Market access for beekeepers
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This Guide was prepared for use in Uganda, however it is relevant to other parts of Africa.

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INTRODUCTION

With low start up costs and high demand for honey, beekeeping offers the potential to alleviate poverty on a significant scale . . .

Beekeeping in Uganda is successful and profitable, however it is carried out mainly at subsistence levels where low volumes of honey are harvested and most trade is informal. The volume of honey traded is unknown because of the difficulties of monitoring and measuring informal trade. Benefits to beekeepers clearly exist otherwise they would cease to manage their bee colonies. However, our concern is that beekeeping is not alleviating poverty on a significant scale, despite the low start up costs and high demand for honey.

Changes in the way trade happens are key to raising the contribution of beekeeping to economic development in Uganda. This Guide provides information and analysis to help design interventions to bring about these changes and support beekeepers in Uganda.

The Guide explains the importance of creating direct links between beekeepers and buyers and how this can be achieved. It is not about harvesting and processing honey nor is it a beekeeping manual. Its focus is how to make beekeeping a business in Uganda and topics concerned with the sale of bee products are central. Another feature of the Guide is emphasis on scale - the need to develop an industry in which thousands of people can participate. This emphasis means looking at trade beyond the local area of the beekeeper, towards the wider market system and the way it works.

The Guide considers three main themes:

- Beekeeping as a business
- Industry for thousands of beekeepers
- The wider market system and trade to distant markets.

Honey is in high demand in Uganda
The beekeepers

There are thousands of beekeepers in Uganda, mainly of two categories:

- those with long experience of using local style hives. They have learnt through doing, have practical know-how, yet may have little theoretical knowledge.

- those who have been trained recently, often in methods associated with the use of top-bar hives or movable-frame hives.

Members of the second category tend to be more visible and better integrated into development initiatives, however the first category should never be overlooked as they have a significant role to play in the honey industry. There is great variation in beekeepers' skills and knowledge of colony management and harvesting and handling of bee products.

In terms of harvest, a realistic average might be about 50 kg of honey per beekeeper per year, although the variation is huge. Some beekeepers may harvest a tonne of honey in one year.

The resources

The primary resources for beekeeping are honey bees, nectar and pollen from flowers, and water. In Uganda these are available in plentiful supply. Uganda's honey bees are currently free from introduced pests and diseases, and thrive well in their natural environment. They can be kept by beekeepers in appropriate, well-placed hives. Honey bees live according to the seasons, and honey harvesting is seasonal. Managing African honey bees is different from managing the honey bees that occur in Europe, and care should be taken to consult only text books that have been written for African honey bees and African conditions.

A honey bee foraging for pollen
Commercial agriculture

In recent years a strong imperative has emerged in Uganda to transform farmers from subsistence farming to commercial agriculture, and the Plan for Modernisation of Agriculture is one manifestation of this drive. It is increasingly understood that subsistence farming cannot lift people out of poverty nor contribute significantly to the national economy. What of beekeeping? Can beekeeping be transformed?

This Guide is about beekeeping at the household level and how this can supply a larger industry.

Plan for Modernisation of Agriculture

The Plan for Modernisation of Agriculture (PMA) provides the principles and framework for the design and implementation of programmes and projects that impact on agricultural based livelihoods in Uganda.

The PMA Objectives are to:

(i) increase income and improve the quality of life of poor subsistence farmers;
(ii) improve household food security through the market;
(iii) generate gainful employment;
(iv) promote sustainable use and management of natural resources.

(Government of Uganda 2003)
It is the business approach that matters most, not the type of hive

Beekeeping as a business

Beekeeping as a business must have the same features as other farming enterprises. All resources necessary for production must be available and the beekeeper needs to have a business-like approach. However, most beekeeping currently undertaken in Uganda is at a subsistence level and so a transformation is needed.

