RURAL APICULTURE DEVELOPMENT FOR LIMPOPO

CONSOLIDATED FINAL REPORT

JANUARY 2016

COMPILED FOR:

INDUSTRIAL DEVELOPMENT CORPORATION

Industrial Development Corporation

Your partner in development finance

COMPILED BY:

NKWELE AGRIBUSINESS PLANNING AND INVESTMENTS (PTY) LTD

Nkwele Agribusiness Planning & Investments (Pty) Ltd
Physical Address: Cnr Mandela Drive & Meiniger Str, 13 Sparrows Centre, Modimolle, 0510
Postal Address: P.O. Box 2135, Modimolle, 0510
Cell: +27 (0)73 702 3779 | **Fax:** +27 (0)86 614 2852 | **Email :** thati@nkweleagribusiness.co.za
: nkweleagribusiness@gmail.com

TABLE OF CONTENTS

CHAPTER 3

LIMPOPO APICULTURE SURVEY

CHAPTER 4

APICULTURE DEVELOPMENT STRATEGY FOR LIMPOPO

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

APPENDICES

LIST OF TABLES

TABLE OF FIGURES

ACRONYMS

ABET	Adult Basic Education and Training
APCF	Agro-Processing Competitiveness Fund
DAFF	Department of Agriculture, Forestry and Fisheries
FAO	Food and Agricultural Organization
LDA	Limpopo Department of Agriculture
LED	Local Economic Development
LEDA	Limpopo Economic Development Agency
LEGDP	Limpopo Employment, Growth and Development Plan
IDC	Industrial Development Corporation
NAMC	National Agricultural Marketing Council
NDP	National Development Plan
PGDP	Provincial Growth and Development Plan
SA	South Africa
SABIO	South African Bee Industry Organization

EXECUTIVE SUMMARY

The study on Rural Apiculture Development for Limpopo was undertaken to conduct research and develop an apiculture development strategy for Limpopo Province. The study was motivated by challenges affecting the development of the apiculture industry in the province as well as opportunities and developmental potential that still exists for the sector.

South Africa is estimated to consume approximately 4 000 tons of honey per year, while the country only produces around 2 000 tons per annum. This situation results in demand deficit of approximately 2 000 tons per year that gets imported into the country to satisfy the demand. This positions South Africa as a net importer of honey, with China being the single biggest exporter of honey into the country. From 2010 to 2014 South African imports of honey from China amounted to over 90% of the total honey imports.

At the same time South Africa is endowed with rich forage for bees. This resource can be exploited for beekeeping thereby generating income for most rural people. The importance of beekeeping in terms of socio-economic benefits such as poverty alleviation, employment creation and incorporation in conservation programmes are well recognized and supported in various local economic development initiatives.

The South African apiculture industry is a well legislated and regulated sector. Various pieces of legislations and regulations exist to regulate the beekeeping industry along the entire honey value chain. The development of beekeeping sub-sector is well aligned with most national and provincial development policies and strategies that promote agriculture and agro-processing to support rural-based smallholder producers.

The South African Bee Industry Organization (SABIO) is the main voluntary national commodity association representing all industry players within the honey value chain. With the exception of Limpopo Province, most hobbyists and commercial beekeepers from other provinces belong to provincial beekeepers associations which liaise with SABIO at national level.

The apiculture survey conducted in Limpopo Province during November and December 2014 revealed that the majority of smallholder beekeepers are located in the Vhembe district. Both Vhembe and Mopani districts were identified as having high potential for beekeeping due to favourable climatic condition. The smallholder beekeepers in Limpopo Province were mainly supported by Limpopo Department of Agriculture (LDA) and Agricultural Research Council (ARC).

The main factors affecting the development of the smallholder beekeepers in Limpopo Province were found to be: 1) Lack of production resources, 2) Lack of processing equipment, 3) Lack of processing facility (premises), 4) Lack of transport, 5) Theft and vandalism, as well as 6) Inadequate training and skills. Despite the initial support provided such as provision of production inputs like beehives and protective clothing, most smallholder beekeepers still lack adequate production resources. Notwithstanding the initial beekeeping training provided, many smallholder beekeepers still display limited beekeeping knowledge and skills due to inadequate training. Lack of information, low productivity and lack of processing equipment are the major economic impediments for the development of market-oriented commercial beekeeping enterprises for smallholder beekeepers.

Most smallholder beekeeping developmental projects are characterized by ineffective organizational structures for collective action. In most provinces there are no organizational or institutional structures that represent smallholder beekeepers, whereas commercial beekeepers have provincial forums to mobilize their participation, disseminate information, be a voice for their concerns, and for market development. Despite these challenges most beekeepers in Limpopo still aspire to grow and operate commercial beekeeping enterprises.

Some of the intervention measures implemented by smallholder beekeepers to address their challenges include making use of self-made hives; traditional honey processing methods; local informal markets, and establishing apiaries within backyard, own farms and orchards. Most smallholder beekeepers use beekeeping as a secondary source of income generating enterprise within agriculture. This is due to lack of adequate production resources. The other factor that limits the production capacity of smallholder beekeepers is the seasonal nature of the beekeeping which enables them to harvest only twice a year from few hives.

The training and capacity building interventions required to develop smallholder beekeepers include practical training on beekeeping, honey processing, business management and marketing. Beekeepers need to be assisted with provision of adequate production resources and processing equipment as well as marketing support. These interventions are necessary and would contribute significantly towards the development of smallholder beekeepers and the apiculture industry in Limpopo Province.

