005). Much of the tapping across the north is done by organized groups of young men from Tigray where poverty rates are high, and who migrate seasonally to Amhara and Benishangul-Gumuz.

(iii) Diminished participation after the phase out of NGO pilot projects

Most forest user groups and PFMs were organized with the help of NGOs that provided financial, material, and technical support. When projects end, financial and technical supports cease, and the number of cooperative members actively engaged in frankincense production tends to decrease significantly. A field assessment report showed that in some districts (e.g. Jawi in Amhara region), most of the organized user groups stopped frankincense production after the project was phased out. In other districts such as Metema, cooperatives are still engaged in production and production continues, but the number of members actively participating has declined significantly (Table 1).

Table 1: Number of cooperative members engaged in frankincense collection before and after the end of NGO support in Metema district, Amhara region.

Name of Cooperative	Area (ha)	Number of members at establishment (2004)	Number of active members in 2020 (after project phase-out in 2009)
Tach Lemlem terara	1485	70	10
Lay Lemlem terara	1100	320	20
Gundo	3400	707	40
Das	5516	250	125
Agam wuha	3000	32	15

Source: Authors' survey

The fact that so many NGO project participants drop out when support ends implies that either the members selected to participate were not the right ones, or that the benefits of engaging in frankincense production were too low to justify their continued participation. This might also suggest that the NGOs failed to link cooperatives effectively to markets. Whatever the case, it is important for NGOs and those seeking to promote frankincense production, to learn from this experience.

6. Impact of governance dynamics on local livelihoods

Ethiopia has undergone a series of reforms in natural resource management, with a shift from a pre-1995 centralized regime, to a more decentralized regime and then an era of devolved management from the late 1990s, with greater responsibility for forest management given to local communities. However, care is needed in order to distinguish between the deep political decentralization after the mid-1990s, and the more limited changes in forest governance under regional administrations. From the mid-1990s, there has been increased involvement of communities in the management and use of forests, which has not been extended to the drylands until recently, with the participation of organized youth groups in the last two or three years, and with cooperatives and private companies granted concessions to produce frankincense.

The power to administer rural lands, based on the laws of the federal government, was devolved to regional states following the enactment of the Ethiopian Constitution in 1995. Since 2011, the size of frankincense production areas allocated to local communities organized into cooperatives increased, by taking over the management of forests that used to be managed by the state owned and private enterprises.

As stated above, Ethiopia adopted PFM widely, as the principal approach to forest management, to enhance biodiversity conservation while generating incomes through the sustainable extraction of forest products. The impacts of PFM in terms of improved livelihoods and the conditions of forests, are reported to vary across high forests (Amha, et al., 2014). Results have largely been positive in terms of conservation goals, but there is little information on the impacts of PFM in dry forest areas, and a lack of rigorous analysis of livelihood impacts. Moreover, a comparative investigation is lacking that might show whether such management reforms help rural communities to improve their livelihoods in the dry forest areas. Anticipated changes in household incomes under the three forest governance regimes are described and discussed below.

6.1 Economic contribution of forest resources to local communities under centralized and decentralized forms of forest governance

Under centralized governance, all forest resources were state property (this remains the case) and local people living near forests were deprived of their rights to access, use and control forest resources. The state owned company was the only enterprise allowed to engage in the production, processing and marketing of frankincense from allocated dry forests. State ownership of forests persists, but use rights, community management and commercial exploitation have expanded greatly. After 1994, economic policies of the EPRDF were oriented towards free(r) markets and encouraging private enterprises to engage in the collection and marketing of frankincense. Some privately owned companies were also given access and use rights in state forests controlled by regional states. Still, both state owned and private enterprises prohibited local communities from harvesting frankincense from forests under their control.

A number of research reports have stressed the fact that the management approach at that time did not appear to have produced significant economic gains for local people in terms of cash income generation, as it excluded local people from the planning, designing, implementation and evaluation of institutions and systems that affected their physical environment, while private companies involved were able to run profitable enterprises. Almost all householders in northern and northwestern Ethiopia did not benefit from government and private-sector gum and resin production (Eshete et al., 2005; Lemenih, et al., 2007; Lemenih et al., 2011). Although there was no commercial harvesting of forest products by local people due to the farming culture and the prevailing forest policy and tenure systems, local people were able to extract different types of wood and non-wood forest products for household consumption, such as wood for fuel, construction and farm implements, fencing materials, grass for thatching, herbal medicines, honey, wild fruit, and wild meat from hunting, The vegetation also provided the main source of grazing for local livestock keepers. Some trees are sources of feed for animals, especially during the long dry season and whenever the onset of rains is delayed. It should also be noted there that although this kind of subsistence use of forest resources by the communities for hunting and gathering was allowed by NGPME, private companies did not allow communities these rights.

6.2 Economic contribution of forest resources to local communities under devolved forest governance

While there were frankincense-producing cooperatives in Tigray and Amhara regions before 2012, PFM-based frankincense production on a large scale expanded greatly in Ethiopia after 2012. Frankincense collection started to generate a considerable amount of cash income for member households of cooperatives, and today constitutes a larger share of total forest income (Walle and Nayak, 2020). Abtew et al. (2014) reported that frankincense collection contributed US$831 in Abergele, which is more than four times higher than the aggregate income from other forest products collected by households which are mostly used for home consumption or subsistence. Walle and Nayak (2020) also indicated that non-timber forest products in Quara and Metema districts of Amhara region contributed an average of 23% of households' annual cash income. Frankincense production accounts for the largest share (61%) of all non-timber forest products, and is collected primarily for cash incomes (rather than home use). The same authors reported that income from the production of frankincense could reach a maximum of 54,000 Birr per year (approximately US$1000), with an average annual per capita income of 2540 Birr (approximately US$50). These figures illustrate the growing importance and potential of frankincense as a source of cash income for local people. But a caveat is required, as it is necessary to not look only at incomes generated from frankincense, as fuelwood is much more important than frankincense in terms of subsistence use and as a source of cash income, especially for poorer people. In terms of total income, crop and livestock will continue to be the major income sources.

Data from Farm Africa, (an NGO that supports PFM in several parts of Ethiopia) showed that individual households that are members of frankincense producing cooperatives are earning a maximum of 19,200 Birr (US$390) per year, with an average of 5,580 Birr (US$110) per household

per year. The data also show an increase since 2012 in the number of cooperatives, and the number of members of a given cooperative. The increase in the number of cooperatives organized with the objective of frankincense production through conservation is also confirmed by data from the Federal Cooperative Office. Currently, hundreds of forest based cooperatives exist in the country. For instance, according to reports of the Federal Cooperatives Agency, the current number of forest based agencies is 450 in Oromia and 450 in Amhara. It is expected that the majority of forest based cooperatives in Amhara, Tigray and Bensihangul-Gumuz regional states will be producing frankincense.

Sustainable frankincense production through PFM enhances the economic significance of woodland and tree resources to communities in dryland regions of Ethiopia. Although no up-to-date and comprehensive time series data were available to make quantitative assessments, group discussions with members and key informant interviews with regional experts confirmed the same trend, whereby income from frankincense production contributed significantly to household incomes when the pilot project was active, leaving aside the question of dependence on NGO support.

There is another major caveat here. This growth in incomes and livelihoods for some, needs to be seen in light of the fact that PFM has shifted free access for all members of the surrounding communities to regulated use by PFM members only, with a responsibility to protecting forests and woodlands. This actually reduces use and hence value for users, but also prohibits forest use for non-PFM members, so that other community members experience diminished welfare. Still, the focus here is on those community members that are incentivized to conserve under PFM.

