

Moving forward in the
Implementation of Non-Legally
Binding Instrument (NLBI) on All
Types of Forests in Liberia,
Nicaragua and the Philippines:
A contribution to Reducing
Deforestation and forest
degradation

FOREST INSTRUMENT LIBERIA

FARMER LEVEL TECH – NOTE FOR

BEGINNER BEEKEEPING



With support of



**Forest & Farm
FACILITY**
and partners for natural resource justice



**Federal Ministry
of Food, Agriculture and
Consumer Protection**



The views expressed in this information product are those of the author(s) and do not necessarily reflect the views of BMELV, FAO, FDA, FFF.

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Preface

In May 2007, the National Forum on Forests (UNFF) adopted the Non-Legally Binding Instrument on All Types of Forest (NLB), which is commonly called the "Forest Instrument". This significant international consensus was reached to boost the implementation of sustainable forest management (SFM), and thus to maintain and enhance the economic and environmental values of all types of forests, for the benefit of present and future generation. Most specifically, the Forest Instrument is to: (i) Strengthen political commitment and actions at all levels to effectively implement SFM, (ii) Enhance the contribution of forests to the achievement of the international agreed development goals including the MDG, and (iii) Provide a framework for national action and international cooperation.

The overall objective of the project is "to support Liberia, Nicaragua and the Philippines, on a demonstration basis, to move forward in the implementation of the Non-Legally Binding Instrument on all types of forest".

Towards this end, an agro forestry component under the Project is providing intensive training to rural communities in three Counties, including Nimba, Grand Gedeh, and River Gee respectively in the areas of beekeeping and snail farming and total of 60 farmers were trained.

Beekeeping is a traditional activity in Liberia and the rich vegetation of the country offers great potentials for beekeeping. It is an activity that can be carried out both by man and women as an additional income generating activity. It is not a labour-intensive activity and honey harvesting is generally undertaken during the lean season when demand for agricultural labour is not high. Land does not need to be owned to be able to practice beekeeping because hives can be hung in trees in the forest. The products of the beehive, among which honey is the most known can be consumed by the family, sold on the market, processed for value adding or stored for when the household needs cash. Beehive products can also be used as medicines. Training people in sustainable beekeeping practices does not only contribute to the food security of the households, it can also raise awareness among the beekeepers about the importance of sustainable forest management. This training manual aims at providing the basic skills necessary to practice small scale sustainable beekeeping with topbar hives and highlight the essential role that bees play in nature and food production.

Through this publication, FAO and the Forest Development authority of Liberia (FDA) want to contribute to the income generation and food security of the Liberian farmers.

Jean-Alexandre Scaglia

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Hunting for Honey in the forest

Honey hunting or Bees Killing is a process where honey hunters/bees killers go in the forest, set fire on the tree hollow/bees nest, kill the bees and press the honey combs, to extract honey. This primitive method of harvesting honey has lot of negative impacts on human and the environment, therefore it should be discouraged.



The honey hunter/farmer

Because the honey hunters do not have training on beekeeping, they go in the forest, to harvest honey without properly dressing or wearing protective cloths. And in the processing of killing the bees by fire to take the honey combs, the bees become defensive, by stinging and chasing the hunters/farmers. When this happens, the hunters get sick.



Drawing: Result the bees attack



The Forest

When the honey hunters go in the forest to harvest, they use fire to kill the bees, before taking the honey combs. Sometimes, especially on a windy day the fire goes out of control, leading to bush fire outbreak. And in some cases, thousands of forested hectares are destroyed.

Also, bees killing should be completely avoided, because the bees play a vital role in plants cross pollination, thereby producing vegetation to protect the environment and its biodiversity and food for human.



The Beginner (Beekeeper)

Giving the above mentioned disadvantages of harvesting honey in the forest, it is advisable to keep the bees and produce honey yourself. As a starting beekeeper seek the advice of an experienced beekeeper or participate in training on improved beekeeping, so as to acquire the technical skills required for sustainable beekeeping.



