

REFINED COMPREHENSIVE APICULTURE PRODUCTION PROJECT

Kenya farmer guide from first hive to stable profit

Hive selection • costs • labour • forage • management • processing • value addition • queens • colonies • pollination • integrated farming

Indicative 2026 Kenyan planning costs. Actual prices, yields and regulations vary by county, season and supplier.

1. INTRODUCTION TO APICULTURE

Apiculture is the rearing and management of honey bees for honey and other valuable products. It is a low land requirement enterprise with high returns, suitable for small, medium and large scale farmers in Kenya.

Benefits

- Generates income and employment
- Requires little land
- Improves crop pollination and yields
- Environmentally friendly
- Multiple products and by-products

2. TYPES OF BEE HIVES IN KENYA

LOG HIVE



- Traditional
- Low honey yield
- Hard to manage
- Prone to pests

Best for: Beginners in forested areas

IMPROVED BOX HIVE



- Locally made
- Moderate yield
- Easy management locally
- Low cost

Best for: Small scale beekeepers

KENYAN TOP BAR HIVE (KTBH)



- Modern traditional
- Low cost
- Easy to construct
- Good comb quality

Best for: Most Kenyan beekeepers

LANGSTROTH HIVE



- Modern movable frame
- High honey yield
- Easy inspection
- Requires more investment

Best for: Commercial beekeepers

3. COST OF BEE HIVES (KENYA)

Hive Type	Materials (KSh)	Labour (KSh)	Total Cost (KSh)
Log Hive	800 – 1,200	300 – 500	1,100 – 1,700
Improved Box Hive	2,000 – 2,800	500 – 800	2,500 – 3,600
Kenyan Top Bar Hive (KTBH)	2,000 – 3,500	700 – 1,000	3,200 – 4,500
Langstroth Hive (10 Frame)	6,500 – 8,500	1,500 – 2,000	8,000 – 10,500

*Prices vary by location, wood type and time.

4. BEEKEEPING EQUIPMENT AND COSTS (KENYA)

Equipment	Unit Cost (KSh)
Bees suit / overall	3,000 – 4,500
Veil / hat	1,000 – 1,500
Gloves (pair)	500 – 800
Bee smoker	1,500 – 2,500
Hive tool (crowbar)	500 – 800
Bee brush	300 – 500
Honey extractor (Manual 4 frame)	18,000 – 25,000
Honey extractor (Manual 8 frame)	35,000 – 45,000
Honey extractor (Electric 20 frame)	120,000 – 160,000
Uncapping knife	1,000 – 1,500

5. LABOUR COSTS

Monthly wage for an employed worker in Kenya:

- Skilled beekeeper: KSh 18,000 – 25,000
- General worker: KSh 12,000 – 16,000

Duties include: hive management, feeding, harvesting, processing, record keeping, and security.

6. GETTING STARTED – STEP BY STEP

- Training – Learn basic beekeeping
- Site Selection – Water, forage, security, shade
- Acquire Equipment – Start small
- Acquire Bees – Buy colonies or capture swarms
- Install Hives – In the right season
- Manage Colonies – Regular inspection
- Harvest & Process – Extract honey & other products
- Market Your Products – Build customers
- Record Keeping – Track income & expenses
- Expand Gradually – Reinvest profits

7. INVESTMENT MODELS AND PROFITABILITY

Small Scale (20 Hives – KTBH)

Start Up Costs

- 20 Hives @ KSh 3,500 = 70,000
- Equipment @ KSh 35,000
- Protective gear = 5,000
- Miscellaneous = 10,000
- Total = KSh 120,000**

Annual Production (Est.)

