
Regional Lessons Learned for Somalia in the Apiculture (Beekeeping) Sector



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Background

The Somali apiculture industry is still very much in its infancy, yet the potential to reap real rewards, is apparent. Today, though there is not much documented evidence on the current practice of beekeeping in Somalia, institutional memory points to the fact that the industry was making reasonable strides, and prospective for growth was high in the early 1980s. At that time, beekeeping was a private enterprise. Even though commercial beekeeping was not practiced at this time, annual production of honey was estimated to be around 225,000 liters, or an approximate annual value of 13 million Somali Shillings

(\$113,043 - \$305,882 USD).¹ The majority of beekeepers (approximately 3,000) were located along the Juba and Shebelle rivers, where there was an estimated 71,000 log hives. Conditions were most conducive for beekeeping in this area.ⁱ

The following two decades were periods of relative inactivity in the apiculture industry in Somalia. Available information points to beekeeping activities taking place in the North and North East in the 2000s on a subsistence level, supported through donor organizations. Today, an investigation of the beekeeping industry in Somalia would show that there are but a handful of initiatives on the ground. According to the Somaliland Beekeeping Development Organization (SOMBEE) as of 2011, there were an estimated 1,100 beekeepers in Somaliland. These beekeepers are widely dispersed across the region and largely operating on a subsistence level.ⁱⁱ Production is taking place, but commercial beekeeping is yet to take off.

At the present time, Somalia is well-positioned to transition from a subsistence to a commercial level in this sector. There is an economic momentum that is currently gaining ground with involvement from multiple stakeholders interested in seeing that Somalia brings its developmental potential to bear. Businesses seem to be at the forefront of the “facelift” that Somalia is currently undergoing. Their involvement in the beekeeping industry may be the extra push that is needed to transform the industry.

Industries such as beekeeping, which are in essence multi-functional, are worthy to be pursued. Apiculture not only acts as a fitting option to subsist and reinforce livelihoods in the community, but also of the environment. This sector plays a significant role in contributing to food production through increased pollination of food crops and cash crops, and production of various bee-derived products for the market. Beekeeping also fosters sustainable environmental management practices.

The apiculture industry is more than just the production of honey, but extends to other by-products, such as propolis, beeswax, and royal jelly. These products are very much sought after in Somalia, but the demand is not always satisfied by local supply. When the highly preferred local honey (especially highly regarded varieties from the Sanag highlands)ⁱⁱⁱ is unavailable, other types of honey fill the unmet demand. In this case, the production and demand gap is consequently being met by Ethiopian imports of honey. There is therefore a huge domestic market for honey in Somalia which could be exploited.

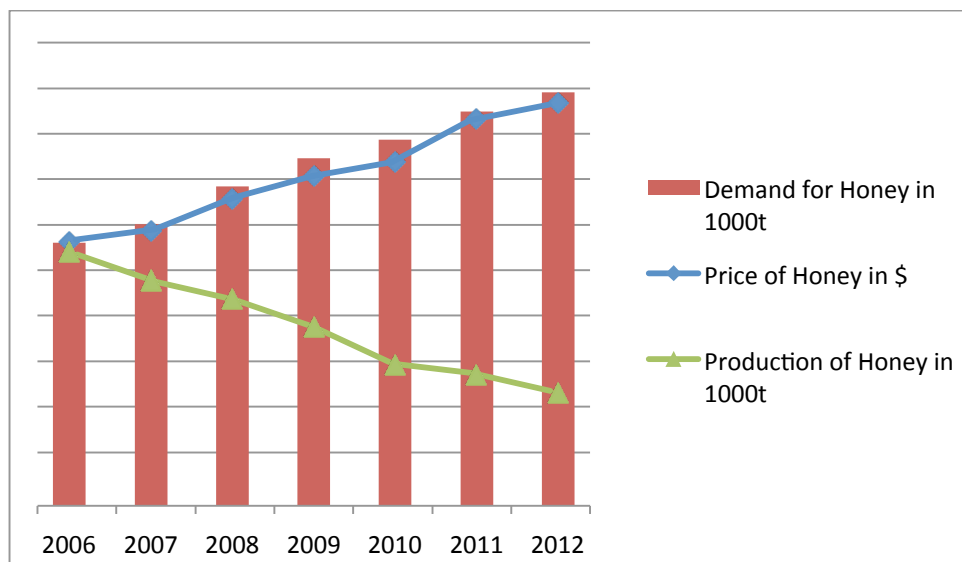
The demand for honey on a worldwide spectrum has been increasing. Prices of honey have also risen, and will continue to do so. In many regions, particularly in North America

