

Yatta Beekeepers

A BEGINNER'S GUIDE TO BEEKEEPING



Gatta Beekeepers

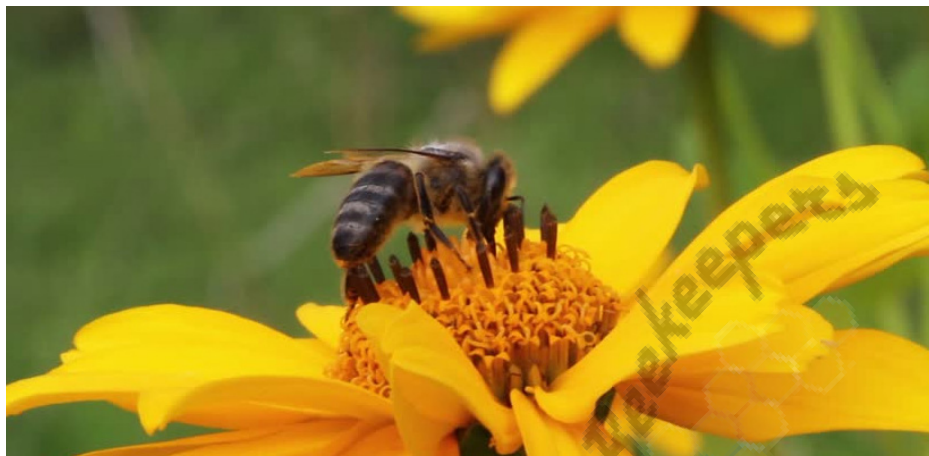




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FUN FACT



Fun Fact 1

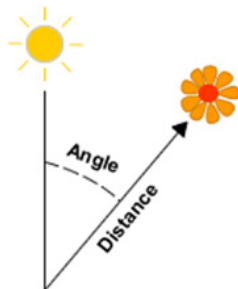
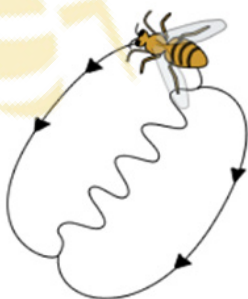
Why bees are important?

Did you know one third of the world's food supply depends on pollinating insects like honey bees. According to Albert Einstein, if bees disappeared off the face of the earth, man would only have four years left to live.

Fun fact 2

Advanced mode of communication

Did you know that bees have the most advanced mode of communication among all social insects? They communicate through dances, vibrations and body chemical signals known as honey bee pheromones. The scout bees have the task of finding new pollen, nectar and water sources. Once they have sourced these they return to the hive and perform either a round or waggle dance across the honeycomb.



Fun Fact 3

Honey production

To make a pound of honey bees have to travel to about 2 million flowers. An average worker bee makes only about 1/12 teaspoon of honey in its entire lifetime.



Fun Fact 4

The democracy

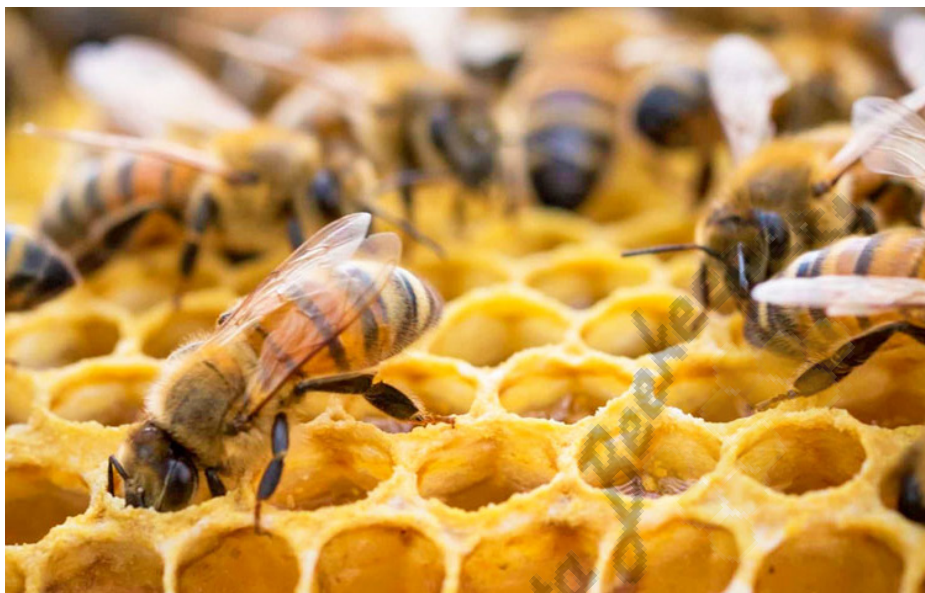
Honeybees make decisions collectively-and democratically. When honeybees seek a new home, they choose the best site through a democratic process that humans would do well to emulate