- Honey 500 kg (25 kg/hive) @ KSh 600/kg = 300,000
- By-products (wax, propolis) = 50,000
- Total Income = 350,000**
- Gross Profit = 180,000 (After running costs)
- Break-even in: 1 Year

Medium Scale (100 Hives – KTBH/Langstroth)

Start Up Costs

- 100 Hives @ KSh 4,000 = 400,000
- Equipment @ KSh 120,000
- Protective gear = 15,000
- Miscellaneous = 25,000
- Total = KSh 560,000**

Annual Production (Est.)

- Honey: 3,000 kg (30 kg/hive avg) @ KSh 600/kg = 1,800,000
- By-products: 120 kg @ KSh 400 = 48,000
- Total Income = 1,848,000**
- Gross Profit = 1,100,000
- Break-even in: 1 – 2 Years

Large Scale (300 Hives and Above)

Start Up Costs

- 300 Hives @ KSh 4,500 = 1,350,000
- Equipment @ KSh 250,000
- Processing Unit = 300,000
- Protective gear = 30,000
- Miscellaneous = 50,000
- Total = KSh 2,000,000**

Annual Production (Est.)

- Honey: 10,000 kg (33 kg/hive avg) @ KSh 600/kg = 6,000,000
- By-products: 600 kg @ KSh 800 = 480,000
- Other products = 200,000
- Total Income = 6,780,000**
- Gross Profit = 4,900,000+
- Break-even in: 2 – 3 Years

8. PRODUCTS FROM BEEKEEPING



Honey



Beeswax



Propolis



Bee Pollen



Royal Jelly



Bee Venom

Large Scale Products & Opportunities

- Queen Bees – For sale and colony multiplication
- Nucleus Colonies – For sale to upcoming beekeepers
- Bee Swarms – Capture and sell
- Pollination Services – For crops (Avocado, Macadamia, Watermelon, etc.)
- Value Added Products – Soaps, lotions, creams, candles, lip balms, mead

9. PROCESSING PROCEDURES

HONEY PROCESSING

- Harvest (use honey capped combs)
- Uncap using uncapping knife
- Separate using honey separator
- Strain through cloth
- Store in cool and shady place
- Label and store in cool dry place

BEESWAX PROCESSING

- Collect and centrifuge
- Melt in hot water (double boiler)
- Strain through cloth
- Store in cool and shady place
- Mold into blocks
- Store in dry place

PROPOLIS PROCESSING

- Scrape from hive traps or frames
- Freeze to harden
- Crush into small pieces
- Soak in 70% alcohol (1:3 ratio)
- Strain daily for 7-14 days
- Filter and store in dark bottles

POLLEN PROCESSING

- Collect using pollen trap
- Dry in shade or dehydrator
- Grind into powder
- Store in airtight containers

10. PRODUCT PRICES IN KENYA (RETAIL)

Product	Price Range (KSh)
Raw Honey (per kg)	500 – 700
Processed Honey (per kg)	600 – 900
Beeswax (per kg)	400 – 600
Propolis (per 100g tincture)	2,000 – 4,000
Bee Pollen (per kg)	1,500 – 2,500
Royal Jelly (per 100g)	1,500 – 2,500
Queen Bee	1,000 – 2,500
Nucleus Colony	3,000 – 8,000
Full Colony (with hive)	12,000 – 18,000
Bee Swarm (per captured)	1,500 – 3,000

11. MERITS AND DEMERITS OF HIVES

Hive Type	Merits	Demerits
Log Hive	Very cheap Natural insulation Long lasting	Low honey yield Hard to inspect Prone to pests Not movable
Improved Box Hive	Easy to make Affordable Easy management	Lower yield than Langstroth Needs painting
Kenyan Top Bar Hive	Low cost Good comb quality Easy to construct	Harder to expand Less honey storage space than Langstroth
Langstroth Hive	Suitable for Kenya High honey yield Easy inspection Expandable	Expensive More equipment needed

12. FLOWERING PLANTS FOR BEES IN KENYA

ARID & SEMI-ARID AREAS (COASTAL, ASAL, LOWLANDS)



MEDIUM ALTITUDES (1000 – 1800M)