The apiculture development strategy identified nine main strategies and project activities to be implemented over short, medium and long term. The short term approach addresses institutional enhancement and kick starts the roll out plan; the medium term covers the full project implementation phase, while the long term addresses the exit plan and project hand over. The identified strategies and activities seek to address challenges along the honey value chain, institutional arrangements and capacity building issues.

The strategic goal is to implement a coordinated honey production, processing, branding, marketing and distribution strategy to empower and create sustainable jobs for beekeepers and unemployed rural people in Limpopo Province. The strategic vision is to achieve a market-driven commercial and sustainable beekeeping industry in the province. The purpose is to increase incomes of beekeepers at the individual and co-operative levels. The strategic interventions include expansion of the local production capacity, market development, training, mentorship, and institutional enhancement, as well as strengthening and empowering local producers. The proposed strategies and strategic interventions would need to be facilitated to ensure buy-in and support from all stakeholders in order to achieve successful implementation and development of the apiculture industry in Limpopo Province.

CHAPTER 1

BACKGROUND AND INTRODUCTION

1.1. INTRODUCTION

This study seeks to evaluate apiculture development in Limpopo Province, South Africa, and further to develop an apiculture development strategy for the province. The study was undertaken as part of the agro-processing competitiveness fund research focusing on rural areas. The study was motivated by challenges affecting apiculture development in most rural areas of South Africa, as well as opportunities that exist for the development of the sector.

1.2. BACKGROUND OF THE STUDY

The Industrial Development Corporation (IDC) put out a call for proposals on agro-processing research targeting rural areas of South Africa. The IDC partnered with Economic Development Department (EDD) through the Agro-Processing Competitiveness Fund (APCF) to provide research grant to interested institutions (both public and private) that wished to undertake research focusing on the agro-processing sector, opportunities and challenges of rural agro-processing initiatives and others, which can be beneficial to the sector at large. The objective of the APCF is to facilitate increased competitiveness, growth, job creation and development in the agro-processing and beverages sectors. Nkwele Agribusiness Planning and Investments (Pty) Ltd was awarded a funding portion of the APCF research grant to conduct a study on rural apiculture development for Limpopo Province and further develop an apiculture development strategy for the province.

1.3. AIM OF THE STUDY

The main aim of the study was to conduct research and develop an apiculture development strategy for Limpopo Province.

1.4. OBJECTIVES OF THE STUDY

The objectives of the study were to:

- Assess the honey production potential in Limpopo;
- Undertake a survey on beekeeping activities in Limpopo;
- Undertake resource and training needs assessment for rural beekeepers in Limpopo;
- Analyse the current value/supply chains and market channels followed by the beekeepers in Limpopo;
- Evaluate production and processing technologies used by beekeepers in Limpopo;
- Evaluate opportunities and challenges for apiculture development in Limpopo, and
- Develop an apiculture development strategy for the province.

1.5. PROBLEM STATEMENT

There are number of challenges known to be affecting smallholder beekeeping projects. Among others the following challenges are known to prevail:

i. Limited information about smallholder beekeeping projects

There is limited information about the rural based beekeepers: their location, how they operate, who they are, when and how much they produce, the frequency of harvest, their challenges, what they do with their produce, their market channels and marketing systems, and prices, etc.

ii. Limited knowledge about beekeeping potential of the areas

The development of smallholder beekeepers is limited by lack of knowledge about the natural potential of beekeeping in most rural areas under which they operate. There is little information and knowledge about the potential of the forage (both from the indigenous and commercial plantations), the floral and honey flow patterns. This information is critical in guiding the siting and management of apiaries.

iii. Limited beekeeping knowledge and skills

Despite the initial training having been provided for most smallholder beekeeping projects, many smallholder beekeepers still display limited knowledge and skills due to inadequate training and capacity building.

iv. Marketing constraints

Lack of information, low productivity and quality are the major economic impediments for the development of market-oriented commercial rural beekeeping enterprises.

v. Ineffective organizational structures for collective action for emerging beekeepers

In most provinces there are no ineffective organizational or institutional structures that represent smallholder beekeepers, whereas commercial beekeepers have provincial forums meant to reach the beekeepers and mobilize their participation, disseminate information, and be a voice for their concerns for market development.

vi. Ineffective coordinated support systems for developing and empowering rural beekeepers

There are ineffective coordinated supports structures for smallholder beekeepers to improve their production systems and market development.

1.6. SIGNIFICANCE OF THE STUDY

There are numerous smallholder beekeeping initiatives and projects in Limpopo Province. However, most of these projects are not sustainable and do not graduate to commercial level. A detailed study was therefore necessary to understand the types of beekeeping practices and systems employed by both the smallholder and commercial beekeepers in Limpopo Province. The study was further motivated by numerous challenges as

mentioned earlier that are known to be affecting the development of the apiculture industry in South Africa, particularly smallholder beekeepers. The study needed to evaluate and assess the extent and level of these challenges in Limpopo Province so as to come up with strategies to address them.

1.7. FORMAT OF THE REPORT

Chapter 1: Introduction and background

Chapter one provides a brief introduction and background of the study. It also outlines the aim of the study including objectives and significance of the study.