Requirements for beekeeping as a business

The business must be right

- There must be a plan with an aim and steps to achieve it
- Income from the sale of honey and beeswax must be more than the total cost of making hives, managing colonies, harvesting and marketing
- The beekeeper should harvest for a target market - not just wait for a passing sales opportunity

The beekeeping must be right

- Honey bee colonies must receive at least minimum management by the beekeeper to ensure that they are not stolen or damaged. They should be placed where bees have access to water and forage and are shaded and secure from predators
- It must be possible to harvest honey and other bee products without destroying or driving away the colony
- Harvested honey must be of a quality fit for the market

Some people believe that this change must involve replacing local style hives with alternative hives, such as top-bar or frame hives. In fact this is not correct. Provided all the criteria below are met, beekeeping will be business-like, whatever type of hive is chosen. It is most important to focus on the business approach of the beekeepers.
TRADE IN HONEY AND THE MARKET SYSTEM

Benefits for beekeepers

Bees and beekeeping bring many benefits. However, almost all interventions and efforts to develop beekeeping are undertaken with one main aim: income generation. This means that honey and other bee products must be sold, and this immediately takes us into the subject of trade.

Beekeeping is valuable in different ways

1. **Pollination services**
   - The economic value of pollination is difficult to measure. However, pollination is incredibly important as it improves the yield and quality of many food and cash crops, and maintains biodiversity.

2. **Direct consumption (not sold)**
   - Many beekeepers share honey among their family and neighbours to eat or to use as a medicine.

3. **Local markets**
   - Honey is sold often in small local markets. It may also be exchanged for other goods.

4. **Distant markets**
   - Honey is bought by significant numbers of people in large towns and cities in Uganda and may also be exported.

   Distant markets can be reached via intermediate traders, cooperative organisations or directly. Distant markets usually have different expectations from local markets in terms of quality and packaging. Distant markets offer growth potential.
Trade to distant markets

Significant incomes can be achieved only by significant volumes of trade and this means trade beyond the local area of the beekeeper — either to the nearest medium sized town, a city or outside the country. This is called trade to distant markets.

Well packed and presented Ugandan honey is in high demand

Trade to distant markets creates a flow of money into rural areas
For a beekeeper, the key to marketing is bulking honey and forming groups

The market demand

The market for packed, table honey in Uganda is growing due to an expanding population and growing wealth among some sections of society. Established packers say they have no difficulty in selling honey and shopkeepers report increased sales. The estimate for annual sales of packed, Ugandan honey currently stands at 500 tonnes. Small volumes of honey are exported to different countries including Kenya, UK and Yemen, although total exports rarely exceed 10 tonnes a year (UBOS 2008). Several honey packers have secured overseas interest in Ugandan honey but low volumes of supply and high local demand hinder export.

Although the demand is high, honey packers face a number of challenges: weak supply chains, lack of finance and poor availability of quality containers. There are fears that unless local businesses adequately and efficiently supply the Uganda market, honey imports could increase. Honey is currently imported from neighbours DR Congo and Sudan, and from further afield including India, United Arab Emirates and the UK. Statistics produced by Uganda Bureau of Statistics report that in 2007 total recorded imports reached about 70 tonnes (UBOS 2008). It cannot be assumed that imported honey is of higher quality than local honey, and it is a challenge to Ugandan companies to prove that buying Ugandan, means buying quality!

Marketing

What is the difference between marketing and selling? Marketing is a proactive process of identifying and meeting the needs of customers or buyers in a profitable way, whereas selling is just the actual transaction: exchange of product for money. All the players in the flow diagram on page 8 need to think about proactive marketing, and not just selling.

Honey packers market their honey for shop customers and there are well established approaches for marketing at this stage in the market chain. See Further Reading on page 28 for more information on marketing.

Beekeepers need to move away from thinking just about selling, to thinking about marketing. This is an important part of transforming a subsistence activity to a business, and involves understanding the wider market system and how to develop a proactive role within it. The best way for beekeepers to do this is by forming a marketing group. They can then collectively offer a reasonable volume of honey to the market and this means that they can negotiate with buyers from a stronger position.

Without significant volumes, beekeepers are vulnerable to simply taking whatever price they can get. For a beekeeper, the key to marketing is bulking honey and forming groups. This is explained in the following sections.
The way trade happens

This Guide is concerned with honey sales to distant markets such as Kampala. Local markets can quickly become saturated whereas markets that are more distant may offer potential for growth. Herein lies the problem — how do beekeepers in remote areas access markets far away? There are two main routes: the trader route or the direct to packer route.

The trader route involves a series of traders buying and selling honey, until the honey reaches an end market point. Arua Park is a well-known trading location in Kampala where honey that followed the trader route can be found in large quantities. It is often transported in jerry cans, may be semi-processed and of varying quality.