HIGHLANDS (1800 – 3000M)



VERY HIGH ALTITUDES (>3000M)



13. REPLACEMENT WHEN FLOWERS ARE SCARCE

NECTAR REPLACEMENT (FEEDING)

Sugar Syrup Recipe (1:1)

- 1 kg white sugar
- 1 litre clean water
- Boil in a pot until sugar dissolves
- Feed in evening using feeders

Protein Supplement (For brood rearing)

- 1 kg dry yeast
- 1 kg water
- 1 kg sugar
- 1 kg pollen
- 1 kg protein supplement

16. COMMON CHALLENGES AND MANAGEMENT

- Varroa mite infestation – Inspect and treat with miticides
- Beeswax moth infestation – Clean hives, use traps
- Queen bee loss – Replace with new queen
- Swarm – Prepare swarm boxes, move hives
- Pesticide use – Avoid spraying during flowering, use organic pesticides

14. INTEGRATED FARMING SYSTEMS

- Crop Pollination – Increases yields of fruits, vegetables, sunflowers, macadamia, avocado, coffee, etc.
- Crop + Bees – Plant bee forage around crops
- Livestock + Bees – Use manure for forage plants
- Agroforestry + Bees – Plant trees that provide nectar
- Honey + Bees – Plant flowers, herbs and trees
- Idle Land + Bees – Turn unused land into income

15. RECORD KEEPING

- Keep a detailed log
- Record hive health
- Record honey yield
- Record expenses
- Record income
- Record beekeeping activities

16. BEST MANAGEMENT PRACTICES

- Prevent water source
- Prevent robbing
- Prevent queen loss
- Prevent colony collapse
- Prevent disease
- Prevent pest infestation

17. BREAK-EVEN AND PROFIT STABILIZATION

Most small scale beekeepers break even in 1-2 years

Start Today, Harvest Tomorrow!

18. CONCLUSION

Apiculture is a profitable, sustainable and climate smart enterprise suitable for every Kenyan farmer. Start small, learn, practice, add value and grow gradually. Bees turn flowers into gold!

Original training infographic included as a visual overview. Detailed guidance follows.

1. Project Purpose and Training Philosophy

This guide is written for a farmer starting apiculture from scratch. The recommended path is simple: learn first, establish forage and water, start with manageable colonies, keep a hive by hive record, harvest hygienically and expand only when the first units are performing. Bees are living production units, so the business cannot be managed like a warehouse of empty boxes.

Kenyan research shows strong seasonal and landscape variation in bee forage. A recent Taita Taveta study identified 224 honey bee forage species and found that different plants dominate nectar and pollen supply at different elevations and seasons. The practical lesson is to build a flowering calendar rather than rely on one plant.

2. Hive Types and Their Merits

Hive	Planning price KSh	Merits	Demerits	Best use
Log hive	2,000–4,000	Cheap, locally made, familiar in dry areas.	Hard to inspect; harvesting may damage comb; lower quality control.	Very low capital and traditional systems.
Improved box	4,000–7,000	Simple and repairable; better control than a raw log.	Designs vary and extraction can still be difficult.	Transition systems.
KTBH	4,000–8,000	Kenyan design, moderate cost, locally constructible.	Comb handling needs skill; pressing/extraction is less convenient.	Small and medium farms.
Langstroth	5,500–8,500+	Movable frames, extraction, inspection and queen work are easier.	More expensive and management is more technical.	Commercial honey and breeding.