The good goodthings we get from beekeeping

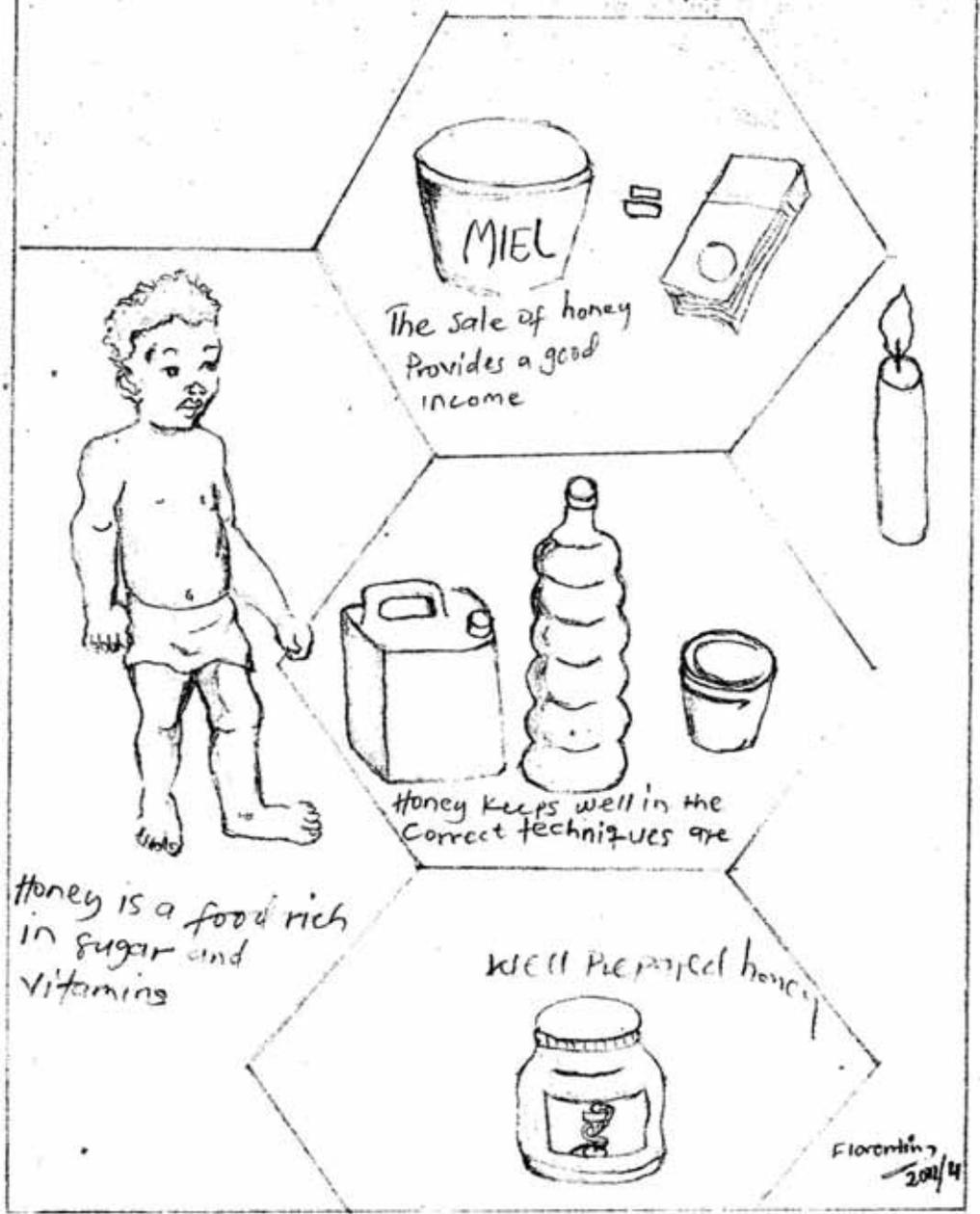
Beekeeping means to take good care of the bees so you can get their honey, wax and other things.

Now, if you are doing beekeeping on your farm, lot of good things can happen. Besides just getting honey from the bees, you get other good things like:

1. Pollination: the bees take flower dust (pollen)from other flower to other flower and when this thing happen the plant can make fruit and seeds for us to eat; and plenty trees can grow around us.
2. Useful Products: when you take good care of the bees you can get plenty good good things from them, like the honey. We sell honey to get money. Use some of the honey for food and for medicine to take care of our body. Also, we can get beewax from the bees. The wax is use to make lot of things we use every day like; Bath soap, Shoes polish and Candles.
3. Land Use: beekeeping is not like rice farm or oil palm farm that can use plenty farm land. You can do beekeeping on small farm land. This means that you can set plenty boxes (beehives) on small farmland and the bees will go to the nearby farmland to collect their food (nectar and pollen).
4. Low Cost: you don't have to get plenty money before you start beekeeping, because most of the things you need to start beekeeping are in your town or villages. For example, wood, flowering trees, water are in your town, and you don't have to feed the bees. The bees go around from flower to flower, water to water, collecting their own food. Meaning that you as beekeeper don't need to buy food for the bees.
5. Income Generative: if you take good care of the bees and the bee box, the bee can make plenty honey and wax. You sell the honey, wax and other things to get money. The money you get from selling can be used to feed your family and pay children school fees.
6. Gender and Age Inclusion: everybody, men, women, children can do beekeeping to get money and food.



THE IMPORTANCE OF ISCC KEEPING



Honey is a food rich in sugar and vitamins

Well prepared honey

Florentin, 2011/4



The things bees need to live better life

Bees are part of the small six legs called insects. Bees like to live in bush with plenty flowering trees. To take care of bees for their honey, you must know what they need to live better and produce more honey. Here are some of the things bees need:

1. **Nets or Living Place:** the place the bees live must be clean, dry and protected. Sometimes, bees live in a trees or rock holes or in containers, old tires, boxes, beehives.
2. Food/Flower Sweet Water and Small Dust (nectar and pollen)
3. Water
4. Fresh Air

The things that can give bees hard time are:

1. Ants
2. Lizards
3. Birds
4. Disease or sickness



The life of bees



There are many types of bees, but the one that produce honey is called honey bees; and the big name for the honey bees in Africa or Liberia is ApisMellifera.

Bees are friendly insects. Plenty bees live in one nest to help each other. About 10,000 to 60,000 bees can live together. When plenty bees live together, you called them colony. One bee can't live be itself, for the colony to be strong, many bees need to be together.

When the bees born plenty babies, then the old bees and the young bees become plenty in the beehive or box; and the box become small for all the bees to live in it. When the box becomes small, all the old bees along with one mother (Queen) will leave to find new place to live. When the old bees leave you called it swarming. Before honeybees grow to make honey, it has to go through four steps:

Step 1 --- The eggs

Step 2 --- The larva

Step 3 --- The pupa

Step 4 --- The adult

The young bees are called brood. There are three types of bees in the bee colony. They are: The Queen, the Drones and the Workers.