Chapter 2: Situation analysis

This chapter reviews the apiculture industry in South Africa and beyond and gives an overview of the apiculture development in Limpopo Province. The chapter analyses the literature relevant to the study.

Chapter 3: Rural apiculture survey for Limpopo: consolidated survey report

This chapter presents the findings of the study. The findings are presented in the form of summaries of the research interviews. The chapter further compares and links the findings of the primary data with those of the secondary data to find any similarities or deviations. The chapter finally makes recommendations and proposes areas of interventions to develop the apiculture industry in the Limpopo Province.

Chapter 4: Rural apiculture development strategy for Limpopo

This chapter presents an apiculture development strategy for Limpopo Province. It outlines the vision, objectives, the strategies and strategic interventions that should be employed in order to develop the apiculture industry in Limpopo Province.

Chapter 5: Conclusion and Recommendation

The study culminates with brief conclusions and provides crucial implementation guideline for the draft apiculture development strategy for Limpopo Province.

CHAPTER 2:

SITUATION ANALYSIS

2.1. INTRODUCTION

This chapter presents the situation analysis (desk top review) on issues related to the apiculture industry. It focuses on the assessment of the entire apiculture industry value chain outlining opportunities and challenges. The chapter also provides an overview on status of beekeeping development in Limpopo Province. It is based on synthesis of publications and documents on beekeeping, honey production, processing and marketing in Limpopo, South Africa, and other developing countries on the African continent. In addition, the report incorporates general views from key stakeholders in the beekeeping industry in South Africa and Limpopo Province in particular.

The report also provides an overview of the South African apiculture industry, legislations affecting the apiculture industry, policy and strategy alignment, the value chain analysis as well as opportunities and challenges affecting the development of the beekeeping industry. The report concludes by presenting an overview of beekeeping projects in Limpopo Province and identifying successful local and regional beekeeping endeavours.

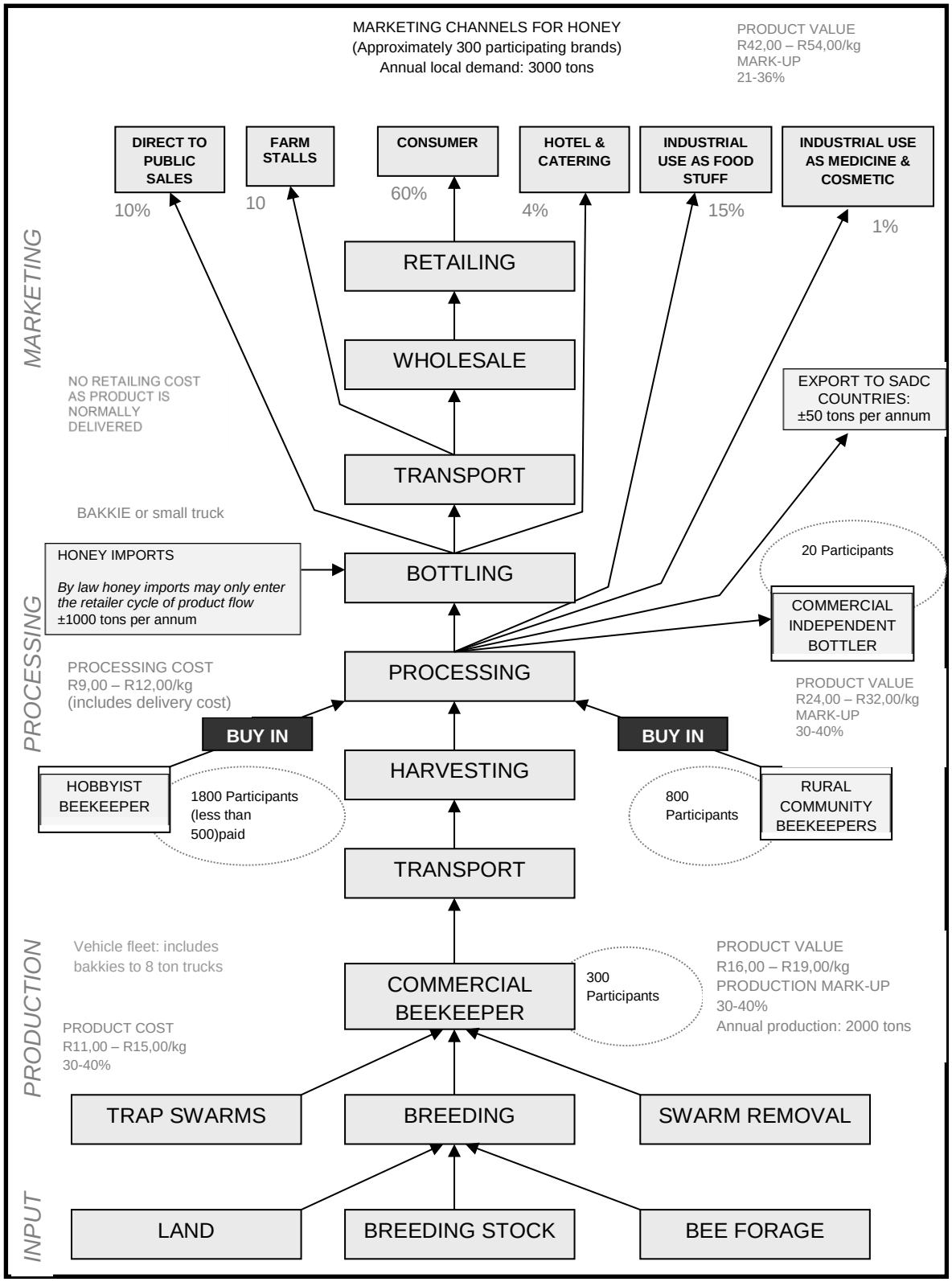
2.2. OVERVIEW OF THE SOUTH AFRICAN APICULTURE INDUSTRY