3. Core Equipment Costs

Equipment	Indicative KSh	Purpose
Bee suit	3,200–3,800	Protection
Smoker	1,000–1,500	Controlled bee handling
Hive tool	1,000–2,000	Hive and frame work
Hive stand	~1,500	Raises hive and improves protection
Feeder	~650	Supplemental feeding
Swarm catcher	~1,800	Swarm collection
2 frame extractor	~28,000	Small scale extraction
3 frame extractor	~35,000	Higher throughput
6 frame extractor	~65,000	Commercial extraction
50 L settling tank	~20,000	Settling
100 L settling tank	~30,000	Larger processing
Honey press	~30,000	KTBH comb processing
Refractometer	~3,100	Moisture testing

4. Starting Investment Packages

Item	20 KTBH starter	50 Langstroth	100 Langstroth
Hives	120,000	350,000	700,000
Initial colonies	75,000	187,500	450,000
Stands	30,000	75,000	150,000
Protective/tools/feeders	20,000	38,000	74,000
Extraction/settling	15,000 shared	67,000	110,000
Water/shade/fencing	15,000	35,000	70,000
Training + transport + misc.	40,000	77,000	140,000
Working capital	20,000	35,000	70,000
Indicative total	330,000	864,500	1,764,000

The small starter package deliberately shares or hires extraction equipment. Buying expensive machinery before the farm has enough honey can slow payback.

5. Labour

Arrangement	Planning allowance	Suitable scale
Owner managed	No cash wage, but record owner's time as a cost.	1–20 hives
Part time helper	KSh 5,000–10,000/month.	20–50 hives
Full time worker	KSh 10,000–15,000+/month plus applicable employment obligations.	50–100+ hives
Skilled apiary technician	KSh 18,000–30,000+/month or more.	Commercial breeding and processing

The applicable Kenyan agricultural wage order should be checked before employment. Housing, duties, location, statutory obligations and skill level affect the real cost.

6. Site Selection

Factor	Practical rule
Forage	Several nectar and pollen sources across the year.
Water	Clean shallow water with floats, stones or sticks.
Shade and wind	Protect from extreme heat and strong wind.
Security	Fence, mark equipment and keep a hive register.
Pesticides	Avoid frequent exposure and coordinate with neighbouring farmers.
People/livestock	Keep away from busy paths and animal handling areas.
Drainage	Avoid flood paths and permanently wet sites.
Access	Keep a practical path for harvesting and transport.

7. Getting Bees Into the Hives

Method	How it works	Strength	Main risk
Natural swarm	Use clean catcher boxes and safe collection methods.	Low purchase cost and local genetics.	Unpredictable timing and absconding.
Purchased colony	Buy from a traceable beekeeper; inspect queen, brood, stores and pests.	Fast establishment.	Disease or poor queen.
Colony division	Split only strong colonies during good forage.	Rapid expansion.	Weakening colonies if badly timed.

Number every hive. Record colony source, queen source, strength and production. A healthy colony is a biological asset and should be treated like breeding stock.

8. Routine Management Calendar

Period	Main work
Before flowering	Repair hives, establish water, manage ants, plant/protect forage.
Flowering begins	Assess colony strength and space; reduce unnecessary feeding.
Honey flow	Minimise disturbance, watch swarming and stores.
Harvest	Take mature honey and leave adequate stores.
Dearth	Water, shade, security and justified supplemental feeding.
After harvest	Record yield, repair equipment and inspect colony.
Breeding	Select productive, calm and healthy colonies.

9. Feeding When Flowers Are Scarce

Need	Option	Caution
Energy	Clean white cane sugar syrup, often 1:1 sugar to water by weight for stimulation.	Avoid spills and stop before market honey flow.
Stores	Experienced beekeepers may use stronger syrup during severe dearth.	Do not harvest syrup contaminated honey as market honey.
Protein	Fresh pollen or a clean pollen substitute/patty.	Natural pollen is preferable; do not over trap.
Water	Clean shallow water with floats.	Keep it consistently available.
Propolis	No true feed substitute.	Encourage resin plants and use propolis traps.
Wax	Clean beeswax foundation/starter wax.	Avoid contaminated wax.

10. Kenyan Bee Forage: Arid to Highland

The gallery below has been expanded so the farmer can recognise important plants. The selection combines dryland trees, food crops, orchards and highland agroforestry plants. Local suitability must always be confirmed before planting.