After pilot projects ended and the external financial and technical support ceased, income generation from frankincense production was maintained in Benishangul-Gumuz, while it declined significantly in Metema, Amhara, and was almost non-existent in some cooperatives in Jawi, Amhara. Significant change was observed in the level of benefits obtained from dry forest resources in Amhara. The increase or at least the maintenance of income from frankincense production in Benishangul-Gumuz is attributed to the community need to diversify livelihoods and reform the tenure regime. The major livelihoods for some members of local communities were limited to hunting, gathering and artisanal gold mining. Recognizing the economic potential of frankincense production, some cooperative members needed to diversify their livelihood strategy and wanted to incorporate frankincense production into their livelihood strategy. Although not accepted as per the arrangements used in Amhara, some cooperatives leased production areas to private companies on concession bases. Members are expected to do the harvesting by themselves. In Benishangul-Gumuz, there was no such restriction. Cooperatives contracted out private companies that in turn hired skilled labour for frankincense production. This appears to be a good practice worthy of emulation and broader uptake, with due emphasis on how to regulate use. And there is a need to challenge the rationale behind regional guidelines that do not allow cooperatives to contract out private companies or groups in collecting gums and resins. The fear that doing so will lead to over exploitation should be addressed through regular monitoring of tapping practices by authorized government agencies.

The perceived decline in the contribution of frankincense production to household economies in Amhara is attributed to many factors. These include the policy environment (restricted rights to contract out to others), the high opportunity cost of land (relatively high returns from farming), the absence of meaningful support from government offices that take over when NGO pilot projects ended, especially in creating market links for cooperatives, the lack of interest among individual cooperative members in continuing in frankincense production, local people's interest in focusing on expanded farming through forest clearing, the lack of access to wider markets for frankincense, and the low prices paid to local producers by the few monopolistic buyers. The variation in income generation from frankincense production across cooperatives after the completion of externally supported projects to establish PFM confirms the speculation that local people cannot involve themselves in the extraction of forest products uniformly across sites, and that the role of forest products in household economies varies with traditional sources of livelihoods, and the resource use behaviour of local communities associated with their social and cultural backgrounds and resource use patterns. Still, the fundamental underlying factors here remain economic attractiveness (or lack thereof) to local people, and poor linkages to wider markets.

An important lesson that can be drawn is that governments should provide expanded rights to cooperatives and local communities and allow them to hire skilled labour for frankincense production, which is currently prohibited by some regional governments, notably Amhara. This limits the possibility of local communities to secure substantial benefits from frankincense, that in turn may also trigger rapid land use changes. Policy and management interventions should be contextual and tailored to suit the resource use behaviour of the local people, that requires a radical change in the mindset of the relevant government actors, who typically assume that the provision of expanded rights to local communities means opening these forests up to unmanaged exploitation.

7. Impact of governance dynamics on the conservation of forest resources

Dry Afromontane forests are among the most exploited forest ecosystems of Ethiopia (EFAP, 1994; Teketay, 1996; Tesfaye et al., 2003). Agriculture has been the most important driver of deforestation and degradation, while population growth and the absence of land use and forest policies are among the underlying causes of deforestation (EFAP, 1994). But despite the high rate of deforestation and degradation, lowland dry forests resources were the least affected due to relatively low human and livestock populations, remoteness from economic centres, under-developed infrastructure, and a harsh environment for human settlement.

After the shift towards free market policies since 1991 and the issuance of the Agricultural Development-Led Industrialization (ADLI) strategy in 1994, PASDEP in 2005, and successive national plans since then, Ethiopia has aimed to boost agricultural production to enhance food security as well as foreign currency earnings. This led to the allocation of large areas of land in the drylands for commercial framing, followed by significant land use changes in lowland areas. The most important change was the introduction of resettlement programs for vulnerable people, moving them from degraded highlands to dry forest areas, especially in the late 1990s and early 2000s, and the development of large scale commercial agriculture in the mid-2000s, an increase in the number of private enterprises involved in gum and resin production, the development of infrastructure (particularly roads and electricity supply), and the expansion of smallholder farmland (Lemenih and Kassa, 2011). These changes increased the rate of deforestation and forest degradation of the country's lowland dry forest resources (Eshete, et al., 2005; Lemenih et al., 2007).

The increased and continuous deforestation and forest degradation processes occurring in both the Afromontane and lowland dry forests forced the Ethiopian government to undertake natural resource management reforms that arose mainly from environmental and food security concerns (World Bank, 2020). Government faced policy imperatives to address both accelerating environmental degradation, as well as deepening poverty. The twin objectives of engaging communities in forest management were to ensure sustainability and conservation, and improve local livelihoods (Ameha, et al., 2014; Tesfaye, et al., 2012).

7.1 Conservation status of forests during the Derg era (1975-1991)

Like other forest resources, the lowland dry forest resources of Ethiopia remain state property, following the radical land reform in Ethiopia in 1975. Local communities were not legally allowed to use these forests, though they have been using them with *de facto* rights. Legally, no one was allowed to harvest timber, frankincense, bamboo or other forest products for sale. People, however, were allowed to collect firewood, edible and medicinal plants, and wood for farm implements, and to collect grass for feed.

Forest management during this period centred more on resource conservation and environmental protection. Frankincense production and marketing was entirely controlled by

the state company, NGPME, which tried to maximize frankincense production by expanding gum and resin production areas throughout the country, and by importing better production technologies from neighbouring countries, that could enhance the volume of production (Lemenih and Kassa, 2011).

The limited capacity of NGPME, poor road and other infrastructure, and persistent security problems were the main factors responsible limiting the production area covered by NGPME. Under NGMPE, frankincense production was managed, controlled and supervised by permanently employed and qualified foresters. Moreover, frankincense production was facilitated by employed and supportive staff. The enterprise developed its own production guidelines for sustainable frankincense production. It also hired skilled labourers and provided training for new employees to minimize damage to trees through tapping, and to improve or maintain the quality of frankincense produced. All these factors contributed to reduce the negative impact of tapping on the health of trees in particular, and dry forest resources in general (Kebede, 2010).

Local communities in most frankincense production areas in northwestern Ethiopia are sedentary agriculturists practicing mixed farming. In some areas shifting cultivation was also practiced. Different animals were raised and the main grazing areas during the planting season were in woodlands (Eshete et al., 2005). There was no visible conflict of interest over land use between local communities and the state company, as people were not engaged in collecting frankincense. The low human pressure in the drylands meant that the vegetation was little affected, in contrast to the situation in the Afromontane forests, which were severely degraded owing to intense human pressure over a long period (Teketay, 1996).

7.2 Forest status during the EPRDF era (mid-1990s to 2012)

The 1995 Constitution, unlike the previous period, decentralized power and accorded administration of natural resources to regional states based on policies issued by the federal government. It also provided use rights for local communities and for private investors on the basis of payment arrangements regulated by law, with the power to manage and grant use rights for dry forest resources vested in regional governments.

During this period, regional governments managed dry forests and woodlands that are the sources of frankincense, and were transferring use rights either to state owned or private enterprises on concession, so that they would use the resource according to agreed management plans (Kassa et al., 2011). Local governments were responsible for the provision of management and utilization guidelines and for enforcing regulations, overseeing the utilization and management of the vegetation and authorizing gum and resin production and marketing licenses. Regional governments granted short-term lease rights (1-2 years) to companies to extract frankincense from dry forests. The minimum requirement to obtain use rights was a management plan that focuses on frankincense production, forest development, protection (fire control) and resource conservation (biodiversity, including wildlife). Tigray, Amhara and Benishangul-Gumuz adopted frankincense production guidelines. In Tigray and Amhara,

frankincense production was entirely controlled by the state and private companies, whereas community based collection dominated and continued in southern Ethiopia. In northwestern Ethiopia, only in some cases were local community members employed as tappers. Most companies brought in tappers from outside the production areas, as local people were hardly willing to involve themselves. Regional governments granted short-term leases to companies, on the basis of a management plan.

At least 34 private companies at national level and 20 private companies in Benishangul-Gumuz were involved in the production and marketing of frankincense. Despite the utilization guidelines, frankincense production was practiced in an exploitative way by almost all private companies, aiming to maximize profit over the short-term, and excessive tapping was done mainly by private companies, resulting in greater injury to trees (Kebede, 2010; Lemenih et al., 2007; Tolera et al, 2015). The target was the maximum extraction of frankincense in the time available, without due emphasis on sustainability of the resource base.