¹ Converted according to the official SOS/USD rate and parallel SOS/USD rate at that time.

and in Europe, domestic production has decreased owing to a reduction in bee populations. Bees in these regions are also more susceptible to disease. In Somalia, production is low not because of disease or a decrease in the bee population, but because the potential in apiculture is yet to be maximized.

The graph below reveals the trend for honey, where production cannot meet demand. Prices are on the rise, but this has not impacted demand. There is an obvious gap between production and demand, and countries like Somalia can contribute the reducing this gap, while gaining a high price for honey produced in the region.

Trend in Honey Production²



Lessons Learned for Beekeeping in Somalia

Drawing from Somalia's own apiculture experiences, as well as those of neighboring East African countries, this paper seeks to highlight some of the major lessons that have emerged from the apiculture experiences of the more seasoned players in the region. Countries like Kenya, Tanzania, Uganda, and Ethiopia have established themselves as countries to emulate as they continue to demonstrate success in the beekeeping industry. It is expected that the application of these lessons to Somalia's current situation will prove beneficial.

² This graph is a depiction of worldwide honey trends. Honey prices are taken from the US at the wholesale level and are assumed to be reflective of prices increments in other countries. Demand is not only rising in the US, but also assumed to be rising in other countries. Where production cannot meet demand in these countries, honey is imported.

The lessons that are highlighted in this paper are by no means exhaustive. They are however thought to be the most significant for Somalia. Having mentioned that the industry is not entirely new to the country and the advantages that beekeeping would bring, it is safe to assume that beekeeping could be a very successful venture in Somalia.

This paper will address the importance of having a beekeeping calendar, a good beekeeping area, knowledge of potential pests and diseases that could harm the bees, the appropriate type of hive to use, the value of extension services and market linkages, and the significance of having government policies that aid in the development of the sector.

a) *The beekeeping calendar*

The importance of a beekeeping calendar cannot be understated. A beekeeping calendar informs beekeepers of what to expect in bee-forage availability, so that beekeeping colonies are managed appropriately. An understanding of the approximate date and duration of the blossoming periods of honey and pollen plants in their area would serve Somali beekeepers well. The achievements that other countries have made in this sector have been because the beekeepers have committed to not only know their bees, but the flora that surrounds them. Beekeepers in Uganda have been encouraged to make a general survey of the area, drawing up a list of flowering plants found, with special attention being paid to plants with a high floral population density per unit area/tree. This is so that they can promote planning of appropriate interventions to boost production of honey and other hive products.^{iv}

The beekeeping calendar is an essential tool because it allows for an optimum amount of honey and beeswax to be produced.

The creation of “a beekeeping calendar for any specific area requires complete observation of the seasonal changes in the vegetation patterns and/or agro-ecological zones, the foraging behavior of the bees, and the manner in which the honeybee colonies interact with their floral environment. The accuracy of a beekeeping calendar, and hence its practical value, depend solely on the careful recording of the beginning and end of the flowering season of the plants and how they affect the bees.”^v

Beekeeping calendars should be created on a regional level in Somalia. Though there is not much variance with regard to seasonality in Somalia, there are differences in vegetation across the region.

b) Determining areas for beekeeping

A flourishing apiculture industry is dependent on the area where it takes place. The area chosen for beekeeping is largely determined by the surrounding vegetation, as it is this vegetation that will provide pollen and nectar to the bees. Because of this, apiaries should be located within a reasonable distance to where the food source is located. There should be a source of good water in the immediate surroundings as bees need as much water as pollen and nectar, and a colony may drink up to several liters of water a day.^{vi}