Vachellia tortilis

Dryland umbrella thorn; conserve natural stands and plant suitable local material.



Melia volkensii

Mukau, a Kenyan dryland multipurpose tree suitable for ASAL agroforestry.



Ziziphus mucronata

Dryland indigenous forage and biodiversity resource.



Mangifera indica

Mango orchard: fruit income plus seasonal bee forage.



Sunflower

Seasonal nectar and pollen source plus seed income.



Calliandra calothyrsus

Bee forage, fodder, hedge and windbreak in suitable zones.



Grevillea robusta

Highland/medium altitude agroforestry and flowering resource.



Coffee arabica

Flowering coffee can be integrated with bees and shade trees.



Citrus spp.
Flowering citrus orchard plus fruit income.



Persea americana
Avocado orchard plus pollination and honey opportunity.

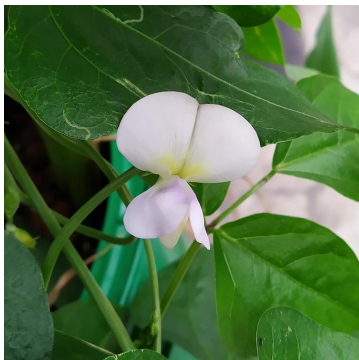


Eucalyptus spp.
Flowering resource where locally appropriate; avoid monoculture dependence.



Cajanus cajan
Drought tolerant legume and seasonal forage.

Photo not available



Vigna unguiculata
Food crop with flowering resource in warm zones.

11. Additional Forage Plants to Put on the Farm Calendar

Plant	Where to consider it	Farm value / caution
Balanites aegyptiaca	Drylands to medium zones	Indigenous bee forage, fruit, fodder, gum, shade and windbreak. Protect seedlings from browsing.
Senegalia senegal	Dry and semi arid	Dryland forage and gum arabic tree.
Croton megalocarpus	Medium/high rainfall areas	Agroforestry and bee forage.
Azadirachta indica	Warm lowlands and medium zones	Multipurpose tree; avoid pesticide exposure during flowering.
Sesamum indicum	Warm, well drained areas	Seasonal crop and bee friendly flowers; seed income.
Grevillea robusta	Medium/highlands	Agroforestry, shade and flowering resource.
Calliandra calothyrsus	Suitable medium/high rainfall	Bee forage, fodder, hedge and windbreak; monitor invasiveness locally.

Kenyan and East African literature contains many more forage species. The best farmer practice is to record the local plant, first flowering date, peak flowering, end of flowering and bee visitation. This turns general plant lists into a county specific forage calendar.

12. Integrated Farming and Idle Land

Idle area	Integrated system	Bee benefit	Other income
Boundary	Indigenous trees + hives	Long term forage and shelter	Timber, biodiversity, erosion control
Orchard	Mango/citrus/avocado/macadamia + hives	Forage and pollination	Fruit/nut income
Dryland field	Sunflower/sesame/pigeon pea/cowpea + hives	Seasonal flowers	Food and seed income
Coffee farm	Coffee + suitable forage trees + hives	Flowering resources	Coffee, shade, fodder, honey
Livestock farm	Dairy/beef + forage trees + hives	Diverse forage	Honey, fodder, shade
Unused corner	Apiary + forage nursery	Nearby forage	Seedling sales plus honey

13. Products From Small to Large Scale

Product	Small scale	Large scale
Honey	Filtered, settled, moisture tested and bottled.	Branded retail, bulk and specialty honey.
Comb honey	Clean capped comb in food grade packs.	Premium niche product.
Beeswax	Render and mould; candles and polish.	Foundation wax, candles, cosmetics and crafts.
Propolis	Trap, clean and package.	Standardised raw material and compliant extracts.
Pollen	Selective trapping, drying and packaging.	Specialty product with stronger quality control.
Queens	Start only after training.	Mated queens and breeder program.
Nuclei/colonies	Sell strong colonies after establishment.	Regular live bee supply.
Pollination	Local agreements.	Professional seasonal contracts.
Royal jelly/venom	Specialist only.	Specialist facility, cold chain and safety systems.