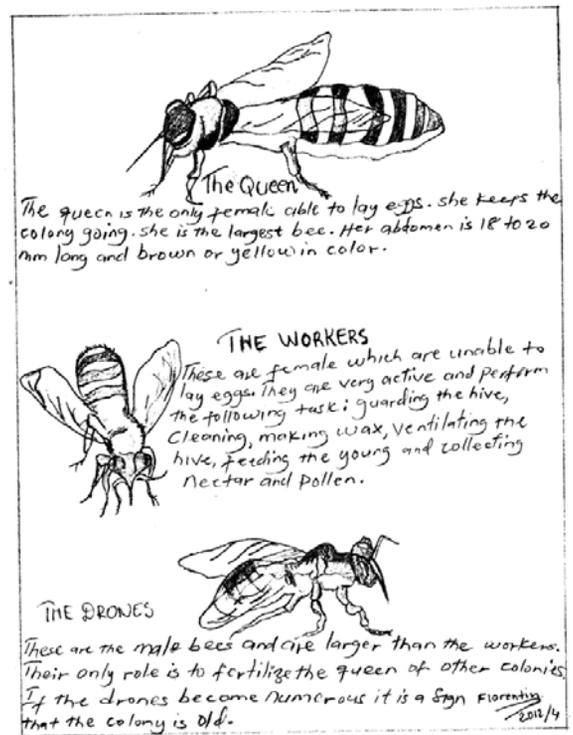
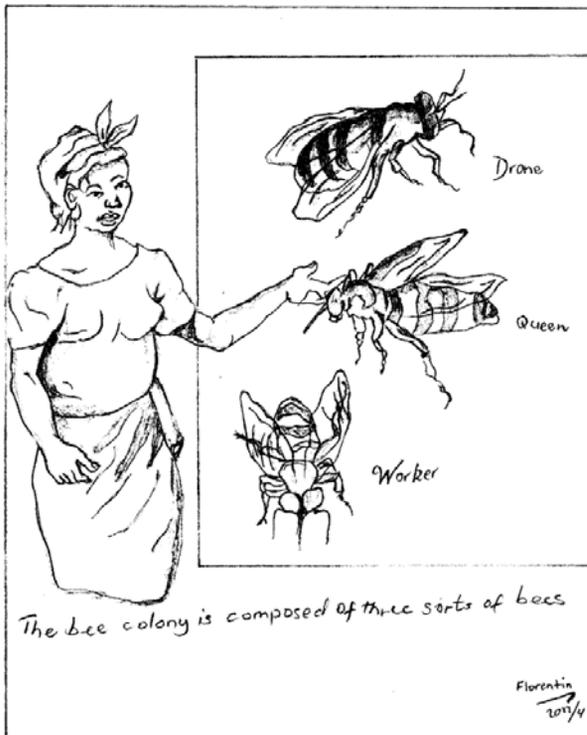
These three types of bees have different work to do in the colony:

1. The Queen or the Mother of the Bees: A colony with 10,000 or 60,000 bees has one Queen. The work of the Queen to lay eggs. When the Queen ready to mate or do man and woman business, it flies from the box (beehive). It will go up in the air and the men (drones) bees will follow it to mate (do man and woman business). After matting, the Queen will go back in the box and start to lay eggs. The fertilized eggs develop into female bees (worker bees). While the unfertilized eggs develop into males (drones). In fact, the present of lot male broods can be an indication that the colony is preparing to swarm. All larva (Queen, Workers and Drones) are fed with royal jelly for the first three days, at the larval stage. After the three days, the workers and drones receive beebread for the remaining days (about four days) of their larval stage. In short, the queen larva receives only royal jelly throughout the larval stage, while the worker and the drone larva receive both royal jelly and beebread. Therefore the bee referred to the royal jelly as a noble food. And the queen egg cell is larger than the normal worker cell. This makes the differences between the queen and the worker bee, because they all from fertilized egg. The Queen is the biggest bee in the colony. The Queen lives for five years. When the Queen become old, the worker bees will build one or more Queen cell, the Queen will lay an egg in the cell and the worker bees will feed the queen larva with only royal jelly, throughout the larval stage until new Queen develop. Once the new Queen develop, the old Queen will be chased out of the beehive or killed.
2. The Drone or the Men Bees: The drones are not many in the colony. From a colony of 10,000 to 60,000 bees colony, the drones are about 500 and the drones are the men in the colony. Their work in the colony is to mate the Queen or to do man and woman with the queen. So, the Queen can lay eggs. The drones depend on the workers bees for food. When food business gets hard the worker bees kill the drone, so that the other drones can't eat the small food.
3. The Workers Bees: In the colony there is only one queen and a few hundred of drone (depending on the season). The rest are all worker bees,.. The workers bees are females. The female bees are key in the colony; the Queen and drones cannot feed themselves, so they depend on female bees for food, so they would die without female bees. the work of the female bees include:

A. Find food for the colony:



1. Find food for the colony
2. Cover and warm the baby bees
3. Make honey and wax and royal jelly
4. Keep the box warm
5. Clean and protect the box
6. Collect the small small dust and sweet water from flowers
7. Look for good house or nest for the colony to live.
8. Create Queen by feeding the queen larva with only royal jelly, throughout the larval stage.
9. The worker bees don't live for long time, they live for about 7 - 8 weeks, depending on the season. During the dearth season, worker bees live longer, because they don't have to work so much (fly they work a lot (collecting nectar) and live for short time. because they don't have to work so much (fly to collect nectar and pollen) during the nectar flow season, they work a lot (collecting nectar) and live for short time.