Eshete et al. (2005) and Lemenih et al. (2007) explicitly indicated that local people were not generating economically attractive benefits from frankincense production under forest management arrangements during this governance era. Campbell et al. (2000) noted that the denial of access to resources for local communities, while issuing permits to outsiders to harvest, leads to challenges and the unsustainable use of resources, irrespective of existing legal restrictions. As a result, local people started to convert frankincense production areas managed by either the state enterprise or by private companies to farmland, while private companies practiced improper tapping, heavy tapping (with a large number of tapping spots per tree) and continuous tapping without resting periods, in order to maximize frankincense production, regardless of damage to tree health (Eshete et al., 2012). Such malpractice is known to speed up the death of trees and result in the production of poor-quality seeds with much lower germination rates (Eshete et al., 2012; Rijkers, et al., 2006).

Woodlands were severely deforested and degraded during this governance era, due to the combination of the above two factors and others that included free grazing, recurrent fire, weak and inappropriate forest institutions, limited effort or support from government institutions and lack of follow up and monitoring (Eshete et al., 2005; Lemenih et al., 2007). Emrie and Tarekegn (2010) estimated the annual rate of cropland expansion in Metema at 0.49% or 1855 hectares per year between 1972 and 2007. Estimates generated in support of the Ethiopian GHG Emission Reference Level also show that lowland dry forest resources were the most severely deforested and degraded forest resources in Ethiopia between 2000 and 2013 (FDRE, 2017).

7.3 Conservation status of forests during the devolved forest management era (since 2012)

Rates of deforestation and forest degradation of dry forest resources in northern and northwestern Ethiopia were high, leading to concern about the loss of ecosystem services, biodiversity, carbon storage, water and food security (Eshete et al., 2005; Lemenih et al., 2007, 2011,). Lowland dryland areas are ecologically sensitive and forest clearing has major impacts

on the environment and make areas very susceptible to soil erosion and even desertification (Lemenih et al., 2007), especially those in northwestern and southern Ethiopia. Therefore, there was a national effort to promote sustainable forest management by enabling local people to act as owners and managers of the vegetation. As a result, Ethiopia promoted community participation from the 1990s through participatory forest management in selected high forests, with the help of NGOs, with the understanding that communities could gain from secure management and use rights that underpin resilient local economies. Through time, PFM was widely accepted in most high forests and has become a recognized approach, following the enactment of the 2007 forest policy and the 2018 Forest law which acknowledge the significance of community participation in forest resource conservation for the sustainable management of forest resources and the improvement of people's livelihoods.

Under PFM programs in Ethiopia, natural forest resources remain state property, but organized communities are given rights to manage and use forests as per a management plan agreed by PFM members and local forest authorities (Kassa et al., 2017) and that follow the rules and regulations (Ameha, et al., 2014). The PFM approach was gradually adapted to lowland dry forests and since 2012, PFM-based frankincense production has become the dominant dry forest management arrangement., primarily for the sustainable management of non-timber forest products, including gums and resins, lowland bamboo and forest honey (Tolera et al., 2015). Almost all villages (kebeles) in most lowland dry forest areas have at least one legally organized cooperative to sustainably utilize and manage a defined and protected production area.

The performance of PFM-based frankincense production management after pilot projects ended showed differences in the level of forest conservation among the different forest management groups between and within regional states. Forest conditions were perceived to have further improved or to have remained stable for most of forest management groups in Benishangul-Gumuz, and to have deteriorated somewhat for most forest management groups in Amhara and Tigray.

All participants in the two workshops conducted for this study, and group discussions with members of PFM groups in Amhara region, indicated that cooperatives are not receiving from the local authorities adequate technical, financial and material support, or facilitation and market linkages support, nor support in resolving disputes particularly after projects end. No local institutions have stepped forward to take on such responsibilities. Participants also indicated that most members are not actively participating in frankincense production after the end of pilot projects. Due to this, a significant change was observed in the level of benefits people derive from forests in most of the sites. Local people reversed to old practices of forest clearance for agriculture. Cooperative members in Amhara are farmers and are not familiar with frankincense production. Members, in most cases, also prefer farming to frankincense production for a number of reasons, mainly uncertainty of tenure, limited access to markets, poor or unfair prices, and policy or regulation issues as well as high opportunity costs of engaging in frankincense collection compared to farming (Dejene et al., 2013; Kassa et al., 2017; Lemenih et al., 2012). Farming also provides stronger legal land use rights than frankincense production. Agricultural products are easily and freely traded (with no restrictions) to local markets, as

opposed to frankincense where the number of buyers have remined limited. Individual farmers are free to hire extra labour for farming, but not for frankincense production, due to the restricted rights attached to the agreements with the local government in Amhara. According to these agreements, only cooperatives members have the right to tap trees for frankincense. Members can neither transfer their tapping rights nor hire skilled labourers for tapping. Thus, regional government restrictions remain the major constraining factor for farmers' involvement in frankincense collection.

Most frankincense production areas managed by PFM groups are declining in size over time. This is because either the benefits from production are less attractive than those from the competing land use, farming (Lemenih et al., 2011), elected committees become inactive, because efforts by government institutions have not been adequate to reducing expansion of agriculture, or in linking producers with markets. A land use-land cover change analysis, conducted in the Jawi district of Amhara region, sheds light on this (Table 2). Areas under commercial farmlands, smallholder farmlands and settlements increased by 40%, 85% and 230% respectively between 2000 and 2020. On the contrary, areas under open woodland and dense woodlands showed a significant decrease, by 28% and 50% respectively, over the same period.

Table 2: Land use land cover changes in of Jawi district, Amhara region (2000-2020)

Land cover classes	2000		2020		Change between 2000 and 2020	
	Area (ha)	%	Area (ha)	%	Area (ha)	%
Commercial farmland	8643.5	2.53	12115.4	3.54	3471.9	+40
Dense woodland	33104.1	9.67	16377.2	4.78	-16727	-51
Farmland	85490.5	24.98	158292.7	46.25	72802.2	+85
Open woodland	214283.1	62.6	153468	44.84	-60815	-28
River	492.6	0.14	1151.1	0.34	658.5	+134
Settlement	267.5	0.08	883.4	0.26	615.9	+230
Total	342281.3	100	342287.8	100		

Source: Report of the dry forest research team of the Catalyzing Forest Sector Development in Ethiopia project.

Perversely, in terms of the incentives to conserve, legal arrangements, and the ways in which they were implemented, made it easier for local people to secure their tenure by converting forest and woodland to farmlands. Thus, the forestry and land administration authorities at local level need to work together to address this challenge.

The process of degradation become intense when the second-level land certification (based on georeferenced digital maps) started to be issued for farmers by the Bureau of Rural Land Administration and Utilization (BRLAU) under the Land Investment for Transformation (LIFT) program, which aims to strengthen land ownership rights through better documentation and management of land rights. During this time, a number of farmers, including members of the

cooperatives, converted frankincense woodlands to farmlands and obtained land use certificates for the newly cleared woodland, changing the collective use rights to an individual use right. Land use-land cover change analysis showed that about 5,000 ha of woodlands from three cooperatives in Jawi district, Amhara, were cleared and converted to individual farmland in order to secure farming land rights (Table 3).

Table 3: Area of frankincense production transferred from collective use rights to individual use rights through conversion of forests to farmlands in Jawi district, Amhara Region.

Kebele (cooperatives), region	Intersected area between the Land Investment for Transformation (LIFT) program and forest area (hectares)
Asech	1241.0
Dirmariam	1901.7
Jahimala	1857.7
Total	**5000.4**

Source: Report of the dry forest research team of the Catalyzing Forest Sector Development in Ethiopia project

Although no quantitative data were provided, participants in the group discussions conducted, reported similar trends in Metema district, Amhara. Members reported that neither cooperative leaders nor local authorities were able to protect the demarcated woodlands from land use changes. This shows how the lack of functional forestry authorities at local level affects conservation efforts, as this would not have happened if forestry agencies had advised the local land authorities against certification of forests under PFM as farmland. It also emanates from a lack of mapping, and certification of Ethiopia's forests in general and dry forests in particular.

