



Situation Analysis of Beekeeping Industry



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Africa's Renewal

Situation Analysis of the Beekeeping Industry in Botswana, Lesotho, Malawi, Mozambique, South Africa, Swaziland, Zambia and Zimbabwe

Following a market study of the honey industry in Southern Africa (South Africa, Zimbabwe, Botswana, Malawi, Swaziland, Zambia, Lesotho, Mozambique), it was established that (a) the region has vast potential for honey production which currently is under-exploited, (b) all the countries in the region (except Zambia) are net honey importers, (c) despite the potential most of the honey is exported from outside Africa with South Africa importing and exporting to the other countries in the region, (d) the organization of beekeepers is weak and has to be strengthened. Table 1 below indicates honey production and consumption in the region among other honey production aspects. Following the table are the situational analyses of beekeeping in each of the seven countries selected.

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1. SITUATIONAL ANALYSIS OF THE BEEKEEPING INDUSTRY IN BOTSWANA

1.0 Introduction

In the last 40 years, Botswana's economy has shifted greatly from being dependent on agriculture, which then accounted for 40 % of GDP. Today agriculture contributes a meagre 3 % to GDP, with the dominant contributors being mining (42 %) and services (55 %). The decline in the agriculture sector was a result of the dramatic growth of other sectors of the economy, and also the rather dormant growth of the agricultural sector itself. Despite its low contribution to GDP, agriculture still remains an important source of livelihood in rural Botswana.

Some of the reasons for the poor performance of the agriculture sector include: poor soils and erratic rainfall, poor management practices, lack of access to and adoption of technology, lack of diversification, water unavailability, high fuel costs and poor physical infrastructure in production areas.

Despite the stagnant growth of the agriculture sector since independence, government has and continues to invest heavily in agricultural activities. During most of the 1970's and 1980's governmental support was mainly geared at pursuing the objective of food self sufficiency. Support instruments during these periods included input subsidies, and grant schemes. Most of these programmes were however supporting traditional activities such as cattle and small stock farming, as well as arable farming.

However, during the 1980's government began to strengthen support towards the development of non-traditional farming activities such as horticulture, dairy, piggery, poultry production, and beekeeping. One notable programme, which provided substantial support towards the development of non-traditional enterprises, was the Financial Assistance Policy (FAP), which operated during the 1982-2000 period. Its aim was to diversify the economy into activities other than cattle production, mining and the public sector, and to promote income generation, employment creation, import substitution and production for the export market (Molokomme, 1992). FAP provided grants to entrepreneurs for the establishment of projects, which promoted these objectives.

Through the FAP scheme, hundreds of farmers received grants to start beekeeping projects. At the start of FAP, there were only 12 beekeeping projects nationwide. Today there are approximately 500 bee farmers in the country. The Government of Botswana on realising the potential that

beekeeping has, has recently commissioned a feasibility study whose aim is to develop a commercialisation strategy for the beekeeping industry in Botswana. This work is underway and it is expected to be completed in the next 5 months. Specific objectives of this study are: (1) To assess and determine the appropriate beekeeping technology and management practices that could be applied to enhance production levels of the farming community; (2) Promote a sustainable and competitive beekeeping industry.

2.0 Production

2.1 Characteristics of producers

Botswana are traditionally honey hunters. Domestic beekeeping only started in the last 30 years with the aim of diversifying Botswana's vibrant economy, which is dominated by minerals. Many of the beekeeping projects are managed by groups, while only a few are individually owned. On average producers keep only one colony of bees at a time. Beekeeping is advantageous for rural livelihoods as production costs are low and also one does not necessarily need to own land for this practice.

In the last 5 years, the Ministry of Agriculture has trained about 1000 people in beekeeping, but only 500 are actually engaged. This drive shows the Ministry of Agriculture's commitment to the diversification strategy as outlined in the National Development Plan 9.

2.2 Production costs

The two hive types, which are in use in Botswana, are the Tanzanian top bar hive and the modern Langstroth hive. The Langstroth hive allows for honey to be extracted from the combs without breaking the combs. As a result, bees require less time to refill the combs. Also, in comparison to the top bar hive, the modern Langstroth hive produces more liquid honey than the top bar hive.

With regard to cost of production, on average the Tanzanian top bar hive costs P250.00 (US\$50) while the modern Langstroth hive costs P300 (US\$60). Both these types of hives are produced locally. Maintenance costs are reasonably low at P50.00 (US\$ 10) per year for paints, glue, nails, etc. Other costs relate to protective clothing (overall, boots, gloves and bee

veils), and equipment like smokers, honey containers, strainers, hive tools, honey extractors and kitchen scales.

There is also a cost relating to feeding bees during the dearth period (when there is little or no nectar and pollen for the bees to forage). During this period, weak colonies are provided with sugar syrup or skim milk. Water is also provided to cool the hives if temperatures are high.

2.3 Production levels

Production levels of honey have grown significantly in the last 20 years. Through training and mentoring received from the Ministry of Agriculture, average yield per hive has grown from below 5 kg in the 1980's to 15 kg per hive in 2000, and a remarkable 20 kg per hive in the 2004 season in isolated cases (Beekeeping annual reports 1999-2004). Table 1 below shows annual production levels of honey in the 6 agricultural regions. On average, Botswana produces five tons of natural honey per annum.

Table 1: Production levels of honey in 2004/05 and 2005/06 seasons

Region	Production in 2004/2005 (kg)	Production in 2005/2006 (kg)
Gaborone	1594	1336
Central	1465	1430
Southern	983	1082
Western	924	1092
North West	200	263
Francistown	367	131
Total national production (kg)	5533	5334

Usually, harvesting is carried out twice a year. However in exceptionally good forage years, harvesting can be done three times.

2.3 Production constraints

- One of the most prevalent problems faced by bee farmers in Botswana is that of absconding colonies. Several causes have been identified, and these include: invasion by ants and hive beetles, animal disturbance, effects of drought, lack of proper bee management, bee

pirate invasion, and human disturbance. Most of these however can be minimised by strengthening management practices.

- Another key constraint is that beekeepers are not able to access lucrative markets. This is due to their fragmented production units, which makes collective action in input acquisition, production planning and output marketing difficult.
- Low production efficiency.
- Inadequate infrastructure.

2.4 Benefits brought about by beekeeping

- Beekeeping is of vital importance in rebuilding and kick starting rural economic activity, especially that of women and youth. An enhanced economic activity would address socio-economic problems such as HIV/Aids, unemployment and poverty.
- In beekeeping, a diverse range of by-products is produced apart from the main product – honey. These are beeswax, propolis, royal jelly and bee venom. These products are not only rich in carbohydrates, proteins and vitamins, but also have medicinal (healing) properties.
- In arable farming, bees are also known to improve crop yields through increased efficiency in pollination.
- Beekeeping diversifies agriculture as it can be integrated with other agricultural activities like arable and pastoral farming, as well as agro forestry. Furthermore, bees do not compete for resources with other agricultural enterprises. Bees obtain their food from the wild, cultivated and wasteland areas.

3.0 Marketing

All of the domestic produced honey is marketed locally. As mentioned earlier, production is generally low with average outputs of 5 kg per hive. Economies of scale remain a key issue to address, as it affects the marketing of honey and its by-products. Honey is usually sold to individuals through price negotiations. Most of the honey is sold in raw form, with minimum packaging. The packaging consists of food trays, covered with a clear plastic. Other farmers sell liquid honey in bottles. Prices for comb honey

range between P30.00 and P40.00 per kg; bottle honey costs between P20.00 and P30.00 per kg; and beeswax costs between P15.00 and P30.00 per kg. Producers near towns and cities do not experience any marketing constraints. However, those in rural areas have a challenge of bringing their produce to towns and cities for marketing. The question of transport becomes an issue. Another constraint is with regard to pricing the commodity. In villages, consumers view P40.00 per kg of comb honey as being too expensive, while that is the normal selling price in urban areas. Therefore, producers are often forced to travel long distances to market their produce in urban areas.

4.0 Imports

Secondary data suggests that Botswana depends heavily on imports to meet its requirements of natural honey and other by-products of beekeeping. Therefore, there is room for the local market to absorb an expansion in honey production, through import substitution. Table 2 below depicts quantities of natural honey imported from South Africa and other countries between 2001 and 2004. These figures may be lower than the actual imported quantities as not all people follow the formal procedure of obtaining import permits prior to importing honey.

Table 2: Main sources of imported honey 2001-2004

Country	Tonnes of honey imported			
	2001	2002	2003	2004
South Africa	12,904	67,922	81,663	91,952
Zambia	164	-	-	-
Zimbabwe	-	19,240	-	-
Germany		185	490	
Total imported honey	13,703	87,348	82,186	91,953

Source: Central Statistics Office reports

Countries exporting less than 10 tonnes of honey per annum to Botswana have been excluded from Table 2. Table 2 shows that South Africa is the main source of honey consumed in Botswana. However there are other countries that occasionally export honey to Botswana, and these are: Zambia, Zimbabwe and Germany. The amount of imported honey has had a significant positive growth between 2001 and 2004.

Table 3: Pula value of imported honey 2001-2004

<i>Year</i>	Quantity (Tonnes)	Value (Pula)
2001	13, 703	377, 759
2002	87, 348	562, 409
2003	82, 186	847, 981
2004	91, 953	923, 565

Table 3 shows that the Pula value of imported honey has trebled in the last five years. This relates to a substantial increase in honey consumption. This escalation is partly attributed to the rise in awareness of improved nutrition in the fight against HIV/Aids. Natural foods have become popular as they mitigate the adverse effects of the pandemic.

5.0 Producer associations

Currently, bee farmers in Botswana have not established any producer associations. Training is being provided by Ministry of Agriculture to guide farmers into forming producer associations. It is envisaged that district associations will be formed first, and these will merge to form regional agricultural associations. At national level, the regional associations will come together to form the Botswana Beekeepers Association.

At the moment, Mahalapye sub-district in the central region is at an advanced stage of registering a bee farmers association. Other districts are expected to follow in due course.

6.0 Conclusion

Beekeeping is still at infancy stage in Botswana, with very few farmers (about 500) actively engaged in this activity. Production levels are increasing in response to training being provided by the Ministry of Agriculture. Viability of beekeeping projects has been proved and this will contribute immensely in the fight against rural unemployment, which in some areas is estimated at 60 %. The role of beekeeping in attaining healthy socio-economic livelihoods cannot be over-emphasised. Like all agricultural endeavours, beekeeping has its own challenges and constraints. Most of these setbacks pertain to management practices and so can be dealt with.

2. SITUATIONAL ANALYSIS OF BEEKEEPING INDUSTRY IN LESOTHO

1 Introduction

Beekeeping activity had been started as early as November 1990 in Lesotho. It has been considered as potential source of commercial honey and also contributes to the protection of the environment and agricultural production through the pollination action of bees. Due to its potential Soil and Water Conservation Programme (SWaCAP) started up a pilot project in 1992, which included four or five households in each district. Although apiculture seems to be of importance in Lesotho its progress has been little because of the shortage of bee colonies in the country. The rural communities when collecting honey from the natural habitats of bees have destroyed most of the colonies.

2. Beekeeping

2.1 Site selection

The present situation is that the prospective beekeeper should consult with the Extension Officers in order to ensure that the site is suitable. The requirements for an ideal apiary site include a Northern or Eastern slope, good air drainage, availability of water for the bees. The siting of the apiary must also ensure enough natural nectar, honeydew and pollen for bees. It should be such that, within a radius of 3 km from the apiary site, nectar and pollen sources consist essentially of organically produced crops or spontaneous vegetation.

2.2 Equipment used in beekeeping

- **Bee- hives:** A set of wooden boxes filled with frames that each holds a sheet of wax.

- **Smoker:** A device designed to produce incomplete combustion of fuel. The bees appear to be calmed with a puff of smoke.
- **Bee veil:** A neck and shoulder cover that protects a farmer from bees.
- **Hive tool:** A piece of equipment designed to aid in opening up hives and by facilitating the removal of frames during inspection.
- **Bee Brush:** For brushing the bees off the frame.
- **Hand Cloves:** Part of the protective clothing
- **Gum Boots:** Part of the protective clothing

2.3 Procurement of bees

The present situation is that the bee industry is still at an infant stage so there is no reliable source where prospective beekeepers can purchase colonies of bees with a mated queen. And that being the case farmers have to search where they can acquire bees. The easiest way that they use is to catch a swam cluster, if one is available. So the prospective beekeeper must not delay when s/he sees a swam clustering otherwise s/he will likely lose it.

A bee- hive is used to collect the bees. Some people shake the bees from the cluster on the branch into the bee- hive and in that activity they should ensure that a queen has not been left out. In other cases the bees are attracted into the hives by using the bee wax. The farmers are trained on how to collect the bees from the wild colonies (trees, caves, holes).

2.4 Feeding

Beekeepers in Lesotho do not practice artificial feeding of colonies. This is due to the fact that they produce organic honey that is believed to be of good quality. At the end of the production season, hives must be left with reserves

of honey and pollen sufficiently abundant to survive the winter. Though the majority of the farmers do not advocate artificial feeding, there are still few individual beekeepers supplementing their bees only between the last honey harvest and 15 days before the start of the next nectar or honeydew flow.

2.5 Honey production costs

The major costs of honey production are the start-up costs. These include boxes, bee hive, and protective clothing. Currently the inputs used in starting honey production are all imported from the Republic of South Africa. The following table shows the start-up costs of producing honey in one box:

Table 2: Honey production costs in Lesotho

Item	Cost (Maloti)
Bee hive	490.00
Bee brush	49.00
Bees wax foundation	74.00
Bee gloves	39.00
Bee overalls	124.00
Rubber boots	65.00
Veil	90.00
Smoker (small)	205.00
Honey bottles (24)	54.00

2.6 Distribution of beekeepers

Lesotho is divided into four agro-ecological zones these being the Lowlands, Foothills, Mountains and the Senqu (Orange) River Valley. Beekeeping in is mainly concentrated in Lowlands especially the northern and central districts. The northern districts consist of Botha Bothe and Leribe while central districts consist of Maseru and Berea (Table 1). This skewed

distribution of beekeepers in the country is due to previous attempts which concentrated in these districts. The Beekeeping Section of the Ministry of Forestry and Land Reclamation is expanding its services to the southern and mountain districts. The average number of hives per farmer is around one. Honey producers in Mafeteng and Mochales Hoek on average have two hives with the other districts having an average of one hive.

Table 1: Distribution of beekeepers in Lesotho

District	Number of Farmers	Number of Hives
Botha Bothe	25	31
Leribe	79	85
Berea	48	77
Maseru	64	100
Mafeteng	33	77
Mochales Hoek	2	6
Qachas Nek	Under piloting	1
Mokhotlong	Under piloting	1

Source: Beekeeping Section, Ministry of Forestry and Land Reclamation.

In Quthing and Thaba Tseka districts training of trainers has been done and plans are underway to start piloting activities.

2.7 Government Support Services

Government support service to beekeeping industry in the country is through the Beekeeping Section of the Ministry of Forestry and Land Reclamation (MFLR). Currently the Beekeeping Section is manned by two people; the Head of the Section and Conservation Officer. The Section supports the beekeeping industry by training of prospective honey producers, assisting in the importation of production inputs, assisting in the extraction of honey as

well as finding markets for honey. The Section also assists in bee removals and elimination of destructive colonies. It also assists honey producers to source donor funds.

2.8 Development Projects

The Lesotho Highlands Water Development Project (LHWDP) supports several farmers around the ‘Muela Hydroelectric Plant in Botha Bothe district. The project work very closely with the Beekeeping Section of MFLR. The Send Me a Cow Stock Aid Project located in Morija in the Maseru district also supports 7 beekeepers. The beekeepers at Morija were given training on beekeeping by the Beekeeping Section of MFLR. The Section also supplied the beekeepers with production inputs and bees.

2.9 Producer Associations

The Lesotho Beekeepers Association (LBA) is supposed to be the umbrella beekeepers’ organization in the country. LBA mostly consist of beekeepers from Leribe District and most of the members of the Executive Committee come from the same district. Beekeepers from other districts seem not to be aware of the existence of LBA. LBA was established in 2002 and is registered under the Societies Act of 1966 (Registration No. 2002/135). The objective of LBA is to eradicate poverty by promoting honey production in the country. Annual membership fee is M50.00. The Executive Committee consists of 11 members and their term of office is 2 years. The founding Executive Committee is still holding office as there has never been a General Assembly/Annual General Meeting to elect new office bearers. The current Executive Committee of LBA stands as follows:

‘Maphilipi Phamotse	-Chairperson
Makopela Ntsane	-Deputy Chairperson
‘Mankhotha Fokane	- Secretary

Litsitso Sekamane	-Treasurer
‘Matebello Mpobole	-Member
Axinia Machobane	-Member
Nancy Marathane	-Member
‘Makhefu Ramaema	-Member
‘Mataoana Matooane	-Member
‘Mathapelo Lekhula	-Member

One member is deceased.

Currently the LBA Executive Committee as well as the association are inactive. Members of the Executive Committee cannot even remember when they last met. The current membership is not known. One major problem facing the association is non-payment of the annual membership fee by members. The other problem is non-attendance of meetings by members.

