

# Pack #117

# Type: Backgrounder

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**Backgrounder: Honey production in Ethiopia**

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***Why is this subject important to listeners?***

* To learn how beekeeping can generate employment and income.
* To understand bees’ roles not just for honey production but as pollinators.
* So farmers can understand the tasks required for honey production.
* To become familiar with beekeeping by-products such as wax.
* To identify the plants which provide pollen and nectar required for bees to make honey.
* To understand the equipment which is necessary for beekeeping and harvesting honey.
* To understand how to select a good location for an apiary \*.
* To understand the types of hives that can be used to keep bees.
* To know the average income that can be earned from beekeeping.
* So that rural beekeepers can learn how to maintain honey quality after harvesting.
* To understand the best way to market their harvested honey.
* To understand the importance of being a members of a honey co-operative.
* To understand the advantages of producing pure honey and marketing issues, including market access and competitiveness)

***What are some key facts?***

* Bees forage for nectar and pollen in an area within three kilometres of the hive. Keepers should grow plants and trees around the apiary that provide bees with nectar and pollen. Plants such as sunflower, passion fruit, cotton, and blackberry, and trees like cashew, mango, orange, coffee, tangerine, citrus, calliandra, neem, eucalyptus, banana, acacia, *D*iospyros *abyssinica* (called *selechegn* in Amharic, *lokko* in Oromia, and *aira* or *zellimo* in Tigragna*)* croton, African cherry, and bottle brush are good sources of nectar and pollen.
* Bee hives should be mounted in hygienic environments that are not too shady, foggy, humid, and windy as this can be unhealthy for bees and cause diseases.
* Bee apiaries should be located away from regions with intensive agriculture where harmful pesticides are likely to be used.
* Prune bulky bushes and low branches to enable bees to fly freely around the apiary and reduce populations of bee predators and ants.
* Construct the apiary so that hives are mounted 50 to 60 centimetres above ground and spaced wo metres apart. Install rodent guards on posts that anchor the structure to stop predators like rats or ratels from crawling into hives.
* Store honey in airtight containers away from direct sunlight and in areas with low moisture content, less than 65 percent relative humidity. The storage temperature should be less than 11 degrees C to prevent fermentation.
* Honey is used in food preservation, medicines, cosmetics, beverages, and as food.
* During heavy rains and in dry seasons, food for bees can be scarce. At these times, they should be fed on sugar syrup or pollen from bean, chick pea, and soya plants.
* The wood used to make bee hives must be dry so that it doesn’t warp or crack.
* Ethiopia is the largest honey producer in Africa.
* Selling through co-operatives is the best way for Ethiopian rural beekeepers to get better prices for their honey. The co-operatives also facilitate the beekeepers ‘access to credit so they can expand by buying new beekeeping equipment.

*For further information, see documents 1, 3, 4, 5, 7, 8, 9, 11, 15, 16, and offline documents.*

***What are the big challenges of honey production in Ethiopia?***

* Using agrochemicals for crop protection is killing large numbers of bees.
* Honey bees are susceptible to contagious and easily transmittable diseases such as varroosis, tropilaelapsosis, *Nosema amoebiasis* (amoeba disease), and others.
* Bees are attacked by predators such as ants, wax moths, honey badgers (also called wild cat or Ethiopian ratel), and bird-eating bees.
* After honey is harvested, the colony may die off due to lack of food. This is especially true in rainy and dry seasons when there are no flowers to forage on.
* Lack of knowledge by beekeepers on how to properly manage bee colonies.
* Use of traditional hives instead of modern ones, which are easier to manage.
* In Ethiopia, the scarcity of extension officers to give farmers advice on beekeeping.
* Deforestation and depletion of vegetation needed for bees as forage in order to produce honey.
* Inability of potential beekeepers to access credit facilities needed to buy beekeeping equipment like hives and honey harvesting suits.
* Beekeepers’ lack of knowledge on how and where to fairly market their honey.
* In rural *kebeles*, Ethiopian beekeepers sell their crude honey informally to consumers, small traders, and wholesalers in buckets and plastic containers.