The direct to packer route involves a packer buying direct from the beekeeper. Currently this happens particularly with beekeepers' associations such as Connoisseur, Kabarole and Kamwenge. Larger packers such as Bee Natural Uganda also aim to pack honey sourced directly from beekeepers. The packed honey is then sold in shops in towns, especially Kampala.

The price of honey

What of price? Which route delivers more income to beekeepers? Intuitively most of us think that a short market chain means producers can achieve higher prices, but this is not always the case. A dedicated honey packer must operate at scale and therefore is thinking in tonnes not kilograms. They may not offer a higher price per kg than a trader, but they may buy more volume. In this way a beekeeping group can be motivated to double production once they are connected directly to a packer, and this means nearly double the income, even if the price per kg may be sometimes lower.

Selling honey informally for cash can be easy with no cost barriers, but it has limitations and does not promote growth.
The two main routes to market for honey in Uganda

<table>
<thead>
<tr>
<th>Trader route</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantages</td>
<td></td>
</tr>
<tr>
<td>Most honey is traded in this way.</td>
<td>Beekeepers are not motivated to increase production because the trader does not encourage them.</td>
</tr>
<tr>
<td>This route works for almost any quantity and quality of honey.</td>
<td>Quality control is difficult and there is no traceability.</td>
</tr>
<tr>
<td>Small amounts of cash are moving through the chain all the time, so there is no need for any player to have a lot of working capital locked up at any time.</td>
<td>Traders are opportunistic and do not invest in the industry.</td>
</tr>
<tr>
<td></td>
<td>There is no premium price for high quality honey.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Direct to packer route</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantages</td>
<td></td>
</tr>
<tr>
<td>Good communication between packer and beekeeper can be achieved — this motivates beekeepers.</td>
<td>The direct to packer route is easier on a small-scale than on a large scale. On a large scale this route has the following challenges:</td>
</tr>
<tr>
<td>Serious packers need a large volume to achieve economy of scale — this presents an opportunity for beekeepers to harvest more and earn more.</td>
<td>The packer needs to focus on honey (to cover the cost of their investment) so they need large volumes to achieve economy of scale.</td>
</tr>
<tr>
<td>Easier to establish quality control systems which are necessary for access to premium markets.</td>
<td>Creates cash flow difficulties, either for beekeepers or packers or both.</td>
</tr>
<tr>
<td>Beekeepers have a chance to participate in the market from a more informed position.</td>
<td>Requires a collection centre that will have overhead costs. Demands a level of organisation that is not needed by the trader route.</td>
</tr>
</tbody>
</table>
Selling direct to packers is important to develop the sector

For the benefits of beekeeping to increase for rural producers, the industry must grow in total volumes of honey and beeswax traded each year.

To achieve this, beekeepers must invest time, effort and money. The current informal trading system does not create an incentive for beekeepers to do this. The main obstacle is lack of confidence in the market. Beekeepers cannot be sure to whom they will sell their honey and they cannot be sure that increased investments will pay off. Traders are opportunistic because that is the nature of their livelihood, it is how they keep costs down, and they lack confidence to focus on honey as a primary business because of uncertainty about available volumes. The *trader route* works, but it does not ignite growth, even when the market demand is high.

The *direct to packer route* is important for growth because packers know their suppliers and can communicate with them directly. This means a packer can motivate the beekeepers to increase production, with the promise of a secure market. The outcome can be increased volumes which secure the relationship and position of the packer.

Marketing honey as a group gives beekeepers a number of benefits. They can offer a large volume of honey for sale, attract a reliable buyer, negotiate terms and lower their own marketing costs.
A short market chain does not necessarily mean a higher price

This kick-starts a positive feedback response: the more honey the beekeepers produce, the easier will it be for them to sell more in the future.

The packer will motivate a beekeeper where a trader does not, because the packer has invested more in the honey trade and really needs the honey. An opportunistic trader does not have that investment and commitment, and if there is no honey, will trade in something else.

Furthermore, the direct to packer route is the only way of reliably offering a higher quality product to the market and this has implications for the value of the industry.

The reasons for this are two-fold:
- Investments in improving quality, such as insistence on using clean containers, are more likely to pay off where the packer knows and is in touch with suppliers.
- Traceability can be achieved. This allows a packer to rectify problems with quality, helps to maintain standards, and allows a packer to secure more high value markets.