On the contrary, in Benishangul-Gumuz, improvements or maintenance of forests was perceived, even after pilot projects ended, by experts from both government offices and NGOs. There are many reasons for these positive outcomes of the PFM approach, that include livelihood strategy, sociocultural factors, the particular resource use behaviour of local people, and an improved policy environment with the presence of expanded rights. Frankincense production has become an integral part of the livelihood strategy for some cooperative members, notably those from the Gumuz and Berta ethnic groups. The major livelihood strategies of the Berta community are hunting, gathering, and artisanal mining on a limited scale, and with no significant damage to forest resources. Frankincense production was a very good option for the Berta to diversify their livelihoods. According to workshop participants, cooperative members actively participate in frankincense production and in managing forest resources as per the agreed forest management plan, and in tasks such as forest protection against illegal harvesting and forest fires, with the construction of fire breaks. Tolera et al. (2015) also reported that forest resources managed by cooperatives from the Gumuz and Berta ethnic groups showed improvements in the composition and diversity of plant species (medicinal plant, grasses, etc.). Most cooperative members also believe that the condition of the forest is improving over time.

The expanded rights (although not legally indicated in agreements) for cooperatives are the main reason for the better results. Cooperatives are allowed to lease production sites allocated to

Table 4: Changes in forest and livelihood outcomes over the three periods

Policy environment	Actors involved	Benefits to local community	Contribution to national economy	Conservation status of forests
1975-1995				
- State ownership - Focus on environmental protection - The private sector and local communities are prohibited from engaging in commercial utilization of frankincense resources	- State owned enterprise - Skilled laborers - Wholesalers and retailers in major towns	- Non- timber forest products for household consumption - No cash income from frankincense collection especially in northwestern Ethiopia - Incomes from guarding stores and transporting products from inaccessible production sites to roads	- Very limited contribution to the national economy due to limited capacity of the state company compared to frankincense potential - On average 3,045 tonnes of gums and resins exported annually	- Frankincense resources were the least affected
1995 – 2011				
-State ownership -Resource management and environmental protection type -Local communities are prohibited from commercial utilization of frankincense resources	- State and private enterprises - Skilled labourers - Wholesalers and retailers in major towns	- Non- timber forest products for household consumption - No benefit from collecting frankincense - Income from guarding stores and transporting products from inaccessible sites to roads	- Relatively very high incomes/contribution to the national economy, due to the involvement of > 34 private companies - On average, 750 tonnes of gum and resin exported annually	- Frankincense resources were severely deforested and degraded, and rapidly declining in extent
Devolution of management to local communities				
(since 2012) -State ownership -Devolved management and use rights to local communities -Resource management and environmental protection	- Local communities • Private enterprises (concessionaries) • Skilled laborers • State Owned company • Wholesalers and traders	- Non- timber forest products for household consumption • Devolved management and use rights • Cash incomes from frankincense resources	- Contribution to the national income reduced due to the decrease in volume of production and exports due to the declining role of the state and private companies from production, as their forests were given to coops - On average, 2,709 tonnes of gums and resins exported annually	- During the pilot project period, the rate of deforestation and forest degradation is reduced - After the pilot project ends • Deforestation and degradation increased in Amhara due to lack of adequate support and restricted use and management rights • Frankincense resources improved due to relatively better support and expanded use and management rights in Benishangul- Gumuz

them and contract licensed frankincense producing companies who have knowledge and experience in production, as well as the financial means to cover the food and transportation costs of tappers. Concessionaires employ tappers, provide their basic needs, cover all expenses, and pay tappers according to a contracted seasonal wage. Concessionaires ultimately deliver the produce to the cooperatives, and finally the cooperatives sell it back to the concessionaires at a pre-fixed price. Cooperatives also regularly monitor and supervise the production system. This concession system has helped cooperatives to generate a reasonable level of benefits from forest resources and has incentivized forest conservation. Moreover, this leasing of concessions by community groups appears to offer a promising path for their participation in the upgrading of frankincense value chains, bringing in private actors with greater capacity, while ensuring a measure of inclusion.

8. Frankincense value chains during the three governance periods

Value chain analyses of gum and resin products in Ethiopia have been carried out by different researchers at different times. Previous studies focused on mapping the value chain, tracing the value added, identifying the participants in the value chain (main and support actors), the functions of each participant along the chain, their mutual relations, the factors affecting the performance of the chain, and the analysis of organizational and institutional issues that affect performance. The marketing chain for gums and resins involves the flow of gum and resin products from producers/collectors to consumers, and to domestic or export markets through intermediary enterprises, wholesalers and retailers (Lemenih and Kassa, 2011). Such studies at temporal scales would show the dynamics of the value chain with changes in resource governance, and make it possible to see any positive developments in terms of improving forest conditions as well as the livelihoods of local communities. Note that supply chains indicate where the raw product is being marketed and there is little or no processing, and value chains are where processing adds value to the product.

8.1 Supply chains during the Derg era

The two major supply chains prevailed during this period.

(1) Exporters engaged in production, processing and marketing of frankincense. This was common in the northern and northwestern Ethiopia.
(2) Farmers/pastoralists collecting and selling to buyers and rural retailers. Buyers would then sell on to wholesalers and or exporters. This was common in the south and in southeastern Ethiopia.

The first supply chain was governed by a formal state owned sector that excluded the involvement of local communities and the private sector from the production and trading of gums and resins, while the second supply chain was governed by informal/customary institutions which avoided the involvement of both state and private actors in the collection of gum and resin products.

The key actors in the first supply chain are collectors, buyers/processors, exporters/wholesalers, and retailers. Their collective or individual actions influence the efficiency and effectiveness of the supply chain and their competitiveness in the global market. In the first supply chain, collectors are organized into groups and led by a group or squad leader. A number of tappers (10-12) organized under squads are hired as daily labourers. These tappers come mainly from northern Ethiopia (principally from Tigray) and are young men who upon agreement, come to work seasonally in frankincense production sites (Kassa et al., 2011). The group leader has the responsibility of selecting, recruiting, paying and monitoring the work of labourers in the team. The leader also acts as a commission agent, ensuring the supply of labour. A number of squad leaders are organized under one coordinator. Thus, labourers, squad leaders and coordinators are the directly responsible actors in collecting gum and resin from dry forests and woodlands. The harvest is gathered are and put under shade to dry before storage. In Tigray and Amhara, no local community members were involved in frankincense collection during this governance

era, while there were no such restrictions in southern Ethiopia. The state-owned company covered transport costs for labourers and provided training on sustainable harvesting of gums and resins for tappers/labourers, as well as providing production inputs (tapping tools locally known as Mingaf, sacks and other equipment), cooking materials, food, and medicine for labourers on a credit basis. No other support was provided by the government, whose role was limited to allocating production sites, collection of taxes and royalty fees, and providing pass permits for transport and export of products.

The state owned company was the sole company involved in the production and marketing of gums and resins. The company would also buy and bulk products from smallholder producers, clean and grade the product, and finally sell the products in domestic or export markets, based on the quality of the product (Kassa, et al., 2011). Private traders who acted as wholesalers or retailers were involved in the marketing of gum and resin products within the country.

The second supply chain was formed mainly by smallholder farmers and pastoral and agropastoral communities. They were the major collectors of gums and resins from the dry forests and woodlands. Almost no value addition was done by local people as they sold raw gum and resins to village traders/retailers. Traders sometimes provided collectors cash advances, to be paid back when they sold the product either to the wholesalers or directly to the state-owned company.

8.2 Market structure during the mid-1990s to 2012

Three groups of marketing chains were identified during this period.

(1) Exporters engaged both in producing and marketing frankincense. These were the dominant market chain actors during this period, in the northern and northwestern part of Ethiopia.

(2) Farmers/pastoralists collecting and selling to rural retailers, who then sold to wholesalers or exporters.

(3) Exporters, not engaged in collection, focusing purely on marketing products sourced from others. These actors sourced products from companies managing concession areas.

The main difference in this era was the type and number of participants. During this era, following the 1995 shift towards free market policies, private enterprises were granted production and marketing licenses and became value chain actors, as collectors, buyers/processors and/or wholesalers or exporters. In addition, some contracting parties became participants in the value chain, collecting on behalf of the state enterprise and private enterprises. Private companies played a similar role (collection, buying, processing and marketing) to that of the state company before the mid-1990s.