14. Honey Processing

Step	Procedure
1	Harvest mature honey and leave adequate colony stores.
2	Remove bees gently and hygienically.
3	Uncap clean frames over food grade trays.
4	Extract with suitable equipment; press KTBH comb where appropriate.
5	Filter through coarse and fine sieves.
6	Settle in a food grade tank.
7	Measure moisture using a calibrated refractometer.
8	Bottle, seal and label by batch.
9	Store cool, dry and away from sunlight and strong odours.

15. Beeswax Processing

Separate clean cappings from dark brood comb. Melt using a solar wax extractor or controlled hot water method. Filter, settle and mould. Clean wax can become candles, polish, foundation wax and other compliant value added products. Never burn wax directly over a flame.

16. Value Added Product Cost Guide

Product	Basic process	Indicative processing cost
Bottled honey	Extract → sieve → settle → test → bottle → label	About KSh 80–190/kg depending on packaging and labour.
Beeswax candle	Render → filter → melt → mould → cool → trim	About KSh 100–300 per candle.
Wax polish	Melt clean wax → blend → cool → package	About KSh 50–150 per small pack.
Propolis raw	Trap → cool/freeze → clean → package	About KSh 50–200/kg excluding equipment.
Propolis extract	Clean → controlled ethanol extraction → filter → bottle	About KSh 100–300 per small bottle, formulation dependent.
Pollen	Trap → clean → controlled drying → package	About KSh 100–300/kg excluding equipment.
Royal jelly	Queen rearing → cell management → harvest → rapid cooling	High skill and cold chain cost.

Food, cosmetic and other processed products should be made under appropriate hygiene, labelling and regulatory requirements. Avoid unsupported medical claims.

17. Large Scale Queens, Nuclei, Colonies and Swarms

Enterprise	How to build it	Control point
Mated queens	Select proven colonies, raise cells, mate and record.	Parentage, mating date, acceptance and daughter performance.
Nucleus colonies	Split strong colonies in good forage.	Do not split weak colonies.
Full colonies	Multiply strong colonies and sell with traceable queen.	Biosecurity and health records.
Swarm collection	Use catcher boxes and safe transfer.	Captured swarm may abscond.
Breeder colony	Select calm, productive, healthy colonies over several seasons.	Do not select on one trait only.

18. Profitability and Payback

The farmer should calculate profit from saleable kilograms, not from hive count. The following conservative model is a starting point and should be replaced with actual local records.

Scenario	Output assumption	Sales	Operating cost	Net
20 KTBH	130 kg/year	KSh 91,000 @ 700/kg	50,000	41,000
20 Langstroth	260 kg/year	KSh 182,000 @ 700/kg	65,000	117,000
50 Langstroth	750 kg/year	KSh 600,000 @ 800/kg	130,000	470,000
100 Langstroth	1,600 kg/year	KSh 1,280,000 @ 800/kg	220,000	1,060,000

Kenyan field observations demonstrate wide production differences by ecology and management. Some field reports have observed around 10 kg per Langstroth harvest in dry areas and substantially higher yields under favorable forage. Therefore no responsible farmer should treat a single national yield as guaranteed.

Scale	Capital planning	Payback logic
20 KTBH	~KSh 330,000	Can be slow if only raw honey is sold; improve through shared equipment and value addition.
20 Langstroth	~KSh 380,000–450,000	About 3–4 years under conservative assumptions.
50 Langstroth	~KSh 864,500	About 2 years under model.
100 Langstroth	~KSh 1.764 million	About 1.5–2 years under model.

Profit stabilization should mean that routine costs, replacement costs and the original investment have been recovered and the business remains cash positive over several production periods.