The other active beekeepers’ association is Women for All Seasons (WAS). WAS is made up of retired professional women who are on pension (Senior Citizens). The association was started in 2001 with the objective of contributing to economic development of the country as well as eradicating poverty. WAS is registered under the Societies Act of 1966. It started with 35 members and currently has 10 members. Registration fee is M50.00 and annual membership fee is M50.00. WAS meets every Tuesday at 1.00 p.m at Naledi Chambers, Maseru. The current Executive Committee is as follows:

T. Chimombe	-President
M. Maphasa	-Vice President
M. Ntsane	-Secretary
M. Mosala	-Vice Secretary
M. Khechane	-Treasurer

M. Matete	-Publicity Officer
M. Lets'oara	-Member
M. Lebotsa	-Member
M. Khali	-Member
M. Tsepene	-Member
M. Lebeko	-Advisor

Women for All Season started with each member contributing M500.00. The also engaged in fundraising activities like selling sandwiches, raffle, etc. The money was used to purchase bee hive from the RSA. The bee hives were located at Roma but were vandalized by herdboys. The remaining hives were relocated to Ha Foso where there were also vandalized. The association was given a boost by the Church of Christ of the Latter Day Saints with a donation of 100 bee hives and honey extractor. The hives were located at Qeme where some were washed by floods. The association has several hives under storage while the honey extractor has never been utilized. The association harvested honey once which was sold to members at M20.00 per bottle. WAS is currently looking for two sites. The first site is going to be used to build a beekeeping training centre and the second site is for beekeeping. Members of the association will be going to RSA soon for training on beekeeping.

The major problems faced by WAS include the following:

- ✓ A large number of members have lost interest in beekeeping such that they don't pay annual membership fees and do not attend meetings
- ✓ Some members of the Executive Committee have lost interest in beekeeping

- ✓ Lack of knowledge about beekeeping. For instance they have the equipment but do not know how to use it, e.g. the honey extractor has never been used.
- ✓ The Beekeeping Section of the Ministry of Forestry and Land Reclamation competes with WAS in some activities.

Members of WAS feel if they can be given thorough training on beekeeping, honey processing and honey marketing most of their problems can be solved.

3. Marketing of honey

3.1 Honey crop harvesting

Mostly beekeepers become remotely interested in their bees when it is time to harvest the crop, and they wonder why their yields are sometimes low. The other reason contributing to low yields is drought. In order to solve the problem the beekeeping Extension Office is currently training the beekeepers and the emphasis is on how to increase honey production in the country. In order to produce a good crop honey a beekeeper must see to it that a colony has a good queen, there is sufficient food reserves, sufficient field bees and adequate space for brooding.

A smoker is used to calm the bees during harvesting. Harvesting is done on a quarterly basis. The majority of farmers harvest three times in a year, which is from September to March but this, depends on the amount of vegetation like *eucalyptus tree* species. One box/bee- hive of bees can produce 20 bottles (500ml) of honey per harvest. The beekeepers harvest their honey when there is a thin layer of wax forming a seal on honey. When harvesting, some of the honey is left in the hives as a reserve food for the bees in the off- season period.

3.2 Processing of honey

The harvesting of honey involves extracting the honey from the combs. The extraction of is done by a mechanical extractor or manually. During

extraction farmers make sure that they do not extract combs with broods. In Lesotho honey in most cases is extracted manually using a cloth and hands. Some farmers in the Leribe district extract the honey manually by squeezing the combs through the white cloth. There is only one farmer located in Maseru (Maqalika) who owns an extractor. The Beekeeping Section of the Ministry of Forestry and Land Reclamation usually assists producers by transporting the honey combs from producers' homes/farms to the producer who has an extractor. The producer with an extractor does not charge any fees for extracting the honey. Women for All Seasons Association has a honey extractor which has never been used. Honey is stored in the bottles (500grammes) and sold direct to consumers.

3.3 Returns from honey production

There are three honey productive seasons in the bees' community a year in Lesotho. This means a beekeeper harvests three times from each bee hive. Beekeeping has minimal operating costs. Currently each box yields 10kg of honey per harvest. The 10kg of honey is sold for M200.00 which means 1kg of honey sells for M20.00. This means in a year the returns from beekeeping in Lesotho per box are M600.00 ($M200 \times 1 \text{ bee hive} \times 3 \text{ harvests}$). Currently there are 378 bee hives in the country which are expected to yield around 4,000 kg of honey per harvest. This means the total production in a year in the country is expected to be 12,000 kg amounting to M240,000.00.

3.4 Marketing channels

The marketing of honey in Lesotho is very informal. Beekeepers market honey through informal channels. Farmers market honey direct to consumers. The consumers of honey include individuals and chemists. The major buyers of honey in Maseru are the Husted's Chemist and Allied

Chemist. The chemists complain that they wish to purchase honey from locally but the supply is usually not enough and is very irregular.

3.5 Honey Consumption

Statistics of honey consumption in Lesotho are scanty. Most of the honey consumed in Lesotho is imported from the RSA. Table 3 below shows the value of honey imported into from the RSA. It is evident from the Table that honey consumption is increasing in Lesotho. The major consumer of honey in Lesotho is the Lesotho Pharmaceutical Company (LPC) located in Mafeteng. LPC manufactures essential generic drugs for local consumption and export. The honey imported by LPC is mainly used in the manufacturing of medicines. Chemists, Shoprite Checkers Supermarkets and Fruits and Vegetable City also import honey from the RSA. This clearly shows that honey production in the country is far from meeting the local demand.

Table3: Lesotho Imports of Honey (Maloti)

Year	Value
1993	34,000
1996	50,000
1997	90,000
1998	100,000

1999	150,000
2000	287,535
2003	300,000

Source: Bureau of Statistics Annual Yearbooks and Trade Statistics

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3. SITUATION ANALYSIS OF BEEKEEPING IN MALAWI

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1. INTRODUCTION

The Malawi economy is based on agriculture, which is responsible for more than 90 %, by value of export earnings with tobacco, sugar and tea as the main contributors to foreign exchange. Other crops of importance to the Malawi economy are macadamia nuts, cut flowers and foliage, chillies, natural rubber, groundnuts, coffee, pulses, cassava, sweet potatoes, rice, sorghum and millet etc. Some of these commodities are currently being exported albeit in lower volumes but have potential of being developed into important foreign export products for Malawi.

The agricultural sector in Malawi contributes over 38% to the country's Gross Domestic Product (GDP) and is also the largest employer in the country, constituting over 85% of total employment. The sector is also a big supplier of raw materials to the manufacturing sector especially the agro processing sub-sector.

Malawi has a very small manufacturing sector which contributes about 13% to the GDP of the country with the major manufacturing activity being agro – processing composed of mainly sugar production, rice milling and processing of pulses (Dhal), cotton, natural rubber, tea, groundnuts and tobacco.

However, the contribution to GDP by the manufacturing sector has declined from MK1.7 billion in 1998 to MK1.4 billion in 2002. This is attributed to the decline (and in some cases closure) in the number of both private and public companies engaged in various manufacturing activities in food

processing, clothing, leather and footwear, packaging, printing and publishing, chemicals and fertilizers, pharmaceuticals, paints and soaps, machinery and motor vehicle assembly. The major factors that contributed to the poor performance of the manufacturing sector have been macro-economic instability, low skilled labour, high illiteracy rate, stiff competition from cheap imports, high cost of transport (since Malawi is land locked) and low endowment of natural resources and raw materials.

Other sectors with some significant contribution to the GDP in Malawi are Electricity and Water (3%), Construction (4%), Distribution (11%), Transport and Communication (5%), Financial and Professional services (6.5%), Private, Social and Community Services (6.5%) and Government Services (4%).

3.2 Bee Keeping Sector

Bee Keeping, also known as Apiculture, is the art, science and / or business of managing honey bees (*Apis Mellifera Scutellata*) ⁽¹⁾ for the purpose of producing honey, beeswax and other bee products for personal consumption and industrial use. Since Malawi's economy is dependent on agriculture as explained above it follows that the role played by bees in pollinating crops is very crucial. In addition the majority of people involved in agricultural production in Malawi are poor and live in the rural areas where large tracts of forests are found. In this regard the Government of Malawi has adopted poverty reduction as one of its development strategy, and apiculture is one of the industries that are being promoted in the rural areas to improve off farm incomes and employment. The apiculture industry provides the much-needed diversification in the agricultural production base. It is also an

activity that can be done by anybody whether female or male, young or old (as long as there is a will and strength) or in deed by people of any profession. It is therefore imperative that efforts to encourage beekeeping in Malawi should be supported and encouraged.

Bee Keeping in Malawi is a traditional part time occupation practiced throughout the country especially in natural forest reserves and around large mountains such as Mulanje and Dedza by the rural people. Some companies and individuals who own estates and plantations such as rubber, macadamia and coffee also carryout beekeeping. Other requirements of successful bee keeping are presence of water supply, safety from pests and predators and away from excessive sunlight, extreme moisture and winds.

Bee Keeping, being a forest based activity, it is practiced under the purview of the Department of Parks and Wildlife and is affected by the policies of this department especially with regards to access to national parks and forest reserves.

2. Products

a) Honey

Honey is the main product produced out of beekeeping activity in Malawi. It is a natural sweetener that is widely used in the food, beverage, bakery and pharmaceutical industries.

b) Beeswax

One by-product out of bee keeping but not yet produced in Malawi in large quantities is Bees Wax. It has a lot of industrial uses particularly in the manufacturing of cosmetics, candles, polishes and pharmaceuticals. In 2003 some 6 metric tons of bees wax was imported into Malawi from South Africa (6mt) and India (2mt).

c) Other beekeeping by – products are ⁽²⁾:

- 1) **Propolis** used in the manufacturing of antibiotics. Bee Keepers often use this product to seal unwanted gaps in the beehives and attracting bees to new beehives.
- 2) **Bee Venom** is not produced in Malawi but has potential for use as treatment for various ailments and for treating bee allergies.
- 3) **Royal Jelly** is produced by worker bees but not produced in Malawi. The product has potential use in the cosmetic industry.
- 4) **Bee Brood** is the developmental stages of bees, which is a rich source of proteins. It is a delicacy for some tribes in Malawi but if bee brood is ‘over-harvested’, or seriously damaged during honey harvesting the swarm may abscond, or through swarm reduction result in low honey production.

3. Standards of Honey

Honey produced in Malawi is supposed to be subjected to testing to ensure that it meets the prescribed quality standards by the Malawi Bureau of Standards (MBS). However, a standard for honey was developed and implemented in 2003 by MBS using the COMESA treaty which calls for

harmonization of standards among member states aimed at facilitating trade among member states by the removal of tariffs and non – tariff barriers to trade. Inspection is usually arranged at the initiative of the producer who is also required to pay a cess for the services and issue of mark and certificate of quality. Unfortunately this does not often happen because the MBS is thin on the ground in terms of funds and technical personnel. As a result most honey produced in Malawi is not tested by the MBS unless if the honey is for export. Therefore the current situation is that almost all branded and informally sold honey is not inspected by MBS.

3.3.1 Standard Specifications

The following are some of the factors that are taken into account by the MBS to ascertain that the product is of good quality and that it meets the prescribed standard:⁽³⁾

a) Quality Factors

- Purity. Honey should not contain any additives; be it food or non-food additives.
- Honey shall not be heated at any stage of processing.
- Moisture content: $\leq 20\%$ (foreign importers usually demand a maximum of 18%)

b) Sugar Content:

- Fructose + glucose: $\geq 60\text{g}/100\text{g}$
Honeydew honey or blends of honeydew with blossom (nectar)
honey: $\geq 45\text{g}/100\text{g}$

- Sucrose: Lavender, Borage $\leq 15\text{g}/100\text{g}$
Alfalfa, Citrus Acacia, honey suckle, M. Banksia, Red Gum, Leather wood $\leq 10\text{g}/100\text{g}$. Others: $\leq 5\text{g}/100\text{g}$

c) Water Insoluble Solids

- Pressed Honey $\leq 0.5\text{g}/100\text{g}$
- Honey other than pressed honey $\leq 0.1\text{g}/100\text{g}$

d) Contaminants:

- Honey to be free of contaminants like heavy metals and pesticide residues. To comply with maximum residue limits as set by the codex Alimentarius Commission.

e) Hygiene:

- To observe rules of hygiene during packing: clean packing area, packers to wash hands and wear gloves, all utensils to be washed and well dried before being used, avoid leaking fingers, and jars to be clean and dust free.
- Packing room to have insect proof windows by fitting wire mesh.

f) Labelling:

All the jars should be labeled accordingly. Information on labels to include name of product (in this case honey), name and address of packer, quantity of honey in the jar, country of origin, date of minimum durability preceded by the words 'Best Before' and batch number. For easy and convenient handling and transportation, the jars should either be shrink-wrapped or

packed in cartons. Cartons should also be labeled and in addition to general information on the label cartons should also show number of units it contains as illustrated in the example below:

Eco Products Honey	
Packed by Eco Products	
Mzuzu Factory	
P.O. Box 001	
Mzuzu.	
Malawi	
20 x 280g	
Batch ec/09	Best Before 03/2007

HMF (Hydroxymethylfurfural) Value $\leq 80\text{mg/kg}$

4. Testing

Since the MBS is not often invited to test the honey it follows that the only quality factor commonly monitored at producer and consolidator level is moisture content. Good quality honey is supposed to have moisture content of between 16 and 20 %. Organised beekeeping associations / clubs and most consolidators, processors do use refractometers to check moisture content. The defunct Malawi German Beekeeping Project had trained some individual beekeepers in the use of refractometers. The use of this equipment has therefore diminished the risk of beekeepers adulterating honey with water and has improved the quality of honey produced.

5 Objectives and Methodology

The objective of this report is to gather information on the beekeeping sector in Malawi following the guidelines provided by TTA, which inter alia

involves looking at the product, how it is produced, processed and marketed. The study was also required to look at post- production storage, handling, challenges and issues and successes.

To obtain this information the consultant reviewed a number of publications on the subject. In addition interviews were held with two large processors Eco Products and CTL who are involved in buying, processing and distributing honey from the Northern Region and Southern Region respectively. In addition the consultant also interviewed the Blantyre District Forestry Officer. A selected retail shops were also visited to see if honey was being sold. Since the communities producing honey were not visited the information contained in this report is based on secondary sources and the interviews undertaken.

6 Structure of Report

The consultant has structured the report in such a way that the TTA checklist is covered as much as possible depending on the relevance of the item to bee keeping. The report has Introduction, Producers, Consolidators / Processors, Consumers and other end users.

7 PRODUCERS

Apiculture has traditionally been an important activity in Malawi for many decades and has been a source of food, income and employment for people in the rural areas. Honey in Malawi is mainly produced by Small-scale beekeeping households who may operate individually or in a beekeeping associations / clubs and Medium/large scale semi-commercial beekeepers.

8 Small-scale beekeeping households

There are approximately 3,500 people employed in the bee-keeping sector in Malawi with over half of them in the northern region. ⁽⁴⁾ Most of them are men but there are also a number of women who are active beekeepers. It is estimated that more than 800 people have been trained in beekeeping but still the activity is therefore much of a part time activity by most beekeepers. However, there have been a number of interventions by Department of Forestry, and the Department of Parks and Wildlife, Non – Governmental Organizations such as GTZ and USAID and other stakeholders to teach people modern methods of bee keeping. In this regard a number of bee keeping associations and clubs with membership of between 5 -15 people have since been established with financial and technical assistance from NGO's, Government and private companies and the main objective being to increase the production of honey in Malawi and in the process earn income and improve the standard of living of the people. Other stakeholders keen in seeing that the above objective is met are the National Association of Small and Medium Enterprises (NASME), COMPASS II, Wildlife and Environmental Society of Malawi (WESM), Malawi Environment Endowment Trust (MEET) and Small Beekeepers Development and Research Association (SBDARA).

9 Medium / Large Scale Semi-Commercial Beekeepers.

These are private companies who produce honey at their respective estates and plantations. These beekeepers use the five-storey Langstroth hive ,

which is capable of producing between 80 – 100kg per beehive per year ⁽⁵⁾:

These producers are:

- i. Kawalazi Estate Ltd, in Nkhata Bay whose brand name of its honey is ‘Macadamia Honey’.
- ii. Chimpeni Estate in Zomba.
- iii. Satemwa Tea Estate in Thyolo with about 60 hives and
- iv. Chiwogoro Apiaries in Mzuzu.

10 Production Methods

In Malawi honey is produced using a combination of the following methods:

- Honey hunting where honey is collected from wild colonies in cavities trees and caves;
- Use of traditional beehives made from logs, barks and bamboo and logs. This accounts for more than three quarters of the hives in the country),
- Use of low technology top bars hives such as the Kenya top bar and the Malawi improved top bars (a modified Kenya top bar). However wooden top bar hives are expensive to construct as compared to traditional ones and it is difficult to find trained and reliable carpenters. The top bar beehive is made of local timber planks and waterproof roofing felt or plastic paper and
- Use of the Langstroth hive.

The beehives are suspended in trees at strategic places in the woodlands, forests, along riverbanks, plantations (coffee, macadamia, rubber) away from ants, predators and other unwanted intruders. Bait is placed in the

beehive and left alone for the bees to colonise the beehive. The colonized beehives are usually harvested twice a year by extracting comb honey manually.

11 Production

Top bar hives have a yield potential of 20 kg per year while the traditional bark hive has a yield potential of 3-5 kg per year. Production of honey in Malawi is on around 60 metric tons per year according to Eco Products. More than half of the honey produced in Malawi comes from the northern region, which is sparsely populated and has large tracts of forest reserves, national parks, coffee, macadamia and rubber plantations. Another area with great potential to produce a lot of honey in the southern region is around mount Mulanje where the Mulanje Mountain Conservation Trust with funding from external donors are planning to empower 25,000 villagers to engage in beekeeping as a way of conserving the Mulanje and Phalombe forest reserves.