Areas that are deemed most suitable are densely vegetated areas. Somalia has existing forest type environments in Gacan Libaax, Daallo and Libaaxley that would be well suited to the beekeeping industry. However, some of these forests have been, and continue to be, sacrificed for charcoal production. Many of the best beekeeping areas no longer exist because charcoal production is a much more practiced economic activity. Charcoal production is detrimental as it denies bees of necessary pasture for food, destroying the environment and contributing to food insecurity. A more serious problem lies in the fact that charcoal trade has funded deadly campaigns carried out by Al-Shabaab. Beekeeping is therefore a much more sustainable and responsible industry than charcoal. Areas that are still conducive to apiculture must be maintained for the purpose of successful beekeeping. Integrating beekeeping with forest conservation can be a very good approach for the industry itself, as well as a means of curbing environmental degradation.

Securing a good beekeeping area is not just limited to locating surroundings where there are trees, shrubs and flowers, with a relatively long blooming season. Prospective beekeepers should also be cognizant of whether farming occurs in the area. This is crucial to know because if there are agro-chemicals and pesticides that are being used on those particular crops, these may cause an adverse effect on the honeybees. Ethiopia has had cases where the application of agro-chemicals in areas where beekeeping was also taking place resulted in massive deaths of honey bees. The crop-spraying practices utilized by farmers have therefore severely impacted beekeepers' livelihoods. So it is necessary for crop growers and beekeepers to work together. In the event that it is absolutely vital for chemicals to be applied, these chemicals should be applied during late evening when honeybees are not active for foraging. Beekeepers can also move colonies temporarily to a safe place.

Areas where honey hunting is practiced are worthy to be explored as well. Honey hunting can be described as an initial precursor in beekeeping development, followed by traditional methods, and then commercial apiculture. The determination of an ideal area

for beekeeping can also be established in areas where honey hunting in Somalia takes place are found.

c) Colony management

Having noted the usefulness of the beekeeping calendar, and a beekeeping area, a basic knowledge of colony management is also essential. Colony management can only be successful if the beekeeping calendar and the area where the bees will work are in-sync. This is because the objective of colony management is to coordinate the colony's development with all the natural plant resources available, in order to have a maximum amount of honey producing bees when the major nectar producing plants are in season. Colony management does not only depend on the environment or the climate but also "the species or race of bee that is used for beekeeping, the choices of technology or methodology that are easily available and the personal circumstances of the beekeeper."^{vii} Countries like Ethiopia and Kenya, that tend to have higher yields of honey, have mastered the art of colony management, maximizing both the survival and productivity of the bee to their benefit.

d) Specific characteristics of African/Somali bees

Because bees across the globe exhibit different traits and characteristics, an understanding of the type of bee common to Somalia is essential. Generally speaking, honeybees across Africa are known to be more aggressive, more likely to indulge in excessive swarming, have high tendencies of absconding and are classified as opportunistic foragers. Other areas are home to the stingless bee – a gentler race of bee found at high altitude. Both types of bee exist in Somalia with the more docile bee most prevalent in the North.

The aggressive nature of honeybees is explained by their defensive characteristics. These bees are more prone to defend their nest, so any disturbance that comes either from humans or animals and pests in the area, is likely to cause a negative reaction to the beekeeper. Re-queening (the introduction of a completely new queen from another natural hive) is known to be one answer to bees that have aggressive tendencies. Re-queening will calm the hive and will allow for less aggressive worker bees to be hatched.^{viii}

The honeybee prevalent in Somalia is also more likely to swarm because of environmental conditions that surround it. Drought is known to make bees more susceptible to swarming. Swarming reduces honey production as the old queen leaves for procreation, taking more than 30-60% of the bees of the parent colony with her.^{ix} Swarming is beneficial for the bees, as it is a means of reproduction for them, but not necessarily for the beekeeper. The bees leave the hive in order to reproduce. The

beekeeper will have to relocate the swarm, or find a new queen for the remaining colony. Just as re-queening is a suitable solution to aggressive bees, it is also a potential solution for swarming. It is recommended that deliberate re-queening take place in the spring when there is a supply of replacement queens from other hives or other local natural beekeepers.^x