19. Four Year Development Plan

Year	Target	Focus
0	Training + 10–20 hives	Forage, water, security, colonies and records.
1	20–30 productive colonies	Occupancy, survival, first harvests.
2	30–50 colonies	Better extraction, wax and propolis.
3	50–100 colonies	Brand, processing and live colony market.
4	100+ or specialist unit	Queens, nuclei, pollination and bulk honey.

20. Risks and Practical Responses

Risk	Effect	Response
Drought/dearth	Low forage, weak brood, absconding.	Diverse forage, water conservation and justified feeding.
Pesticides	Poisoning and colony loss.	Communicate with neighbours and protect bees during spraying.
Theft	Loss of colonies/equipment.	Fence, mark equipment and keep records.
Ants/pests	Colony stress and comb damage.	Clean stands, barriers and inspection.
Weak queen	Low brood and productivity.	Select and replace failing queens.
Market swings	Income instability.	Direct sales, branding and multiple products.
Over expansion	Capital tied in empty boxes.	Expand only when occupancy and production justify it.

21. Kenyan Quality and Standards

Reference	Use
KS EAS 36:2020	Honey specification.
KS ARS 1418:2018	Honey processing unit technical requirements.
KS ARS 1402:2018	Beehive specification.
KS ARS 1411:2018	Radial honey extractor specification.
KS ARS 1415:2018	Solar wax extractor specification.
KS EAS 989:2020	Bee pollen specification.
KS EAS 990:2020	Bee propolis specification.
KS EAS 992:2020	Beeswax specification.

22. Records Every Farmer Should Keep

Record	Minimum information
Hive register	Hive number, type, installation date, colony source, queen source.
Inspection	Date, queen, brood, stores, pests, strength and action.
Harvest	Hive, date, kg honey, wax, moisture/quality and destination.
Feeding	Hive, date, feed, quantity and reason.
Queen	Parent colony, mating date, introduction, performance, replacement.
Sales and expenses	Customer, product, quantity, price, labour, transport and other costs.
Forage calendar	Plant, first flower, peak flower, end flower, bee visitation.

23. Evidence Base and Photo Credits

The guide was refined using Kenyan and international sources including KALRO apiculture training materials, Kenya Bureau of Standards standards, Kenya Forestry Service and KEFRI dryland tree guidance, World Agroforestry/ICRAF databases, Infonet Biovision, FAO beekeeping resources, Kenyan field research and current Kenyan equipment market observations.

Source family	Main contribution
KALRO	Apiculture training, site selection, management, nutrition and harvesting.
KEBS	Honey, processing, hive, extractor, pollen, propolis and beeswax standards.
KFS / KEFRI	Kenyan dryland forestry and <i>Melia volkensii</i> guidance.
World Agroforestry / ICRAF	Tree suitability, Balanites and integrated agroforestry.
Infonet Biovision	Kenyan farmer beekeeping and plant references.
FAO	Bee products, nutrition, dearth management and value addition.
Kenyan studies	Seasonal forage and production variation by ecology.
Plant photographs	Wikimedia Commons, Infonet Biovision, Trees4CO2, IUCN/Keys, botanical reference sites and other identified providers.

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24. Final Farmer Advice

Do not begin by buying hundreds of empty hives. Begin by building a forage base, water source, secure apiary and practical skills. Start with a manageable colony number, keep records and let production records decide when to expand. Sell more than honey when your scale and skills permit. Use the same farm boundary, orchard, dryland plot or idle corner to produce food, fruit, timber, fodder, pollination services and bee products.

The most resilient apiculture enterprise is one that combines bees with the rest of the farm. A farmer who plants the right trees, protects flowering crops, controls costs, processes cleanly and builds repeat customers can gradually convert a small apiary into a diversified income generating enterprise.

Build the forage. Build strong colonies. Build the market. Then build the scale.