11.1 Inputs and Input Costs

To produce honey the following inputs are required:

11.1.1 Bee Hives:

a) Traditional Beehives

The traditional beekeepers use cylinder bark hives or cylinder trunk hives. They average 1.2 to 1.3 m in length and have diameters of up to

35 cm, depending on the diameter of the trunk used. This type of beehive is not recommended because it encourages deforestation, which is like destroying habitat for the bees and in the process destroying working capital for the beekeeper. Bark hives normally last 3 to 4 years. Since the objective of various stakeholders is to increase the production of honey, it is envisaged that the modern beekeeper will have as many beehives as possible say 100 of which about 25 will have to be renewed each year. ⁽⁶⁾

The cost of a tradition beehive is between K1,400 and K1,650 but considering that it leads to serious deforestation the potential cost is equivalent to the cost of replacing an indigenous tree. The cost should be very high.

b) Modern Beehives (e.g. Kenya Top Bar, Malawi standard top bar hive {modified Kenya Top Bar} and *Langstroth hive*).

These types of beehives are manufactured by carpenters and are made from planks such as Gmelina and Pine planks, which are all fast growing and renewable tree species. To construct one Kenya and Malawi top bars beehive the materials required are ⁽⁷⁾:

- i. 6 planks of 1 x 6 inches broad x 6 feet long
- ii. Wire nails
- iii. Grease (for ant protection)
- iv. Roofing felt (for water proofing the beehive).

The cost of constructing a Malawi standard top bar beehive varies from K2,000 to K3,950 whilst the Kenya top bar costs K2, 000. ⁽⁸⁾

The Langstroth costs between K3.000 and K5,000 ⁽⁹⁾.

11.1.2 Bait (To attract the bees. Sugar syrup or comb honey may be used as bait).

10.1.3 Harvesting suits (protective clothing, veil, glove, boots) are used to protect the beekeeper from being stung by bees. The protective clothing is imported at prices ranging from K2,500 – K4,500 each. Glove costs K700/pqir and Gumboots in excess K650 pair. These prices are beyond the reach of most small-scale beekeepers.

11.1.4 Smoker: Smokers are used to render the bees harmless but not fatal during harvesting. The cost ranges from K650 to K1,500.

11.1.5 Buckets: To store honey during harvesting and transportation to the markets or collection points. Most beekeepers in Malawi use plastic buckets, which are made locally and cost K120 per 20 litre size. Second hand 200 litre plastic drums are also available on the market at prices ranging from K800 to K1, 200.

11.1.6 Processing equipment:

- a) **Cloth:** The most commonly used honey processing equipment is a clean white cloth, which costs about K60 per meter. This is used by the majority of small-scale beekeepers in Malawi.

b) **Pressing machine:** These are used to squeeze honey out of the honeycombs. They are imported from South Africa or England. According to Eco Products squeezing machines are very expensive and are out of reach of ordinary beekeepers. No price figure was given as it was considered privileged company information.

c) Although these are the standard inputs required most beekeepers in Malawi are unable to access modern beehives and harvesting paraphernalia particularly harvesting suits, smokers and mechanical honey extractors due to lack of access to soft loans. As a result beekeepers resort to using inefficient traditional harvesting methods, which are cheap and destructive to the environment. This affects the quantity and quality of honey produced and this maybe the reason why honey production in Malawi is very small and of poor quality.

However, discussions are going on among various stakeholders in the beekeeping sector to see how harvesting suits, smokers, beehive roofing felt and other inputs could be made more affordable and readily available to beekeepers. Once available sharing of bee suits and smokers among beekeepers could be another way of maximizing the utilization of the equipment by the beekeepers. Other issues being looked into are how investment in bee harvesting inputs might be financed and how processors/consolidators could play a greater role in providing advisory and input supply/financing services to beekeepers. ⁽¹⁰⁾

11.1.6 Harvesting Processes

Once the beehives are placed at strategic places in the selected trees and bait is placed and beehive is left alone. The only thing that the beekeeper does is

to occasionally check if the beehive has been colonized and is safe from enemies or if honey has matured.

Because cropping of honey is time consuming, labour intensive and dangerous (due to bee stings) no more than 2 hives are cropped per day. And if the beekeeper has a number of hives this may take even longer times and may employ other people to help out.

The traditional beekeeper starts a smoky fire below the hive to scatter the bees while the modern beekeeper uses a smoker to this. The beekeeper then climbs the tree and ties the beehive with a rope and lowers it to the ground. Smoke is applied through the escape holes to drive bees away and the hive is opened to retrieve the honeycomb. It is then broken and put in the storage bucket and transported to the settlement for storage. This process is repeated for each beehive.

12. Cold Dripping Method

The most common method used in the processing of honey is called Cold Dripping Method (CDM). Combs are sliced and filtered overnight through a mesh or net. This may be repeated to ensure good product quality. CDM method is easy and economical as there is no need for sophisticated equipment. But with regards to honey recovery it is not so efficient as a substantial amount of honey does remain in the combs. However, CDM produces very clear (physically pure) honey, which is very good for marketing purposes.

13 Pressing Method

a) Pressing method using a cloth

Most beekeepers use the traditional method of extracting honey from the honeycombs by pressing by hand the honeycombs in a white clean cloth and honey oozes out of the cloth into a storage bucket. Sometimes honey does crystallize while in the honeycomb and this makes it difficult to extract. In this case the honeycomb is heated so that the wax floats on top and is removed after cooling. These methods are not efficient and results in bad quality honey which attracts low price.

b) Pressing method using a pressing machine

This method of extracting honey is not commonly used because of the high cost of pressing machines which are reported to cost some K15, 000 each. However, this method results in higher honey recovery than CDM method. In addition the honey contains high proportion of nectar and hence more nutritious. Unfortunately, nectar does not have a very good taste and the appearance of honey with high proportion of nectar is blurred, hence unattractive to the prospective buyer. High nectar content honey also crystallizes much quicker.

Harvesting of honey in Malawi is done twice a year depending upon the availability of bee pasture. Where bee pasture is available in abundance harvesting can be done more than twice a year. The harvesting period is preceded by a period of flowering of the vegetation, which then makes nectar and pollen available for bees to collect. Availability of honey varies from one area to the other depending on the climate of a particular area.

However, the major honey season in Malawi is during the period September to December with the biggest flow occurring in December to January. There is a relatively smaller amount of honey in the winter months of May, June and July.

14 Value Addition Strategies

Currently there are very little value addition strategies by the beekeepers. The only strategy being adopted to enhance value is to ensure that the content of the moisture is as low as possible and that hygiene is strictly adhered to.

It should be noted that the quality of the honey being produced in Malawi is inconsistent due to differences in the pastures where the bees collect their pollen. This leads to differences in colour taste and appearance. In addition, most of the honey produced is of low quality due to impurities/foreign matter in the honey. In order to enhance the value of honey beekeepers are being taught to select honeycombs, which are well sealed and filled with honey for processing. In addition the use of a cloth, which may not be clean, is being discouraged in favour of mechanical pressers.

15 Marketing

Most of the honey produced by beekeepers in Malawi is sold:

1. In bulk to consolidators and processors such as CTL and Eco Products who process and bottle the honey for sale to wholesalers and retailers. These consolidators and processors pay K150 per kg. (US\$1.07/kg). Some consolidators may also be large-scale beekeepers or clubs/associations with bottling facilities and easy access to big markets in the urban areas.

2. In bulk to large-scale consumers like hotels, pharmaceutical industries, and hospitals as bulk honey.
3. In small quantities directly to individual consumers within neighborhood, village or nearest trading center/market place which is readily accessible to them and
4. To small scale processors who process and pack honey at their back yards (Cottage Industries) for sale to consumers door to door or at village markets.

The farm gate prices paid by small-scale processors is not documented but is likely to be lower than K150/kg as these buyers are likely to bargain for better deals. Eco Products sells its honey for K220 for a 280g bottle and K350 for a 500g bottle. Therefore, farm gate price paid by individual consumers is likely to be lower than these prices as the prices would be negotiated.

16 CONSOLIDATORS and PROCESSORS

Consolidators and processors are an important part of the honey value chain in Malawi. The individual beekeeper or even some beekeeping associations and clubs do not have the financial capacity and economies of scale to produce, process and market honey to consumers and other end users. Consolidators and processors,

therefore, are a bridge between beekeepers and end users. They provide the following services:

1. Bulking service and moving honey from remote points of production to their respective processing units.
2. Honey processing, bottling and labeling.
3. Branding and marketing the honey in the domestic market and
4. Exploring market opportunities in external markets.

17 Active Consolidators and Processors

The following companies are active consolidators and processors in the honey sub - sector: ⁽¹¹⁾

17.1 Smallholder Coffee Farmers Trust (SCFT), Mzuzu, uses honey sourced from its members in Chitipa district and from non-members. The honey processing plant currently being used by SCFT was previously owned by the defunct Beekeepers Association of Malawi (BAM). It was transferred to SCFT by the Border Zone Development Project (BZDP) in 1998 and is now housed in a purpose-built premises constructed by SCFT. The plant has a capacity to process 40 tons per year but the equipment is still under-utilised.

17.2 Eco-Products Ltd (EPL), is a subsidiary of Corporate Governance Centre, Blantyre. It is based in Chitipa and buys raw honey at a price of K150/kg (US\$1.07) from contract beekeepers in Chitipa. The company provided 1,500 hives to contract beekeepers in Chitipa and plans to distribute 1,500 hives in Nkhata Bay and another 1,500 in Ntchisi within the next three years. It is estimated that each beehive is capable of producing

20kg of raw honey per annum. It has a number of trained extension workers who provide technical advice to its contract beekeepers. EPL has also organised a loan package with the New Building Society Bank whereby contract farmers will get a soft loan (10% interest) to buy inputs for their beekeeping operations. The company has lined up a number of carpenters to produce the top bar hives and tinsmiths to re-produce smokers for its contract beekeepers.

EPL packs its honey in 280g and 500g bottles and markets them under the ECO Honey brand name.

17.3 Small Beekeepers Development and Research Association (SBDRA), SBDRA is based in Nkhata Bay buys raw honey from beekeeping clubs in both Northern and Central Regions.

17.4 Chiwogoro Apiaries is based in Mzuzu. The company consolidates and process raw honey from its own beehives and from other beekeepers. It markets its honey under its own ‘Chiwogoro Honey’ label in 280g bottles.

17.5 Mr Siwandem, is based in Chikangawa in the northern region and sells honey mostly derived from Blue Gum pasture.

17.6 Mr A. Chunga, is based in Mzuzu and buys raw honey from beekeepers in the Nyika forest reserves. His honey is marketed under the Nyika Honey brand name.

17.7 Mr A. Banda proprietor of Kumavembwa Food Products is based in Mzuzu and markets his honey under the ‘Uchi Honey’ brand name.

17.8 Village Hands Ltd, operates from Mwanza in the southern region. The town of Mwanza is adjacent to the Mozambique border town of Zobue on the Blantyre – Tete – Harare corridor. The company is under supervision of Wildlife and Environment Society of Malawi and supported by grant funding from GTZ. It buys raw honey from beekeeping clubs around Mulanje and Mwanza.

17.9 Tambala Foods Ltd. Previously a subsidiary of Press Foods Ltd is now in private hands does not consolidate. It buys raw honey from beekeepers who bring it to their factory in Blantyre. The honey is processed, bottled in plastic jars and marketed under the Tambala Foods brand name.

17.10 Nali Ltd. is based in Limbe (Blantyre City) and is a privately owned family business. It buys raw honey from beekeepers mostly in Chikwawa and Zomba who deliver raw honey to its premises in Limbe.

17.11 CTL operates from Chigumula Trading center in Blantyre. It buys raw honey from individuals and clubs around the Mulanje Mountain and Phalombe in the southern region. It works closely with the Mount Mulanje Conservation Trust. The company uses imported bottles and labels from South Africa and markets its honey under the “Produce of Malawi The Warm Heart of Africa” brand name. The market targeted is

the upper market segment and export market to speciality health food shops. Mr. John, a European settler in Malawi, owns the company.

18 Packaging and Labeling

Malawi honey is packaged in locally made plastic (PVC) bottles. These bottles are not really ideal for honey as they are not gas-proof which makes the bottled honey absorb moisture leading to fermentation. In addition the plastic jars have poor lids which do not fit tightly leading to leakages and poor presentation.

Glass jars would be ideal technically but are costly to import. PET plastic, which is harder, gas-proof and has an attractive glossy finish, could be a suitable alternative but are also expensive to import. However, CTL packs its honey in PET consumer bottles.

Most labels found on plastic jars are locally made and are of poor quality and expensive. They are not waterproof and tend to come off. Some consolidators / processors such as CTL and Eco Products import their labels from South Africa and Zimbabwe respectively. The quality of imported labels is good, waterproof and cheap.

19 Marketing

19.1 Domestic Market

Most of the Malawi honey is sold on the domestic market in consumer bottles ranging from 200g to 500g with varying prices. Smaller bottles sizes of 200g are most preferred by individual consumers. The honey is marketed using one or a combination of the following methods of distribution:

- (i) Selling directly to consumers
- (ii) Selling directly to wholesalers. McConnell Ltd., is the largest buyer of honey in Malawi at wholesale prices. It then distributes the honey to its 'Kwik Save' and PTC retail outlets throughout the country (These are the major honey outlets in Malawi).
- (iii) Selling directly to retail outlets such as Kandodo super markets, Peoples Trading Centers, Kwik Saves, Shoprite etc..
- (iv) Selling to export markets. This trade is currently at 'exploring stage' since the current production is too small to warrant any serious export effort.
- (v)

19.2 International Markets (Export Markets)

Statistics from the National Statistical Office show that in the past some small quantities (10 metric tons) of Malawi honey were exported to Mozambique in 1998 and South Africa in 2003. Malawi is currently not exporting any honey due to inability to satisfy the domestic demand by the Consolidators and processors. However, there has been some trade enquiries from Germany, South Africa, Zimbabwe, Mozambique and Australia which were never executed. For example SBDRA in Nkhata Bay exhibited its honey at a trade fair in Bulawayo, Zimbabwe in 2005 and obtained orders for honey amounting to 26 metric tons from various interested importers. A consignment for 500 x 500g bottles was sent to one importer in Zimbabwe as a trial order but it was a disaster because SBDRA spend 28 days in Harare waiting to be paid. The exporter was eventually paid in Zimbabwe dollars and could not convert the

money to international currency due to foreign exchange problems in Zimbabwe.

Eco Products received an enquiry from Germany for 2 container loads of honey per month from Germany last year. However, this was on condition that Malawi should first send a ‘Pesticide Monitoring Plan’. Efforts to have this done by government were in vain.

19.3 Prices

Honey sold in the retail outlets seem to be on the higher side considering the low quality of the packaging and labels used. Prices in some retail outlets visited range from K350 to K400 for a 500g bottle and K220 to K260 for 250g bottles. These retail prices for honey are not matched to level of consumer demand.

19.4 Product Promotion/ Awareness Creation

Because demand outstrips supply consolidators and processors feel that it is pointless to do product promotion. Even retailers do not promote the honey they sell in their outlets.

20. CONSUMERS AND OTHER END USERS

The main users of Malawi honey are individual consumers who comprise urban middle and high-income earners. The other end users such as hotels, pharmaceutical companies and food processing industries use very small quantities of Malawi honey. They import most of the honey used.

The domestic demand for Malawi honey is small due to the low per capita demand for honey by consumers and low per capita incomes. In addition the presence of a number of substitutes for honey of which cane sugar is the

most important offers an alternative to honey among most people. Sugar in Malawi retails at K95/kg while honey is sold for K350 per 500g bottle which is equivalent of K700 per kg. For K700 an average Malawian will buy seven (7) packets of white refined sugar.

In addition, the poor per capita consumption of honey is attributed to lack of promotion on the advantages of honey. Since most consolidators / processors sell all their output and that the production of honey at 60mt per year ⁽¹²⁾ is very low and leading to frequent stockouts even during high output season, retailers do not see any advantage of spending money to advertise the product.

20.1 Retail Pack Size

Consumers demand smaller pack sizes and in response Eco products introduced 280g size bottle in addition to the 500g bottle and sales seem to be doing very well. Similarly, Chiwogoro Apiaries introduced a 200g pack size.

21. SERVICE INDUSTRIES INVOLVED IN POST PRODUCTION, HANDLING AND PROCESSING

There are several service industries involved in post production handling processing activities in the apiculture industry in Malawi. These include government ministries/department, public organizations, private, non-governmental organizations and civil society of which the following are the most active organizations: Department of Parks and Wildlife

The Department of National Parks and Wildlife (DNPW) within the Ministry of Tourism is responsible for the conservation and management of wildlife resources. The Departments' activities are mainly concentrated in national parks and wildlife reserves. It collaborates with other stakeholders

including local communities, the private sector, and NGOs in sustainable natural resource.

21.1 Department of Forestry

The Department of Forestry is responsible for the conservation management, protection and utilisation of forest resources in the country with an aim of sustaining the contribution of the forest resources to the upliftment of the quality of peoples' lives, particularly those of the rural areas. With the support of the Forestry Act (1997) the Ministry is promoting the **participation of rural communities in the sustainable management of natural resources.**

21.2 Ministry of Trade and Private Sector Development

The Ministry of Trade and Private Sector Development is the line ministry responsible for the Micro, Small and Medium Enterprises (MSME) sector in Malawi. The Department of Small, Medium Enterprises and Cooperatives of the ministry is responsible for the promotion and development of Small and Medium Enterprises and Cooperatives Societies so that they are capable of producing high quality goods for both domestic and export markets.