While the direct to packer route is important for growth, it may be difficult to establish.

Connecting beekeepers directly to packers is the key to growth in this industry. Packers will be motivated by having confidence in their supply base, and beekeepers will be motivated by confidence in the market. This confidence will lead to investment, increased volumes, increased trade and ultimately wealth creation.

What is the key to connecting beekeepers directly to packers? Bulking of honey and beeswax into significant volumes.

Bulking explained

Beekeepers individually harvest relatively low honey volumes. Bulking refers to the accumulation of the honey harvested by many beekeepers for the purpose of making a single onward sale. For example, 50 beekeepers may each harvest 100 kg of honey, but find it difficult to sell their 100 kg individually. However, if they choose to bring all their honey to one collection centre, they will then have 50 X 100 kg = 5 tonnes. It will be much easier to sell the entire 5 tonnes directly to one packer. This process is called bulking.
CONNECTING BEEKEEPERS DIRECTLY TO PACKERS

Beekeeping associations as honey packers

Before discussing bulking and collection centres in more detail, it is important to consider the role of beekeeping associations as honey packers. This arrangement falls under the direct to packer route as beekeepers (members) sell their honey directly to the beekeeping association (packer).

The main advantage of this arrangement is the close relationship which can be achieved between the packing operation and the beekeepers. This can motivate beekeepers and create loyalty and consistency of supply. However, there are some limitations.

Linking beekeepers directly to honey packers can lower transaction costs and increase confidence.
This arrangement relies on beekeepers bringing their honey to the premises of the beekeeping association that will pack and sell the honey. This imposes a geographical limit and therefore limits total volume of produce available. This type of business works well only if located reasonably near to a town and with easy access to inputs (e.g. jars) and a market (e.g. shops). It is therefore unsuitable for remote, rural areas. For these reasons such an arrangement may not offer a route to significant growth in the Ugandan honey industry.

To address this, a beekeeping association can create collection centres in more distant locations that then supply a packing business located near town. Creating collection centres in remote rural areas will enable the association to source honey from a wider geographical area and from more beekeepers. This is an important way of increasing market access for beekeepers and increasing honey supply for the association.

The direct to packer route is the only way of reliably offering a higher quality product to the market

Collection centre options

A collection centre may be established by a honey packer or by beekeepers. Where a collection centre is managed by beekeepers they must organise themselves into a marketing group. Together they can bulk their honey and sell it to a private buyer or to a beekeeping association which packs honey.

For information and guidelines for producer organisations and marketing groups see the Further Reading section on page 28.

A collection centre may be a simple logistical arrangement: a place where a group of beekeepers agree to accumulate their honey before contacting the buyer with whom they have a supply arrangement.

A collection centre may be run as a business. In this case beekeepers sell their honey to the collection centre at one price, and the marketing group who are running the collection centre sell it to the packer at a slightly higher price. The margin is used to pay the costs of the collection centre.
RUNNING A COMMERCIAL COLLECTION CENTRE

Whether run by beekeepers or a honey packer, a collection centre must be commercially viable. Every care must be taken in the design of the centre, not to build-in expensive operating and running costs.

Commercial considerations

A collection centre must compete with traders on a commercial basis and this can be achieved when:

- A minimum volume of honey is always traded at the collection centre, enough for income to cover all costs.
- Transaction costs of suppliers and packers are lowered and savings are made.

Minimum volume of trade

A collection centre will be viable only above a minimum volume of honey — probably at least eight tonnes per year. A packer or a beekeepers' marketing group should work out all the costs associated with running a collection centre then calculate the volume of trade needed to generate the income to cover these costs. This is the minimum target volume.

Transaction costs

Transaction costs are borne by both supplier and buyer. A collection centre and a supply agreement with a reliable buyer can lower transaction costs for everyone and save money. Reduced costs may then make it possible for a buyer to increase the price they pay. This is a commercial advantage of a successful collection centre.

Transaction costs are those associated with carrying out a sale and include:

- Phone calls to suppliers and buyers
- Bank charges
- Transport to a market place
- Advertising
- Time spent pursuing sales or supplies that are not finalised
- Wastage, e.g. making a mistake or buying sub-standard produce
Supplier and packer relationships

It is important that arrangements be put in place so that packers and beekeepers can communicate and easily provide feedback and information to one another. In this way a good relationship can be built between suppliers and packers and this brings a number of advantages:

- Mutually convenient arrangements can be established
- Each party will have confidence to invest and make plans for the future
- The suppliers understand what the packers want and can endeavour to meet this demand
- Packers will be willing to persist with the suppliers, even when there are temporary problems.

