

# Frankincense in Peril

Analysis of the Resin Economy in Somaliland

## Preliminary Findings and Executive Summary

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## Executive Summary

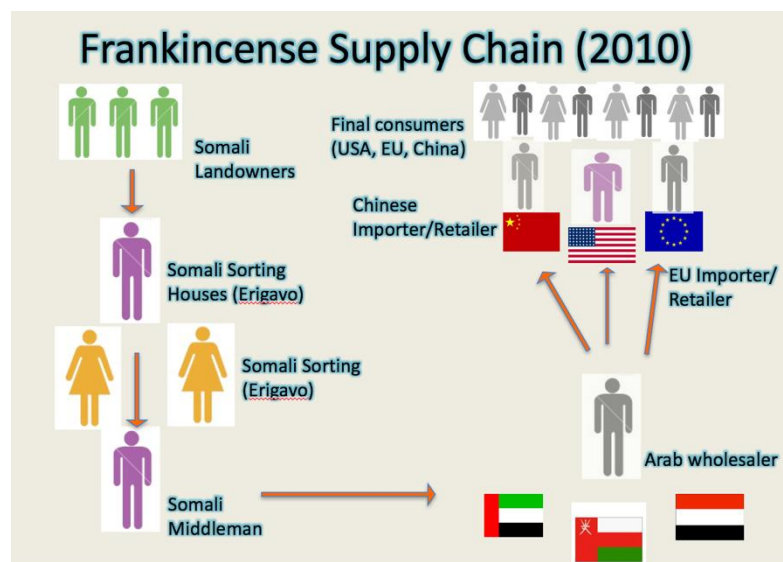
### Background:

In 2010, frankincense prices were low (<\$1/kilo of resin), there was relatively little market for the resin, causing harvesters to underbid each other in an attempt to sell product, and the main market was wholesale frereana to Arab middlemen (DeCarlo and Ali 2011). The trees were being overharvested to attempt to sell more volume to make up for the low price. In 2016, we had planned to work on designated test site to conduct analysis on tree health. We used qualitative interview and focus group methods along with applied tree health and direct observation field methods and data collection from site visits. We were able to revisit 3 locations visited in 2010, as well as 2 new locations. To effectively conduct analysis, we formed a consortium of organizations and received support from the government along with forming a team including an expert Somali forester and academics from the University of Erigavo and University of Hargeisa.

### Major Findings:

#### 1. Significant changes in the frankincense supply chain, with increasing complexity

In 2010 there was a relatively simple supply chain, with Somali harvesters supplying resin to Somali sorting houses, where it was cleaned and then sold via Somali middlemen to Arab wholesalers. These wholesalers then sold the product onwards to importers in the USA, EU, and China (Figure 1). For the Somalis the industry was largely primary resource extraction, with secondary manufacturing and value added later in the supply chain, with the majority of profits going to non-Somalis (DeCarlo and Ali 2011).



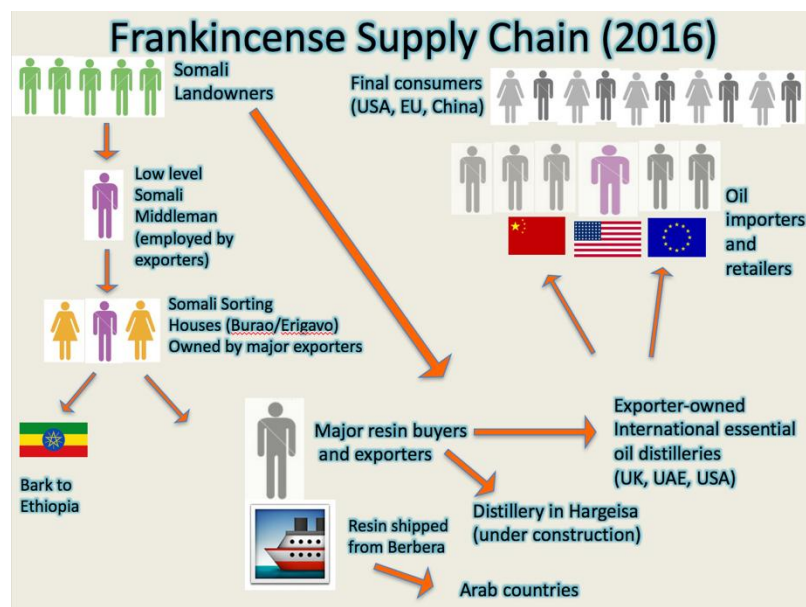
**Figure 1.** Frankincense supply chain in 2010.

Today, the supply chain has become more dynamic and complex. Somali-owned and international frankincense exporting businesses are major actors that negotiate directly with landowners, control Somali supply for the international market, and significantly influence price and harvesting practices. Consequently, the exporter-landowner relationship is critical to achieving sustainability in the supply chain.