The Department of SME's support the apiculture industry by among other things supporting training programmes for bee farmers, provision of bee farming equipment, and supporting the participation of bee farmers in national and international trade fairs.

21.3 Malawi Bureau of Standards (MBS)

The MBS was established in 1972 and is the national enquiry point on the WTO Agreement on Technical Barriers to Trade, and SPS. MBS sets and implements standards and conducts conformity tests on selected imports and exports. An increasing proportion of its funding over the years has come from revenues generated by its quality assurance and testing activities.

There are three technical divisions operating within MBS: (i) chemical and textile; (ii) engineering and materials; and (iii) food and agriculture. For food products, MBS usually uses CODEX standards. The bureau has set standards for some of the country's major exports such as tea, tobacco and sugar and other products such as honey.

MBS works closely with its counterpart agencies in other SADC/COMESA countries to harmonize their standards under the Standard, Quality, Accreditation and Metrology program (SQAM). MBS's capacity is relatively limited due to lack of adequate and up-to-date testing equipment and qualified personnel.

21.4 Malawi Export Promotion Council (MEPC)

MEPC based in Blantyre was established in 1971 with the objective of promoting Malawi's agricultural and manufactured products including services. This is done through the provision of market intelligence on supply positions of Malawi products and on demand of these products in the international markets. Other services include product and market development, export trade facilitation and exporter extension services. However, its services are constrained by lack of adequate funding since the organization is fully subvented by government.

21.5 Department of Livestock (Animal Health/Animal Products).

This department functions within the Ministry of Agriculture and is responsible for export inspections of the respective animal products from the beekeeping industry, notably to the EU.

21.6 Smallholder Coffee Farmers Trust (SCFT)

Smallholder Coffee Farmers Trust based in Mzuzu in the northern region is an organization of farmers aimed at promotion of sustainable production, processing and marketing of high quality Arabica coffee and other food products through farmers owned, controlled and managed sustainable business organizations.

Apart from its core function of promoting production and marketing of coffee, the Smallholder Coffee Farmers Trust is also operating in honey production and marketing. In the apiculture department, SCFT's objective is to increase honey production by increasing the number of bee hives in coffee growing areas, training coffee farmers in harvesting, processing of honey and related products including bees wax; linking with bee farmers outside the trust who can supply honey to the Trust and explore economic modern bee hives.

22. Small Beekeepers Development and Research Association (SBDRA)

SBDARA is an organization formed in the year 2000 and aims at advancing apiculture development in Malawi and promoting community participation in the management of natural resources. SBDRA's specific objectives are to promoting beekeeping in Malawi as a reliable source of income; improving skills of beekeepers; and improving natural resource management. It also

buys honey and related products from beekeepers. Currently SBADRA's activities are localized to some areas in the northern region including some parts of Nkhata-Bay.

22.1 Chiwogoro Apiaries

Chiwogoro Apiaries is a private company engaged in honey and related products production. Apart from honey production the company also buys honey and related products from apiculture farmers. Apart from this the company also trains people in apiculture and forestry management. The company operates from Mzuzu city in the northern region and its services are limited to surrounding areas/districts.

22.2 Malawi Entrepreneur development Institute (MEDI)

Is an autonomous incorporated trust under the Ministry of Labour and Vocational Training founded in 1985. It provides technical training courses at its institute in Mponela in Dowa District in the central region. It offers training in entrepreneurship, business development and management of small business including skills development in beekeeping, carpentry, information technology, bricklaying and other skills.

23.3 Manufacturers of Plastic Bottles and buckets

The plastic containers used in the beekeeping industries such as plastic jars and buckets are manufactured locally by a number of companies of which Poly pack and Enterprise Containers are the biggest.

23.4 Other Organisations and individuals

There are a number of other organizations and individuals who are involved in some aspects of beekeeping. Local and international registered charities, foundations and trusts organisations that are interested in beekeeping and honey production, especially for communities include:

23.4.1 World Vision International,

23.4.2 Concern Universal,

23.4.3 Malawi Environmental Endowment Trust (MEET),

23.4.4 Mulanje Mountain Conservation Trust (MMCT),

23.4.5 OXFAM and Ptarmigan Trust UK (supporting EDETA).

23.4.6 Bees Abroad, a UK Charity has provided direct funding to SBDRA of K1.7 million for technical assistance, buildings construction and equipment supply since September 2002.

23.4.7 GTZ. Has been involved in the development of beekeeping industry in Malawi. It is mainly involved in training bee management to beekeeper. GTZ is also supporting Village Hands.

24. Issues And Challenges

The Beekeeping industry in Malawi does face a number of issues and challenges, which need to be addressed in order to accelerate the development of this sector. A selection of these issues and challenges are:

25. Domestic Market

The domestic market for honey in Malawi is small and the per capita consumption is relatively very small. Honey is facing stiff competition from other substitutes. There is need to educate consumers to use honey for its

medicinal attributes. Processors also need to create brand loyalty among consumers.

26 International market

Currently export market is non-existent although enquiries have been received from importers in Germany and Zimbabwe. In addition Malawi has very limited capacity in meeting international standards including the absence of the Residue Monitoring Plan for the export market.

27. Deforestation

Malawi has very serious deforestation taking place caused by wanton cutting of trees to make charcoal for fuel. A lot of forest reserves, mountains and riverbanks have been stripped off their vegetation denying bees of pasture for breeding. Alternative source of fuel is a must if the trees are going to be saved. Efforts by Malawi Environmental Endowment Trust (MEET) to educate the civil society to replenish trees should be intensified.

28. Bee Management

The quantity of honey produced in Malawi is too small. In order to increase honey production in Malawi civic education and technical training in bee management for beekeepers should be extended to small scale beekeepers in the rural areas. In addition access to financial and material loans should be available to them. Apart from increasing production this will also ensure that good quality honey is produced.

29. Pricing strategies

At a workshop of stakeholders on honey which took place this year ⁽¹³⁾ it was observed that the retail price for honey is not matched to level of consumer demand. Retailers' pricing strategy seems conservative and margin based as opposed basing it on demand. It also appears that prices (K150/kg) to harvesters/producers (beekeepers) by consolidators and processors were not high enough to induce sufficient production increases.

30. Access to Loans

The cost on inputs for beekeeping is mostly too high for most beekeepers. Although some material assistance to beekeepers is provided by some NGOs there are no financial institutions targeting beekeepers to offer loans either as startup or working capital. The need to empower beekeepers through the provision of soft loans to enable them procure starting and working capital will assist to make beekeeping an attractive occupation.

31. Improving Links

The current situation shows that there is a very weak link between all the stakeholders in the beekeeping industry. It is apparent that important stakeholders should cooperate as much as possible to develop the industry. There is therefore need to improve business contacts and working relationship between:

- Beekeepers and consolidators / processors
- Consolidators / processors and wholesalers / retailers and
- Retailers and consumers.

- Consolidators / processors and input manufacturers and importers
- Government and the stakeholders in the honey sub-sector.

It seems reasonable to conclude that the real cost of shipping honey from beekeeper to consolidator or from consolidator to (an alternative) urban market is around K15/kg. Each kilogramme of honey, traveling twice, may thus incur an indicative logistics cost of around K30/kg. Longer trips will result in more expensive transportation costs.

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4 . SITUATIONAL ANALYSIS OF BEEKEEPING IN MOZAMBIQUE



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Summary

The central and south part of Mozambique is one of huge potential area for honey and wax production. The climate can generally be described as good and conducive to beekeeping. The major vegetation types are savannah scattered with trees or bushes, savannah woodland and forest, all of which are capable of supporting large bee populations. This vegetation gives an adequate supply of bee forage together with some agricultural crops and exotic species of trees.

The honey bee found in this area is most likely the African honeybee, *Apis mellifera* and *Apis scutellata*. Although it is generally considered to be aggressive but very productive bee.

Traditional beekeeping has always been part of the lifestyle of most families in Mozambique and in Manica province particularly with experience passed from one generation to the next. The majority of beekeepers utilize traditional hives constructed from either the bark or the trunks of locally available trees. Although some of beekeepers work as association, the produce is individually. Hives are generally harvested twice a year with harvested period varying from region to region. Due to the lack of protective clothing, the rural beekeepers harvest their colonies at night.

Three basic processing techniques for separating honey from the wax are employed by beekeepers:

- The comb may either be boiled;
- Squeezing the comb;
- Melting the comb (dropping from the sack through sun heat).

This methods makes the honey unsuitable for the commercial market because the quality produced is poor. Wax is of little practical use to the beekeepers and is generally discarded.

The following are the main uses of honey in Mozambique:

- As nourishing food product;
- As a medicine;
- As an income generating product;
- Production of alcoholic beverages.

There is no market for wax. Honey is sold locally and some retailer buys for resale in the cities. Due to poor quality, poor packing, the price is often very low.

The long history of beekeeping in Mozambique particularly in Maputo, Inhambane and Manica provinces and the sound knowledge of beekeepers suggest that beekeeping is capable of further development through well planned assistance program, designed to help overcome the weakness in the traditional honey production procedures, making the whole practice becoming environmentally friendly and profitable.

At the present, some of the beekeepers in Maputo province are receiving technical assistance in the form of training from non governmental organization (Coop of Beekeepers of Maputo Province) in Inhambane Province is Fruit Mel an private Company operating using the European Union's Funds, currently in Manica Province no project in Beekeeping only some small private initiative in Sussundenga and Gondola.

In the past, some of the beekeepers of the Manica province their use to receive assistance in the form of training and technical assistance from non governmental organizations (AAMURU with Ford foundations funds, ADEM with UNDP's funs, Magariro with Concern's funds). Therefore, the assistance is still needed and expanded and transform the beekeeping sector as profitable and market driven production process.

1. Background of the Manica Province

1.1. The natural environment

The Manica province is one of ten provinces of Mozambique and is situated in the east of the country in the central region of the country.

Vegetation type is primarily an expression of environmental features such as topography, altitude, aspect, soil and climate. Vegetation type has a direct bearing on the beekeeping potential of particular region due to the bees reliance on vegetation for their success. The major vegetation types of the province are savannah.

1.2. Natural potential and limitations for the Manica province

The province has considerable potential for beekeeping owing to the presence of suitable bee stocks, favourable climatic conditions and plentiful supply of bee forage. The indigenous honeybees, *Apis mellifera scutellata* are highly productive and well adapted to the conditions of the province. They are known to be vicious and aggressive, but are highly productive

The high rainfall and moderate temperatures afford climatic condition that is well suited to sustaining colonies of bees that yield good honey crops.

Extreme weather conditions appear to be only real natural limitation of the province, a region which is otherwise ideally suited to beekeeping. The region periodically experiences uncharacteristically dry conditions and high rainfall.

2. Ecological aspects and their effects on honeybees and honey production
Beekeeping and honey hunting like other human activities can be detrimental to the environment and its flora and fauna if care is not given to appropriate management strategies. Honeybees are an integral part of any ecosystem dominated by insect pollinated angiosperms. As with any other component of an ecosystem they are susceptible to bad ecological practises.

One of the major problems of large scale beekeeping and honey hunting as practised at present in Manica province is the destruction of trees when they are debarked for the manufacturing of hives, bush fires and uncontrolled late burning, at the end of dry season.

3. Objective of the study

This present study was conducted in Maputo and Manica Province to garner the beekeeping data for base line study for Total Transformation Agribusiness in link with WK Kellogg Program in Mozambique.

In Manica province 4 districts were taken in to consideration as main beekeeping production site in the province:

- Sussundenga – Chimanimani community
- Guro – Chivure community
- Macossa – Katique community
- Gondola – Pindanganga community

In Maputo province 3 districts were analyzed

- Matutuine – Machangulo and Katuane Community

- Magude – Mahel and Kanimambo Community
- Manhiça – Manhiça – sede and Kalanga Community

The areas of studs where the basis of the present situation of beekeeping in the provinces given its great potential and limitations related to the beekeepers, the characteristics of practice, the quality of produce, commercialization practice, forage characteristics and the management aspects of the beekeeping practices at the provincial level.

This information will help TTA to design appropriate intervention strategy based on market, quality, quantity of the produce as all as the willingness of the beekeepers to become entrepreneurs on this sector.

4. The methodology

The metrology that was applied to conduct the study included, structured interview using questionnaire received from TTA's Head Office and semi structured interviews to different stakeholders, beekeepers, non-governmental representatives, and community leaders. Secondary data was also used to compliment the study.

5. Results

5.1. The characteristics of the beekeepers

Beekeeping has always been part of the life style of most families South and Central site of Mozambique, with experience inherited from the past generations. This activities does not consume a lot of time and it is practiced at seasons when another productive activities are few, in addition it does not require a specific land.

Regardless of success that the traditional beekeepers has achieved over the years, traditional beekeeping is carried out with less technical knowledge and traditional equipments hence, the potential available is not maximally exploited.

5.2. Manica's beekeeping

Both the young and old irrespective of their sex, practice beekeeping, but the practice is predominantly dominated by man. Despite the fact that, the head of the family practice beekeeping, the rest of the families also

give a hand in the construction of the hives, at the time of harvesting, processing and commercialization of the honey.

5.3. The beekeeper's age

Majority of man that practice beekeeping are between 40 and 60 years, the woman between 30 and 45 years and youth 18 and 23 years as demonstrated by the following table:

Classification	Age
Men	40 – 60
Women	30 - 45
Youth	18 - 23

5.4. The total number of beekeepers

The total number of beekeepers varies from one district to next taking into account the conditions and the motivation factors that exists in each of these districts and provinces. The study that was carried out indicate that there are many beekeepers in Sussundenga and Macossa than Gondola and Guro this is because in the past beekeeping was promoted in Sussundenga by AMURU though Ford Foundations fund and in Macossa through FAO's funds. However is no exactly specification of the difference with a number but it is estimated that there is a total of 3.500 beekeepers in Sussundenga, Gondola, Macossa and Guro in Manica province and proximately 4.000 beekeepers in Maputo Province.

5.5. Beekeeping in relation to other production system

Beekeeping is not separated from the family production system. It is one of the flexible activities as far as time is concerned, thus it enhances its integration in the existing production system.

The only activities that are time consuming include the hives construction and placing them at the correct poison and harvesting. Harvesting is one of the activities that is carried out at night at a predetermined period that does not interfere with the routine activities.

5.6. How organized are the beekeepers

In reality the beekeepers produce honey individually and others are organized in groups, coops and association as shown in the following:

- **Maputo province**

- Magude district - group of Mahel and Kanimambo Community.
- Manhiça district - group of Manhiça sede and kalanga community
- Matutine District – Group of Machangulo and Katuane community
- Cooperativa de Apicultores de Maputo (Maputo's Beekeepers Cooperative).

- **Manica province**

- Sussundenga District – Beekeepers Association of Sussundenga-sede, group of Chimanimani, Kamupunga, Muribane, Kanguru, Munhinga, Rotanda, Mucuawaya, Mutambora, Dombe and Mahati community,
- Duro district – Group of Chivule community
- Macossa district – group of Macossa sede and Katique community.
- Gondola district – groups of Pindanganga, Mutenga and Mussikir community.

In Maputo province only one cooperative (Cooperativa dos Apicultores de Maputo) and one private entity Fruit-Mel and in Manica province is only one legal association (Beekeepers association of Sussundenga sede) and it is very weak, out of this one in Manica is no an other legal entity or club that defends the interest of the beekeepers.

5.7. The number and types of hives

The Beekeepers in Mozambique use two types of hives:

- The traditional hives from the bark or trunk of the trees
- The improved top bar hives made from planks of wood.

The number of hives differ from one beekeeper to the other and varies between 20 to 180 traditionally hives and 5 to 60 improved top bar hives.

The traditional hives and some of the improved top bar hives are constructed by the beekeepers themselves, however, other improved top bar hives were provided by the chimanimani project in Sussundenga in form of credit to the beekeepers and in Maputo by Beekeepers Coop and Frui-Mel.

The hives are normally hanged on the trees in the forest or in the orchards.

5.8. Equipment

The beekeeping practiced in Mozambique still traditional and it is occasionally subsistence. These fact contribute for the limited use of equipments the basic equipment included are:

- Knifes
- Matches
- Grass
- Torches
- Sisal rope and
- Bucket

Some of beekeepers in Sussundenda – Manica, Boane – Maputo use modern equipment that were provided by Chimanimani project and other projects.

Other reasons for limited use of modern equipment are as following:

- High cost of acquisition
- Lack of these equipment in the local market
- Lack of capital (financial inputs)

5.9. Technical assistance and training

The beekeepers receive basic training regarding of the beekeeping as following:

- The general behaviour of bees;
- The composition of the colony;
- Honey harvesting;
- Honey processing;
- Honey classification;
- Bee forest;
- Hives construction;
- Hives positioning and
- The use of modern equipment

The chimanimani project introduced the modern equipment in Manica province and moderate those courses in collaboration with the following organizations:

- The Provincial Directorate of Agriculture
- Ford Foundation

- Magariro
- ADEM

In Maputo the modern equipment was introduced by FAO project implemented by the Ministry of Agriculture, were as result of end of project was formed the Beekeepers Cooperative of Maputo Province. The Coop and the Fruit-Mel are introducing the modern equipment in collaboration with the provincial department of agriculture to the groups of beekeepers were their working with.