*For further information, see documents3, 7, 11, and 15.*

***Gender aspects of honey production in Ethiopia***

* In Ethiopia, the entire beekeeping value chain is dominated by men.
* In recent years, women in Amhara have began keeping bees and producing honey due to the introduction of easily accessible modern hives.
* In Ethiopia’s Amhara region, women had difficulty engaging in beekeeping due to lack of training and access for finance to buy beekeeping equipment. But recently, the honey value chain is offering a way to fight poverty among small-scale farmers, landless people, youth, and women.
* Women don’t typically own land in Ethiopia because of cultural reasons, so beekeeping can provide a way for them to earn a livelihood on the land they live on.
* Though men dominate beekeeping activities, women are mostly responsible for making secondary products like the famous *tej*\* (honey wine).

*For further information, see documents 4, 6, 12, and 13.*

***Predicted impact of climate change on honey production in Ethiopia***

* Encroachment on forests due to increasing human population is resulting in climate change and destruction of plants that bees forage on for honey and pollen.
* Climate change is reducing the population of bee colonies and bee forage plants.
* Because of increasing temperatures and little rain, bees spend relatively more time collecting water to cool hives than they do collecting nectar and pollen. In Ethiopia’s Welmera district, beekeepers sometimes skip one honey harvesting season due to climate change in order to save bee colonies for the next honey season.
* Older beekeepers in Welmera district are more likely to adopt climate change adaptation measures than younger beekeepers.
* Beekeepers in groups are more likely to share information related to the impacts of climate change impact among themselves and plan measures to adapt.
* Climate change is creating conditions that increase the spread of pests outside their typical range, including the *varroa destructor mite* that attacks honey bees.

*For further information, see documents 2, 10, and 15.*

**Key information about honey production in Ethiopia**

In Ethiopia, regions at1000-2400 metres above sea level are most suitable for beekeeping. Bees produce much honey in those regions after the rains, when there is a dry and sunny period that promotes quality nectar flow and ideal foraging weather.

**Pollination**

In sub-Saharan Africa, over 75% of seed- and fruit-producing crops for human consumption rely on pollination to produce decent yields. Studies in Ethiopia show that honey bee pollination increased yields of apples, red onion, niger, and faba bean by 33.5-84%.

* Bees are considered the most efficient pollinators because their hairy bodies easily gather pollen as they forage. In one day, a bee can visit hundreds of flowers searching for pollen and nectar.
* Today, 35% of world food production relies on pollination, and bees account for 70-80% of food produced through pollination. According to FAO, one-third of plant or plant products eaten directly or indirectly by humans depend on bee pollination. In Africa, bee pollination is estimated to be 100 times the value of honey harvests.
* For example, bees increase the yields of coffee, avocado, bananas, cotton, onions, papaya, oranges, beans, mangoes, sunflower, and many other food crops.
* Farmers should use non-harmful biopesticides that specifically target individual pests or small numbers of pests rather than pesticides that kill a wide variety of insects, including bees. Spraying should be done early or late in the day when flowers are closed and no wind can carry pesticide droplets onto flowers and hives.
* Today, bees face threats from parasites like varroa mites, and predators like the Asian hornet, the honey buzzard, the small hive beetle, and honey badgers which invade hives and feed on honey, the bee brood, and pollen. Synthetic agrochemicals and pesticides like neonicotinoids also kill bees. Diseases like nosemosis, amoebiasis, American foulbrood, European foulbrood, chalkbrood, and stonebrood infect bees.
* Habitat loss due to intensive agriculture, land degradation due to over cultivation, and deforestation all cause bee populations to decrease.