How to make the box/beehive for the bees to live

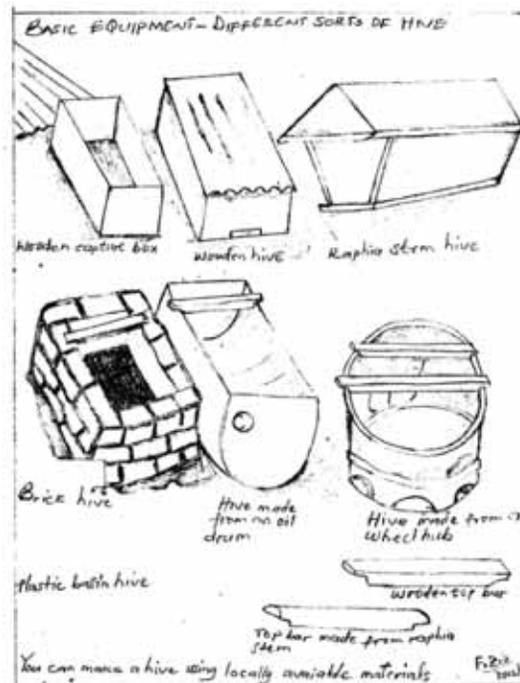
Honey bees live in the nest or holes in the bush. The hunters go in the bush, burn and kill the bees and then take the honey. This kind of bad thing took place for a very long time; but for now the people who can take the bees honey are trying to do something to help the bees. The people (beekeepers) are making boxes (beehives) for the bees to live in the box and make plenty honey. The beekeepers can use smoke to take honey from the box without killing the bees. The smoke will calm down the bees and will make it easier to harvest the honey combs from the beehive.

The beekeepers can make a type of beehive he or she like but for the bees they want to live somewhere that is safe, dry and big for the whole colony to live and keep their food. The best beehive is the one that is built with good materials that you find in your community. The simpler and cheaper a beehive is made, the more plenty people will start to do beekeeping.

In Liberia, more beekeepers use the Kenyan top bar beehive to keep bees; because it is easy to take care of it. Kenyan top bar beehive (KTB) is a box made with planks and top bars. The top bars are also long pieces of plank. About Twenty seven (27) pieces of top bar are place over the box. The bees make their honey comb on the top bar in the box. The beehive/box is set over a stand in the bush.

The things that are used to make one Kenyan Top Bar beehive are:

- | | | |
|----------------|-----------|----------------|
| 1. Planks | 1"X12"X14 | 1pc |
| 2. Top Bar | | 27pc |
| 3. Cover/Zinc | | ½ sheet |
| 4. Nails | 3" | 1pk |
| 5. Live sticks | | 8pcs or planks |

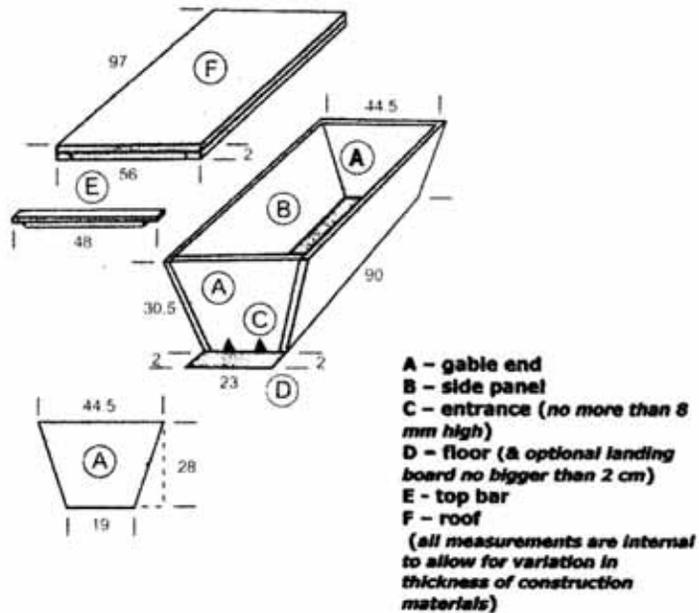


Basic Equipment - Different sorts of Hive



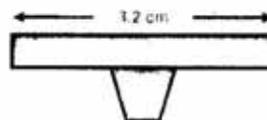
Kenyan Top bar Beehive Measurement

The plan shows the size to make the hive. Standard sizes allow a beekeeper to move comb from one hive to another. This allows bees to be more easily managed and makes honey harvesting easier.

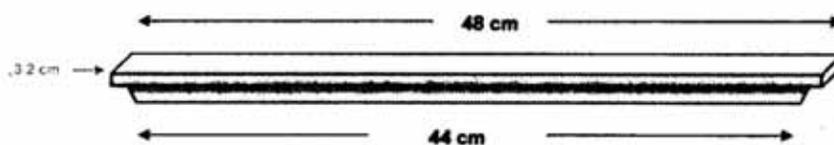


Top Bars are usually wedge-shaped. It is essential that the top bars are exactly 3.2 cm wide:

END VIEW OF TOP BAR



SIDE VIEW OF TOP BAR



The simple carpenter use to construct beehives

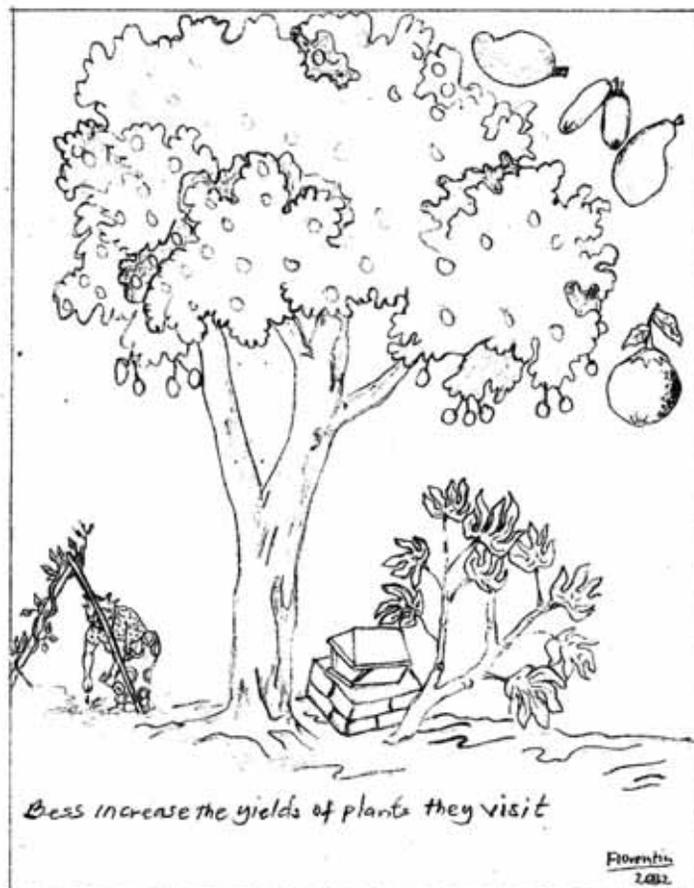
6. 1 Hammer
7. 2 Saw Plain
8. 3 Chaser
9. 4 Tape rule