START UP KIT

Description	Quantity	Photo
Langstroth hive	10	
2 frame plastic honey extractor	1	
Beekeeping suit	1	
Hive tool	1	
Bee Brush	1	
Decapping fork	1	
Double sieve	1	

INTRODUCTION



Beekeeping is the maintenance of bee colonies, commonly in man-made hives, by humans. Most such bees are honey in the genus *Apis*, but other honey-producing bees such as *Melipona* stingless bees

80% of the Kenya's honey production potential remains untapped.

The demand for honey is increasing at a rate of 15% per year while honey production has stagnated over the years posing a great opportunity for youth to tap this potential.

We can embrace this opportunity. Beekeeping has a high potential for creating employment and generating a sustainable income and reducing poverty in Kenya. Beekeeping requires very minimal resources like land and capital and .Additionally beekeeping is important for biodiversity it plays a key role in crop pollination and conservation of biodiversity,

Most beekeepers lack the knowledge and skills required to efficiently maximize the honey production level. Resulting to poor apiary performance, hive occupation rate, honey yield and quality.

This practical guide to beekeeping provides a simple technical and theoretical information on the most important aspects of beekeeping to supplement initial information for beginners.



Importance of beekeeping

Bees play a key role in the pollination of agricultural crops and many other flowering plants. They contribute to nutritional food security for increasing the production for most fruits and vegetables. Bees are major pollinators of agricultural crops and contribute to nutritional food security and biodiversity conservation through pollination. Pollinators transfer pollen and seeds from one flower to another, fertilizing the plant so it can grow and produce food. Cross-pollination helps at least 30 percent of the world's crops and 90 percent of our wild plants to thrive. Without bees to spread seeds, many plants including food crops would die off. Beekeeping is also an essential economic activity for generating income and improving the livelihoods of community groups.



Benefits of Beekeeping

- Environmental conservation
- Provides food sources and increases production in the farms
- Earns foreign exchange through export
- Requires limited land
- Requires minimum time for production
- Low labour requirements

HONEY BEE COLONY

Honey bees are social insects that live in colonies. (Bee species) Honey bee colonies consist of a single queen, hundreds of male drones and 20,000 to 80,000 female worker bees. Each honey bee colony also consists of developing eggs, larvae and pupae. A honey bee colony typically consists of three kinds of adult bees: workers, drones, and a queen.

	Queen	Worker Bee	Drones
Developmental stage	16 days	21 days	24 days
Life span	2-3 years	3 months	3 months

Who Lives In A Colony?



Queen

There is just one queen in the hive. Her job is to lay eggs and preside over the hive.



Worker

All worker bees are female. Their role is to collect food and water, care for the larvae and guard the hive.



Drone

Drones are the only males in the hive. Unlike the queen and the workers, drones do not have stingers.