*For further information, see documents 1, 7, 8, 11, and 15.*

**Selecting a site for the apiary**

When selecting an apiary site, consider the following factors:

* Establish the apiary within two kilometres with natural plant habitat or cropland where pesticides are not used. Plants such as climbers, trees, shrubs, herbs, and flowers provide sufficient pollen and nectar. Maize, sorghum, peas, sunflower, linseed, rapeseed, fruit trees, and plants like clover, vetch, bottle brush, calliandra, alfalfa, and trifolium can supply bees with sufficient nectar and pollen.
* Bees need water to drink, to raise their young, and for ventilating the hive. Fresh water sources should be within half a kilometre from the apiary. If there is no river or pond near, a fresh bucket of water, trough, or dripping tap can be placed in or near the apiary.
* Position apiaries where you can easily access and regularly visit them to monitor the condition of bee colonies and easily move honey after harvesting.
* The poles that anchor the hives in an apiary should be 50-60 centimetres above the ground, with each hive spaced two metres apart. Guards should be placed on anchoring poles to stop predators like ants and rodents from crawling into hives *(see diagram below).*



* Poles can be painted with oil or grease to preserve them and repel the ants and termites that destroy them.
* Clear plant and tree growth around the apiary so that bees can move freely when foraging, and remove bushes that host pests such as ants and rodents.
* Hives should face the direction of the morning sun.
* In hot regions, hives need shade since sun melts the combs. In colder regions only minimal shade is required to stop hives from being damp. Dampness encourages growth of disease microorganisms that result in a weak and diseased colony.
* Depending on the availability of forage, it’s recommended that an apiary have up to 20 hives. Other apiaries should be positioned at least three kilometres away.
* Fence the apiary to stop bees from being disturbed or honey stolen.

*For further information, see documents 3, 5, and 11.*

**Hives**

For bee keepers to best manage their colonies and harvest more honey, modern hives are recommended. The two commonly used modern hives are:

* *Kenya Top Bar Hive:* The top part of this hive is wider than the bottom. Bars are inserted on the inner side of the top of the hive, where bees build their honeycombs. There are a few holes in the narrower bottom part of the hive where bees enter and leave. The top part is covered to avoid water from entering. Depending on the amount of forage available, this kind of hive can give harvests of20-40 kilograms of crude (raw, unprocessed) honey per year.
* *Langstroth Hive:* This partitioned hive has two main chambers, a lower brooding chamber for the queen and an upper chamber where workers make honey. It’s less disruptive to bees than other hives and makes inspecting and harvesting honey much easier. Up to 40 kilograms of honey can be produced in a Langstroth hive every year.

Waxing the bars and interior of both kinds of hives can attract bees. Melt waste beeswax and paint it on the areas where you intend bees to build combs.

**Colony capture**

To capture a colony, smear a hive or catcher container with beeswax or propolis\* or put a few remnant honeycombs in the capturing hive or container to encourage the bees to enter them because of their scent.

Bees that swarm on tree branches are mainly docile and easier to catch. You can spray or sprinkle the bees gently with sugar water to stop them flying away and they will begin licking each other. While wearing a protective suit, find a swarm bigger than a person’s head and shake the bees off the branch and into a catcher container or hive. When the queen is inside a catcher container or hive, the other bees will follow her. Wait for 20 minutes until all the bees are in the hive or container and settled. If you use a catcher container, cover it with a damp cloth on hot days. The best time to transport a capture colony is evening.

**Beekeeping calendar**

A typical beekeeping calendar in Ethiopia lasts from September to August of the following year. Over that period, beekeeping activities are carried out as follows:

* From February to August, beekeepers plant melliferous plants. \*
* In December-January and July-August, beekeeping equipment is purchased.
* In December and August, apiary sites are selected.
* In September and December, bee colonies are obtained.
* Throughout the year, bee hives need constant supervision.
* The common honey harvesting period is September to December, though in some areas, May to June, following small rain showers starting in March.
* After harvesting, the honey is treated by extraction and sieving, the wax is collected, and the honey and bee products sold.
* Preparations for the next beekeeping season starts in December and August the next year.
* Bee colonies are sourced in September, December and August of the next year.
* After the bee colony is captured, post-capture operations are carried out. This includes partitioning the hive and feeding the captured colony with a syrup made from 1 kilogram of sugar mixed with a litre of water. For a period of 15 days, bees are fed 0.5 litres of the syrup once every 3-4 days.