The South African apiculture industry includes all persons involved in the keeping of honey bees whether for commercial purposes or recreational use. Bees are kept either for honey production or for pollination purposes, or both. According to SABIO, any persons involved in research work, training and development in apicultural science and beekeeping; any persons involved in the bottling, packaging or manufacture of honeybee products; any persons involved in the sale or manufacture of beekeeping equipment; and any persons involved in the capture, removal and relocation of honeybee colonies (bee removal services) are all part of the South African bee industry. In short, all persons or institutions involved in one or more activities of the beekeeping or honey value chain forms part of the apiculture industry.

2.2.1. The South African honey value chain

The South African honey supply (value) chain is illustrated in figure 1 below.

Figure 1: The Supply Chain for South African Honey



Source: Du Toit (2007)

Figure 1 shows the number of participants involved in the production, processing, packaging and distribution of honey and honey products. These participants are also referred to as value chain actors or players. These actors, who are linked by trade and services, each add value to the product (Roduner, 2007). The information on Figure 1 regarding production volumes and value, costs and prices are 2007 estimates. There is lack of accurate statistical information and considerable time has elapsed between 2007 and 2014.

The supply (value) chain characterizes (a) the way goods move from producers to consumers; the exchange of payment, credit, and capital among actors; price signals, pricing behaviour, and value added; the dissemination of technology; and, the flow of information across the chain, and (b) the institutional arrangements that link producers, processors, marketers, distributors, and consumers (Mayoux, 2003). It shows how and where returns are generated in the value chain and measures the addition to value done at each stage or from each set of activities. It also characterizes and measures the distribution of gain along the value chain. The distribution of gains among producers along the chain is determined by governance within the chain. The magnitude and distribution of margins along the value chain determine the incentives emanating from engaging in production, distribution, processing and trading in a given commodity.

Some people and firms benefit more than others from being part of the chain. Individuals and firms can grow rich if they exploit advantages in the chain. Smallholder farmers are often at a disadvantage in most chains. This is often the case if they produce and market on an individual basis, because they have little bargaining power over input suppliers, traders or output buyers; they often lack market information; they are often involved only in producing the product, and not in processing it to add value; they lack an understanding of the market, and they do not control the terms on which they participate in the chain. Smallholder beekeepers are not immune to these challenges.

The honey value chain actors

The value chain actors are those involved in producing, processing trading or consuming a particular agricultural product. They include direct or indirect actors who are commercially involved in the chain (producers, traders, retailers, consumers) and indirect actors who provide financial or non-financial support services, such as bankers, and credit agencies, business service providers, government, researchers and extensionists. A supply chain is a set of linkages between actors where there are no binding or sought-after or informal relationships, except when the goods, services and financial agreements are actually transacted. A value chain is a specific type of supply chain, one where actors actively seek to support each other so they can increase their efficiency and competitiveness. They invest time effort and money, and build relationships with other actors to reach a common goal of satisfying consumer needs - so they can increase their profits (Chain Empowerment, 2006).

The actors in the South African honey value chain include beekeepers, honey buyers, processors, wholesalers, packers, retailers and consumers. Suppliers to the honey industry may include manufacturers of honey-production inputs, packaging equipment, and chemicals or feed supplies, etc. Honey producers, packers and marketers negotiate with suppliers and buyers. Honey buyers and industry suppliers have bargaining power that can affect honey industry profits. This bargaining power may include:

- negotiating honey prices down or delaying payments;
- having packers or producers maintain honey inventories at their own expense;
- increasing the quality standards for honey without increasing prices (e.g., demanding implementation of food safety systems like Hazard Analysis Critical Control Points (HACCP) that may be costly to implement or specifying reductions in permissible maximum residue levels); and
- increasing the price of input supplies (or reducing the quality of supplies).

Number of players in the value chain

Table 1 below shows the number of players/actors in the South African value chain. These are all from the first economy except one equipment supplier based in Pretoria. Some beekeepers, packers, wholesalers and retailers operate as independent businesses. Other combinations are common, e.g. commercial beekeepers also buy bulk honey from other beekeepers (big and small), they then bottle, and act as wholesalers.

Table 1: Number of players/actors in the South African honey value chain

Value chain players/actors	Number of players/actors
Commercial honey processors	11
Wax processing plants	4
National equipment suppliers	5
Producers of honey confectionery	4
Producers and buyers of pollen and importers of pollen capsules	4
Buyers of propolis	5
Producers of royal jelly and importers of royal jelly capsules	8
Producers and distributors of cosmetic products	3
Producers of non-commercial medicinal products in South Africa	2

Source: Du Toit (2006)

Other opportunities in the South African honey value chain

Pollination service to crop or fruit producers contributes a big component of the South African honey industry but require management skills and infrastructure. This is found mainly in big commercial beekeeping enterprises. There is currently a strong demand in the horticultural industry for hive pollination services. According to NAMC (2008), the value-added by managed honeybee pollination to the South African deciduous fruit industry alone is estimated to be in the region of R189 - R828 million per annum or 16-69 times the amount of R12 million that beekeepers receive for this service. There is also an unknown but potentially lucrative market for specialist or “fancy” bee-keeping products such as honey of origin and honey in the comb. Craftwork incorporating beeswax (fancy candles, ornaments, etc.) and mead (alcoholic beverage made from honey)presents other possible opportunities.