Plants for bees

The flower trees and the bees can help each other. First, the flower tree helps the bees by giving the bees sweet flower water (nectar) and small flowers dust (pollen). The bees use the sweet flower water and dust to make food in their box (beehive).

Secondly, the bees help the flowering trees by taking the flower dust (pollen) from one flower to another flower. Once the bees carry the flower dust to the other flower, the flower that receives the dust will make big fruit and make seeds. We eat some of the fruits as food. Some of the flowering trees are:

Orange, palm, cocoa, coffee, powpow, cassava, rice, pepper, bitter ball.



The good place to set the box (beehive):

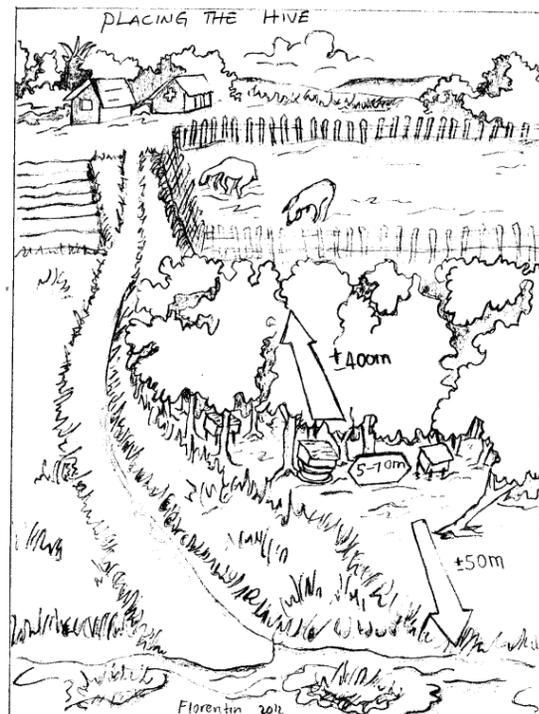
Bees live in the bushes and flowering trees, but you need to look for the good place to set your box, so that when the bees are get in the box, they can't give people hard time or so the people can't give the bees hard time. Because when people give the bees hard time, then the bees will not make plenty honey. Or the bees will do bad things to the people. So don't set the box in the town or near the town.

When you are looking for good place to set your box, some of the things you must think about are:

1. Don't set the box near the road or near the street. The box must be about 25 ft away from the road or street.
2. Don't set the box near water or river. The box must be about 25ft away from the water or river.
3. Don't set the box near ants hills, and don't set the box under trees with plenty ants.
4. Set the box under trees with plenty flowers.
5. It is good to set the box near palm farm, cocoa farm, orange farm, plum farm.



Drawing: Bees increase the yields of plants they visit



Drawing: Placing the hives

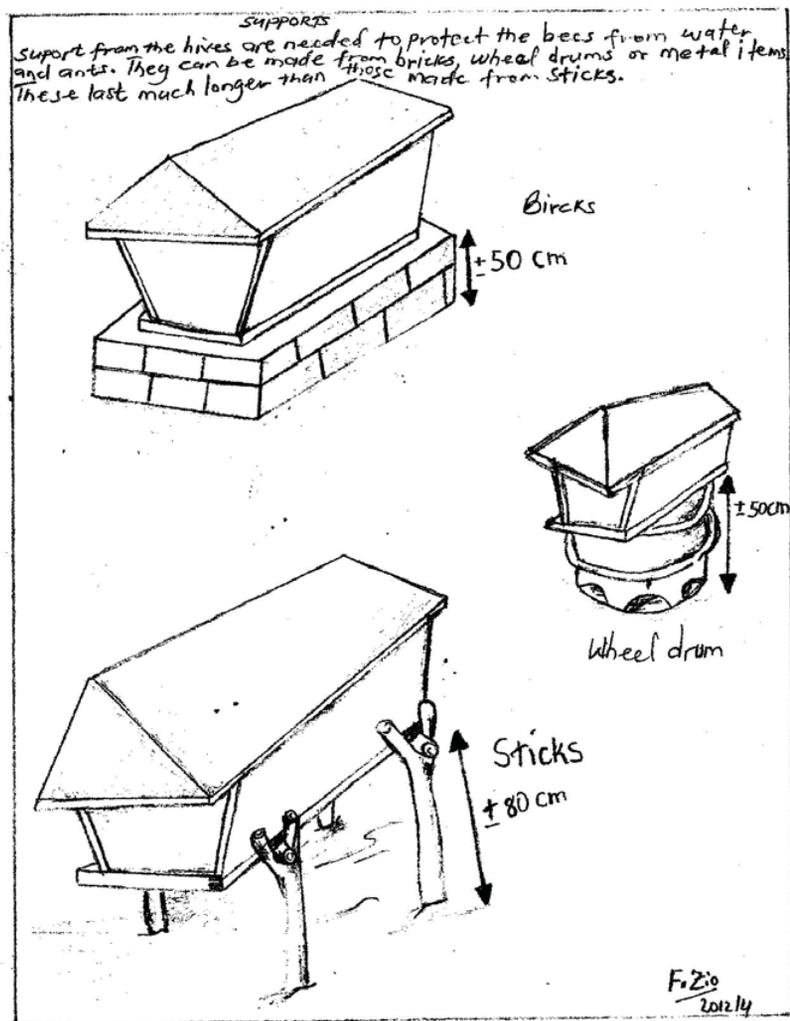


How to make the stands for the box (beehive)

The box stand needs to be very strong, because when the stand is not strong and the bees and honey become heavy for the stand, the box will fall and all the honey will waste and spoil, and beekeepers will not get money. Plenty beekeepers lost honey and money because their boxes fall. So if you are making a stand for bee box you need to use strong materials like trees that are quick to grow (life trees). You can hang the box on the life tree by using strong rope.