Despite the fact that, the courses were not reinforced by the provision of necessary equipment, specially in Manica Province, the impact is satisfactory and there is an obvious improvement in the quality produced. The course follow up was not however, satisfactory and should de improved the follow up system in the future projects.

Post harvesting

5.10 he harvesting seasons

The harvesting season differ from one districts to the other. It occurs twice per years in the second quarter (April and May) and the fourth quarter (November and December).

In general the production is very low (5kg of honey per hive) with no great deviation from one beekeeper to the other. In accordance to the number of hives each beekeeper possesses the production varies between 40kg to 600kg per annum.

The stud demonstrates that the mean production per apiculturist in Sussundenga is 411 kg and in Gondola 53kg and the average of 500kg in Maputo

5.11 Processing Methods

The apiculturist separate the honey from honey cobs and they process the honey themselves using various methods. The wax due to lack of market is discarded. Basically three methods are normally applied:

- Centrifuged

This process use mainly used in Maputo province were are the great number of improved top bar hives

- The use of manual pressur

Under this methods, the apiculturists in Gondola use the traditional systems because they do not posses the pressures, in Sussundenga, other beekeepers have them and others do not.

- Melting method

Under this methods the sun melts the honey.

For the honey purification, they use traditional instruments for sieving or to remove other impurities.

The traditional methods, lack of equipment for harvesting and processing are some of the limits encountered at this period of post harvest.

5.12. The use of produce

Honey

- honey is used as food for infants and adults;
- medicine;
- For production of local beer and
- As income generating product

Wax – wax has no practical use but it is used to attract bees in new hives.

5.13 – Commercialization

A system of commercialization of honey is non existent in Manica province. In Maputo province two entities are operating in the commercialization process, the Beekeepers Cooperative of Maputo Province and Fruit – Mel. The local market is saturated thus no market for everyone. In additional to this limitation there is also problems of packaging, transport, market and non existence of warehouses for honey.

There is no efficient and permanent information about honey markets. At the local level information circulates at informal meetings and individual contacts.

Honey is sold individually at the local markets, along the road and in cities. Some of the organized apiculturists in groups sell their use to sell to chimanimani project but at present is no an other entity buying honey in bulk in Manica.

It is only rarely that price is negotiated. The findings of the research are that the price offered is low and practically does not cover the production cost; consequently, the interviewees also have limitation on how to calculate the cost of production.

5.12 - Honey standards

The standards used for honey classification is the following:

- Low humidity level;
- Purity and cleanliness,;
- The colour and
- The smell.

Due to the processing techniques used it is difficult to meet the stipulated standards especial in Manica Province, some of groups working directly with Fruit-Mel and Beekeepers Coop their manage to achieve the acceptable quality.

5.13 – The forage

Normally, bees get nectar from trees and the shrubs to produce honey from plants like sunflower and orchards.

The main nectar source are the following:

- Plants

- Maize
- Sunflower
- Sugar can

- Fruits

- Mango trees
- Orange trees
- Tangerine tree
- Banana trees

- Trees and shrubs

- Mussassa

- Mutondo
- Puzua
- Mupfut
- Munhimbe
- Mucumbue.

There are no program for improvement of the general flora and fauna. Each beekeeper plants individually trees and fruits at the region. In Sussundenga CEF (the Forest Experimental Centre) has a program of introducing new species of indigenous fruits.

6 – The situation analysis

Beekeeping in Mozambique in general and in Maputo and Manica province in particularly is considered to be :

- An income generating activity that complements other activities practiced by farmers;
- As a potential resource for development of small scale farmer
- As the environmental protector.

There is a great potential for beekeeping and willingness of apiculturist in honey production. As it is happens in the fieldwork, beekeeping does not require fertilizer, insecticides and pesticides. Regardless of this it requires a certain investment for a maximum of 8 years. Currently other activities are emerging that need new investment (training, organizing beekeepers, equipments) that is still insufficient. Institution involved in this process are only in Maputo (Beekeeper’s Coop and Fruit – Mel). In past up to 2002 in Manica province son institutions there were involved in honey production and marketing promotion (Provincial Directorate of Agriculture, ADEM, Magariro, Chimanimani Project) at the present is there no one institution working on this field.

7- Conclusion

The following conclusion can be made

- a) Men, women and youth practice beekeeping. The majority of these are men aged between 40 to 60 years. The participation of women and youth is relatively weak.

- b) A great potential exists for honey production that is not being exploited. Beside Sussundenda in Manica province, Boane Marracuene and Matutune in Maputo province. In Manica and also Maputo the other districts as well are the huge potential of honey production, the total production at the provincial level is 16 tones for Manica per year and 20 tons Maputo per year. This production can actually doubled if the production is well organized and managed.
- c) The beekeeper needs motivation to improve the production technology to upgrade the family income.
- d) The traditional grass torch used as smoker is responsible for the bush fires occasionally evidenced. It is also responsible for killing of many bees and dirty honey.



- e) The use of the improved top bar hives, instruments and equipment is inexistent in Manica province. It is rare to find them in the local market, when present they are expensive.
- f) A systematic analysis about the evolution of beekeeping, the market, the quality, experiences acquired, production, sales, and production system is non-existent.

- g) The actual yield is very low (5 -10 kg per hive/year). This production level can be improved if concrete projects for honey commodity chain reinforcement are designed and implemented.
- h) There no financial service or credit program for apiculturist in Mozambique at all.
- i) There are no solid groups or associations among the beekeepers. This aspects limits the designing of consistent programs relates to this activity.
- j) No program exist for the improvement of the flora and fauna.
- k) In Manica province is no one institution that buys honey in large quantities, the beekeepers sell honey individually along the roads and in the cities to clients who buys a quantity of 1 to 5 litres.

7 - recommendation

There is a great potential for development of beekeeping in activity Mozambique that has been less explored.

To attain and to explore maximally the potential that exist, a program with concrete strategies and proposal should be designed and implemented in order to improve the actually production systems that will finally lead to increased quality and quantity of production of honey, better marketing and information systems as well as the overall management. These proposal and strategies will improve the capacity of the existing institution, the beekeepers as well as create new functional structures.

The project of this program should be:

- To improve the traditional production methods used
- Increase number of apiculturists and guarantee the sustainability of the activity in future
- To improve the organization of apiculturists in association (clubs)
- To create a stable and secure market system.
- To define the roles of the various stakeholders in the chain.

These objectives can be achieved through:

- Creating a database on beekeeping at the provincial and national level;
- To modernize beekeeping
 - Organization of beekeepers
 - Techniques
 - Technology
 - Basic conditions
 - Exchange of experience
- To improve the beekeeping management methodologies
- Creates and introduce training in apiculture in rural areas
- Create an efficient and stable market through improved information on market needs, insistence and control systems.
- Create credit lines for beekeeping to facilitate them to get access to the necessary equipment, hives and markets.
- Develop local production system of equipment, hives and protection materials.
- Creates honey warehouses, a place for sale testing, storage, processing and technology and technique demonstration.
- Promote the use of wax.
- Define and improve the roles of various stakeholders.
- Introduce a program for reforestation and improvement of flora and fauna.

5. SITUATIONAL ANALYSIS OF BEEKEEPING IN SOUTH AFRICA

1.0 Introduction

Currently the honey industry in South Africa is dominated by about 50 commercial beekeepers who produce about 80% of the nearly 2000 tons produced locally and about 2950 hobbyists largely from the first economy. These beekeepers have had many years of experience. However, South Africa still fails to produce enough honey for its domestic needs and export despite the fact that the country has potential to produce a surplus.

The exploitation by the previously disadvantaged farmers of the opportunities presented by beekeeping has been limited due to a number of crosscutting constraints. Since the Agricultural Research Council (ARC) has adopted the commodity approach in agriculture and farmer development, it is critical that a business approach be implemented for beekeeping. Currently the country experiences a shortfall of honey in the excess of 1 000 tons annually. The active participation by emerging beekeepers could fill this current but growing shortfall in the honey industry in South Africa.

Beekeeping by previously disadvantaged farmers is active in all the nine provinces of South Africa with the Eastern Cape beekeepers producing the highest quantities in the region of 8 tons per year, followed by KwaZulu-Natal, Limpopo, Mpumalanga, etc. In most provinces beekeepers have come together under the guidance of the ARC to collectively practice beekeeping. In Eastern Cape, the group has a processing facility in Umtata. A Board of Directors is in place to provide strategic guidance to the honey processing project in Umtata.

Although many thousands have been trained, there is about 1 000 plus active emerging beekeepers working closely together with the support of the ARC.

Emerging beekeepers are generally poorly organized at provincial and national levels. Only localized groups/ associations exist. None of the processing facilities is importing honey to supply contracts when honey is in short supply as what others in the first economy do. None of the groups is involved in pollination services. The groups are not linked to beekeepers in the region (SADC).

Although interest in beekeeping in the second economy is huge and increasing, the return in terms of income to beekeepers is still very low and unattractive. Methods which enhance honey production and other services such as pollination and bee removal must be developed. The individual profit motive should be recognized and encouraged.

Changing the present emerging beekeepers to commercial honey producers is critical if the beekeepers have to earn a reasonable living from beekeeping. Alternative systems to improve productivity and income have to be examined and implemented.

2.0 Beekeepers legal requirements in South Africa

Registration of all persons with hive colonies in South Africa is mandatory as specified in the Government Notice R1674 of 24 December 1998 under the Agriculture Pest Act 36 of 1983.

Registration is managed by the South African Beekeeping Industry Organisation (SABIO). Registration involves supplying the name and postal address, and paying the registration fee. Every registered beekeeper is allocated a registration number. This number must be displayed clearly and legibly on all hives and all apiary sites of the owner.

Urban and Peri-Urban Areas: The registration pertaining to the keeping of bees in urban and peri-urban areas are issued by the municipality of an area. All imported honey is required to be irradiated before it can be used in South Africa. It is not allowed to keep imported honey in bulk. It must be repackaged immediately for retail.

3.0 Current Commercial Honey production in South Africa

The Beekeeping industry in South Africa is made up of three sectors: The commercial beekeepers who are about 50, and hobbyists who are about 2 950, all in all with about 150 000 hives nationally. The third sector is that of emerging beekeepers in the second economy. These beekeepers at present operate in groups motivated largely by the Agricultural Research Council (ARC) and some NGO's. While there appears to be no growth any more in the commercial beekeeping sector, the beekeeping emerging from the second economy is growing quickly in response to the promotional work done by the ARC and other organizations.

The commercial beekeepers operate on large commercial farmers, while the emerging beekeepers use small pieces of land due to previous historical limitations. Therefore, for the emerging beekeeper to assume the size attained by the commercial beekeepers, he or she must use commercial farms.

They are no official figures for the production of honey in South Africa. Production figures available from the South African Beekeeping Industry Organization (SABIO) are estimations and indicate that approximately 2000 tons of honey will be produced during 2005 (table 1). 80% of this production comes from commercial beekeepers and the remainder from small-scale hobbyist.

Honey production in the commercial sector in South Africa has been stagnant suggesting that the current shortfall for honey which has been met by imports will continue to exist while growth in demand for honey is increasing. The recent recognition of possible use of honey in the treatment of HIV / AIDS patients will no doubt significantly increase the demand for honey.

Almost all commercial farmers practise migratory beekeeping and therefore have five to seven harvests per year. Small scale farmers generally do not move their hives and harvest 2-3 times per year.

Average annual yield per hive depends on many factors including rainfall and temperature and is approximately 35-50kg per hive in the commercial beekeeping sector.

Beekeepers are found throughout all nine provinces of South Africa. Certain provinces e.g. Mpumalanga, North West, Kwazulu-Natal, Gauteng, and Western cape have better honey production potential than others (Table1).

Table 1: Forecast Production in 2005 June (to December 2005).

Area	Current Stock,	Possible production up to December(tons)	Total
Mpumalanga	19	90	109
Western Cape	50	150	200
KwaZulu Natal	180	80	260
Free State	90	138	228
North West	6	39	45
Limpopo	4	34	38
Southern Cape	80	40	120
Eastern Cape		50	50
Northern Cape	30	80	110
Gauteng	284	270	554
	743	971	1714

Source: Survey conducted by the South African Beekeeping Industry Organisation. (2005) (SABIO).

Although Kwazulu Natal and Mpumalanga have been quoted as having the greatest potential for high yields in honey, there are other areas which have been identified as having high potential for beekeeping due to availability of forage. These areas are given in table 2.

Table 2: Some Area with high potential for beekeeping

Province	High Potential Area
Limpopo	Magoebas kloof, Duiwelskloof, Haenertsburg, Gravelotte, Namakgale, Lois Trichardt, Waterpoort, Lake Fudundzi, Willie’s Poort and Thoyandou.
Mpumalanga North West	Bushboksridge, Ohringstad, Pilgrim’s rest, Mantrose, Graskop, Hazyview and Lydenburg. Potchefstroom, Coligny, Ventersdorp, Bakerville, Rustenberg, Koster, Groot Marico, Milvalle, Brits and Magaliesberg Natural Area.
Gauteng	Magaliesberg, Westonaria and Hartebeespoort Dam
Kwazulu Natal	Berbice, Paulpietersburg, Pongola, Louwburg, Mkhuze, Jozini, Mbaswana, Nongoma, Hlabisa, Mtubatuba, Mpangeni, Eshowe, Nongoma, Ngobeni, Pongola Nkwalini, Rockmount, Drakensberg, Mooi River, Ukhahlamba, Pietermaritzburg, Underberg Bouwler, Kingscote Ixopo, Swartberg, Stafford’s Post, Umzinto, Umzikhulu and Doonybrook.
Eastern Cape	Mount Ayliff, Brook’snek, Flagstaff, Qumbu, Tsolo, Lusikisiki, Libode, Umtata, Mqanduli, Port St.Johns, Butterworth, Stuterheim, Magusheni and Elliotdale.

4.0 Consumption

Local consumption of honey is believed to be approximately 2800 tons per annum which includes industrial, medicinal and consumers. Comparing the market demand with current stock as well as expected production and imports of 1500 tons of honey indicates an over stock of honey supply. This oversupplying is due to cheap Chinese imported honey – being dumped on the South African market at a very low price R8 – R12per Kg. In the past, honey has been imported with a rebate permit of 22%. The rebate permit was revoked by the Department of Agriculture (NDA) in March of 2005. This will increase the demand for locally produced South African honey with the result of an increased wholesale price.

No official market research on consumer preferences is known but based on experience and hearsay honey with lighter color sells easier. Consumers do not like granulized honey but are willing to pay extra for creamed honey, whilst darker honey is seen as healthier for medicinal purposes. There has always been a shortage of South African honey and imports of honey are therefore necessary.

Importation of honey has sharply increased over the last three years. During 2003 approximately 780 tons of honey were imported whilst during 2004, more than 1500 tons were imported. Exporting countries are mainly China, Australia and Argentina. Some honey has also been imported from Zambia and Tanzania.

5.0 Marketing

South Africa which potentially can produce more than it needs produces less than its requirements at present.

Currently there is no national marketing strategy in place to stimulate the demand for honey. The current move towards health and wellness will benefit honey sales.

The distribution of the locally produced honey is at present as follows:

- ❖ Retail (70%)
- ❖ Industrial (10%)
- ❖ Catering (5%)
- ❖ Medicinal (10%)
- ❖ Direct(5%)

Other honey products include

- ❖ Chunk honey
- ❖ Comb honey
- ❖ Raw honey
- ❖ Creamed honey

The biggest growing market is the bed and breakfast industry with specialty packaging and the HIV/AIDS patients.

Producer bulk prices of honey range from R16 to R23 per kg while retail prices range from R32 to R49 per kg. One can get R600 per annum from one beehive.

Honey is commonly marketed and sold in processed form although markets for unprocessed comb honey exist. Smallholder beekeepers do not market their products effectively. Smallholder honey producers do not target lucrative markets, and do not have the opportunity to access these markets. A number of reasons are attributed to this; these beekeepers are not producing bulk quantities of honey required by these markets. Most of these groups do not have a proper marketing strategy due to lack of expertise. Already a marketing platform has been created in the Inyosi Honey brand. This brand is an exclusive platform for producers in collaboration with ARC and it is a proudly South African credited Brand. It won the Impumelelo Award for Innovation. The Inyosi honey is 100% pure honey produced by historically disadvantaged communities all over South Africa. The Beekeeping for Poverty Relief Programme of the Agricultural Research Council is a development programme providing training and support to prospective beekeepers. Funding is provided by the Poverty Relief Funds of the Department of Social Development, Department of Science and Technology and the Department of Agriculture.

The retail price for Inyosi Honey is R40 per Kg and R20 per 500g per bottle. According to the ARC survey, 82% of honey produced by smallholder beekeepers is sold to community buyers in smaller quantities. Only 6% of their produce is sold to retailers or supermarkets, and 9% is sold to organizations.

Current honey processing methods employed by the smallholder producers are not very complicated and thus require limited harvesting equipment. Most honey that is produced by these farmers is mainly pure liquid honey. To harvest honey in this form you basically need bee brushes to clear bees from your super frames, a smoker, an extractor, strainer, bottles and an enclosed room to work from. Most of the smallholder producers harvest and process honey using these basic equipments and methods. A smallholder producer harvests and processes his/ her produce in a small set up that may be a room designed for this purpose or in some cases a much bigger facility. For an example in Umtata in the Eastern Cape, 16 beekeeping projects are using a processing facility set up for them by the ARC. Harvesting takes place outside the facility. The 16 projects deliver capped super boxes to the facility where they are processed and bottled. Most groups harvest twice per year, mainly in June and December.