2.3. APICULTURE ORGANIZATIONS IN SOUTH AFRICA

At the national level, the South African apiculture industry is mainly organized through the South African Bee Industry Association (SABIO). In 2013 the South African Apiculture Federation was also established. At the

provincial level, beekeepers are mainly organized through Provincial Beekeepers Associations. At the local level smallholder beekeepers are mainly organized through cooperatives and community groups.

2.3.1. South African Bee Industry Organization (SABIO)

SABIO acts as the representative of the South African beekeeping industry in all dealings with government. It presides as the consultative spokesperson on all forums affecting the beekeeping industry and agriculture, and strives to set and maintain world-class standards in apiculture. It has been in existence for over 10 years representing beekeeping interests at local, regional, national and international level. Its mission is "to represent and promote the interests of all persons involved in the beekeeping industry in South Africa in order to establish, support and develop an economically viable and sustainable apicultural sector and ensure the environmental security of the honeybee".

SABIO has regional beekeeping associations and commercial beekeepers structures, such as the South African Professional Bee-Farmers Cooperative and the Pollination Services Association. At provincial and local levels the industry is organized through structures like provincial Beekeepers Associations and Co-operatives for commercial enterprises and developing beekeepers respectively. SABIO, together with the Department of Agriculture, Forestry and Fisheries (DAFF) also administers the registration of bee farmers and collates the resultant data.

According to the National Agricultural Marketing Council (NAMC, 2008), the financial support for SABIO from the beekeepers through the voluntary membership fees and voluntary levies (based on producers and numbers of hives) has so far been poor. This has made it very difficult for SABIO to effectively act as the official representative body for the domestic beekeeping industry. The participation of emerging beekeepers in SABIO, which is estimated to be about 2000 in the country, is viewed as insignificant. Significant change is still required in SABIO in terms of representation of the emerging sector. In the absence of better organization of emerging beekeepers as it is at present, it remains a challenge on how emerging beekeepers can participate in SABIO more effectively. It is also argued by NAMC (2008) that hobbyists who dominated the business of SABIO failed to represent the strategic interests of commercial beekeepers. Basically the point to learn from particularly the upcoming emerging beekeepers is that those persons representing their interests must be beekeepers or industry players who understand the industry (NAMC, 2008).

2.3.2. South African Apiculture Federation

The South African Apiculture (SAA) Federation is a fairly new organization which was established in 2013. The SAA Federation's goals and aims are to achieve a prosperous beekeeping industry for all who are involved, from those who do research to those who bottle honey. One of its aims is to develop future commercial beekeepers among the historically disadvantaged individuals.

2.3.3. Provincial Beekeepers Associations

Various provincial beekeepers associations exist in most provinces. With the exception of the Eastern Cape, most provincial associations are mainly dominated by commercial and hobbyist beekeepers. Smallholder

beekeepers are mainly organized through community projects or co-operatives supported by the government or Non-Government Organization (NGO). In most cases these groups are localized and not linked to other beekeepers locally or in other provinces. Limpopo Province does not have a provincial beekeepers association. Table 2 below shows different provincial beekeeping associations in South Africa.

Table 2: Provincial beekeeping associations in South Africa

Province	Name of Association
Gauteng	Northern Beekeepers' Association
Gauteng	Eastern Highveld Beekeepers' Association
Free State	Free State Beekeepers' Association
Kwa-Zulu Natal	Kwa-Zulu Natal Bee Farmers' Association
Mpumalanga	Mpumalanga Bee group
Northern Cape	Northern Cape Bee group
Western Cape	Southern Cape Bee Industry Association
Western Cape	Western Cape Bee Industry Association
Eastern Cape	Eastern Cape Honey Producers' Association (ECHOPA)

Source: South African Apiculture Federation (2014)

2.4. CLASSIFICATION AND NUMBER OF BEEKEEPERS IN SA

Beekeepers are generally differentiated and classified according to the number of hives managed. This classification ranges from professional or commercial beekeeper who individually manage up to 10 000 hives to smallholder or developing beekeeper with as little as 5 hives. According to SABIO, commercial beekeepers may manage between 800 and 10 000 beehives, hobbyist beekeepers manage between 1 to 100 beehives, and smallholder beekeepers manage between 10 to 150 beehives (often in co-operative bodies or community development projects).

The National Agricultural Marketing Council (NAMC) estimated that there are in total between 90 000 and 110 000hives operating in South Africa, NAMC (2008). There are about 2950 hobbyists, who are smallholder beekeepers with less than 200 hives who are largely from the first economy. There are further estimated 2000 smallholder beekeepers but the number of hives owned by these beekeepers is generally not known.

It is estimated that between 2 and 10 of the historically disadvantaged beekeepers in the country could be classified as commercial. These beekeepers are mainly located in the Eastern Cape and Kwa-Zulu Natal, managing between 500 and 1000 beehives. The number of smallholder beekeepers has however been fast growing in most provinces of South Africa. These beekeepers are however less organized and largely driven by government and developmental programmes including SAPPI, MONDI and ARC as well as some NGOs.