Since 2010, there has been an increase in demand for resin. Over the last five years, Asli Maydi has become the largest exporting company (based on preliminary analysis of Maersk shipping records). The exporters, including Asli Maydi Ltd., Som Gum Trading Ltd. (Internationally Maydi Frankincense), NeoBotanika, Ismael Imports (Internationally Böswellness) and Luban Aromatics typically purchase resin directly from the landowners via middlemen they employ. A number of these companies also harvest resin from their own private lands.

Some of the companies clean the resin at sorting houses they own or rent. In 2010, most of the sorting activity took place in Erigavo, while in 2016 it has shifted to Burao. The resin is then shipped to exporter-owned or partner distilleries in the UK, UAE, USA, and EU where it is distilled into essential oil, a process that adds significant value. In an attempt to benefit the local economy, NeoBotanika has recently constructed a steam distillery in Hargeisa, though it is not yet operational. Additionally, there has been an increase in the sale of bark, both sorted from resin and stripped directly from the tree, to Ethiopia.

After distillation, oils and other byproducts are largely sold to companies that typically use them in cosmetics, perfumes, medicines, and aromatherapy applications (Figure 2). International demand for essential oils has increased as research and marketing have branded frankincense as the 'King of Essential Oils' (Moussaieff and Mechoulam 2009; Prakash et al. 2014; Carmarda et al. 2007; Banno et al. 2006; DoTerra 2016).



**Figure 2.** Frankincense supply chain in 2016.

## 2. Changes in demand and prices for resin

In 2010, the price for resin was approximately \$1 or less per kilo, with limited markets and low demand. Consequently, harvesters were underbidding each other in an attempt to sell their resin to exporters, who were sending it primarily to the Middle Eastern market for incense and gum. The economy was based more on *Boswellia frereana* which is culturally popular in the middle east, while *Boswellia carterii* had less of a market (DeCarlo and Ali 2011).

We observed dramatic changes in 2016. First the *frereana* market has declined due to fighting in Yemen and disruption of traditional trade routes, while demand for *carterii* oils has increased drastically in other international markets. Today, the price of a kilo of raw resin is on average \$6, with some of the best quality resin selling for \$9 per kilo. The *carterii* market for Somali frankincense has expanded to include high-value products such as essential oils for cosmetics and medical applications. A rise in demand has led to an increase the price for a limited resource. In fact, demand has outstripped supply and we observed that rather than harvesters underbidding each other, the exporting companies are competing against each other to get access to the resin.

## 3. High levels of overharvesting and damage to trees

Despite the increased price of the resin, no controls to regulate harvesting practices have been implemented. Consequently, many harvesters have been capitalizing on the dramatic price increase by harvesting as much resin as possible. Illegal harvesting which was already an issue has increased as well. Exporters themselves have also used price war tactics to secure supply ie offering a higher price to landowners. This situation has led to using highly destructive practices including:

- A. Overwounding both *carterii* and *frereana* trees. We were told in interviews with clan elders that traditional practices call for 6-12 wounds on a tree, depending on the size of the tree. We routinely observed trees with up to 70 wounds, and some with as many as 120 wounds. This practice is highly damaging as it saps the tree's metabolic reserves, limits its ability to defend itself against pests, and exposes the tree to pests and disease (Lemenih and Kassa 2011; Corroborating photograph from findings, Appendix, Figure 3).
- B. Bark stripping of *Commiphora* and *carterii* trees. We observed that many trees were completely stripped of their bark, which kills the tree. Stripping may temporarily increase resin yield, and the bark is sold to Ethiopia for low-grade incense. However, after a single harvest the tree usually dies (Figure 4).
- C. Continuous harvesting/illegal harvesting of *carterii* and *frereana* trees. Clan elders told us that tradition calls for a harvest cycle of 2 years of harvesting, May-October (*carterii*), and then one year of resting. However, our interviews revealed that trees are now harvested every year, and that moreover a double-harvest system has been implemented: when *carterii* resin is collected in October, the harvesters begin cutting the trees immediately again for a second harvest. This practices drains trees of their metabolic resources, increases their susceptibility to pests, and leads to high rates of tree death (Lemenih and Kassa 2011; Rijkers et al. 2006).

- D. Harvesting of immature trees. We observed that harvesters had begun cutting immature trees, which were not yet at a tappable age, in an effort to get more resin. Tapping these immature trees will likely stunt their growth and lead to increased juvenile tree death (Lemenih and Kassa 2011; Corroborating photograph from findings, Appendix, Figure 5).
- E. These stress factors have been linked to an inability of the trees to produce seeds (Rijkers et al. 2006). There are also preliminary findings that resin quality is in decline.

#### **4. Rapid dying of adult trees**

As a result of these harvesting practices, we observed high rates of adult tree morbidity and mortality across the growing region. We did not observe a single site that had well-managed trees or a majority of healthy trees. This was blatantly obvious at the non-viable study site in Ga'ab where the adult trees were dead and dying.