Also, you can use the life tree to make a strong "Ski-foll", about 3ft high from the ground level, and set the box on the Ski-foll.

If you have money, you can use cement blocks or you can use generator old frame. You can use anything to make stands for the box, just make sure that the stand is very very strong to support about 40,000 – 60,000 bees and their honey combs.

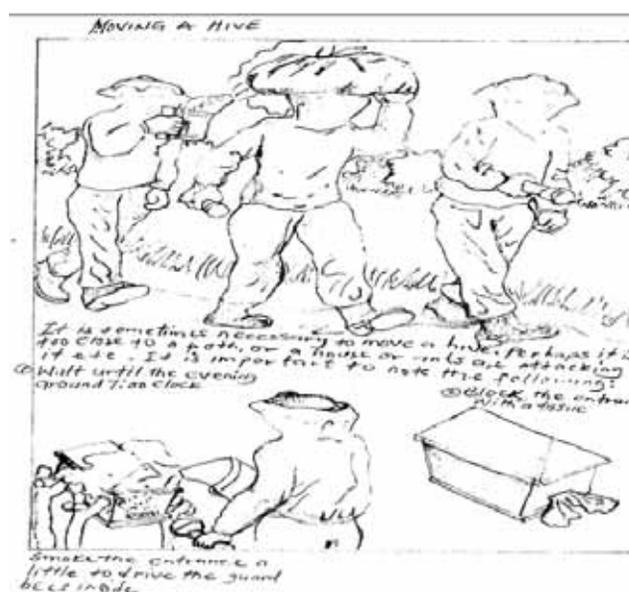


How to make bees come in the box (beehive)

In beekeeping one of the hard things to do is to make bees come in the box and to live in it. If you just set the box in the house, the bees will not come to live in it. If you just set the box without robbing it with wax for the bees to smell, the bees will not come around.

There are so many things you can do for bees to come and live in your box. Some of the things are:

1. You robe bee wax on the top bar and in the beehive before you set it. If you rub the bees wax on the box and set it and after 2 – 3 weeks the bees don't go in the box, than you have to clean the box and rub the bee wax again. After long time, like one month if the bees don't go in the box than you have to look for new place to set the box. All of the baiting and rebaiting activities should be carried out during the bees swarming seasons, because if these activities are carryout during the dearth period no matter how many times you bait the beehive, the bees will not come, because they are not swarming. Materials use for baiting are:
 - Wax • Honey • Sugar water • Dipper • Cow dune
2. Another way of putting bees in the box is by catching them. To speedup the process of beehives colonization, during the swarming seasons, fix and bait a small box. Than you set the small box in a flowering tree. When bees go to visit the flower, they will smell the wax and move in the box. When the bees move in the small box, take the small box to the big box (beehive), and take the bees from the small box and put them in the big box.
3. If you don't have plenty bees on your farm land, you can take the small and baited box to an area with plenty bees, during the swarming seasons. When bees get in the box, you should wait until the bees start to build combs in the new box, to make sure that they have chosen the box, as their new home. Also, if you move a new box, you should move it long distance, about 3 meters, if not so, the bees will go back to the old box, and if they don't find the old box than you will lose the bees.
4. Is good to move the new box at night, at which time all the worker bees are in the box, and to avoid nose and stress.



5. The other way you can get bees in your box is to divide the colony after harvesting. That is from the old box, take one honey comb with young bees (brood) and one honey comb with some bees and put them in a new box, then you take the old box to different place. Enough honey reserve should be left in both hives for the bees to feed on. Also, the beekeeper leave in both hives combs with fresh eggs (less than 3 days old) so that the colony can create a new queen. The queen will be either in the old hive or on the frame that is moved into the new hive. If there are no eggs of less than 3 days, the bees won't be able to create new queen cell and the colony will not survive.

TRANSFER FROM A CATCHER BOX TO THE HIVE

Once the colony in the catcher box is well established and 4 top bars have comb built on them, it is time to transfer the colony to a hive. The catcher box has 6-8 top bars, each with a little wax to help the bees start building their comb. The transferred bars should be placed next to the hive entrance.



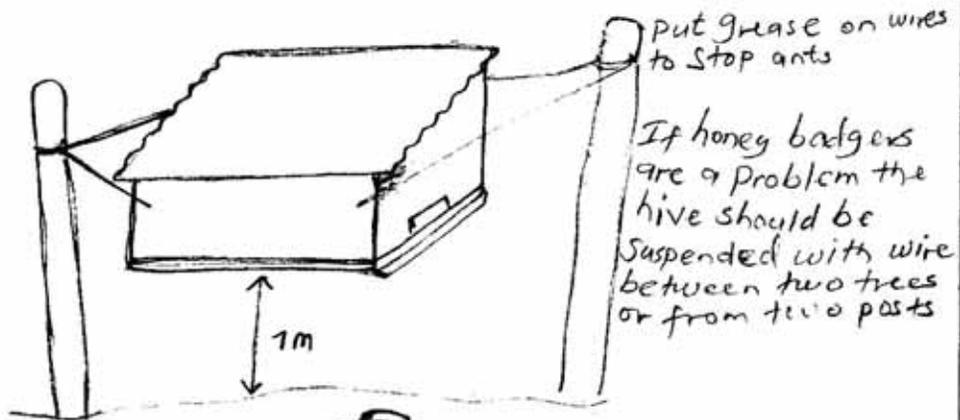
Taking care of the box (beehive)