Queens

Life expectancy 3-5 years

Queens are the only members of a colony able to lay fertilized eggs. An egg-laying queen is important in establishing a strong honey bee colony, and is capable of producing up to 2,000 eggs within a single day. Queens mate early in life and store up millions of sperm within their bodies. While they are capable of living up to five years, they only often only live two to three years producing eggs.

Drones

Drones, or male honey bees, have only one task: to fertilize new queens. Drones mate outdoors usually in midair and die soon after mating. Some honey bee colonies will eject surviving drones during fall when food for the colony becomes limited.

Workers

Worker honey bees are the largest population within a colony. Worker bees are entirely female, but they are unable to produce fertilized eggs. If there is no queen they do sometimes lay unfertilized eggs, which become male drones. Worker bees use their barbed stingers to defend the colony, but after attacking, the barbs attach to the victim's skin, tearing the stinging bee's abdomen, resulting in death. Workers are essential members of honey bee colonies. They forage for pollen and nectar, tend to queens and drones, feed larvae, ventilate the hive, defend the nest and perform other tasks to preserve the survival of the colony. The average life span of worker bees is approximately six weeks.



BEE PRODUCTS & USES

Bees produce several products like honey, wax, pollen, propolis and royal jelly and venom

Bee Product	Description	USES	Applications
1.Honey	Honey is made using the nectar of flowering plants and is reserved for eating during times of scarcity.	<ul style="list-style-type: none">• Medicinal properties- Heals burns and reduces infections.• Nourishes the skin has a moisturizing and soothing effect• Food Additive-Binding agent and Preservative• Health benefits has antioxidants that help in boosting immunity.• Essential nutrients -a good source of proteins and vitamins, flavonoids and amino fatty acids.	Food Soaps Creams Ointments
2.Beeswax	Beeswax is secreted from the abdominal glands of worker bees. The glands of worker bees convert the sugar contents of honey into wax, which oozes through the bee's small pores to produce tiny flakes of wax on their abdomens.	<ul style="list-style-type: none">• Honeycomb construction• Attract bees to the hive• Stabilizer• Weak emulsifier• Increases water holding capacity of ointments and creams	Beehives Creams Soaps Candles
3.Propolis	Propolis is a resin-like material made by bees from the buds of poplar and cone-bearing trees.	<ul style="list-style-type: none">• Highly effective Antiseptic• Contains antioxidants• Has anti inflammatory properties• Antibacterial• Antifungal• Anti-dandruff• Tissue regeneration• Tissue rejuvenation	Shampoos Mouth rinses and toothpaste Cleansing creams Medicine against bacteria viruses and fungi.

Bee Product	Description	USES	Applications
4.Royal Jelly	Royal jelly is a gelatinous substance produced by honey bees to feed the queen bees and their young.	<ul style="list-style-type: none"> • Skin refreshing regeneration • Rejuvenation, healing • Antioxidant and Anti-Inflammatory Effects • Nutritious 	Medicine Food Beauty products
5.Beepollen	Bee pollen is the primary source of protein for the hive. Foraging bees bring pollen back to the hive from flowers.	<ul style="list-style-type: none"> • Nutritious - A complete protein, rich in vitamins, minerals, enzymes, amino acids and anti-oxidants, • Boost energy • Helps digestion • Reduces symptoms caused by air born allergens. 	Food Immune builders Vitality medication. alertness and concentration
Bee Venom	Bee venom is made by bees. This is the poison that makes bee stings painful. Bee venom is used to make medicine.	Bee venom (BV) is a complex mixture of proteins and contains proteins such as phospholipase and melittin, which have an effect on blood clotting and blood clots.	Medicine Apitherapy