Honeycombs should be replaced after two years and queens after 1-2 years. But beekeepers should retain docile, disease-resistant, hygienic, and highly productive queens.

*For further information, see documents 3, 7, 9, 11, 16, and offline documents.*

**Harvesting**

Dry seasons are ideal times to harvest honey. In regions with a lot of bee forage, honey should be harvested after flowers wither. Inspecting hives weekly will help beekeepers know when the honey is ready to harvest. For convenience and efficiency, it is recommended that two people harvest the honey. The best time to harvest is 5:30 p.m. to 7:30 p.m. Before harvesting honey, obtain a harvesting bucket, a brush with soft bristles, wear a protective suit, and light up the smoker. \*

***How to harvest honey***

* Smoke the entrance to the hive with 8 to 10 puffs of the smoker and then open the lid. Smoke inside the hive and then leave for 1-2 minutes to allow the smoke affect the bees.
* Select combs with honey and leave combs with pollen and brood for the bees.
* Gently brush off any bees remaining on the honeycombs.
* As you cut the ready honeycombs, leave a comb layer on framesthat workers can build on for new combs.
* When placing a honeycomb in the harvesting bucket, replace the lid of the hive to stop bees from getting inside.
* Return the empty combs to the hive and leave enough honey for bees to feed the larvae, then close the hive.
* Do a final smoke before leaving the apiary to prevent bees from getting inside the harvesting bucket and stop them from following you. You can do the smoke as you walk away to prevent any bees from following.
* Move through a thicket or bush to get rid of any bees that follow you.

***Extracting honey***

The most basic technique of honey extraction is sieving and straining sliced up honey combs through a nylon sieve mesh fibre or an ordinary sieve.

* Use a knife to scrape off the wax coating on the honeycombs.
* After sieving and straining the honey, leave it in the sun for 2 to 3 hours to gently heat it so it can flow freely.
* After 2 days when the honey has settled on the bottom of the bucket, pour it on honey jars and start selling it.

***Extracting wax***

For every 100 kilograms of honeycomb you can get 8 to 10 kilograms of wax. Here’s how to extract wax from honeycombs:

* Mix the honeycombs with water in an aluminum pot and heat.
* Heat until the wax melts at about 60 degrees centigrade. Don’t let the water boil as that destroys the wax, and overheated wax can burst into flame.
* Pour the melted combs and water into thin cotton fabric to sieve it.
* Sieve the wax again into a second container by firmly squeezing the cotton material with the melted combs to extract the wax.
* As the yellow wax is extracted, some waste remains in the filter bag.
* After the filtering, the wax separates and floats on water.
* Scoop out the floating wax and leave it to cool for 12 hours in a container.
* Store the wax block in a cool, dry place away from harmful chemicals as they can be absorbed by the wax.
* Alternatively, a beekeeper can buy a solar wax extractor. Place the honeycombs inside and leave it in the sun. The sun melts the wax off the combs.



*Solar wax extractor*

**Propolis**

This is a black and sticky natural resin that bees collect from plants. Bees use it to cover the inside the hive and fill cracks. Propolis has antibiotic properties, may prevent flu and colds, soothes sore throats like lozenges, and can be chewed though it’s bitter. Propolis can be packed in a capsule and used as an ointment, and propolis oil can be used for cuts and abrasions because of its anti-inflammatory and anti-microbial properties. After scraping it off the hive, store it in an airtight container. There is a ready export market for propolis.