The only way you get plenty honey from your box is to take good care of it. The ways you can take good care of your box are:

6. You visit the box at least two times a week, to see the condition of the box, how the bees are moving. Sometimes you wear the bee suit and look in the box to see what is happening in the box. If there is lizard or moth; or anything that is not supposed to be in the box, you move it. If you don't visit the box you will not know if something is happening to the bees in the box. When visiting the box wear white, red and yellow clothes. If you wear these colors, the bees will take you to be flowers. If it is your first visit, don't go too close to the box, stay away about 2 meters. And take the beekeeper instructions.
7. Clean around the box about 5ft big cycle. Make sure no rope hangs over or touches the box. The tree branches should be far from the box. The road leading to the box must be brush all the time. When the road is not clean, it will be hard for you to visit the box. If around the box and the road are not clean it will be hard to harvest the honey.
8. The box stand must be strong and clean. Try to put dirty engine oil in old cups around the legs of the stand to stop lizards and ants from getting in the box.
9. After 1 or 2 years of harvest, try to fix the top bar and part of the box that is damaged.



MEASURES TO DEAL WITH PESTS



HOW TO TELL THAT A HIVE
IS NOT WORKING WELL

WEAK COLONY

- Little or no honey
- Very aggressive
- few bees

OLD Queen

- Many drones
- few bees



How to take honey from the box (harvest)

Taking honey from the box is one of the hard thing to do in beekeeping. The bees make the honey and keep it in the box as their food to eat, when rain is falling. So if you try to take their food (honey), they fight you by stinging you. So before you go to harvest you must dress good. The clothes you wear to harvest are called bee suit. The cloths that make the bee suit are:

1. Mosquito net, trousers and shirt
2. Rain boots
3. Hand gloves
4. Straw hat and veil

The other things you use to harvest are:

1. Knife
2. Bucket
3. Flash light
4. Smoker

Bees close honey cells when the honey is ripe, this means that the humidity degree has dropped enough and the honey when stored properly, will not ferment. So if a beekeeper harvest honey combs with too many unclosed cells, it is not good because if too much unripe honey mixed with the ripe honey, it will make the whole batch to ferment, thereby loosing market value.

It is good to harvest in the evening or in the night when all the bees go to bed. The bees can't fly in the night. So when you harvest in the night, bees will not run behind people in the town. Most of the time two people can take the honey from the box. One person holds the thing that make the smoke, and the other person use knife to slash the honey combs in the bucket. Using smoke and wearing the bee suit will make easier for you to harvest without killing the bees.

Before you harvest, you must check the box to see if it is ready for harvest. To check the box, you move the box cover and knock the top bar one by one. If the top bar gives heavy sound KUOO – KUOO, means that the box is ready for harvest; but when the top bars give light sound KAI – KAI means that the box is not ready for harvest.



SMOKER



For smoker fuel use wood shavings, dry leaves, used maize cobs, cowdung or Sacking (not plastic)

Smoke enables the beekeeper to keep the bees calm.



2011/12

A GOOD HARVEST OF PURE HONEY

Beekeeping is not complicated providing flowering has been satisfactory and regular inspections carried out