Honeybees have a high inclination of absconding. This occurs when a colony of bees leaves their hive or nest due to an inadequate amount of food or an infestation of pests. Absconding reduces the production of the hives because the hives are deserted. Many of Somalia's neighbors are constantly grappling with the problem of bees that abscond, but are slowly adopting mechanisms that reduce this tendency. Some of these mechanisms include leaving food (sugar syrup) for bees when harvesting; checking hives frequently for the presence of pests; making sure that there is always enough food for bees, especially in adverse weather conditions; careful handling of bees; and placing hives in well-shaded areas, but not under dense trees, in high altitude environments.^{xi}

African honeybees are also classified as opportunistic foragers. This means they exhibit more competitive tendencies when it comes to searching for pollen or nectar to feed on, in comparison with European bees. African bees are more individualistic in their behavior, and will start foraging earlier in the day, for longer periods. As a result, hives should be located where nectar and or pollen are always present.

Stingless bees are relatively easier to manage and do not require as much skill level in their management when compared to the honeybee. These bees are more docile and they do not have a high inclination to abscond. The amount of honey from the stingless bees cannot compete with the volume of honey produced by honeybees, but honey from stingless bees is usually valued more highly. Ripe honey from stingless bees has a higher water content than the honeybee. It is very likely then, that it also has a higher antibiotic activity to prevent fermentation.^{xii}

e) Mitigating pests and diseases

When it comes to lessons available vis-a-vis pests and diseases that affect honeybees in the East African region, it becomes quite the challenge to try and match the potential diseases that could be problematic in Somalia. There are two reasons for this. One is that the economic impact of honeybee diseases on the production of honey and other bee products is poorly understood. This is because across the continent many of the diseases purported to attack bees do not appear to cause overt harm.^{xiii} The other is that the diseases that we do know of that affect bees, are likely to be country specific. This is not to deny the experience that other countries may bring, but it is to say that it may be necessary to allow the beekeeping industry in Somalia to evolve so that a more accurate

assessment of the diseases that affect the industry can be made. Speculation about potential diseases, based on another countries' experience, are limited in value, especially when there is no clear evidence that that disease exists in the country being assessed.

Contrary to diseases, pests do tend to have more of an adverse effect on African honeybees. In Somalia, pests are a principal cause of low honey production. Ants are dangerous to the hive, eating sweets such as nectar, honey, sugar and the bee's body. Black ants are one of the most challenging honeybee pests which cause economic losses to beekeepers. They suck out the honey and kill the pupae and eggs. They are too small to be stopped by beehive guards and in many cases make the bees leave the hive.^{xiv} Placing hives high in tree branches can prevent ant invasions. In the event that hives cannot be elevated, greasing hives with oil can prevent ants from climbing up the legs of the hive.

The honey badger is considered to be another extremely destructive pest, capable of destroying more than twenty hives in a single night. Commercial beekeepers in Tanzania have reported losing 10% or more of their honey production to these animals. The honey badgers often raid hives shortly after beekeepers themselves have been working in their apiaries, which suggests that scent plays an important role in the badger's ability to locate the hives. Because the honey badger poses such a threat to the hive and honey production, it may be necessary to place hives in the upper branches of tall trees. Raising hives on stands or trestle tables is one another way of protecting them. Hives can also be secured on timber stands.^{xv}

From a more general perspective, the eradication and/or prevention of honeybee diseases needs an efficient system of monitoring: bee swarming/absconding movements, honeybee hive transfers, and proper honey harvesting methods. This is because it is during these behavioral bee tendencies that diseases or pests are likely to manifest. Effective control or eradication of pests and diseases requires an efficient pest and disease surveillance system in place. Unfortunately, there is no operational surveillance system in Somalia tailored to the eradication of these pests and diseases.^{xvi} Such a system could be created with the assistance of existing apex bodies in Somalia, and other regional bodies.

f) Appropriate hive selection

A key determinant of successful honey production is the type of hive that is used. Log hives are widely used across the continent, and these hives are best if one is looking to get large quantities of wax. When it comes to the production of honey, there is no consensus on the best hive, but modern hives like the Langstroth hive are gradually

becoming the hive of choice, as more groups advocate for use of this hive. These groups consider this the better hive because it allows for a higher yield, a better quality of honey, ease of inspection, and ease of harvesting.^{xvii}