Bulking is important for commercialisation

Side-selling

The collection centre will fail if it does not achieve the minimum volume of honey. The worst thing that can happen is for a collection centre to be established yet beekeepers still choose to sell their honey to informal traders, without using the collection centre. This happens if the price offered by traders is more than that offered by the collection centre, or if traders offer cash on delivery, while the collection centre pays later.

Beekeepers need to realise that the more they use a well run collection centre, the more successful they will be
A collection centre connected with a reliable buyer can reduce transaction costs and increase profit for everyone.

A collection centre can secure the delivery of regular supplies by offering:

- **Reliability**: through a steady market year in, year out
- **Capacity**: to absorb large volumes of honey: this is important for beekeepers who want to develop and grow
- **Accessibility**: being easy for beekeepers to access: open at regular days and hours
- **Dependability**: by keeping promises: farmers are willing to be paid some weeks after a sale provided that they have total confidence of being paid on the date promised
- **A shared aim**: and awareness among beekeepers that the success of the collection centre depends upon that shared aim to create a good market

Ultimately the success of a collection centre depends on the packer or group who run it being able to convince beekeepers that these long term benefits are worthwhile. Beekeeping associations and groups are sometimes better able to do this than packers, and packers must learn how to address this through relationship building.

**Relationship building is the key to building successful collection centres**

Honey deliveries need to be graded, weighed and recorded, while overhead costs must be kept to a minimum.
MAKING TRADE WORK FOR BEEKEEPERS IN UGANDA

This Guide is for practitioners engaged in supporting the honey industry in Uganda. It should be used as a reference when preparing project and development plans. The issues below require particular attention and investment.

It is important to work within the current market system and avoid creating structures and processes which are artificial and dependent on projects.

Subsidised services can threaten private sector providers by creating an unstable market and an unreal trading environment.

Avoid subsidies unless the subsidised service would not otherwise be available (e.g. some expert advice), or when users cannot afford to buy services and their subsidised provision does not threaten private sector providers.

Key areas for intervention to boost honey trade in Uganda

<table>
<thead>
<tr>
<th>Building marketing groups</th>
<th>Beekeepers need access to business training</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beekeepers need to be supported to form marketing groups and collection centres</td>
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<table>
<thead>
<tr>
<th>Forming relationships</th>
<th>Market actors need to communicate and know each other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supplier/buyer relationships need to be strong, positive and based around the shared aim of honey trade</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Finance</th>
<th>Packers and collection centres need working capital for purchases during the honey season</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Grants may be needed to help cover the establishment costs of collection centres</td>
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</table>

<table>
<thead>
<tr>
<th>Monitoring and learning</th>
<th>The success or failure of interventions must be monitored</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>There is a need to learn from other farm businesses and the trader route</td>
</tr>
</tbody>
</table>
ANNEX 1  BEEKEEPING AS A BUSINESS AT FARM LEVEL

Two examples of profit and loss spreadsheets are shown on the following pages. These are intended only as a guide to follow in calculations using actual local and current figures.

The first example spreadsheet (page 22) uses local style hives while the second (page 23) uses top-bar hives. These are prepared to show that profits can be made using both these hive types, although the initial investment for the top-bar hives is greater. This will be a constraint for some farmers.

Assumptions and clarifications

1. Neither example shows how much time was spent by the beekeepers in managing their apiaries

2. No costs for loan re-payment are included, yet these may be necessary in some cases

3. In both the examples the beekeepers shared the cost of a bee suit in Year 2

4. The beekeepers gradually increased the number of hives each year, using proceeds to buy additional hives

Why did the top-bar hives yield slightly more honey, on average?

In this example the top-bar hives achieved a higher average yield because harvesting from top-bar hives may be easier, with possibilities to take more care and not cause wastage.

Why did the beekeeper with local style hives make more profit?

Top-bar hives are expensive and the beekeeper who chose top-bar hives spent a greater proportion of earnings paying for additional hives.

Which hive type is better?