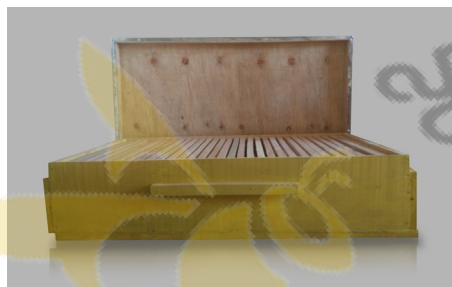
TYPES OF HIVES



Kenya Top Bar hive (KTBH)



langstroth



Long langstroth



Box Hive

Type of hive	Advantages	Disadvantages
Log hive	<ul style="list-style-type: none"> • Easy to make • Large quantities of wax • Hard to steal 	<ul style="list-style-type: none"> • Colony is disrupted • Hard to inspect • Prone to pests • Abscondment
KTBH	<ul style="list-style-type: none"> • Damage to the brood and the colony. • Easy to split colony • Large quantities of wax produced • Easy to inspect • Swarming can be controlled • Harvesting is easy 	<ul style="list-style-type: none"> • High skills and technique required. • Harvesting time only two times a year.
Langstroth modern hives	<ul style="list-style-type: none"> • No damage to the brood and the colony. • Easy to transport • High Honey yield-upto 3 times a year • Easy to inspect and harvest • Swarming can be controlled • Bee breeding and queen rearing is possible • Long lasting 	<ul style="list-style-type: none"> • High skills and technique required. • Minimal Beeswax production

Apiary Management

1. Apiary Set up

Starting a new apiary successfully requires a well-planned and suitable location. You should consider the following

- Apiary Location-Away from public places, roads schools and churches, livestock and agricultural activities.
- Near a water source-Bees prefer flavored and salty water sources like swimming pools.
- Have diverse vegetation for food like roys and trees.
- Protected from strong winds and sunshine
- Away from areas with intensive pesticide uses application of pesticides
- Hives should be well placed fenced and frequently weeded.
- Trees and flowers should be planted in and around the apiary
- Children and animas should be kept away from the apiary.
- Hive placement-One metre from the ground and at least 30cm apart.

2. Hive Inspection

- An apiary should be inspected regularly usually once a fortnight to build awareness of the condition of the colonies
- Check how brood is developing at different stages
- Check cells are filled with honey and pollen.
- Bees are gathering nectar pollen or propolis
- Any pests, diseases or nuisances disturbing the bees.

3. Record Keeping

Record keeping in beekeeping is important because it helps keep track of your hive's progress. Record anything that seems unusual and note your next visit. The Table below shows the essential information to record for each hive after every inspection.

Hive Inspection Records					
Hive No.....	Location Apiary site.....	Date of set up.....	Colonization date.....		
Inspection Date and Time	Queen present	Overall health	Honey frames Harvested	Honey harvested (In Kgs)	Notes
01-Jan-19	Presence of eggs,or developing larvae	Diseases and pests			
01-Feb-19					

DISEASES AND PESTS CONTROL

There are a number of diseases that affect honey bees. Diseases are often a problem in areas with a lot concentration of bee colonies with limited space.

The general control of most diseases to limit importation of bees and reporting any outbreaks to the relevant authorities.

Most bee diseases are bacteria, virus, protozoa, or mites affecting the Brood and larvae and are detrimental to the future adults in the colony. They include, American Foul Brood, European foul brood, chalk brood, Sacbrood, Nosema, Acerine mite and Varroa mite.

Image	Pest	Description	Prevention
	Wax Moth	A damaging pest of beeswax combs, comb honey and bee collected pollen grains. A sign of other underlying hive problems	Maintain healthy colonies Keep the apiary setup clean and sanitized Constant hive inspection Wax moth Traps
	Honey Badger	Feeds on honey and destroys the hives weakening colonies and may cause the population to abscond	<ul style="list-style-type: none">• Hang the hives with wires properly.• Fence the area• Trap the Honey Badgers
	Small Ants/ Safari Ants	Feeds on Honey attracted to the sugars.	Grease the poles and wires. Weeding to prevent ants
	Termites	They destroy wooden posts and hives.	<ul style="list-style-type: none">• Treat posts with anti termite chemicals• Grease the poles and wires• Weeding to prevent termites.
	Small Hive Beetles	Attack colonies in the Tropics Destructive pests of Bee colonies. Damages the combs. Weakens the Brood Feeds on Bee pollen, honey, brood eggs and dead bees. Their excrement also contaminate honey making it fermented and unfit for bee and human consumption.	<ul style="list-style-type: none">• Avoid over-superning hives, which increases the area that the bees must patrol.• Maintain a clean apiary to reduce attraction to beetles. Avoid tossing combs onto the ground around hives, which may attract pests.
	Mice Birds Lizards and Toads	Destroy the combs Eat Large Number of bees	<ul style="list-style-type: none">• Maintain a clean apiary.• Set a trap.