A key feature was the alienation of local people from the major value chain activities in north and northwestern Ethiopia, and the skewed distribution of profit margins, discouraging producers. The state owned company paid very low wages to labourers and set very low purchasing prices for pastoralists or village traders. Low price levels discouraged responsible

forest management and use in north and northwestern Ethiopia, while the lower price in south and southwestern Ethiopia led to illegal cross-border trading (Lemenih and Kassa, 2011). Many recommended that these arrangements be revisited and argued for communities to be given economic incentives to encourage them to adopt sustainable gum and resin collection, with a greater role for local people in production and marketing.

Recommended measures included the following.

- Mapping and registering all dry forest resources of the country.
- Supporting communities in southern Ethiopia to improve the volume and quality of gums and resins collected, with efforts to link them with markets.
- Putting dry forests, subject to a *de facto* open access regime, under community or private sector management to reduce deforestation and degradation.
- Allowing private enterprises or third parties to be involved in the collection of frankincense from forests managed by cooperatives or communities.
- Linking cooperatives or communities engaged in frankincense collection with markets.
- Putting in place monitoring mechanisms to control overexploitation or illegal land-use change.

8.3 Market structure in the devolved governance era, since 2012

In the face of high rates of deforestation and degradation of dry forests and woodlands, mainly in north and northwestern Ethiopia, NGO's and development partners began working on developing gum and resin value chains, targeting their interventions at smallholders with the aim of building their capacity to responsibly manage forests and sustainably supply frankincense. They suggested removing legal barriers and institutional bottlenecks to increase the participation of local people and to improve their wellbeing, while also enhancing the environmental benefits of frankincense value chains. During this period, communities in north and northwestern Ethiopia were organized into cooperatives to be allocated forest areas to manage areas and to collect and sale frankincense.

Cooperative members are the collectors/producers, though in rare cases third parties were contracted to do the collection. Local people showed significantly increased interest in income generation from frankincense production. Cooperatives obtained production sites from the local government under contractual agreements. They collect and store the produce at temporary stores and undertake some primary processing (e.g. drying under shade, and sorting white from black frankincense. NGOs provide technical training on tapping techniques and material support, including production and processing materials, processing and storing houses, and facilitate administrative support from local governments as well as create market linkages between cooperatives and buyers. Cooperatives bulk the produce and either hand it over to unions or sell it to licensed state or private enterprises. Unions sell the produce by auction to licensed state or private enterprises. The role of the licensed state or private enterprises remained the same as in the previous two periods – processing, grading, bulking and marketing for domestic and export markets. The Office of Cooperatives legally organizes local communities as cooperatives, and the bureaus of agriculture provide production permits and collect royalty

fees, while the bureaus of land use administration demarcate and allocate production sites to private companies. The involvement of land administration bureaus is demarcating and certifying forests under PFM continues to be limited, as forests continue to be owned by the state.

Special features of this period include the following.

- An increased involvement of development partners such as NGOs in supporting local efforts and national or regional governments to promote improved management and exploitation.
- A policy change that involved devolution of management and use rights to local people
- A shift in the nature of participants, with cooperatives as producers and (de facto) 'owners' of production sites: almost all having now been allocated to cooperatives. The state owned enterprises no longer manages dry forests areas as production sites.
- An increased sense of ownership on the part of the local people.
- Local communities began to derive commercial benefits legally from dry forest resources.
- A pronounced increase in local people's interest in income generation from frankincense production, especially in Benishangul Gumuz.
- Restricted rights given to cooperatives for production and marketing in north and northwestern Ethiopia. In these areas, local people lack skills and experience in tapping, and produce a very low quantity product in comparison to experienced tappers; with no frankincense production at some production sites after the end of NGO pilot projects.
- Very weak market access and market linkages, such that producers remain price takers, with tight or very modest profit margins.
- Absence of up-to-date market information regarding product prices, that often results with producers getting very low prices for the raw product.
- Effectiveness of forest resource conservation activities is influenced by both the policy environment and by the actual contribution of frankincense to livelihoods of local community members, with varying effects on the extent of the conversion of forests to farmlands.
  - o Cooperatives (mainly in Benishangul-Gumuz) lease production sites to concessionaires and get good incomes that incentivize them to continue in protecting forest sites.
  - o Cooperatives (mainly in Amhara) that cannot lease production sites, earn little or no frankincense income. Farmers continue to clear forests to establish ownership rights over the new farmland, since current legal arrangements mean that farmers have stronger rights over farmland that is certified, than they do over uncertified forest land.
- The absence of organized collection in southern Ethiopia resulted in limited collection as compared to potential.

The present study has shown that, overall, frankincense value chains development in Ethiopia is geared towards helping rural communities to derive commercial benefits from forests and towards enhancing the environmental and social performance of value chains. This performance, according to both of these variables, varies across production sites. However, model sites showed that frankincense resources can be better protected, their productivity enhanced and production sustainably managed, if the right policy environment is put in place (Fig. 5). The management

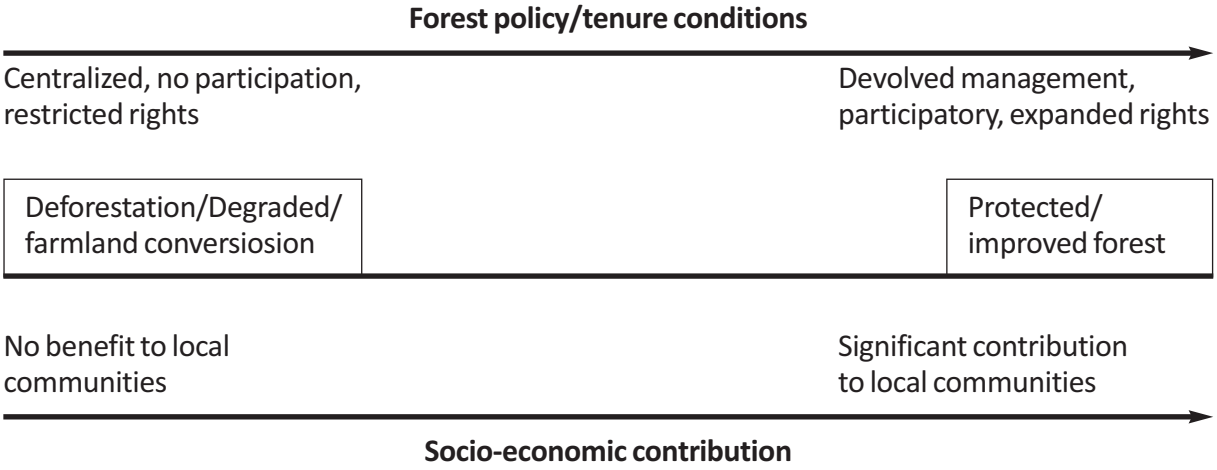


Figure 5: Continuum of woodland vegetation status, from degraded/farmland conversion to better protected natural woodlands, in relation to the policy environment and socioeconomic contribution of woodlands.