One type is not better than the other, they have different advantages and disadvantages.

It is possible to make a profit with local style or top-bar hives
Unit costs of materials and running costs
(examples October 2008)

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost / Yield</th>
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</thead>
<tbody>
<tr>
<td>Local style hive</td>
<td>UShs 6,000</td>
</tr>
<tr>
<td>Top-bar hive</td>
<td>UShs 45,000</td>
</tr>
<tr>
<td>Smoker</td>
<td>UShs 22,000</td>
</tr>
<tr>
<td>Bee suit</td>
<td>UShs 80,000 for one (UShs 40,000 each, sharing the cost)</td>
</tr>
<tr>
<td>Bucket</td>
<td>UShs 10,000</td>
</tr>
<tr>
<td>Average yield from colony in top-bar hive</td>
<td>12 kg per year</td>
</tr>
<tr>
<td>Average yield from colony in local style hive</td>
<td>8 kg per year</td>
</tr>
</tbody>
</table>

Calculating yield

In the examples shown on the next page, the honey yield is calculated assuming a hive colonisation rate of 80%.

Colonisation rate
This means the percentage of hives in an apiary which are occupied by honey bees. It is unusual to have 100% colonisation because African honey bees abscond easily if disturbed and also migrate in search of new forage.

Yield
This is the total number of hives in the apiary multiplied by the average annual honey yield per colony multiplied by 80%.

Four year averages
Bees are part of nature and seasonal and annual variations in yield are to be expected. Yield should be estimated by taking the average over several years. In the examples which follow, yield has been averaged over four years.

Example: Calculating annual yield for a beekeeper with 10 local style hives.

Annual yield $= 10 \text{ hives} \times 8 \text{ kg} \times 80\% = 64 \text{ kg}$
Projected profit and loss account for a farm beekeeping business using local style hives

<table>
<thead>
<tr>
<th>COSTS</th>
<th>year 1</th>
<th></th>
<th></th>
<th>year 2</th>
<th></th>
<th></th>
<th>year 3</th>
<th></th>
<th></th>
<th>year 4</th>
<th></th>
</tr>
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<tbody>
<tr>
<td></td>
<td>unit cost</td>
<td>No.</td>
<td>total cost</td>
<td>unit cost</td>
<td>No.</td>
<td>total cost</td>
<td>unit cost</td>
<td>No.</td>
<td>total cost</td>
<td>unit cost</td>
<td>No.</td>
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<td>5</td>
<td>30,000</td>
<td>6,000</td>
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<td>5</td>
<td>30,000</td>
<td>6,000</td>
<td>5</td>
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<td>smoker</td>
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<td>22,000</td>
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<tr>
<td>bee suit</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>other costs</td>
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<tr>
<td>total costs</td>
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<td>82,000</td>
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<td>kg</td>
<td></td>
<td>price per kg</td>
<td>kg</td>
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<td>price per kg</td>
<td>kg</td>
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<td>price per kg</td>
<td>kg</td>
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<td>2,500</td>
<td>32</td>
<td>80,000</td>
<td>2,500</td>
<td>64</td>
<td>160,000</td>
<td>2,500</td>
<td>96</td>
<td>240,000</td>
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<td>80,000</td>
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<td></td>
<td></td>
<td>260,000</td>
<td></td>
</tr>
</tbody>
</table>

Working out yield for each year

- **Year 1**: 5 hives x 8 kg per hive x 80% = 32 kg
- **Year 2**: 10 hives x 8 kg per hive x 80% = 64 kg
- **Year 3**: 15 hives x 8 kg per hive x 80% = 96 kg
- **Year 4**: 20 hives x 8 kg per hive x 80% = 128 kg

Total yield, 4 years = 320 kg
Total profit, 4 years = 498,000

All currency in Uganda shillings
Total number of hives after 4 years = 20
Projected profit and loss account for a farm beekeeping business using top-bar hives