Honey Harvesting



Harvesting should be done in the morning or evening to avoid attack since bees are less active at this time. Assemble the necessary tools for harvesting. This include; a Beesuit, gloves, Smoker, hivetool, beebrush, bucket, Gumboots. Prepare the smoker to generate smoke use charcoal maize combs and sawdust.

Steps

1. Identify honey flow-nectar sources when the flowers are in bloom and ideal seasons for harvesting.
2. Identify the right window for harvesting
3. Identify wax capping that symbolize the honey is ready for harvesting
4. Wear Protective Beekeeping Suits –Wear safety gear any beekeepers will make this recommendation because lighter-colored clothes have a calming effect on the bees and keeps them calm.
5. Remove the lid
6. Apply smoke continuously on the hive.
7. Open the hive
8. Identify frames with honey.
9. Remove bees from the frames using a bee brush.
10. Uncap the honey
11. Filter the honey
12. Package the honey.

Glossary

Plants to feed bees-that bees love
It is advised to plant a shrub around your apiary to provide forage for bees and reduce bee aggression. Different agroforestry trees and fruit trees would also be beneficial and provide a wide range of nectar and pollen sources. Some examples include:

1. Fruit trees include Avocado, pawpaw, banana, mangoes, coffee
2. Trees-Macadamia plants, Eucalyptus, Bottom brush
3. Native plants and shrubs- Acacia trees, calliandra, leucaena, sesbania and Mulberry.

Save the Bees

Worldwide there is a great concern over colony collapse disorder a phenomenon that has led most part of the world to loose thousands of colonies. Scientists know that bees are dying from a variety of factors pesticides, drought, habitat destruction, nutrition deficit, air pollution and global warming. The solution to restore and protect the world's bees avoid the use of dangerous pesticides. Protect pollinator health by preserving wild habitat and restore ecological agriculture. Other bee species are also important not just the apis –Honey bees.

Cost/Revenue analysis

For economic sense it is advisable to start with 10 hives on an Apiary.

No of hives	Startup kit		10
Estimated Cost of purchase	Kes 5,000 per Hive		Kes 50,000
Estimated Harvest in Kgs per year	Harvest 3 times per year	5 kgs per hive/per harvest	150Kgs
Estimated Revenue per year	Sell 1 kg @a minimum of Kes 500		Kes 75,000

Get a Return on initial investment within the first year and Revenue of 75,000 every year after that when you buy 10 hives .

Bees need water

Water is crucial to honey bee survival .Worker bees use water to control the humidity of the colony. Nectar which is mostly water provides some needed moisture in a colony but not nearly enough. Foragers will collect water when needed in a colony water is used to dissolve crystallized honey when producing food.