6.0 Situational Analysis of the emerging beekeepers in the second economy.

6.1 Description of a smallholder beekeeper

Currently the majority of smallholder bee farmers are from historically disadvantaged groups. In other words these are black farmers who did not take part in beekeeping in the first economy or commercial beekeeping. The recent study by Agriculture Research

Council (ARC) focused on beekeepers in the second economy in South Africa. This involved 32 beekeeping projects with about 96 beekeepers in 7 provinces with the exception of the Western Cape and Northern Cape. The ARC targets to establish 5000 beekeepers in this sector. The significance of this study is that it represents 93% of smallholder beekeepers within the South African Beekeeping Industry with the exception of those beekeepers outside the ambit of the ARC.

Most of these farmers are located in rural areas with the highest number in the Eastern Cape. These smallholder beekeepers have less than 10 years of beekeeping experience. According to the ARC study, 60% of the smallholder beekeepers have less than 5 years beekeeping experience. Most beekeepers are not affiliated to any provincial or national beekeeper association or structure.

The majority of the beekeepers are between the ages of 30-40, while a considerable number is in the age range below 30 years.

All of these beekeeping projects were set up by grant funding and donations from the ARC, the Government’s Poverty Relief Program and local municipalities.

Table. 3 More women seem to be more involved in the projects. The composition of the smallholder beekeeper groups who attended the conference per province

Province	No. of groups	Gender	
		M	F
Eastern Cape	15	15	14
Free State	2	0	1
Gauteng	3	3	3
KZN	2	1	2
Limpopo	4	6	6
Mpumalanga	5	5	5
North West	1	0	1
Total	32	30	32

6.2 Production of Honey

The most common approach to apiary or beehive management by the smallholder beekeepers is the group approach. 88.6% of the smallholder beekeeper manage and own their apiaries as groups. For an example, in Uitenhage three beekeeping projects were initiated by the Uitenhage Dispatch Development Initiative (UDDI) with funding from the Nelson Mandela Metro Municipality. Thirty unemployed youth were selected as beneficiaries. Thirty beehive boxes were placed in 3 different locations, each youth in the group was assigned one box to look after. This approach proved to be very costly in that the project was not profitable to sustain 30 individuals at allowances of R400 a month. Thirty members became difficult to manage due to conflicts amongst the group as well as, impatience among members who expected quick financial returns in the project. This

resulted in the group losing 19 members and 4 bee hives absconded while 8 boxes were unsuitable for beekeeping.

The group approach to beekeeping has a number of constraints when it comes to production. The study by ARC/ reflects that 88% of production loss is a result of bee absconding. However, the study fails to explore the various factors linked with bee absconding. These factors include:

- ❑ Conflict within the beekeeper group
- ❑ Poor apiary and bee hive management
- ❑ Pest, e.g. wax moth

Apart from absconding there are a number of production constraints outlined in the study see Table 4.

Table.4 Factors limiting Increased Honey Production

Factor	Percentage
Absconding	88.6
Theft / Vandalism	74.3
Finance	71.4
Diseases & Pests	62.9
Limited land & Space	54.3
Forage Supply	51.4
Group Approach	23
Lack of Knowledge	14.3

Note: Each factor is measured independently: 100% is all the respondent.

Currently, most of the smallholder beekeepers use the top bar beehive. Most smallholders prefer to use of top bar hives. The top bar hive is suitable for small-scale producers. It is relatively cheap, easy to construct and manage.

7.0 Training of Beekeepers

Most beekeeping training in South Africa is done by white commercial beekeeper’s associations sometimes in partnership with tertiary education institutions. The training and development of black beekeepers is mainly done by the ARC through its Beekeeping Development Program initiated in 2003. This program is aimed at targeting at least 5000 beneficiaries. The aim is to address historical inequities within the South African beekeeping industry and increase its size by 50%. According to the ARC study, 97% of smallholder beekeepers are trained and have gone through mentored beekeeper development program. The training of smallholder beekeepers is very critical to the commercialization agenda.

Courses conducted by Grahamstown brewery in collaborative with Rhodes University, are done for 3 days at a time. The training is divided into 2 levels.

Beekeeping Level One

- Introduction
- Basic beekeeping knowledge
- Use of bee-keeping equipment
- How to handle bees
- Components of beehive
- How to set up a beehive
- How to maintain a beehive
- Preparation for winter
- Caring for bees during winter when food stocks are low
- Preparation for first honey flow
- Providing space for honey storage (setting up the hive “supers”)

Beekeeping Level Two

- Harvesting Procedure
- How to harvest honey without damaging beehive
- How to extract honey
- Trouble shooting
- Disease control
- Controlling of theft and honey predation
- How to market honey products

Level two of this beekeeping training is done when an apiary has been set up for the beekeeping group. Groups are assisted by mentors to set up the apiaries. Mentoring is set to continue for the group at least for a period of 2 to 3 years.

The existing beekeeping training in South Africa has a number of weaknesses; it is not accessible to all beekeepers due to costs associated with it. For example at the Grahamstown Brewery to train 10 people in Beekeeping Level 2 costs R36, 272 including the price of an extractor. In most cases this money has to be paid upfront prior to the commencement of training. For a long time training of beekeepers has been the domain of white commercial beekeepers belonging to associations. Thus smallholder black beekeepers do not belong to associations and therefore excluded from participating in training. The emphasis in content is most likely to focus on creating projects rather than commercial beekeeping businesses.

Partnership between training providers and educational institutions is a good practice and must be replicated elsewhere because it entrenches beekeeping in institution’s curricula.

Most beekeeping training targeting smallholder producers is mainly government funded. Little technical support comes from the provincial Departments of Agriculture.

6. SITUATIONAL ANALYSIS OF BEEKEEPING IN SWAZILAND

1.0 Introduction

Swaziland is a landlocked country sharing borders with the Republic of South Africa and Mozambique. It is a small country with an estimated land area of 17,364 km² and a population size of about 1 million people. The country maintains an open economy with South Africa being a major economic partner. The local currency Lilangeni is at par with the South African Rand as the country belongs to the Common Monetary Area (CMA), which also includes South Africa and Lesotho. This current arrangement has facilitated convenient trade between the three countries as the South African Rand is a legal tender in all of them.

The country's economic annual growth rate was estimated at 2.9% in 2005. Such an economic growth is however not sufficient to support a meaningful provision of public services by the Government. The HIV/AIDS prevalence rate is estimated at 42% making the country the second hardest hit country by this epidemic in the world. As a result of this epidemic there is a pressure on the provision of Government services such as the health service and social grants. The increasing number of Orphaned and Vulnerable Children (OVC) overstretched the capacity of the local traditional structures such as the extended family to provide for them. This situation has worsened the poverty situation in the country with 69% of the total population now living below the poverty line. An effort to attract Foreign Direct Investment into the country has currently not yielded significant results. Unemployment is currently about 29%.

The country's economy is still dependant on the agriculture sector for growth. Amongst the major agro-processing industries are sugar, fruit canning and pulp. The country has always benefited from preferential EU markets which offered a relatively higher price for the sugar. However such an arrangement has been phased out and as a result the price has dropped by about 30%. This development has prompts the need to diversify the agricultural sector in order to enhance its contribution to the economic growth. The identification and development of high value commodities with an opportunity for value-adding is a priority for the country.

2.0 Background

Swaziland is endowed with the natural and man-made forests. The major part of the country's highlands in the Hhohho and Shiselweni regions is covered by gum/grandis man-made forests which are used for timber. The ownership of these plantations is both by local companies and the large multinational corporations. The Lowveld has a vast natural environment which in some of the areas is not yet disturbed. According to statistics (CSO, 2000) about 71.1% of the country's area is covered by the forests. Honey production has a complimentary effect to the vegetation and hence the promotion of bee farming in the country has a significant potential. Besides the provision of valuable income for those involved in this enterprise, experience has shown that the domestication of bees plays a crucial role in minimizing the incident of forest fires, which is a great threat to the local forestry industry.

The Ministry of Agriculture & Co-operatives (MOAC) supports the development of bee farming in the country. According to the Ministry's Bee-keeping Specialist at least 3, 000 farmers were trained by the Ministry in the introduction to bee-keeping. However, out of this number it was established that less than 10% of them are still active in bee farming. Generally the majority of the farmers viewed this kind of enterprise as a hobby and as a result the average number of hives per farmer was less than 5. It was established that the lack of adequate technical support, lack of market information, un-organized marketing channels and the high fragmentation of the bee farmers were the major challenges. Again the lack of understanding about the honey production industry meant that aspiring commercial entrepreneurs would not get support for loans from the financial banks.

The WK Kellogg Foundation (WKKF) started supporting the development of the bee-keeping industry in the country in 1997 through IDEAA I working with the Tikhuba Communities in the Lubombo Region. With the development of the WKKF Programs on economic opportunities such an initiative has been up-scaled to cover most parts of the country. The main thrust of the current initiative is to uplift the profile of bee-farming as an important economic driver through generating relevant information, capacity building and further creating institutional measures that could foster and sustain the growth of this industry.

The Swaziland Government hosted a Job Creation Summit in July 2005 in which different stakeholders identified key priority sectors that could be developed to foster economic growth and the creation of jobs. Bee farming was identified as one of the important sectors that should be developed to enhance its contribution to the country's growth. As a result a number of stakeholders with an interest to support the process to commercialize and bring bee farming into the mainstream industrial development are emerging. The Program intends to exploit this opportunity through providing its valuable experience and lessons of best practice to harness effective linkages and development of a new crop of entrepreneurs that will make meaningful investment in the whole honey

value-chain. Amongst these key stakeholders are Technoserve and the African Development Fund (ADF) through the Manzini Youth Care.

3.0 Purpose of the Study

Southern African countries face serious challenges to enhance economic growth and promoting a transparent and equitable distribution of the national income. Globalization and market liberalization requires that countries develop sufficient capacity to compete and sustain any market share that they can have. Development Agencies identify the need to complement Government effort through developing and nurturing important high value commodities that could yield meaningful results for poverty reduction. Capacity building, appropriate farmer organization, creation of effective linkages with markets & input suppliers and facilitation of meaningful investments are the key elements to commercialize and derive meaningful returns from these commodities.

The purpose of this study is to analyze the production and economic situation of bee-keeping in Swaziland to establish potential opportunity for growing and up-scaling the contribution of this industry. This entails establishing current production levels, farmer engagement, marketing and the prevailing policy situation that impacts on the development of this industry.

4.0 Methodology

Bee-keeping in the country has not yet been fully developed to optimize its potential. This is despite the declaration of this sector as an important agro-business enterprise for rural development. The study is building upon information generated through a study on Catalyzing the Development of the Honey Industry in Swaziland undertaken by the local WKKF Program in July 2005. Interviews were done with key bee-keeping specialists and some individual bee-keepers from all the regions. Some of the data was derived from information that is continuously generated by the Program on the development of the bee-keeping industry in the country.

The production situation has been derived from the number of active hives and the average honey harvest load per hive in a year. The type of hive that is used was important as this has an effect on the level of production and in processing. The bee-keeping situation differs from region to region and hence it was important to separate the information according to the Rural Development Area (RDA) and the regions. In some of the instance there was a problem with getting the average honey harvest load as most of the farmers do not keep some records. For some of the RDA information could not be readily available. Information was gathered on the vegetation in the area to determine the availability of bee flora and the major plant species that support the industry.

The marketing situation was assessed through collecting some data on the institutions that buy the honey and the average farm-gate price. The level of price being offered varied depending on the market and the capacity to bargain in the by the farmer. It was difficult to estimate accurately information from the informal market. Crude information on consumer preference for the local honey was generated from the shop assistants where they sell the honey to determine if there was a likely trend on the honey brand preference.

5.0 Bee Keeping Production

Bee keeping history in Swaziland: This is still a primitive industry in the country yet with a huge potential for development. When bee keeping was initiated in the late 1980s its thrust was in diversifying local agriculture production and addressing the poverty situation. Unlike other agricultural commodities, bee-keeping was spearheaded and developed through the support from the donor community. Amongst these was the Israeli Government which supported the training of the extension officers. Through a training exchange program, local officers attended medium-term training in Israel and would come back and train other extension staff and the farmers. Through the partnership with the donor community and passionate individuals that pioneered bee-keeping in the country, a Bee School at the Lutheran Farmer Training Centre (LFTC) in the Hhohho region was born. The purpose of this school was to support training on bee-keeping through providing participants with practical education that would enable them to quickly engage in bee-keeping. There is need for the local bee-keepers to sustain the operation of the School to ensure that it provides adequate service to this industry. In addition to the training, this should also spearhead research & development in bee-keeping to keep ahead and nurture the growth of bee-keeping in the country.

The major target group for bee-keeping was the small-holder farmers in the rural areas. These would undergo one-week training in the introduction to bee-keeping at the Bee School. Extension officers also undertook training in introduction, hive management and harvesting at the same school. The local agricultural system is zoned into 17 Rural Development Area (RDA) programs which cover the four regions (Hhohho, Manzini, Shiselweni and the Lubombo Plateau) in the country. To intensify the extension support to the farmers, each RDA was supposed to have at least one Officer who would be adequately trained in bee keeping to provide support to the farmers that were trained, however only a few specialists are still visible.

Bee-keeping Groups: There is a National Bee-keeping Association called Lujilo LweMaswati. This comprises members from bee-keepers from the entire country. The group has a national executive committee which should co-ordinate and promote all bee-keeping in the country. This entails facilitating training for aspiring bee-keepers and assisting in developing markets for the honey. This committee should have representatives from all the four regions in the country which should facilitate communication and feedback between the national body and the regional membership. However, it was mentioned that the group has not been able to function effectively to

provide the required services to the membership. There is current effort to revive and strengthen the contribution of the group through a campaign to sensitize members to reconstitute the group.

There are also small bee-keeping groups that are scattered all over the country. The majority of these groups came as a result of donor support that was given to these communities to engage in bee-keeping as an income generating project. Amongst the major stakeholders that supported bee-keeping were the Lutheran Farmer Development Foundation (LFDF), Red Cross, Yonge Nawe and the WKKF Program. The WKKF Program is closely working with the Lubombo Bee-keepers Trust and the Lujulu LweMvelo in the Ngwempisi area. Interviews among the major group members indicated that lack of commercial attitude towards bee-keeping, absence of technical advice, lack of market information and the reluctance amongst the local banks to finance bee-keeping were amongst the contribution of the various

Bee-keeping production: According to the study undertaken in July 2005, the estimated honey production in the country was 83 tons a year. This comprised of honey from both the small-holder farmers and the commercial farmers. The accurate calculation of honey production in the country is very difficult as the farmers are currently not fully organized and also do not keep some records. Therefore the calculation was based on information obtained from the farmers and confirmed by the Extension Service Staff in the different areas. This information was on the number of farmers, number of hives that are held, average harvest load per hive and the average number of harvests in year. Experience in the country shows that the number of bee hive colonies fluctuates a lot due to swarming which is caused by inadequate management and sometimes difficult weather conditions.

Therefore for the purpose of this exercise, attention was given on the estimated harvest load per hive, the number of harvests in a year and the availability of flora. To understand the honey production situation in the country it is imperative to present the scenario on the basis of the country's regional experience. Interviews with the key stakeholders with the key bee-keeping stakeholders indicated that currently the performance of the different areas depends on the intensity of bee-keeping extension support that the communities receive from the MOAC staff. Current Government budget constraints have seen a rapid diminishing of the rural coverage of the extension service. This also led to the decline in the number of bee-keeping training courses that were provided to the small-holder farmers.

Despite these constraints, an encouraging passion and commitment to develop bee-keeping has been observed from the small-holder farmers. The WKKF Program provides support to the Ngwempisi bee-keepers as a part of the process of up-scaling to promote mass production effort from the Tikhuba Site. About a third of the farmers that were found in this area were introduced to bee-keeping by other farmers that had benefited from the MOAC bee-keeping training program. Efforts are now being made to mentor

advanced bee-keepers in the two areas to provide training and support to a greater number of farmers that have an interest in bee-keeping.

From the rapid data that was obtained from the regions, production from the small-holder farmers was approximately 30 tons. However data was not readily available from some areas in the Hhohho Region. Manzini, Shiselweni and Hhohho have the highest honey producing areas in the country. Interviews indicated that these areas have large man-made eucalyptus trees and the natural vegetation. Again these areas generally receive better rainfall as they are in the highveld. The average harvest load per hive was around 18kg. There is an increasing trend for the farmers to enter into agreements with the forest companies to establish appropriate apiaries within the plantation to take advantage of the tree blooms. It was established that generally in these areas, a farmer has at least three harvests in a year. The Lubombo Region was established to lag behind in production. The Region is semi-arid and lacks a wide diversity of the vegetation that can sustain the bees throughout the year. As a result, it was established that the farmers on average do not harvest more than two times in a year. The average harvest load per hive was established to be estimated at 13kg.

Literature indicates that in most high honey producing countries such as China and Mexico production averaged between 50kg – 150kg per hive. The local data shows that it is possible to achieve average production of 50kg per hive in the highveld. Improved hive management, selection and development of appropriate bee species and the bee queens are most of the critical issues that need to be addressed to influence increased honey production. Currently, wild African Bees are trapped into hives and managed to produce the honey. Vigorous efforts are required to improve the technology to make the local industry more competitive.