*For further information, see documents 3, 11, and offline documents.*

**Marketing**

The best way for rural Ethiopian beekeepers to market honey and other bee products is through co-operatives. The following are the advantages of selling honey and other bee products through co-operatives:

* Co-operatives enable beekeepers to aggregate their honey and sell as a group. This gives them greater negotiating power and better prices.
* By selling through co-operatives, beekeepers can fulfill larger orders than by selling as individuals.
* Co-operatives offer ready markets for honey and other bee products and attract large-scale buyers and processors.
* Co-operative membership enables beekeepers to access improved beekeeping equipment like better hives, harvesting equipment, and packaging containers.
* Co-operatives can negotiate sales contracts with international buyers.
* Beekeepers can easily access credit from financial institutions affiliated to cooperatives to expand their beekeeping activities and improve their livelihoods.
* Co-operatives can buy honey processing and packaging equipment that members can use in groups.
* Co-operatives can collaborate with development partners to collectively train beekeepers on quality control so that they can access honey export markets.

**Income**

* Honey and other bee products can be sold locally or beekeepers can sell as a group or co-operative to larger markets. Selling collectively fetches beekeeping group or co-operative better prices, as they have more bargaining power.
* Beekeeping can provide unemployed youth and displaced people with income-earning opportunities.
* The price of a kilogram of honey depends on the location of production, season, quality, the colour of the honey, and consumer preferences. A fair farm gate price for a kilogram of honey is 200 to 250 birr, depending on the factors mentioned above. In remote regions, the price could be 150 to 180 birr for crude honey.
* Tej makers who buy crude unprocessed honey later sell a kilogram of honey at 250-350 birr, depending on market demand.
* A rural beekeeper with five modern hives who applies good beekeeping practices can earn a profit of about 30,000 Ethiopian birr ($715 US) yearly by selling the bee products from his apiary.

**Youth**

* Ethiopian youth are increasingly turning to beekeeping due to land shortages. Unlike traditional farming, beekeeping can be done on small plots or in backyards.
* Youth who plan to start beekeeping can approach the livestock and fish agency at the federal and regional levels and the Ethiopian Agricultural Transformation Agency (ATA), which has offices at the district and kebele (ward) levels.
* The government also operates programs that foster job creation among youth and women. These include:
  + A rural job creation program
  + A small and micro-enterprises (SME) program
  + The trade and marketing sector

Local and international NGOs such as Stichting Nederlandse Vrijwilligers (SNV), CARE International, GIZ, and USAID’s Feed the Future support beekeeping groups and members along the Ethiopian honey value chain. They support youth and women in the following ways:

* Providing beekeeping-related trainings.
* Providing modern hives.
* Offering honey extraction and packaging equipment to beekeeping groups.
* Facilitating market linkages and access to credit from financial institutions.

*For further information, see offline documents.*

**Definitions**

*Apiary:* Place where collections of bee hives are kept so that bees can get into them and brood, make honey, and pollinate.

*Melliferous plants:* Plants containing substances that insects collect and turn into honey.

*Propolis:* Medicinal black, sticky resin produced by bees. Made of bee saliva, beeswax, and substances from plants and trees that bees collect when foraging. Bees use it to cover the inside of the hive and fill cracks.

*Smoker:* Device that emits and blows smoke to calm bees when honey is being harvested. The smoke comes from burning organic matter inside the smoker’s combustion chamber.

*Tej*: A traditional honey wine brewed in Ethiopia.

**Where can I find other resources on this topic?**

*Documents*

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14. Sebho, H. K., and Baraki, Y., 2018. *Challenges and Prospects of Honey Bee Production in Ethiopia: A Review.* <https://core.ac.uk/download/pdf/234662628.pdf> (145 KB).
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Interview:

Hermela Lakew, GIZ GmbH-Advisor Value Chain Development, May 12, 2021

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