Though this type of hive clearly seems to be a better hive in comparison to the Top Bar hives, very few African beekeepers use this hive. Many are still using the Kenya Top Bar Hive (KTBH) which can produce an equivalent amount and quality of honey to the Langstroth, if managed well. People of the Bakool Region in Somalia have already had exposure to the KTBH through a USAID funded beekeeping project that took place in 2007. By employing the KTBH beehives, groups were able to harvest honey eight times per year, as opposed to twice a year with traditional hives, significantly augmenting production. After the first harvest, groups recorded a significant improvement in the quantity and quality of honey produced with the upgraded equipment.^{xviii}

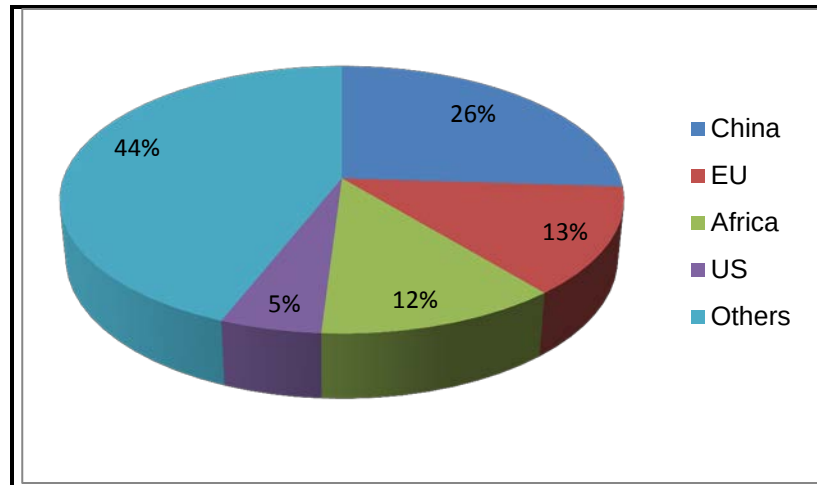
Top Bar hives have similar, but not all the same advantages of the Langstroth. They are quite manageable and do allow for an efficient honey harvest. Most beekeepers continue to use this type of hive for this reason, but mainly because the KTBH is less expensive, and there are no other associated additional costs as there are with the Langstroth. Use of the Langstroth hive requires accompanying extractive equipment which can be costly too.

Tom Carroll, author of several articles on beekeeping in East Africa and former head of beekeeping at Baraka Agricultural College in Kenya, suggests that those who have less experience in beekeeping first use the KTBH. Somalia would be reacquiring its knowledge in the beekeeping industry, and therefore the best hive to begin with for all intents and purposes would be the Top Bar hive, with the hopes of graduating to the Langstroth hive, which is better suited for commercial production. The Langstroth hive is capable of producing between 80-100kg of honey per beehive per year.^{xix}

g) Increasing production efficiency

Generally speaking, production of honey is considered low for the entire continent. Africa's share of world production is estimated to be 12%, which is far below its potential. Though some of the factors mentioned above, explain why production might be low, overall - efficiency is lacking. Even in those countries like Kenya and Ethiopia where beekeeping is practiced and considered successful, honey yields remain low. China averages between 50-150 kg of honey per hive, whereas several African countries average 15-25kg per hive.^{xx} Production can be improved if attention is given to research and development, adequate training programs, and concrete projects for honey commodity chain reinforcement are designed and implemented.^{xxi}

World Production of Natural Honey, Share by Volume 2010



h) Developing institutional and government support

Industry-strengthening institutions are extremely helpful in providing necessary assistance to the beekeeping sector. Countries like Ethiopia, Kenya and Uganda have thrived in the apiculture industry because of the help that has been rendered to them from beekeeper associations. These countries have multiple organizations that are able to steer sector development, generate sector wide strategic interventions, and promote strategic ‘win-win’ partnerships with key public and private stakeholders.