Commercial beekeeping in the country is now emerging. Currently, there are at least 3 commercial bee-keeping groups managing about 1, 900 hives. These are the Mavimbela Brothers, TPT and Sunnyside. These groups manage apiaries within the Mondi Papar Eucalyptus Plantations in the Hhohho Region. The commercial bee-keepers use langstroth hives and practice migratory bee-keeping most often to the citrus plantations in Ngonini and Tambuti. The current number of hives in these plantations is still minimal despite the commitment from the local forestry industries to support bee-keeping. The local experience has indicated that the domestication and proper management of bees in these forests help minimize fire hazard from bee hunters. There is a good opportunity to formalize mutual beneficial relationships between the farmers and the forestry companies.

Beekeeping farmers that received training in basic bee keeping since the inception of the bee-keeping section are estimated at over 3, 000 according to MOAC. However the reality is that less than 10% of these farmers are still active bee keepers. Investigations established that the lack of meaningful extension support, inadequate market information and the lack of organized market systems were the major constraints. Despite the availability of starter kits from the training, most farmers had problems with managing the hives. Some of them would not catch any colony and thus giving up at the end. Swarming incidents were also high. Lack of protective clothing also compromised the management capacity by the farmers. The generation of new advanced bee-keepers that would also provide support and training to emerging farmers will facilitate increase the number of bee-keepers and improve honey productivity through improved hive management practices.

Bee hive and equipment are a major part of bee-keeping. The Swazi Topbar is the major hives being used by the small-holder bee-keepers in the country. More often the farmer receives 2 of these hives and 1 trapping box after the basic training. The expectation is that he would use these to start and grow his/her bee-keeping venture. The advantage with the Topbar hive is that it is cheaper to make and the farmer can use locally available materials. However, due to the size and design of this hive it is not possible to use for migratory bee-keeping. The honey combs and brood are found together. Local farmers like this hive for comb honey selling.

The langstroth hive is used by the commercial bee-keepers. This type of hive is easier to manage, produces a better quality honey and also enhances the productivity. The farmer is able to move the hive from time to time to areas where there is favorable plant bloom for the bees. The design is in such a way that the farmer is able to differentiate the honey product. The prohibitive high cost of this kind of hive limits the number of small-holder farmers that can have access to it. Currently only the commercial bee-keepers are able to use this type of hive. The WKKF Program is working closely with Tikhuba and Ngwempisi bee-keeping groups to provide langstroth hives to advanced bee-keepers that would be used as magnet farmers. As a personal contribution to this initiative, these farmers would be required to exercise exceptional management capacity, participate in

the training of other farmers and also provide access to their apiaries for learning study tours. It is expected that this initiative would enhance the appreciation of the benefits of the langstroth hives and facilitate transition from the Swazi Topbar.

Most of the small-holder bee-keepers do not have protective clothing. This makes it difficult for them to properly manage the hives. It was established however that in most instances the lack of easy access to such clothing was the main problem. A women sewing group at Ludzeludze in the Manzini Region makes protective clothing on order for bee-keepers. It is essential to encourage the production of such uniform and their access to local shops for easier purchase. Generally, most of the bee-keeping equipment is not easily available in Swaziland. It is however anticipated that with the growth of this industry there will a corresponding response to market demand.

Bee-keeping training is provided by the Bee-keeping Section in the MOAC. There are 3 stages of such training with each taking a week. The basic training course provides information on the bee behavior & biology, bee catchment and some elements of hive management. The second stage emphasizes on the management of the hive through providing practical experience in hive inspection, disease prevention & control and some bit of harvesting. The final stage focuses on harvesting, processing and the marketing of the honey. This also infuses concepts of management to assist the farmer to effectively manage his/her operations and be able to do some costing and pricing.

The limited number of service providers that have the competence to provide the training is a problem. The training period is too long hence excluding other interested farmers that might in other employment. As mentioned earlier, the lack of follow up support has meant that a number of the training beneficiaries are not able to keep up with this initiative when they get back home. The WKKF Program is collaborating with MOAC to come up with strategies that interested farmers go through the training and these get the necessary support. The system of the farmer-cum-extension agent and development of more service providers for the training is being worked out.

Vegetation An assessment carried-out indicated that the eucalyptus and the natural vegetation the major sources of nectar flow for the bees in the country. The local vibrant timber industry is major potential catalyst for the rapid transformation of the local beekeeping industry. Besides the provision of the adequate flora, these can also assist develop sustainable industries for the production of essential equipment such as the hives. A young farmer in the Shiselweni Region has entered into a mutual agreement with a farm owner in the area to manage a meaningful apiary to cross-pollinate over 10 hectares of ovacado trees for export to the European markets. It is being hoped that the accreditation of the farm and the annual audits by these European markets will form a positive base for this bee-keeper.

A deeper knowledge of the wide variety of the natural vegetation is required to enable the farmers make advance plans to prepare for bloom the different trees. The same applies to crops to have the capacity to support bee-keeping. There is a deliberate effort to encourage the creation of orchards particularly for areas in Tikhuba where the vegetation is currently not sufficient to support a meaningful number of hives.

Fruit trees production: Some individual small-holder farmers realized the important contribution of fruit tree production to honey production. These are making efforts to establish orchards that will provide bee flora and also some fruits for an extra income. MOAC has a Horticulture Section that provides extension advice on fruit tree production to the farmers. The Section also facilitates training and the purchase of quality tree seedlings from accredited nurseries locally and in South Africa. The transport for buying the seedlings from South Africa is being subsidized by the Ministry. Currently there are some individual farmers (bee-keepers) that have planted about 40 trees (mango, citrus and litchi) each. The strengthening of the horticulture production effort will enhance the economic contribution of the local honey and also facilitate the differentiation and positioning of this local honey product. The Ngonini and Tambuti Citrus plantations have expressed willingness to support local farmers to migrate their colonies into their plantations during the tree bloom.

6.0 Bee-keeping Processing

Honey processing: It is done on-farm by the farmers through manual processing. This forms the major part of the final bee-keeping training that is provided to the farmers by MOAC. It is expected that each farmer should establish a standard honey processing room where he can process and package the honey before taking it to the market. It was established that most of the farmers use available household facilities to process and package the honey. Appropriate technology is used to strain the honey from the combs and is then sieved. It is essential to encourage the creation of adequate processing facilities that can guarantee the quality, safety and the uniformity of the honey.

The commercial farmers have their own modern honey processing equipment and facilities. These comprise the extractors and settling tanks. The Program has an intention

to establish a honey processing facility to enhance the marketing of the local product. Several problems at the time delayed this development.

7.0 Bee-keeping marketing

Bee-keeping products: Honey is currently the major product that is derived from bee-keeping. This is differentiated into honey comb and bottled honey for marketing. The Swazi Secrets, a local company producing a variety of body products from marula and other indigenous trees, requires bees wax for the production of marula lip balm. This will assist create the demand for the bees wax. It is however imperative to identify meaningful markets for bees wax to compliment farmers' income. Propolis, pollen and royal jelly are also some of the products that are produced by the local bee-keepers. Propolis is used by the farmers as a bait to catch colonies.

Marketing: The local market for honey is highly fragmented. Last year the market was estimated at 105 tons a year. At least 20 tons of honey was imported from South Africa in 2004. The country did not have any exports. Random visits in the local shops also indicated that some of this honey was coming from Zambia. Approximately 38 tons of the locally produced honey was absorbed by the local market. The informal market for the honey is very much pronounced and accounting for 60% of the whole local market. Interviews with the farmers indicated that most of the farmers did not have information on how to sell their honey. In some instances the market would require the honey to be labeled and packaged in a certain way and hence denying the farmer an opportunity to sell. However, generally there is a strong commitment from the shops to support the local farmers.

Supermarkets and chemists are the major markets for the local honey. Amongst these are the Spar chain stores (Mbabane, Matsapha, Manzini & Nhlanguano), Shoprite (Mbabane & Manzini), Pick'n'Pay at Ezulwini and the Score chain stores. The commercial bee-keepers have standing orders with the supermarkets. A local brand called Swazi Honey is already circulating in the market. Observations and discussions with some shop assistants and shoppers showed that the product was not visible in the shelves. Some consumers were not even aware that the product was available in the local shops. Only the loyal customers expressed that they knew about the availability of the product in the local shops. There is need for the promotion of the product to create consumer awareness and encouraged increased visibility. Increased production is required to make viable the creation of effective formal distribution channels. The differentiation and positioning of the product is also essential to optimize demand and product price.

Income from honey: At least three kinds of honey products are available in the local market. Comb honey is one of the major products that were reported to have a high demand particularly during the winter season. Most of the shops reported that the demand is rarely sufficiently met by the local supply. The product comes in 300g plastic tub and is generally bought at E25/kg (US\$3.50/kg). The honey comb is properly sliced to fit in

the tub and it is then closed. The majority of the farmers preferred this kind of honey as it is easier to prepare, pays a better price and has a high demand. The farmer brings the honey to the supermarket. The Mavimbela Brothers (Commercial Honey Producers) also buy the honey from the farmers for further processing and marketing to the major supermarkets. The product needs to be properly packaged and labeled to make it attractive.

Manual processed honey is normally sold in 500g plastic jars at around E44/kg (US\$6.30/kg). The demand is less than that of the comb honey. The honey is relatively opaque and granulated. As a result, some of the consumers think it is spoilt when it is in this state and thus not buy it. The bulk of the honey that is imported from South Africa is machine processed and sometimes ultra filtrated. These come either in open or squeeze jars with usually pronounced brands. The market pays around E52/kg (US\$7.50/kg). This honey is more clear and of even consistency.

An economic analysis indicated that the benefits from the local honey production are high. The existence of a wide natural environment and the prevailing market price can ensure that the farmer derives a meaningful income from this venture. It was established that using the local Topbar hive, a farmer can derive a net income of approximately E600 (US\$85.70) per hive. If the farmer manually processes the honey his net income increases to approximately E900 (US\$120.85) per hive. This implies that if the small-holder farmer is developed to manage at least 20 hives, he can possible derive a net income of over E18, 000 (US\$2, 417.00) in year. This income can further be enhanced through the introduction of the langstroth hive which is more productive. This is a meaningful income stream that can significantly contribute to the standard of living for the family.

8.0 Conclusions

The existence of the favorable natural environment and the low disease prevalence improves the country's comparative advantage in bee-keeping. The use of natural environment will encourage communities to practice sustainable development as they learn its importance on the development and growth of this industry. Increased bee-keeping activity will improve crop pollination and thus contribute positively to food security. Bee-keeping can be integrated with other complimentary enterprises such as orchards to differentiate the honey and to also increase the income streams. As the majority of the local people live in the rural areas, commercial bee-keeping can provide job opportunities and meaningful income to the rural communities to alleviate the level of poverty. It is essential however to elevate the profile of this industry through creating effective national and regional trade linkages to improve the marketing and processing.

Table 1: Level of Honey Production by Small-holder Bee-keepers in Swaziland

Region/RDA	No. of Farmers	No. of Hives	Average Harvest Load/Hive (kg)	Main Flora	Average No. of Harvests	Typical Harvest Period
<u>Manzini:</u> <i>Central</i>	6	50	25	Eucalyptus, fruit trees & natural vegetation	3	Feb. – March, May – Aug. & Oct. – Nov.
<i>Mliba/Luve</i>	20	54	15	Eucalyptus, fruit trees & natural vegetation	2	May – July & Aug. – Oct.
<i>Ngwempisi</i>	65	195	18	Eucalyptus, fruit trees & natural vegetation	3	March – April, May – July & Aug.
<i>Mahlangatsha</i>	8	20	18	Eucalyptus, fruit trees & natural vegetation	3	April, June – July & Sept. – Oct.
Total	99	319	19		2.75	
<u>Hhohho:</u> <i>Mayiwane</i>	13	20	13	Eucalyptus, fruit trees & natural vegetation	3	May – July, Sept. – Oct. & Nov. – Dec.
<i>Motshane</i>	2	20	17	Fruit trees & natural vegetation	4	March – April, May – July, Sept. – Dec.
<i>Northen¹</i>						
Total	15	40	15		3.5	

¹ Data not available at the time of the report. However, Northen RDA is a good honey producing area.

Region/RDA	No. of Farmers	No. of Hives	Average Harvest Load/Hive (kg)	Main Flora	Average No. of Harvests	Typical Harvest Period
<u>Shiselweni:</u> <i>Madulini</i>	5	20	19	Eucalyptus, fruit trees & natural vegetation	3	Feb. – April, June & July
<i>Mahamba/Zombodze</i>	56	152	18	Natural vegetation & fruit trees	3	Feb. – April, May – Aug. & Oct. – Dec.
<i>Hluthi</i>	2	50	12	Natural vegetation & eucalyptus	2	June – July & Sept. – Oct.
<i>Southern</i>	7	21	13	Natural vegetation	2	June – July & Sept. – Oct.
<i>Total</i>	70	243	15.5		2.5	
<u>Lubombo:</u> Tikhuba	69	27	15	Natural vegetation & fruit trees	2	March & Sept. – Jan.
KaLanga	12	23	15	Natural vegetation	2	March & Sept.
Siphofaneni	19	8	10	Natural vegetation	2	Jan. & May - June
<i>Total</i>	100	58	13.3		2	
<i>National Total</i>	284	660	15.7		2.7	

7. Situation analysis of beekeeping industry in Zambia

1. Most of the honey in Zambia is produced from the usage of Bark hives scattered randomly in the forests. However with commercialization in recent years apiaries are now in use and incorporating modern top bar hives.
2. Inputs required are beehives, smokers, buckets, gloves, veils, overalls, knives, brushes and safety boots. Training in creating apiaries, management, harvesting and processing is required.
3. Once the honey comb has been harvested, at processing level, the honey comb is broken, settled for nearly seven (7) days. The liquid honey is separated from the combs. The honey is filtered through the calico cloth and stored in bulk (in 30 kg and 300kg containers).
The combs are then pressed to extract the remaining honey. The extracted honey is settled for at least two (2) weeks and then filtered through the calico cloth.

To extract the wax, the combs are heated to the melting point of wax and wax extracted through pressing.

4. At the processing enterprise level, the current average production cost per unit are as follows:-

• Hive construction	40 US\$
• Inputs	1.50 US\$
• Harvesting	0.78 US\$
• Processing	0.25US\$
• Packaging	0.125US\$
• Transport	0.25US\$
• Marketing	0.125US\$
5. Strategies for value addition are:
 - a. Improvement of quality and separation of honey from combs.
 - b. Organic status certification now in place in areas of Northwestern province. In other provinces, certification process is in progress
6. Product harvested through extraction of honey combs from hives manually and placing honey combs in sealable honey plastic buckets.
7. No extra treatment but packed in plastic containers/ waxed steel metal drums.
8. Depending on the weather, it may be in granulated or liquid form. It is packed in compliance with the customers' specification.
9. Yes. The pack size depends on the customers' specification.
10. By road – Trucks.
11. Honey moves on customers' orders.
Two seasons 1) November – January and 2) April – July.
12. Honey 18% or below moisture content has an indefinite shelf life when stored appropriately.
13. On contracts or orders.
14. Zambian honey standards are in the process of establishment. However, all Zambian honey sold has to comply with COMESA and/ or EU standards.

15. Food and Drug commission in Zambia tests any parameters demanded by customer.
16. Local and Export market – No quota system.
17. There are no controls. The price is negotiated with the farmers before the on set of the harvesting season.
18. Primary level processing starts with beekeepers who harvest, process and sell liquid honey and wax to buyers (wholesalers, retailers or consumers). Processing companies buy comb honey and process into liquid honey, package in special containers, label and advertise.
19. **Channel 1.** Farmer sells honey combs to the processor. The processor extracts the honey from the combs. He packs honey and delivers it to the supermarkets, chemists and groceries.
Channel 2. Farmer sells honey combs to the processor who packs it in bulk and sale to COMESA and EU markets.
In this regard, there are business relationships between the, transporters, suppliers of packaging and processing materials and the farmers, processors and buyers of honey on the other hand.
20. In Zambia, there are no standards for different end-users.
21. Currently, Zambia uses COMESA specifications or EU standards when demand arises.
22. training in managing hives, harvesting, processing and storage of the final product. Also training in using appropriate equipment and technology.
- 23 The processor will advise the farmer at the time of buying the honey comb and this is supplemented by training carried out by various governmental and non governmental bodies
governmental bodies
24. Yes, they are there such as Keepers Foundation Zambia, Africare, DANIDA, Forestry Department under Ministry of Tourism and environment and Various beekeepers' Associations. The Zambia Honey Council encompasses producers, processors traders, exporters in the sectors and is also involved in lobby and advocacy for industry policy including standards.
25. No levies currently. There may be as the sector develops.
26. Not so much but this is likely to improve as the sector develops.
27. Nothing at the moment.
28. There are government institutions which govern the quality of food and related products coming in and going out of Zambia eg mount Makulu research station for phytosanitary aspects and Food, Drug Commission and Zambia Bureau of Standards.
29. Yes. To such countries as South Africa, Tanzania and Zimbabwe, Germany, Belgium and United Kingdom.
30. It is used mainly as table honey in bakery and confectionery industry as sweetener.
31. Price, quality, advertising and packaging. Supply in the April- July (following the rainy season may negatively affected for a few months, where as for the rest of the seasons honey s in abundant supply.
32. Estimates in the absence of definite figures are as follows per year:

- Total production is 1000 M/T
- Honey consumption in Zambia < 500 M/T
- Honey exported is around 500 M/T

The country has potential to produce over 3000 M/T per year. Kindly revert to us for further clarification.