Due to lack of accurate statistical information, some discrepancies exist in the classification and estimated number of beekeepers and the hives managed by beekeepers in South Africa. This was observed from information published by SABIO and NAMC. These variations are observed in Table 3 and Table 4 below.

Table 3: Classification of beekeepers and number of hives managed in South Africa

Classification	Number of hives managed
Commercial Beekeepers	800 – 10 000 beehives
Small-scale Beekeepers	100 - 800 beehives
Hobbyist Beekeepers	1 - 100 beehives
Smallholder/ Developmental Beekeepers	10 - 150 beehives - often in co-operative bodies or community development projects

Source: SABIO (2014)

Table 4: Estimated numbers of beekeepers in South Africa by category

Category	Number of beekeepers	Estimated number of hives per beekeeper	Estimated total number of hives
Professional beekeepers	20	1 000 – 7 000	37 000
Commercial beekeepers	150	100 – 1 000	43 000
Hobbyist beekeepers	2 000	1 - 100	26 000
Developing beekeepers	88 groups	5 - 500	

Source: NAMC (2008)

Excluding the beekeeping development groups, the Western Cape and Gauteng provinces are estimated to have the highest number of beekeepers. Limpopo is estimated to have 60 beekeepers under this category. The provincial distribution of beekeepers according to SABIO is illustrated in Table5 below.

Table 5: Provincial distribution of beekeeper

Province	Number of beekeepers
Western Cape	800
Gauteng	400
Kwa-Zulu Natal	130
Free State	100
North West	100
Mpumalanga	80
Northern Cape	60
Eastern Cape	60
Limpopo	60

Source: NAMC (2008)

Other category of honey producers includes traditional beekeepers and honey hunters. Traditional beekeeping is the practice whereby hives are made by stripping the bark from the trunks of large trees to produce a hollow cylinder, which is then plugged at both ends and suspended by bark ropes in large trees. Honey hunting and or traditional beekeeping is still practiced by previously disadvantaged rural people. It normally is robbing of wild hives by honey hunters. The honey hunters are therefore generally familiar with the habits of the honey bees. They also know about beekeeping with hives. The generally do not own any beehives and it is difficult to quantify and classify them according to the number of hives managed. There are also incidences where honey

hunters steal honey from established apiaries. Some of them practice this kind of beekeeping due to lack of resources to undertake formal beekeeping.

2.5. BEEKEEPING SYSTEMS IN SA

Two bee and hive management systems are followed in South Africa. One is migratory beekeeping in which Langstroth hives, with their bees inside, are transported over from crop to crop. This may involve transporting hives to great distances to maximize yields as well as earning extra income through pollination services. However, migratory beekeeping requires sophisticated management and large capital investment. This system is beyond the reach of most developmental projects that aim to establish independent honey production enterprises for the poor.

The non-migratory (stationary) beekeeping with permanent apiaries can generate worthwhile income, particularly in high-producing gum plantations as well as high-flowering indigenous plantations. Beekeeping with stationary apiaries requires far less management and capital than migratory beekeeping and is in fact usually a part-time occupation. Stationary apiaries have the added advantage of low incidence of bee diseases.

2.6. FORAGE AND NECTAR SOURCES FOR BEEKEEPING IN SA

South Africa is endowed with rich forage for bees. This resource can be exploited for beekeeping thereby generating income for most rural people. South Africa, including Limpopo province, is well suited in terms of its topography and natural vegetation for bees to forage on. There are several major nectar sources in the country, notably eucalyptus plantations, sunflower, citrus, deciduous and subtropical orchards, buckwheat, legume crops, fynbos, and others. As a group, the eucalyptuses are the most important source of honey. The nectar from commercially planted species of eucalyptus is the main source for honey production in South Africa. The nectar-producing species used in plantations are *eucalyptus grandis*, *eucalyptus saligna, eucalyptus paniculata, eucalyptus maculata, eucalyptus diversicolor* and several others. Most commercial honey comes from fruit and eucalyptus trees.

Of the total estimated annual honey production of 1 500 – 2 000 tons in South Africa, approximately over 60% is derived from eucalyptus trees. Honeybees are naturally found in all regions of South Africa, but the honey they produce from indigenous vegetation are, with few exceptions, variable and unreliable for commercial beekeeping. The overexploitation of indigenous southern and eastern Cape forests during the 19th century resulted in the establishment of the forest industry based on quick-growing pines and eucalyptuses, the latter forming the basis of the present day beekeeping industry.

Despite this potential, the honey industry in South Africa is still characterized by under-production. Eucalyptus plantations of the country's forestry industry offer a real and significant opportunity for developing honey production enterprises for the smallholders and aspirant beekeepers. Honeybees are critically important for agriculture and conservation in South Africa. This importance, however, far exceeds the value derived from honeybees by beekeepers. This implies that commercial beekeepers on their own would not be capable of providing all the necessary funding and infrastructure to support and sustain the honeybee population in South Africa (Allsopp, 2000). NAMC (2008) also expressed an opinion that sufficient unexploited bee forage exists to

at least double the existing honey production. The areas where this is the case needs to be identified, and the number of hives that can be accommodated, be quantified.