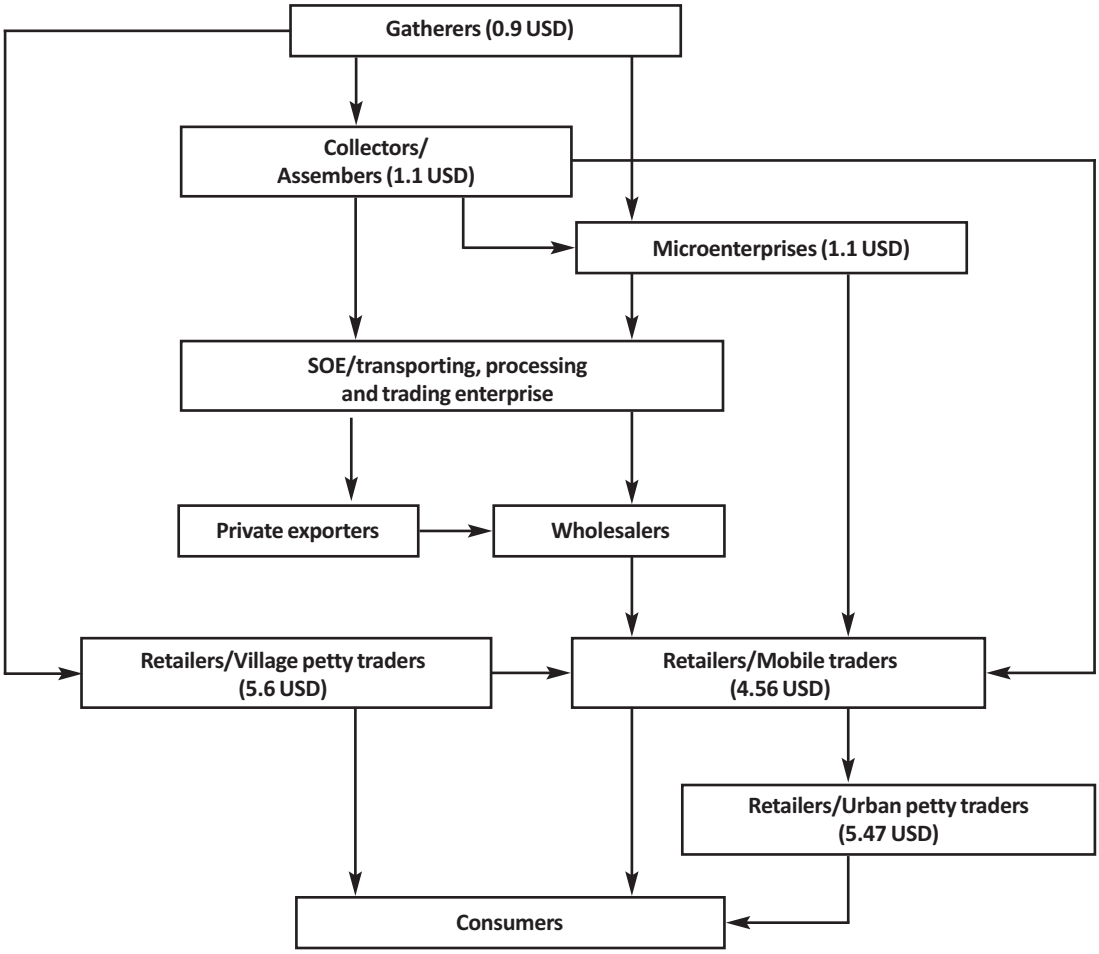
rights afforded to local people need to include the right to hire third parties to do the collection in a responsible way, so that local people can be economically incentivized to maintain ecosystem integrity and to conserve the forest resources. In this regard, practices introduced at Benishangul-Gumuz can be used as a model for the sustainable management of frankincense resources and for the restoration of degraded production systems. If local people lack the capacity for sophisticated production, they can derive significant economic benefits by leasing production sites to more capable private sector actors. Also, care should be taken not to legally certify forests that have been converted to farmlands as this encourages deforestation. The root causes of this conversion need to be investigated and legally addressed.

Various studies have been conducted on gums and resins value chains in Ethiopia, which have detailed the different actors involved, at regional, national and international levels, and the mark-ups along value chains. One such study (Berhanu et al, 2021), conducted recently in the somewhat different context of southern Ethiopia, presents a useful diagram of value chain actors and mark-ups that helps to illustrate some of the discussions here (Figure 6).

Here, one must bear in mind that the international market, including the use of frankincense oils in very sophisticated products, involves much greater mark-ups and the provision of processed inputs for a wide variety of products.

Kassa et al (2011) present a more complex mapping of the broader value chain for gums and resins that includes the Horn of African links in the value chain (Figure 7).

Efforts to empower actors at the bottom end of these value chains must take into account not only the links along the value chain, but also the policy and regulatory environment within which it operates, and the various service providers that underpin it, including sources of finance, equipment and tools, as well as market information.



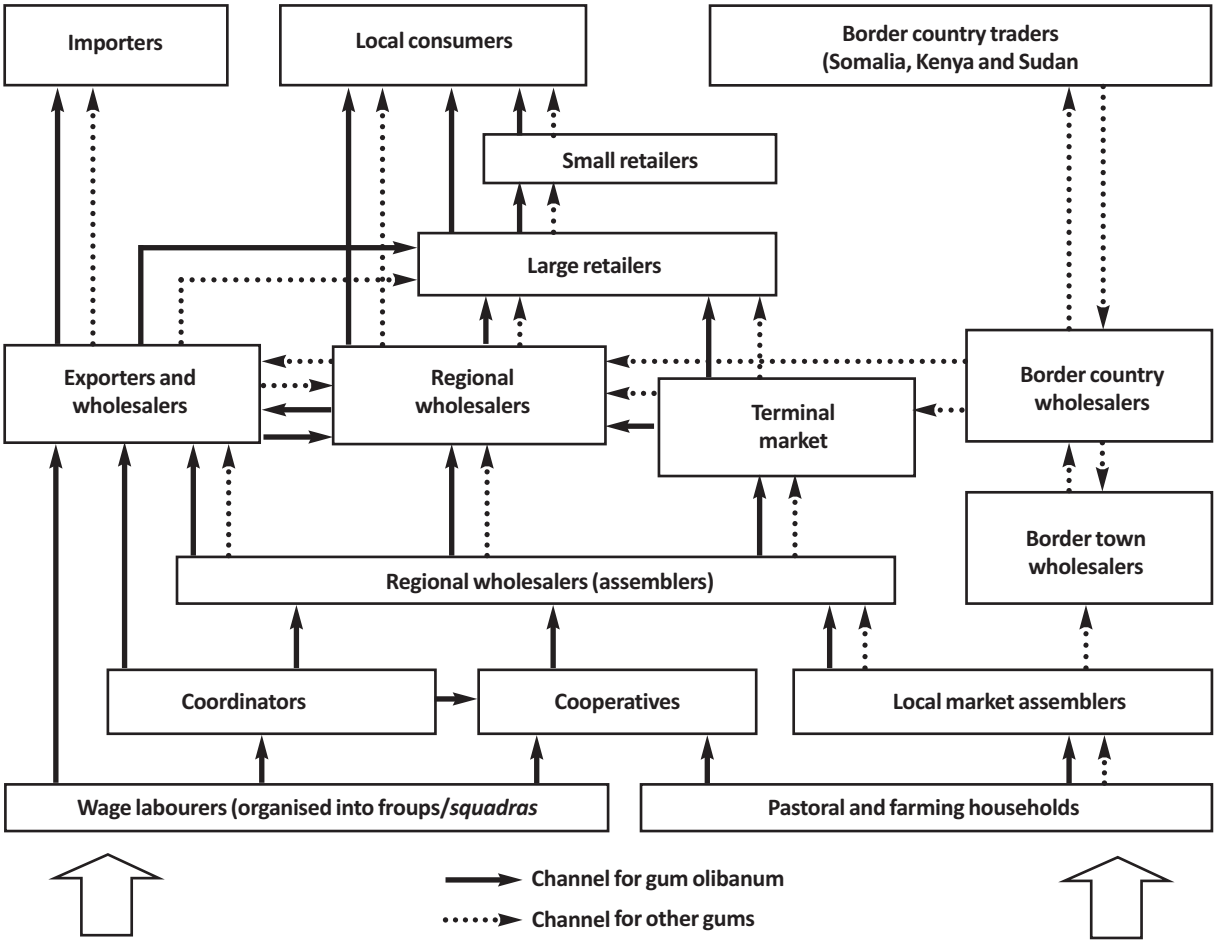
(Numbers in brackets are approximate mean prices per kg received by various types of actors. Data on price received by SOE, exporters and wholesalers not available.)

(from Berhanu et al, 2021)

Figure 6: Value chain actors and mark-ups in the frankincense value chain in southern Ethiopia

Here, the focus is on governance and regulatory issues that underpin these value chains, and at a deeper level, how they shape these markets and determine critical aspects including the number of players. But as we proceed, it is important to bear in mind the basic facts depicted here.

Kassa et al. (2011) also provide a descriptive list of value chain actors, and note the important roles played by various service providers, including universities and research institutions. This study has emphasized the importance of NGOs as promoters of the PFM approach that involved a shift towards community management and strengthened use rights. Universities and research institutions, national and international, play very significant roles in developing and shifting the thinking that underlies policy and programs. Their role should not be forgotten in considering what follows.