Pesticide application

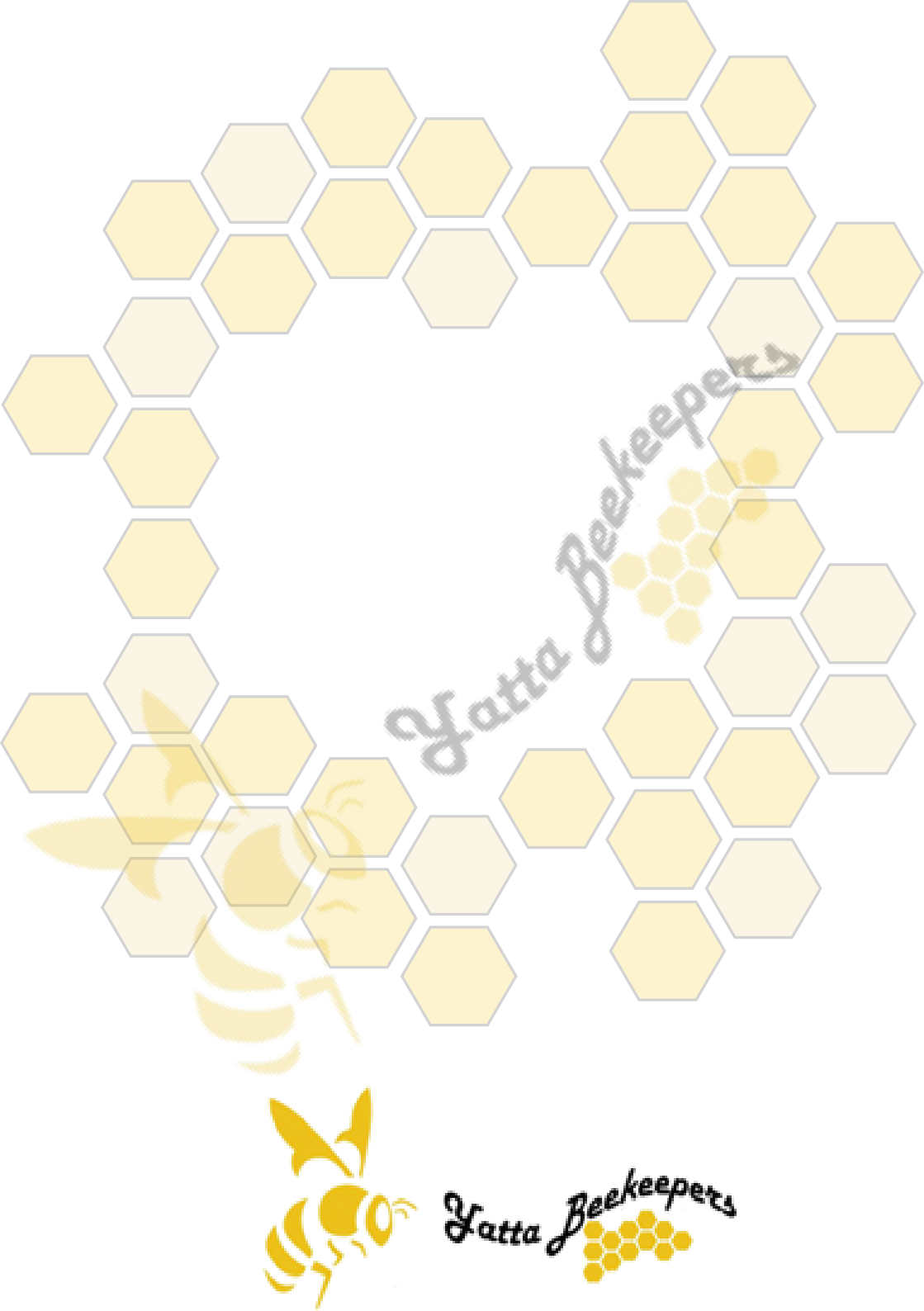
Flowering plants are often visited by honey bees for foraging. Only use pesticides when necessary preferably at dusk to minimize the lethal effect on honey bees and other beneficial insects.

Swarming

Is the natural means of reproduction or division of a colony swarming occurs when a colony is too large for a hive. Consider splitting the hive or putting additional supers.

Absconding

Abandonment of a hive by a colony due to too much disturbance either from the predators or beekeepers or the lack of resources like forage water and sun.



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