2.6.1. Honeybees as pollinators of South African crops

Honeybees have been identified as the most important pollinators of many South African crops because they can be managed by humans on the scale needed to supply the commercial pollination service for our large scale crops. Three species, namely, humans, honeybees and the crops, as well as the entire environment benefit during pollination. Table 6 below shows at least six crop types have been identified to being pollinated by honeybees in Limpopo.

Table 6: Crops pollinated by honeybees in Limpopo

Crop type	Pollinators
Oilseed (sunflower and canola)	Honeybees, non-Apis bees and other insects
Squashes (pumpkins, marrows, and butternuts)	Honeybees (commercial), non-Apis bees and insects
Melons and watermelons	Honeybees (commercial), other bees and insects
Nuts (macadamia, cashews, almonds, and pistachio)	Honeybees (commercial) other bees, wasps, flies, ants and beetles
Citrus (grapefruit, lemons, some orange cultivars, and mandarin hybrids)	Honeybees and other insects
Subtropical fruits (mango, litchi, avocado, granadilla, and papaya)	Honeybees (commercial), other bees, wasp, flies and possibly moths

Source: South African National Biodiversity Institute (SANBI) (2012)

2.7. SUPPLY AND DEMAND FOR HONEY IN SOUTH AFRICA

The honey industry in South Africa is characterised by under-production. South Africa is a net importer of honey. South Africa is estimated to consume over 3 500 – 4 000 tons of honey per year, while it only produces around 2 000 tons. This situation results in a demand deficit of approximately 2 000 tonnes per year which gets imported into the country to satisfy the existing demand. This includes honey for industrial, medicinal and home consumption.

2.8. IMPORTS OF HONEY BY SOUTH AFRICA

Table 7 below shows quantities of honey imported by South Africa from 2010 to 2014. According to International Trade Centre (ITC), South Africa has been importing approximately 2 000 tons of honey per annum over the past 5 years. China has emerged as the single biggest exporter of honey into the country during the period under review, accounting for over 90%. Honey produced locally accounts for approximately 1% of the total world production and 1.5% to 2% of the total world honey trade.

Table 7: Honey imported by South Africa from 2010 to 2014

Exporters	2010 Imported quantity, Tons	2011 Imported quantity, Tons	2012 Imported quantity, Tons	2013 Imported quantity, Tons	2014 Imported quantity, Tons
World	**2,097**	**1,820**	**2,094**	**2,332**	**2,304**
China	1,939	1,700	2,030	2,306	2,275
Zambia	0	0	31	24	22
Area Nes	72	18	28	0	6
Thailand	0	0	0	1	1
Congo, Democratic Republic of the	0	1	0	0	0
Argentina	20	0	0	0	0
Botswana	4	0	2	0	0
Ethiopia	0	1	0	0	0
Germany	0	22	0	0	0
Iran, Islamic Republic of	0	2	0	0	0
New Zealand	0	0	0	1	0
Swaziland	0	9	3	0	0
Tanzania, United Republic of	16	22	0	0	0
United States of America	46	45	0	0	0

Source: International Trade Centre–UN COMTRADE Statistics (2015)

Due to lack of statistical information the quantities of honey produced by South Africa normally exclude honey produced and marketed informally by smallholder beekeepers. Provinces produce different quantities of honey with Gauteng Province recording the highest. This is however, largely because most honey produced in other provinces is mostly brought to Gauteng for bottling and further distribution.

2.9. TYPES OF PRODUCTS RESULTING FROM BEEKEEPING

Although bees are associated with the production of honey, there are many other hive products which are useful to mankind, both for nutritional and medicinal use. Bee products include honey, beeswax, pollen, propolis, royal jelly and bee venom. Different types of beehive products are listed in Table 8below.

Table8: Types of beehive products

Honey and beehive products	Importance and use
Honey	• Bees produce honey from the nectar of blossoms or secretions of plants. The bees collect the nectar and secretions, which are transformed and combined with other substances and stored in honeycombs to mature. • Honey is used as a natural sweetener and an anti-oxidant.
Beeswax	• Beeswax is a natural animal wax produced by various species of honey bees. Beeswax is a very important side product of the beehive. Beeswax has many uses. • Primarily, for the beekeeper, it is used to make the wax foundation sheets put into frames ready for bees to construct their honeycomb on. • It is also used extensively in furniture polish, for tanning leather products and the cosmetics industry. • Beeswax is also used by the pharmaceutical and cosmetics industry, in candle-making and for the production of polishes and varnishes. Lip balm is also made from beeswax.
Pollen	• Pollen is the male reproductive cell of plants and is collected by honey bees. Pollen has a high content of a variety of vitamins, minerals, and amino acids. Pollen only has limited use for human consumption or other non-bee applications. • It is used in some homeopathic remedies for a variety of ailments.
Propolis	• Propolis is a substance collected by bees from the buds and leaves of plants. It contains a natural antibiotic which is used in treating wounds. It allegedly increases resistance to disease and promotes general well-being. • Propolis is sold in capsules, tablets, granules, tinctures, and ointments. • Propolis is a natural antiseptic, and widely used as an ingredient in cosmetics and lip balms, as well as a tonic.
Royal jelly	• Royal jelly is health and cosmetic product, used in skin creams and lotions for its potential beneficial effect on aging skin.
Bee venom	• Bee venom is used medically in desensitising of allergic people.
Mead	• An alcoholic beverage (wine) or related liquor products sold in South Africa under the Liquor Products Act.