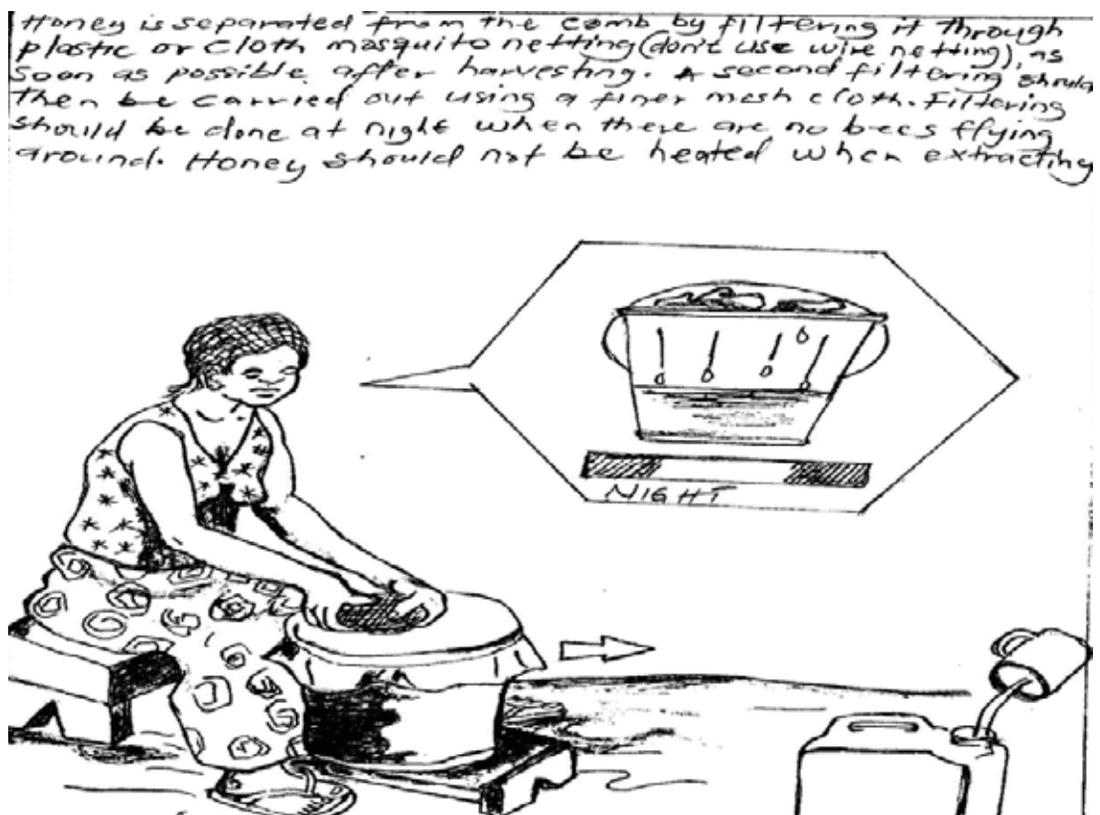


How to keep honey clean and safe

Honey is food and medicine, so there is a need to always keep it clean. Honey is one of the safe foods in the world. If no one touches honey, it can go for 10-20 years and it will still be good to eat. But if you touch the honey with dirty hands, put it in dirty bucket or bottles the honey will spoil quickly. So everything you use on honey must be clean. If you want to touch honey, you must wear clean hand gloves. If you don't have hand gloves you can wash your hands clean before you touch honey. The bucket or bottle you use for the honey must be clean. Wash the bucket or bottle 2-3 times before you put the honey in it.

Don't use strong soap to wash the buckets or bottles. Keep honey to a place that is not too hot or too cool. Don't allow children to play with the honey. Don't put your fingers in the honey. Always use clean spoon to test or eat honey.

Before you put honey in the bucket or bottle make sure it is clean and make sure no dirt is in it. Don't keep honey to area with plenty ants. Always keep honey in a container that can close properly. Honey absorbs humidity from the atmosphere, if the container is not closed, the honey will absorb the humidity from outside and start to ferment fast.



How to buy beehives

There are many ways beekeepers get or buy boxes/beehives to:

A. Farmers/Beekeepers With Beehives And Bees In The Beehives:

There are three ways farmers/beekeepers can get involve in beehives micro loan;

1. Pay two gallons of pure honey and get one box/beehive
2. Pay one gallon of honey in the first year and one gallon of honey in the next year.
3. Pay \$30.00USD and get one box/beehive.

B. Farmers/Beekeeper Who Know About Beekeeping But Don't Have Beehives:

There are two ways;

1. Pay \$15.00USD for one beehive and one gallon on the first harvest
2. The beekeeper will only be allowed to buy one beehive in the first year.

C. Beekeeper who just receive training:

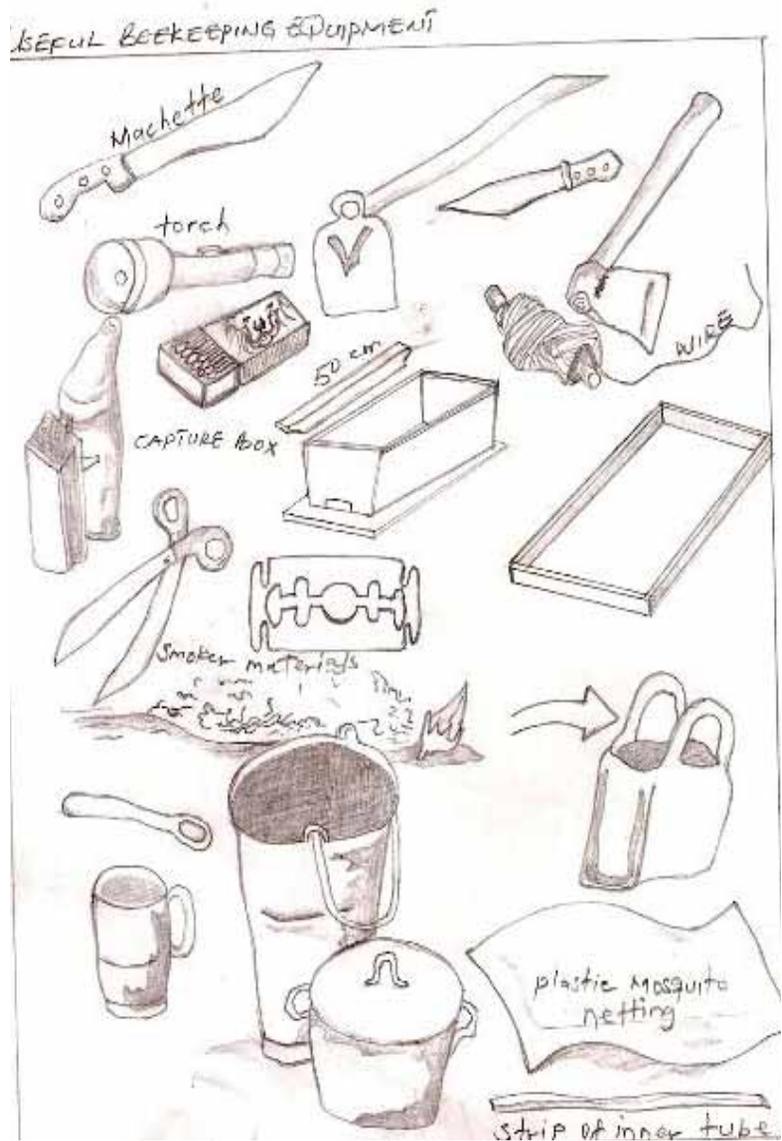
A beekeeper who just received training must be a member of a beekeeping group before he/she can buy beehive.



Simple tools use for beekeeping

The simple tools we use in Liberia for beekeeping are:

1. Beehive
2. Topbar
3. Beehive stand
4. Smoker
5. Beesuit
6. Bucket
7. Knife
8. Rain boot
9. Hand glove
10. Flash light
11. Containers
12. Bottles
13. Hammer
14. Saw
15. Chisel



Drawing: Useful beekeeping equipment





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