<table>
<thead>
<tr>
<th>COSTS</th>
<th>year 1</th>
<th>unit cost</th>
<th>No.</th>
<th>total cost</th>
<th>year 2</th>
<th>unit cost</th>
<th>No.</th>
<th>total cost</th>
<th>year 3</th>
<th>unit cost</th>
<th>No.</th>
<th>total cost</th>
<th>year 4</th>
<th>unit cost</th>
<th>No.</th>
<th>total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>top-bar hive</td>
<td>45,000</td>
<td>5</td>
<td>225,000</td>
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<td>45,000</td>
<td>3</td>
<td>135,000</td>
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<td>45,000</td>
<td>2</td>
<td>90,000</td>
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<td>45,000</td>
<td>2</td>
<td>90,000</td>
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<td></td>
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<tr>
<td>buckets</td>
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<td>20,000</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>sale of honey</td>
<td>2,500</td>
<td>48</td>
<td>120,000</td>
<td></td>
<td>2,500</td>
<td>77</td>
<td>192,000</td>
<td></td>
<td>2,500</td>
<td>96</td>
<td>240,000</td>
<td></td>
<td>2,500</td>
<td>115</td>
<td>288,000</td>
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<td></td>
<td>240,000</td>
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<td></td>
<td></td>
<td>288,000</td>
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<tr>
<td>PROFIT</td>
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<td>-157,000</td>
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<td></td>
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<td>-13,000</td>
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<td></td>
<td></td>
<td>120,000</td>
<td></td>
<td></td>
<td></td>
<td>168,000</td>
</tr>
</tbody>
</table>

Working out yield for each year

<table>
<thead>
<tr>
<th>Year</th>
<th>Hives</th>
<th>Kg per hive</th>
<th>Total Kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>5</td>
<td>12 x 80%</td>
<td>48</td>
</tr>
<tr>
<td>Year 2</td>
<td>8</td>
<td>12 x 80%</td>
<td>77</td>
</tr>
<tr>
<td>Year 3</td>
<td>10</td>
<td>12 x 80%</td>
<td>96</td>
</tr>
<tr>
<td>Year 4</td>
<td>12</td>
<td>12 x 80%</td>
<td>115</td>
</tr>
</tbody>
</table>

Total yield, 4 years: 336 kg
Total profit, 4 years: 118,000

All currency in Uganda shillings
Total number of hives after 4 years: 12
ANNEX 2 RUNNING A COLLECTION CENTRE AS A BUSINESS

An example profit and loss account is shown opposite, for a collection centre run by a beekeepers’ marketing group. During honey harvest season the collection centre is open for business and beekeepers bring comb honey to sell at the centre. After the produce has been graded, checked, weighed and recorded, the combs are processed into liquid honey and wax cakes. The liquid honey is stored in drums for onward, wholesale sale.

The centre is a small building with basic but good equipment. It is open for about six months of the year. The costs of establishment were covered by a grant. The running costs comprise staff, maintenance, water and electricity bills.

The marketing group have calculated that to maintain the collection centre, replace broken equipment and employ the necessary staff

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost / No. / Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>no. of 30 kg buckets of comb honey delivered</td>
<td>330</td>
</tr>
<tr>
<td>no. of kg of comb honey delivered</td>
<td>9,900 kg</td>
</tr>
<tr>
<td>cost of one 30kg bucket of comb honey</td>
<td>UShs 75,000</td>
</tr>
<tr>
<td>yield per 30 kg bucket of comb honey</td>
<td>2 kg wax, 25 kg honey, 3 kg waste</td>
</tr>
<tr>
<td>total wax yield</td>
<td>660 kg</td>
</tr>
<tr>
<td>total honey yield (liquid)</td>
<td>8,250 kg</td>
</tr>
<tr>
<td>selling price per 1kg wax</td>
<td>UShs 10,000</td>
</tr>
<tr>
<td>buying price per 1kg comb honey</td>
<td>UShs 2,500</td>
</tr>
<tr>
<td>selling price per 1kg liquid honey</td>
<td>UShs 3,500</td>
</tr>
<tr>
<td>fixed costs per year (bills, management, book keeper, repairs, buckets, meetings)</td>
<td>UShs 6,000,000</td>
</tr>
<tr>
<td>casual labour (2 people for 6 months at UShs 100,000 per month)</td>
<td>UShs 1,200,000</td>
</tr>
</tbody>
</table>
including a book-keeper, they need to buy at least 10 tonnes of honey per year.

The marketing group

The marketing group is made up of 35 beekeepers, each harvesting 100-300kg of honey per year. The members deliver about six tonnes of honey to the centre and they buy an additional four tonnes from other beekeepers. The marketing group meets regularly and has elected a chairperson and committee.