There are two apex bodies in Somaliland that have been serving the region with apiculture extension services. Formed in 2012, Somaliland Beekeepers Cooperative Societies (SOBCOS) is a subdivision of the Rural Development Centre (RUDEC). SOBCOS organizes beekeepers in Somaliland with the ultimate aim of creating sustainable apicultural knowledge amongst them. Through this process, SOBCOS hopes to contribute to the overall economy of the country by ensuring that beekeepers have a source of income.^{xxii} Another body, SOMBEE, targets capacity building and community knowledge in beekeeping. With the help of its local partner Berri-Somal, SOMBEE has succeeded in implementing projects that focus on the processing of bee honey, wax, and other bee products in Somaliland.^{xxiii}

Though this is commendable, these organizations need continued support. In many countries, similar organizations are supported through relevant Ministries in their governments. Ethiopia’s multiple apex bodies have played a critical role in the success that has been realized in its beekeeping industry. These bodies have played a critical role in: ensuring production and productivity, creating platforms for knowledge sharing, facilitating trainings, developing marketing techniques, participating in trade fairs,

advocacy, and networking.^{xxiv} The capacity to fulfill these roles would not have been possible without enabling policies instituted by relevant government ministries.

The Somali government has a crucial role to play in giving the apiculture sector the recognition it needs. Many in the industry are poorly served by service providers because apiculture is not included in mainstream agricultural policies. These policies are in fact integral to the growth of the industry. The policies created should facilitate expansion, improvement, and interest in the industry. Countries that have beekeeping legislation within the realm of their agricultural policies tend to be high producers of apicultural products. Tanzania is the second largest producer of honey in Africa, and is the thirteenth largest producer in the world. It remains the only country with a beekeeping policy in place to regulate the sector.^{xxv}

i) Donor and international development assistance

Having mentioned the importance of supporting institutions at both the national and regional level, and the significance of relevant agricultural policies, it is fitting to speak to lessons learned with regard to the assistance that development partners and donor agencies can give. In certain cases, interventions have failed to have a positive impact in the long-run because they have been poorly matched to meet an existing gap in the sector.

There have been several donor agency led interventions in Somalia, and the continuation of such initiatives is likely. If these projects are a means for Somalia to become a commercial producer of apicultural products, then these programs should be pursued over and above programs that result in apiculture remaining at the subsistence level. As such, the focus of beekeeping projects initiated by development agencies should be on resolving the limiting factors that prevent development of the industry. They also must be a relevant intervention - projects that only focus on the provision of equipment tend not to be successful in the long run, because equipment is very often not the main limiting factor for new beekeepers, who are typically remote and disconnected from the market.^{xxvi}

The best way to assist these beekeepers would be by enabling them to access reliable, fair, and secure markets for their produce. Poor infrastructure and poor market linkages can become huge bottlenecks when it comes to selling products. According to Bradbear, beekeepers in developing countries need regulatory and organizational services and support to create market links and meet trade criteria, and ultimately to maintain their precious stocks of healthy, indigenous honey bees.^{xxvii} Today, Somalia may not be at a stage where it needs to meet trade criteria, but market linkages are going to be crucial if a beekeeper who is selling their product is to benefit economically. Improved market

linkages can help small-holder producers increase their own supply of honey and other bee products.

In Zambia, an SMS market system has been developed to counteract this issue. In 2009, the Zambian Farmers' Union developed an SMS marketing system for agro products. This scheme is now in use in the apiculture sector too. Under this mobile phone text messaging arrangement, individual honey producers/farmers, associations, or cooperatives, are able to find markets for their bee products. In Zambia, as in Somalia, though much of the honey production occurs in remote areas, most people have access to mobile phones. "The SMS marketing system gives beekeepers access to the buyers. They can find out when the buyers are going to be in the area and where their collection points are," reported Fiona Paumgarten, a CIFOR researcher. This has reduced travel costs significantly on the side of the producers/buyers.^{xxviii} The mobile industry in Somalia is well-advanced, and such a system would be very much in line with the infrastructure of the country.