(Kassa et al, 2011)

Figure 7: Mapping of the broader value chain for gums and resins including links to other Horn of Africa countries

9. Inclusive frankincense value chain development

Responding to rapid deforestation and the degradation of frankincense resources since the mid-1990s, mainly in north and northwestern Ethiopia, farmers' participation in frankincense value chains emerged as a new strategy. The view was to enhance the importance of frankincense as a non-timber forest product in the livelihood systems of local communities, by creating conducive policy and institutional environments that could enable local people to take part in the management and use of state forests, according to forest management plans, and to thereby contribute towards sustainable management of the resource base. NGOs were in fact leading the process in collaboration with relevant government institutions. Government organizations and NGOs consider this a way to enhance farmers' access to frankincense resources, markets and inputs, assuming positive effects on livelihoods, food security, climate resilience and sustainable frankincense production. However, participants in the workshops and group discussions in the field as part of this study asserted that in some production areas, access to frankincense resources led to participation without financial gain, and that most farmers tend to revert to their old farming practices, clearing forest to expand farm production. As a response to this, participants suggested the need to develop more inclusive value chains for frankincense, with better returns for local people.

Inclusive value chain development means a positive or desirable change to extend or improve productive operations and generate social benefits and other development goals. Developing inclusive value chains requires analysing the changing contexts of markets, identifying intervention options that increase efficiency and inclusion particularly of poor and marginalized groups, and proposing approaches to scaling up improvements (Devaux, et al., 2016). By developing an inclusive value chain, a contribution is made to reducing poverty through strengthened linkages among actors, which allow them to take advantage of market opportunities and share benefits. Inclusive frankincense value chain development will support smallholder farmers who are producers, by improving their access to technologies, assets, training and markets. The benefits for smallholders may include increased incomes, more secure tenure, and improved market linkages. The benefits for exporters and/or wholesalers, processors, and others involved in the later stages of the frankincense value chain may include improved quality and sustained flow of frankincense, and reduced transaction costs.

Several strategies have been proposed to improve participation and inclusiveness in value chains.

(1) The first strategy focuses on strengthening or establishing partnerships among value chain actors in general, and between producers and buyers in particular. This strategy emphasizes the importance of multistakeholder coordination and collaboration, both vertically between value chain actors, and horizontally within the landscape where value chains are embedded. NGOs and government organizations often play a major role in supporting the establishment of such partnerships, which will facilitate information flows, including on expected quality standards for products and the volume of products produced. Buyers are expected to play a supporting role in improving producers' access to information regarding volume and quality of products that the market needs.

(2) The second strategy focuses on social upgrading, focusing on improving producers' rights and working conditions. This strategy is an important one, since the current agreement between cooperatives that produce frankincense and local governments was found to restrict the rights of cooperates or undermine their control over resources. According to the current agreement used in Amhara, farmers cannot hire skilled labour for frankincense production. This rule is set for cooperatives without considering the culture and natural resource use behaviour of local farmers. Thus, strengthening farmers' autonomy, capacity and agency is crucial as part of social upgrading that promotes improved rights and working conditions.

(3) The third strategy focuses on smallholder empowerment. Frankincense is an international commodity, but the international market is opaque and highly concentrated, and exporters/wholesalers and processors continue to play a monopolistic role in setting prices. Producers have little or no market information about demand and price trends in wider frankincense markets. Producers also have limited choice as to where and to whom to sell their product, and in most cases they simply sell to a single or very few licensed companies operating in the area. They are not provided with information regarding different marketing channels. Options to organize producers and increase their bargaining power must be identified. The very low number of buyers in turn results in a limited volume of products harvested, which in turn reduces the possibility of attracting buyers interested in larger volumes. In addition to volume, product quality must also improve, and buyers need to be ready to pay more for higher quality products. Companies complain that producers supply small quantities of low quality. Inclusive value chains need to result in higher incomes (profit margins) for producers through market integration and upgrading (applying quality and sustainability standards). This is possible, if producers are given the chance to obtain market information and so produce greater volume and better quality products in response to perceived opportunities, and through training as well as being able to hire skilled tappers.

Other proposed interventions that could be implemented by different main or support actors, including government agencies, NGOs, cooperatives, or the private sector, include the following.

(i) Improving access to infrastructure and markets through increased public investment. Infrastructure, including roads, water, health facilities and marketing centres, is underdeveloped in most frankincense producing areas. Public investment would positively impact people's capabilities to collect, process and market forest products by reducing transport costs (Haggblade et al., 2002).
(ii) Providing the right policy signals. People react to market and policy signals. With a view to developing inclusive frankincense value chains in Ethiopia, the following policy signals or interventions are proposed.

- Lift restrictions as to who can be involved in frankincense production. Companies and communities that have been given concession rights to dry forests to collect frankincense should not be restricted as to whom to employ. The only requirement should be that tappers are trained and tapping is carried out as recommended so that trees are not wounded excessively, and resting periods are observed.

- Include the requirements for updated management plans and environmental impact assessment reports as conditions for obtaining and renewing production permits. Permits should be given for longer periods and monitoring should be done annually, with permits revoked if the management plan is not respected or if evidence of over exploitation is reported.
- In consultation with value chain actors and considering end user demands, revisit grades and standards for frankincense products both by chemical content, size and origin, and work towards building product brands. The introduction of brands, grades and standards would play an important role in helping producers and cooperatives succeed in increasingly liberalized and unregulated markets.
- Reduce royalty fees for marketing frankincense, as these have a significant impact on the price of frankincense. The current 20% royalty fee is affecting the incomes of private producing companies, as they are responsible to paying the fees.
- Support cooperatives and build their capacity to function properly and to be active all year round.
- Build the capacity of value chain actors by increasing their technical and organizational skills to ensure sustainable resource management and product supply. Support value chain actors to work together in accessing and using market information, including information on trends in product price, quantity and particularly quality to enhance competitiveness.
- Establish a multistakeholder platform at regional or production area level, to allow value chain actors to interact, improve communication and mutual understanding, develop trust, and engage in joint activities. It would also help in forming networks, improving coordination, mediating disputes, engaging in policy dialogues at national and regional levels, improving market-chain governance, and documenting results. Platforms need to be flexibly managed and to be able to adapt to unfolding events. Mechanisms for platform funding, planning, management and governance need to be discussed and agreed upon. NGOs or government institutions can assist in the initial establishment and could play a facilitation role.

10. Conclusions and recommendations

Forest governance in Ethiopia has changed over time and significant transformations are observed. The first period covered in this study is from the mid-1970s to the early 1990s, when Ethiopia was ruled by a military government, the Derg, and when the collection and marketing of frankincense was solely conducted by a state-owned enterprise. The second period from the mid-1990s to the early 2010s was when Ethiopia had adopted a devolved governance system and shifted towards a free market economic policy under which the private sector also played role in the collection and marketing of frankincense, especially in northern and western Ethiopia, where the largest volume of exported frankincense is collected. Since 2011, communities organized into cooperatives began playing role in the collection of gums and resins and the relative importance of the state enterprise in gum collection declined, though it remained important in the marketing aspect. During this time, forest policies and laws also changed, with considerable attention given to the nature of forest governance. Assessed in this study were the impact of these changes in governance on forest management, the economic contribution of forests (to households, and nationally), and the willingness of local people to conserve forest resources.

The evolution of resource governance over time and the entry of new market actors

Ethiopia has experienced deforestation and forest degradation, differing in magnitude over time and spatially. During the first period considered, 1975-1995, all natural forest resources were state property, and the state was the quasi sole actor in their management and use, with the private sector and local people excluded. This resulted in a very high rate of deforestation and forest degradation, mainly in high forests. Lowland dry forests were the least affected forest resources due to the limited degree of local economic activity, mainly a consequence of low human populations, political instability, poor infrastructure, and harsh environments that discouraged settlement.

During the second period assessed, 1995-2011, private sector actors were provided management and use rights that enabled them to be involved in gum and resin production and marketing. Local people in Amhara and Tigray however, were not allowed to harvest and sell frankincense from nearby forests. This is believed to have aggravated deforestation and the conversion of forest and woodlands to farmland. High rates of deforestation and degradation were believed to have taken place in lowland dry forests, rather than in the high forests, due to the expansion of smallholder and commercial farmland during this period.