Outcome

After the collection centre was established, every year more beekeepers realised that it offered a reliable market. A number of beekeepers decided to increase their levels of harvest.

Accurate book-keeping is essential for running an efficient collection centre

Example profit and loss account for one year of a commercial collection centre

<table>
<thead>
<tr>
<th>COSTS</th>
<th>Cost in UShs</th>
<th>No.</th>
<th>total in UShs</th>
</tr>
</thead>
<tbody>
<tr>
<td>buckets of honey</td>
<td>75,000</td>
<td>330</td>
<td>24,750,000</td>
</tr>
<tr>
<td>casual labourer (6 months)</td>
<td>600,000</td>
<td>2</td>
<td>1,200,000</td>
</tr>
<tr>
<td>fixed costs</td>
<td></td>
<td></td>
<td>6,000,000</td>
</tr>
<tr>
<td>total costs</td>
<td></td>
<td></td>
<td>31,950,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INCOME</th>
<th>price per kg, in UShs</th>
<th>kg</th>
<th>total in UShs</th>
</tr>
</thead>
<tbody>
<tr>
<td>bulk honey</td>
<td>3,500</td>
<td>8,250</td>
<td>28,875,000</td>
</tr>
<tr>
<td>wax</td>
<td>10,000</td>
<td>660</td>
<td>6,600,000</td>
</tr>
<tr>
<td>total income</td>
<td></td>
<td></td>
<td>35,475,000</td>
</tr>
</tbody>
</table>

TOTAL PROFIT

3,525,000
ANNEX 3 GLOSSARY OF TERMS

Absconding Absconding occurs when all adult honey bees abandon their nest, perhaps after the colony is disturbed by ants or humans.

Apis mellifera The honey bee species indigenous to Africa, Europe and the Middle East. Widely introduced to other areas including the Americas, Asia, Australasia and the Pacific.

Appropriate hive A hive that is technologically appropriate to the resources (for example materials, human skills, bee species) available.

Beeswax Wax produced by honey bees (secreted by special glands on the underside of the abdomen) and used to build comb.

Collection centre Place where many buckets or jerry cans of honey are brought by beekeepers to achieve a larger volume of honey or beeswax for onward sale to a buyer.

Colony Honey bees are social insects. Each honey bee can live only as part of a colony and not individually. Each colony of honey bees contains one queen bee who is the female parent of the colony, a few hundred drone bees and thousands of worker bees.

Comb The wax structure made of hexagonal cells in which honey bees rear young and store food.

Economy of scale As the scale of an operation increases the cost per unit of production falls. This is achieved because large scale operations can achieve operational efficiency and overhead costs can be spread across many units.

Frame A wooden rectangular frame that holds a sheet of wax foundation. A number of frames hang parallel to one another inside a frame hive.
### Frame hive (movable frame hive)
A hive that contains movable frames. The honey bees build their comb within these frames. The frames enable combs to be lifted from the hive for examination, and allow for the empty comb to be returned to the hive after extraction. Frames can be placed in specially designed centrifugal extractors to extract the honey.

### Hive
Any container provided by humans for bees to nest in.

### Honey
Nectar or plant sap ingested by bees, concentrated by them and stored in combs.

### Honey marketing group
Group of beekeepers who decide to work together for the purpose of marketing their honey collectively.

### Honey hunting
Plundering wild bee colonies for their honey.

### Local style hive
These hives are usually simple containers made from locally available materials. The bees attach their combs to the ceiling and walls of the hives, and the beekeeper must cut honey comb to remove it. Such hives are sometimes called fixed comb hives.

### Migration
Seasonal movements of whole honey bee colonies, leaving no brood behind in the nest.

### Nectar
A sweet liquid secreted by flowers, a watery solution of various sugars.

### Nest
The home of a bee colony where they live on their combs.

### Table honey
Honey of high quality, marketed in jars and sold for home use.

### Transaction cost
The cost incurred in making a transaction involving the selling or buying of produce, e.g. costs of negotiating, procuring, waiting.

### Top-bar
The piece of wood under which honey bees suspend their comb in top-bar hives.

### Top-bar hive
A hive containing top-bars (as opposed to a frame hive, or a fixed comb hive). The use of top-bars enables combs to be lifted easily from the hive for inspection, or to harvest honey.
Further reading


References


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