Conclusion

It is evident that both the successes and failures that other countries have had in the apiculture industry, bring much to the table in terms of valuable lessons for Somalia. The constraints faced by many countries highlighted in this paper serve as lessons that Somalia can embrace, to develop and strengthen its own apiculture industry. Beekeeping has great potential to contribute to Somalia's economic growth and foster the creation of jobs.

Summary of Lessons Learned Tailored to Somalia			
Issue	Identified Gap	Result	Take Home Lesson
Beekeeping/ Floral Calendar	There is no national beekeeping calendar that relates to the flowering of honeybee forage plants to honey production that exists in Somalia.	Surrounding flora is not maximized for optimum production of honey and or beeswax.	In order for an optimal level of honey and/or beeswax to be produced a beekeeping calendar specific to the regions of Somalia should be created. The calendar will facilitate and promote planning of appropriate interventions to boost production of honey and other hive products.
Beekeeping Area	There are no dedicated areas that are purposed for beekeeping.	Lack of sufficient provision of necessary pollen and nectar for bees.	Areas chosen for beekeeping must have sufficient vegetation for bees.
		Loss of bee foraging due to widespread charcoal burning in some areas.	The integration of forest conservation and beekeeping can lessen loss of forage resulting from charcoal production.
		Massive deaths of bees in areas where beekeeping and crop spraying takes place.	Crop growers and beekeepers must work together. If chemicals are to be applied, this should take place during the late evening when honeybees are not actively foraging.
Colony Management	The environment, climate, and type of bee technology available to the beekeeper are not factored in to the design a well-managed /organized colony.	Honey yields are not maximized.	For honey yields to be maximized, colony management must be seen as a priority.
Bee-type (Specific to East Africa)	Lack of apiculture knowledge that speaks to the exact type of bee prevalent in Somalia.	Inability to counteract the negative behavioral tendencies of bees specific to the region. These include swarming, aggressiveness, absconding, and opportunistic foraging.	Re-queening of hives is a viable solution for aggressive bees as well as swarming bees.
			To prevent absconding, there should always be an ample amount of food for the bees. This will also assist them in their foraging behavior.
Bee Diseases and Pest	There is no reliable information of the exact nature of pests and diseases that cause harm in Somalia.	There is no specific intervention that addresses pests and diseases unique to Somalia.	In general, the East African region is blanketed as being disease free. Nevertheless, effective control or eradication of these pests and diseases would require an efficient pest and disease surveillance system in place.

			Langstroth hives are preferred because they are less likely to be attacked by pests.
Type of Hive Used	There is a lack of knowledge with regard to the existence and use of the Langstroth hive which would be more appropriate for commercial production.	Stunted progress in the industry. Though the KTBH and log hives work, their efficiency is limited.	Langstroth hives ensure a much higher level of produce quality, are relatively simple to harvest. These hives also produce a greater volume of higher quality honey which could command premium prices. Though KTBH are currently in use, extended usage of the Langstroth hive should be considered.
Low production in honey and other associated products	General lack of efficiency in the production chain of honey.	Potential of honey production is not optimized.	For honey production to be effective, a holistic approach is needed. There are still major gaps in research and development, training that need to be filled.
Industry strengthening institutions – Extension Services	There are a few industry strengthening institutions in play.	Without a cohesive plan of action between government bodies and relevant associations, growth of the industry will remain stunted.	Enabling policies originating from government bodies must be put in place so that trade strengthening institutions are able to serve their beekeepers.
Government Structure	Apiculture not included in mainstream agricultural policy.	Beekeepers will remain poorly served and no real growth and expansion of beekeeping products will materialize.	A more active government role needs to be adopted. Policies that are created must facilitate expansion, improvement, and interest in the industry.
Donor-led agency interventions	Some interventions fail to address the limiting factors for beekeepers.	Beekeeping remains at a subsistence level.	Interventions must target the specific limiting factors that are faced by beekeepers. Interventions must be inclined towards seeing that Somalia produces honey and beeswax commercially.
Market Chain Inefficiencies	Lack of a functioning system that allows beekeepers to distribute their products.	Beekeepers are not able to sell their products.	Zambia is effectively using an SMS system to help in the distribution of its honey. The same can be applied to Somalia.

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