Based on a quadrant analysis at Madar Moge, less than 25% of the trees observed were in good to fair condition. By contrast, at least 30% of the trees were dead or almost dead, and the remaining 45% were in poor condition. Trees that were tagged in Ruqus in 2010 were found dead in 2016. A harvester told us he was losing 20-30 trees per square kilometer per year—a significant percentage of the tree population. In every place we visited, harvesters told us the same cause for the death: overharvesting and a boring worm, most likely a longhorn beetle, called “xare” (Strumia et al. 2007, Groenendijk et al. 2012; Corroborating photograph from findings, Appendix, Figure 6).

#### **5. Animosity towards NGOs, the government, and companies, and the importance of trust-building with local communities**

In every place we visited, local people and elders expressed anger towards the government for a lack of representation or services, NGOs for promising aid and failing to deliver, and to the exporting companies for their lack of investment into the communities. The harvesting communities that we visited, without exception, are impoverished and economically dependent upon frankincense. We observed food insecurity, lack of access to clean water, lack of access to medical care, lack of access to education. We were told time and again that if the frankincense trees die, there is no other livelihood available to the people.

These communities are caught in a vicious cycle: they need to harvest less to keep the trees alive, but they have to harvest as much as they can to feed their families. A disturbing increase in the use of a drug known as Qat is driving some of the illegal harvesting and is exacerbating the poverty trap as well. This situation is causing depression, hopelessness and anger. Furthermore, the harvesters know how wealthy the exporting companies have become, and they are angry about the lack of investment back into their communities. They feel that the government, NGOs, and companies have abandoned them, and consequently they are extremely wary of outsiders.

It was critical for us to sit with the elders and in broad community meetings to hear their concerns, discuss our objectives, and not raise expectations about what we were trying to do. We had to build trust with communities in order to be allowed into their territory and to see

their trees. Only after they had thoroughly vetted and interviewed us did that allow us into their land, with the following conditions: 1) That we make our research available to everyone, 2) That we would continue to work with the local University, 3) That we did not work with only one company or visit only one elder's territory, 4) That we commit to working in the region long-term, including being in the field and working abroad, and 5) That we did not work for the World Bank. One of our goals was to interview as many people as possible on traditional harvesting practices, tree health, challenges, etc. We interviewed a total of 152 people in 30 focus groups and interview. We incorporate much of the initial findings in this executive summary and further academic publications are forthcoming. Moreover, half of the focus groups involving community leaders specifically expressed a real need to meet with the central government to discuss challenges, and all such groups expressed frustration with their lack of government representation. The Sanaag stakeholders have expressed a clear desire for a series of meetings with decision makers in Hargeisa, to facilitate greater cooperation.

#### **6. The necessity of further ground analysis, use of hand flown drones and remote sensing.**

We observed (and were told in interviews, also supported by findings of academic literature review) a disturbing amount of overharvesting, adult tree mortality, and economic conflict within the growing region. However, because of turmoil, time limitations, terrain, having to switch gears in the field and not having a drone, we have not done as much ecological monitoring as the situation warrants. We were told in several interviews with exporting companies, including middlemen, that there are harvesting sites with well-managed trees. Some of these conditions include highly protected private lands, more remote locations, communities that have received education on sustainability and in Puntland. We need to return for a second round of ground analysis to verify these claims. We also must use drones and possibly remote sensing technology in the future. It is also critical to return to continue to hold the trust of the communities: we were told multiple times that we would be allowed into the communities, on the condition that we return and not only visit once.

#### **7. Creation of a Sustainable Resin Supply Chain**

Based on our findings in the field and the preliminary analysis of interviews with 152 stakeholders, we can conclude at this time that it is not possible for any landowner or exporting company to verify or make claims that they have a sustainable supply of resin. However, there are companies that care about maintaining the integrity of the trees and the industry. Therefore, to ensure the continued survival of the frankincense forests and the communities that depend on them, a key priority is determining and establishing a certification process for sustainability of the supply chain. This certification process is currently being constructed.

#### **8. Effects of Drought**

Currently there is a state of emergency due to severe drought in Somaliland. Based on the fact that rains are shifting and are not as predictable as they were in the past, understanding the links between drought and forest health are imperative. The Cal Madow is a rain producing forest ecosystem and protecting the vegetation, including the frankincense trees, provides a critical ecosystem service by increasing rainfall in the form of the precipitation-stimulating evapotranspiration cycle (Spracklen et al. 2012). Furthermore, our preliminary assessment



indicates that people are cutting deeper and deeper into the tree, to get the olibanum out because the trees are not well hydrated and cannot produce olibanum efficiently. Well hydrated trees require only a shallow surface cut for the olibanum to come out.

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#### **Links to media coverage:**

<https://www.youtube.com/watch?v=DoKY3IIaBp8&t=1s>

<https://www.youtube.com/watch?v=atwp2H0AqkM>

<https://www.youtube.com/watch?v=q1b0i-06mV0&feature=youtu.be>

<https://www.facebook.com/conservethecalmadow/>



Appendix:



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Cal Meadow

Figure 3. Overwounding on a *B. carterii* tree.





Figure 4. Barkstripped *B. carterii* tree in the Cal Meadow.





**Figure 5.** Immature trees being tapped.



**Figure 6.** Dead *B. carterii* tree in the Cal Madow.