Then, NGOs worked with the federal and regional governments to better manage lowland dry forest resources through participatory forest management schemes, as PFM gained recognition as a valid approach to supporting sustainable forest management and local wellbeing. NGOs spearheaded the establishment of frankincense producing cooperatives and unions through externally funded projects, and efforts to promote PFM gained momentum as of 2011 in Benishangul-Gumuz. The enactment of forest policy and the forest proclamation in 2007 paved the way for the enhanced participation of local people in the conservation of forest resources through use.

A major milestone was the devolution of management and use rights to organized local communities, helping local communities to derive benefits from forest resources. When pilot projects were active, the rate of deforestation and degradation was reported to have declined significantly while the incomes of local people from forest resources increased. Frankincense production became an integral part of local livelihood strategies and contributed to increased household incomes. But sustainability of gains was not consistent and showed considerable variation across production sites, depending on the regulatory limits established by regional governments as to who can tap trees, and on the degree of local people's access to markets.

Regulations that enable or constrain sustainable frankincense production

In Benishangul-Gumuz, the existing legal provision that provides communities the right to lease production sites or to hire skilled labour for frankincense production encourages cooperatives to continue to manage forests and produce frankincense. Cooperatives were also supported by local governments to access markets for their produce. In Amhara, cooperative members are expected to collect frankincense themselves. Given the high opportunity costs of frankincense collection and their lack of experience in tapping, local people in Amhara are not willing to do so. Prohibiting cooperatives from hiring tappers has also contributed to the decline in the number of cooperative members. Some pointed out that this restriction has also been driving illegal land use changes, whereby some farmers clear forest to establish farmland. Thus, insisting cooperative members must alone engage in frankincense production has failed to create sufficient economic benefits for local communities and to ensure conservation of forest resources.

Bargaining power and power imbalances along the value chain

The bargaining power of producers is very limited and they are largely price takers. Options to address this and link producers to markets are aspects that both government organizations and NGOs should be working towards. Platforms that bring together key value chain actors need to be established, alongside other measures such as access to market information, training and finance, to redress the power imbalance between buyers and sellers. Numerous unskilled producers at the bottom of the value chain lack access to information and finance, and they face a handful of well-connected buyers operating in opaque, oligopolistic markets, dominated at the international end by a small number of big players. Under these circumstances, there is a limit to what can be achieved by training, informing and equipping local cooperatives so they might move up the value chain. Policy interventions that reduce barriers to entry and thus market concentration further up the value chain could have transformative effects lower down. Greater transparency in international markets, together with a fair trade approach involving certification, could do much to promote social as well as environmental goals, particularly if consumers around the world are made more aware of the issues.

Trends in production and export volumes over the three eras

No data were available for the total volume of frankincense production at national level, because of the inaccessibility of data from a number of private enterprises and the paucity of data on cross-border trading. The annual volume of frankincense production was obtained from the

state company that was actively involved over the three frankincense governance eras. Largely as a result of political instability, the volume of frankincense production showed a decreasing trend over the first era, with an average production of 1,437.5 tonnes per year. The production volume showed an increasing trend over the second governance era, with an average volume of production of 1,683.4 tonnes per year, boosted by relative political stability and an expansion of the area under production. In the third governance era, the volume of production showed a declining trend, with an average volume of production of 1,301.7 ton/year, after most production areas were handed over to organized local community groups.

The export volume and value of gums and resins at national level have shown a similar trend as with the volume of production by the state company. Export volumes showed a decreasing trend over the first era, with an average volume of export of 750 tonnes per year. Export volumes showed an increasing trend over the second era, with an average volume of 3,045 tonnes per year. Exports showed a declining trend over the third era, with an average volume of 2,709 tonnes per year. These trends match those observed for frankincense production, driven by the same factors.

Incomes from frankincense, incentives to conserve and steps towards inclusiveness

Findings from the present study indicate that the devolution of management and use rights for forest resources has substantial potential to improve household incomes and livelihoods through gum and resin production. Increases in incomes derived from forest resources, where they occurred, have incentivized local people to invest in management of forests and improve the conservation status of forest resources. However, transferring (limited) rights does not guarantee the flow of benefits to local communities. Ownership still rests with the state. Restricted rights and the fundamental imbalance in market power vis-à-vis other actors, limit the flow of benefits to communities, such that there is little incentive for communities to continue with engaging in sustainable forest management.

It should also be noted that frankincense production is typically only one of a number of economic activities for local producers, along with crop and livestock production, often the main source of their livelihoods. Farmers thus do not invest all their efforts in frankincense production alone. Supporting frankincense production activities as part of a diversified livelihood strategy is likely to have a more positive impact. Still, a modification of regulations in terms of expanding use rights pertaining to frankincense production is a high priority that needs an immediate action. Other interventions are required to help producers to obtain fair prices and a fair share of the frankincense market. Fairness and inclusiveness can be fostered by establishing multistakeholder platforms that bring together all value chain actors and offer a chance for them to discuss product quantity and quality, and to negotiate prices and conditions on the basis of fuller information about regional, national and international markets. Capacity building to enhance the performance of cooperatives as well as local government institutions are also important, making it possible to supervise production areas more effectively, combat improper and intensive tapping and prevent conversion of forests to farmland.

Government's regulatory role and the potential to make markets work for the poor

Finally, attention is drawn to one major insight that became clearer over the course of conducting this study. Beyond the nature of the governance regime, a major factor in poor outcomes has been the failure of government to play its regulatory role. One example is that the annual renewal of permits for private companies has not been linked to performance, in terms of sustainability as well as broader economic goals. Much of the export surge of the second governance era came through transient 'party companies', established by politically connected individuals with a view to making money quickly before a change of government, with short term perspectives that did not encompass issues of environmental and social sustainability and product quality. This is only partly a market failure related to market concentration, with a small number of buyers and market actors at the top of the value chain, and a large number of people at the bottom. It also reflects a failure of the government to take on its responsibilities for quality control and sustainability, which could have done better in terms of monitoring. Attempts to form associations of exporters that could push for higher mark-ups vis-à-vis international buyers, or collaborate on quality standards, have failed. In general, exporters do not want to share ideas and collaborate with others, and they tend to dislike transparency. Here, government could use its licensing powers to impose participation in an association of producers and/or exporters, and in a process that supports upgrading and sustainability. This is another part of the missing element from the government side, and an important one in terms of fairness goals. The many low-skilled, actors at the bottom of the supply chain naturally lack bargaining power. An exporters' association at national level could negotiate minimum prices which would facilitate better pay along supply/value chains, with higher mark-ups cascading down.

But all of this economic activity and potential is dependent upon the conservation and sustainable management of forest resources – and the frankincense trees in these forests. And this in turn, depends on the forest governance regime. Government is reluctant to transfer ownership rights to local communities, but this, with the appropriate conditions and safeguards, might be the only way to establish the incentives for sustainable management and commercial exploitation of frankincense dominated dry forests and woodlands.

In conclusion, the objectives of reforms in resource governance have not been met. Strengthening community use rights, and allowing greater private sector participation, did not help attain the desired dual objectives of positive gains in livelihoods and forest conservation. There has been a decline in production, after a promising peak, and a decline in the resource base. One missing element appears to be government as a regulator. Another could include the transfer of ownership rights to local community members, conditional upon the monitored maintenance of the resource base.

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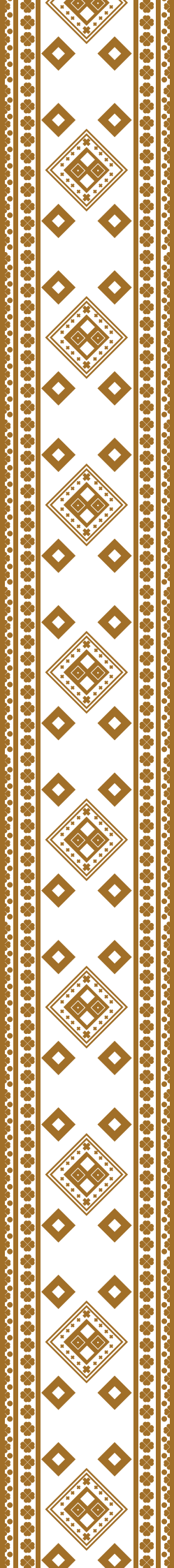

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