**8. SITUATIONAL ANALYSIS OF THE
APICULTURE SUBSECTOR
IN
ZIMBABWE**

7.1 Introduction

Apiculture simply known as beekeeping can be defined as the art and science of keeping honeybees for the benefit of mankind. In Zimbabwe, beekeeping is fast becoming a profitable income generating activity for people of all ages because of the high demand for honey and related bee products on the market. There is currently a high shortage of honey and bee related products such as beeswax in the market in Zimbabwe.

The systems of beekeeping in Zimbabwe are a mixed bag of traditional and low technology beekeeping with the latter beekeeping employing the use of movable top bars. Both systems have their advantages and disadvantages over each other but traditional beekeeping is becoming very unpopular and more discouraged because of its negative effects on the environment. In Zimbabwe, the definition of a 'commercial beekeeper' tended to mean beekeepers using frame hives, a system that was practiced by the majority of white Zimbabwean commercial beekeepers. To date very few individual black bee keepers have successfully commercialized. However numerous collectives and cooperatives have emerged, in the past 10 years.

On the domestic market there has always been a great demand for honey and its derivatives. The demand on the local market has always outstripped supply resulting in very little left for export.

Beekeeping in Chimanimani

The majority of beekeepers in Chimanimani District of Zimbabwe are still using traditional beehives made out of bark or logs. Few of the beekeepers were using movable top bar hives commonly known in Zimbabwe as Kenya Top Bar Hives.

Honey requires grading at harvesting based on the following factors: -

- Colour
- Aroma/taste
- Moisture content
- Presence of pollen grains

Beekeepers in Chimanimani were taught how to grade honey into 3 grades as follows: -

Grade One

- New wax combs
- Medium light colour
- Very little pollen
- Few uncapped honey (80% capped)
- Acceptable flavour/aroma
- Low moisture content

Grade Two:

- New wax combs
- Medium light colour
- Very little pollen
- Few uncapped honey (80% capped)
- Acceptable flavour/aroma
- Low moisture content

Grade Three:

- Mostly new wax combs
- Light brood combs with dark honey
- Small amount of uncapped cells
- Acceptable flavour
- Low moisture content

Grade Four:

- Old brood combs
- Dark honey
- Pollen present
- Doubtful flavour
- Medium moisture

In most cases the middlemen who buy the honey capitalize on the ignorance of beekeepers on honey grading and therefore dictate the grades and the prices of the commodity. Groups of beekeepers deliver their honey to selling points where the honey is bought by unscrupulous middlemen. Once honey has been sold there is no market feedback that the beekeepers get so that improvements on the grades of the commodity could be made.

The local demand outstrips supply of honey in Zimbabwe as a result of the importance attached to it at home as wholesome food, and its numerous applications in traditional and modern medicines. Great importance is also attached to honey by some religious groupings that have become a big market for honey in Zimbabwe.

The service industries involved after honey has been bought and extracted are as follows:

- Manufacturers of confectioneries such as Willards Foods and Crystals Sweets.
- Pharmaceutical Manufacturers like Zimbabwe Pharmaceuticals
- **Manufacturers of beeswax foundations and strips**
- Manufacturers of cosmetics
- Manufacturers of antiseptics
- Baking industries
- Manufacturers of floor polish; shoe polish and furniture polishes with the use of beeswax.

Structure of the Industry

In Zimbabwe prices of honey are not controlled by government hence the prices depend on the beekeeper's ability to bargain but net returns can be as high as 45%. In Zimbabwe beekeeping is a profitable venture because of the abundance of wild colonies and lengthy season that is ideal for honey production. However, many beekeepers have not yet taken beekeeping seriously as a source of their livelihood. The national Government has tried to promote training in bee keeping through the establishment of an Apiculture Section within the Ministry of Agriculture. This unit's responsibilities include the provision of beekeeping training to the Ministry's extension workers. The agents, in turn, train farmers and also have outreach programmes. The Apiculture Section is under resourced and has been unable to have a meaningful impact. The land bank (Agri Bank) does not provide loans to promote honey production (in the same manner that it has supported maize, wheat, tobacco and livestock production). There is an urgent need to influence the government to have strong economic policies designed to promote the development of beekeeping in Zimbabwe.

Production Cycle

The following production cycle is observed by the industry:

- Beekeeping operations start in winter when honeybees are not active. The operations involve the repair of beehives, selection of sites and mounting of beehives in those selected sites.
- At the end of July, honeybees start to be active i.e. the swarming season when the quantity of honeybee food is increasing. In August to October, the food for the honeybees is in abundance and new swarms issue and look for new nest sites thus giving chances to the beekeepers' hives to get occupied by honeybee colonies.
- After two months from the time the honeybees occupied the hives the beekeepers inspect the beehives to check the progress made by honeybee colonies.
- After three or four months, a beekeeper can expect a small quantity of honey depending on the availability of nectar producing (nectariferous) and pollen producing (polleniferous) plants on or close to the site.
- During the following flowering seasons when honeybee colonies have fully established a beekeeper can expect higher honey yields of 40 to 60kg of comb honey from each standard size Kenya Top Bar Hive.

The following inputs are required for a beekeeper with 50 Kenya Top Bar Hives (KTB): -

Item	Quantity	Unity Cost (USD)	Total Cost (USD)
Kenya Top Bar Hives (complete)	50	50	2500
Zip- up overalls (white) with elastic around ankles and wrists	2 pairs	40	80
Jacket and veil	2 pairs	30	60
Gloves-Leather (Large size)	2 pairs	30	60
Smokers (Standard size)	2	30	60
Bee brushes	2	3	6
Hive tools	2	3	6
Beeswax	1kg	10	10
Propolis	0.5kg	5	5
Honey jars with lids	4000x500g	0.3	1200
Plastic buckets with lids	6x 20ltrs	30	180
Honey Strainers (standard)	5	4	20
Settling tanks (100 litres)	2	150	300
Solar wax extractor (standard)	1	100	100

Honey gates	11	2	22
Honey drums (Plastic) - 200litres	5	130	650
Honey heaters	2	20	40
Table knives	2	8	16
Catch boxes (top bars)	10	2	20
Sugar-white for winter feeding	100kg	18/10kg	180
Total			5 515

Rate of exchange used USD1 = ZWD102 000

The processes occurring in Chimanimani in the production of honey follow:

- Cropping of honey from the beehives
- Grading of comb honey.
- Honey is then sold to middlemen

Hurungwe and Mutoko Districts

Beekeepers in Hurungwe District of Mashonaland West and Mutoko District of Mashonaland East Provinces work in groups. Those in Mutoko formed an association known as *Mutoko Beekeepers Association* to enable the members of the association to bargain for fair prices of their produce collectively. Members of the Hurungwe beekeeping groups managed to establish a honey-processing centre at Magunje Growth Point with assistance from *Zimbabwe Farmers' Development Trust*. The latter Trust facilitated the establishment of another honey processing factory at Nyanga District Centre to serve beekeepers in Nyanga and Manicaland Province. Zimbabwe Farmers' Development Trust has Board Members derived from the beekeepers and experts from different disciplines essential for the provision of technical backstopping support to producers.

Beekeeping Systems

In all the Provinces the beekeepers use both movable top bar hives and traditional beehives. The inputs required are almost the same quantity as those used for the Kenya Top Bar hives. The difference comes in the cost of Greek Basket Top Bar Hives made out of straw or reeds that are locally available in most parts of Zimbabwe.

Honey sales

Zimbabwe Farmers Development Trust purchases comb honey from the beekeepers in Hurungwe and transports it to the honey-processing Centre at Magunje in Mashonaland West Province where it is packaged and delivered to market.

In Manicaland the honey purchased within the Province is delivered to Nyanga for processing, packaging and delivery to the market. In agreement with ZFDT, beekeepers established honey-selling centers from which honey is collected in drums to the honey centre. Beekeepers use scotch carts to transport their honey produce to the honey selling depots. The honey is weighed on spring balance scales and the producer is given his/her cash. At the time of writing this report the purchasing price of 1kg of comb honey stood at ZWD200 000.00.

Cost of Production

Land Preparation

This operation involves time taken to choose the best site to the bees but also ideal to the beekeeper, opening enough working space around the beehives and also providing a fireguard where beehives are placed on one site. Where water is not available, then provision of water should be made within a radius of 3km from the bee site (apiary). If the forage is not abundant nectar-producing plants are planted for the benefit of the honeybees in the area.

Each activity requires two people.

Choice of a site takes 4hrs and costs USD2 (USD1 x 2 people)

Mounting beehives takes 27hrs and costs USD 14hrs (USD7 x 2people)

Making beehives takes 45hrs and costs USD23 (USD11.5 x 2).

Input costs

As shown above on input costs

Harvesting

Harvesting of honey demands people working in pairs i.e. one smoking the honeybees with a smoker while the other opens the hive and cropping the honey. In Hurungwe harvesting is done 3 times a year during good seasons and twice (2 times) a year during normal seasons. Each beehive can take about 1 hour to harvest and place back the top bars depending on where the

beehive is mounted. Those mounted up in trees can take about 2 hours or more to harvest.

Processing of honey

An apiary with 50 Kenya Top Bar Hives (each yielding 40kg of comb honey) yield a total of 2000 kg (2 tons) of comb honey. The comb honey is stored in containers, strained, passes through heaters to delay crystallization or granulation. These operations take about 14 days i.e. 4 days to strain the honey, 10 days to allow the honey to settle and mature. During the 2004/2005 season between 15 to 20 tons went through the Magunje Honey Processing Centre. After straining the honey, beeswax is rendered from the empty combs. Processing Costs – 126hrs @ USD1/4hrs x 3times/year x 2people =USD204

Packaging

Packaging of honey at the Hurungwe processing centre involves filling 500g jars with liquid honey, placement of labels and packaging the jars in boxes and stacking the boxes in store rooms ready for delivery to market. The major shortfall experienced in these factories is the lack of quality control systems. problem that was experienced in the past pertained to product quality control.

Bottling –filling 1847 x 3times/year @ 270 bottles/9hrs(day) = 185hrs @USD1/4hrs = USD46 x 2 people =USD92

Packing in boxes and loading – 2hrs x 3times/year @USD1/4hrs =USD2

Transport

Transportation of the product is by road from the Honey Processing Centre to market.

Distance to and from Magunje Processing Centre = 496km

Costs incurred

Fuel – light vehicle	60 litres @USD5/lt	=	USD300
T35 Truck	75 litres @ USD5/lt	=	USD375

Subsistence

Lunch	=USD6
Dinner	= USD6

Breakfast = USD4

Marketing

Offloading = USD20

Lunch = USD6

Storage = USD4

Insurance = USD25

How the product is harvested.

No mechanization is required but it is done manually in pairs using the necessary tools and bee tight gear.

Honey should not be adulterated.

It absorbs moisture from the atmosphere therefore it should be kept in air tight containers at room temperature. Therefore from source of production to processing centre and to market honey is kept in airtight containers.

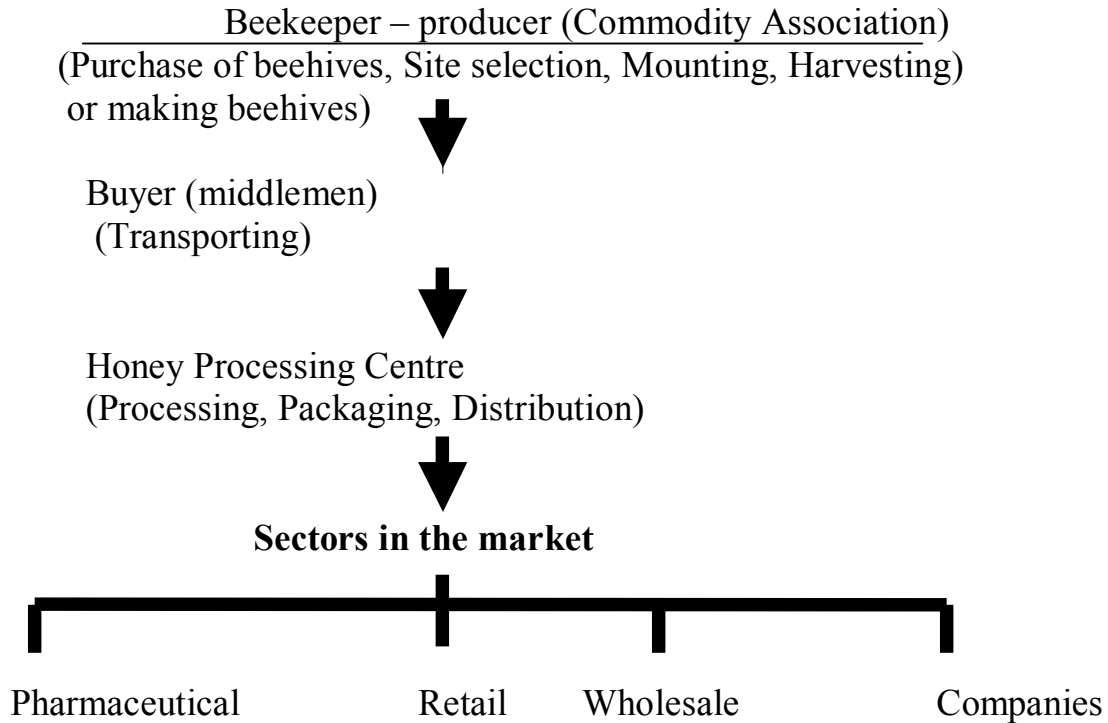
It leaves source of production in comb form

Packaging occurs at the honey-processing centre under hygienic conditions as required by Health Standards of Zimbabwe. Liquid honey is packaged in 500g jars and packed in boxes of 24 jars in each box. The use of Scotch-carts and trucks to the selling or collection points from the source of production i.e. the beekeeper. From the producer honey is sold when available but from the honey processing centre honey is sold by contracts.

Price received is related to::

- Acceptable levels of moisture content (17-18%).
- Absence of pollen grains
- Colour of combs
- Aroma/flavour
- Absence of broken wax particles.

Marketing Chain



Food manufacturers: are involved in the industrial use of honey, namely:

- Honey crunchies and popcorns by Willards
- Toffee sweets
- Cough syrups
- Food sweetener
- Beverage
- Pronutro
- Honey syrup
- Honey Hut Flakes

The farmers

- Harvesting of honey is carried out when honey is ripe or mature.
- They avoid over smoking as over smoking causes the honey to lose its aroma and flavour.
- They avoid harvesting honey when there is high moisture content in the atmosphere (honey is hygroscopic).
- Comb honey is stored at room temperature to reduce crystallization or granulation.

- Grading of honey to remove pollen that can cause fermentation of the honey should be done. Old combs should not be mixed with new combs.
- Containers should be moisture tight, airtight and bee tight

The Processors

- Honey is extracted as soon as it gets to the processing centre or factory to avoid granulation or crystallization.
- The processing room should be warm. Honey is processed under hygienic conditions.
- Containers are sterilized and have lids with seals.
- Honey is not overheated but is heated to the recommended temperatures.

There are some organizations and Associations representing beekeepers such as: -

- Zimbabwe Farmers Development Trust (ZFDT)
- Beekeepers' Association of Zimbabwe (BKAZ)
- Mutoko Beekeepers' Association (MBA -covering Mutoko District only)
- Hygienic Beekeepers' Association (HBA – covering Uzumba Maramba Pfungwe District only)
- Intermediate Technology Development Group – Southern Africa

No black farmers are either making any contributions or paying levies towards research in beekeeping.

The promotion is through field days at farmers' apiaries, agricultural shows at district up to national level, food shows, mass media (radio and television), meetings with board members of associations and organizations such as ZFDT. A presentable product is produced. ZFDT, Kellogg Foundation and Government embark on the promotion of beekeeping through offering farmers training and sourcing funds for training

No regulatory framework in existence that will govern the marketing and distribution of the commodity. The quality assurances are that the honey has not been stored for a longer period of time that the sugar levels are not

within the required levels i.e. (HMF). Moisture levels for honeys from the tropics are not in excess of 17 –18% . Honeys from indigenous trees tend to be favoured by consumers (organic honey).

End products made and sold in retail outlets from the commodity: -

- Liquid honey
- Honey crunches
- Cutex
- Sweets
- Shoe polish
- Furniture polish
- Floor polish

The scarcity of honey causes the prices to rise beyond the reach of many consumers. In such cases the consumer goes for other alternatives instead of buying honey.

Table 1 SADC HONEY PRODUCTION ASPECTS

	Annual product ion	Price (Local) per kg USD	Price (Retail per kg) USD	Price (Export per kg) USD	No of Producers	Production system	No of hives	Type of bee hive	Cost of bee hive	Import (Total)
	87.5 tons	1.07	5.99		3500 (rural producers) & 3 commercial	Individually production	3500 Tr. ² 3500TB ³	Top bar & Traditional	11.7 (Tr) 14.27 (TB)	
	1500 metric tons	0.62	3.6		7500	Individually production	150 000 Tr. 37500 TB.	Top bar & Traditional		
uth	8 tons	2.9	5.7		95	Group production		Top Bar	64.3	-
	83 tons	1.79	-	-	370 (rural) 3 Commercial	Individually production	1230 Tr. 570 TB.	Top bar & Traditional		20 tons From R.S.A
	12 tons Excl.Eas tern Cape	2.9	5.7	Nil	905	Group production		Top Bar	64.3	Nil
)	1680 tons	Nil	5.7		50 Commercial 2950 Hobbyists	Individually production			64.3	

² Traditional bee hives (an enclosed tree buck/ trunk converted into a box)

³ Top Bar Hives