Source: Nkwele Agribusiness (2014) - consolidated information extracted from different sources

Another alternative market for a limited number of beekeepers is the provision of bee colonies for pollination of crops. Beekeepers are either paid on a per hive basis per day or as per the agreement between the beekeeper and the crop farmer for providing the service. Beekeepers must be prepared to respond to the demands of the crop farmers with respect to the moving of hives to orchards where such services are required. Bees are vitally important in the conservation of floral reserves and in terms of biodiversity.

2.10. MARKETS FOR HONEY AND ITS BY-PRODUCTS

Due to the shortage of honey in the country there are good, easily accessible markets for honey and its by-products such as wax and propolis. There is also an unknown but potentially lucrative market for specialist or

fancy beekeeping products such as honey of origin and honey in the comb. Craftwork incorporating beeswax (decorative candles, and ornaments, etc.) also offers significant market opportunities. The market potential for honey and its by-products is also expanding in the medicinal and cosmetics industries as a result of growing interest in natural ingredients. A growing market opportunity is honey with the essence of a specific wild flower, herb or special crop. These products are in demand for their nutritional, culinary and medicinal properties.

2.11. CONSUMPTION OF HONEY AND HIVE PRODUCTS

The use of honey is largely as a natural sweetener. Honey can also be used as a food spread, in home baking and in beverages. Commercial uses include being a sweetener in cereals, cake mixes, processed foods, jams, jellies and increasingly as an ingredient in the health and beauty products.

2.12. HONEY SUBSTITUTES AND COMPLIMENTS

Domestic honey consumption is likely to remain relatively elastic with other spreads representing a close substitute as honey retail prices increase. Honey substitutes are products that compete with table and industrial honey. As the term implies, these products can be substituted for one another depending on factors such as price, taste, availability, and quality. Jellies, jams, high fructose corn syrup, and grape concentrates are all potential substitutes for honey. Price elasticity of honey means that 1% change (increase) in the price of honey will result in more than 1% change (increase) in the quantity demand for the honey substitute.

Complements are products that can be used or combined with honey to add value. These products could be tea, cereal, sweet-and-sour sauce, cough syrup, etc. Complements, therefore, forge an alliance with honey in the competitive environment. Consumers seem to be increasing their purchases of cereal sweetened with honey.

2.13. OPPORTUNITIES AND CHALLENGES FOR SMALLHOLDER RURAL BEEKEEPERS IN SOUTH AFRICA

2.13.1. Opportunities for smallholder beekeepers

Smallholder beekeepers need to exploit the opportunities that prevail for the apiculture industry in South Africa. The following have been identified as opportunities that exist for smallholder beekeepers:

- There are ready and easy markets for honey of reasonable quality.
- There are good, easily accessible, markets for by-products such as wax and propolis.
- Eucalyptus plantations of the country's forestry industry offer a real and significant opportunity for developing honey production projects for the poor.
- Government and NGOs already provide support to rural communities to enter the sector. These honey production initiatives address issues related to provision of start-up beekeeping production inputs, skills and capacity development on a range of issues including initial training, technical beekeeping issues, enterprise management, and marketing.

2.13.2. Challenges affecting smallholder beekeepers to engage in commercial beekeeping

Despite opportunities that prevail for the South African apiculture industry, a number of challenges still exist for smallholder beekeepers in the country. The development of beekeeping for most smallholder beekeepers in South Africa is known to be affected by a number of challenges. The following have been identified:

Limited knowledge about beekeeping potential areas

There is limited knowledge about the natural potential of beekeeping in most regions surrounding rural areas. There is little information and knowledge about the potential of the forage (both from the indigenous and commercial plantations), the floral and honey flow patterns that would guide the siting and management of apiaries.

Lack of accurate information about smallholder rural beekeepers

There is limited information about the locations of the smallholder rural beekeepers: who they are, how many they are, when, how and how much they produce, the frequency of harvest, problems they encounter regarding their beekeeping, what they do with their produce, market linkages and marketing channels they follow, and prices, etc.

Lack of knowledge and skills on beekeeping for most smallholder rural beekeepers

Despite the initial training provided for most beekeeping projects, the emerging beekeepers still display limited knowledge and skills on beekeeping due to inadequate training. Most of the initial beekeeping skills training provided are mainly for a short period, which does not equip new beekeepers with adequate skills on beekeeping. In most cases the training is not followed by a mentorship programme to ensure proper skills transfer to new beekeepers.

Theft and vandalism

Theft and vandalism are the most common and serious problems experienced by beekeepers. In many occasions beekeepers lose income due to the theft of honey and vandalism of beehives. Smallholder beekeepers are most affected as they normally operate in unfenced apiaries.

Lack of access to resources

Smallholder rural beekeepers are constrained by lack of adequate resources such beehives, protective clothing, transport and processing equipment. These prevent them from operating at commercial level in order to achieve economies of scale.

Marketing constraints

Lack of information, low productivity and quality are the major economic impediments for the development of market-oriented commercial beekeeping enterprises.

Absence of an organization for collective action for emerging beekeepers

In most provinces there are no organizational or institutional structure that represent smallholder beekeepers, whereas commercial beekeeper shave provincial forums for reaching the beekeepers to mobilize their participation, disseminate information, and be a voice for their concerns and collective action for market development.

Smallholder beekeeping obstacles identified by FAO

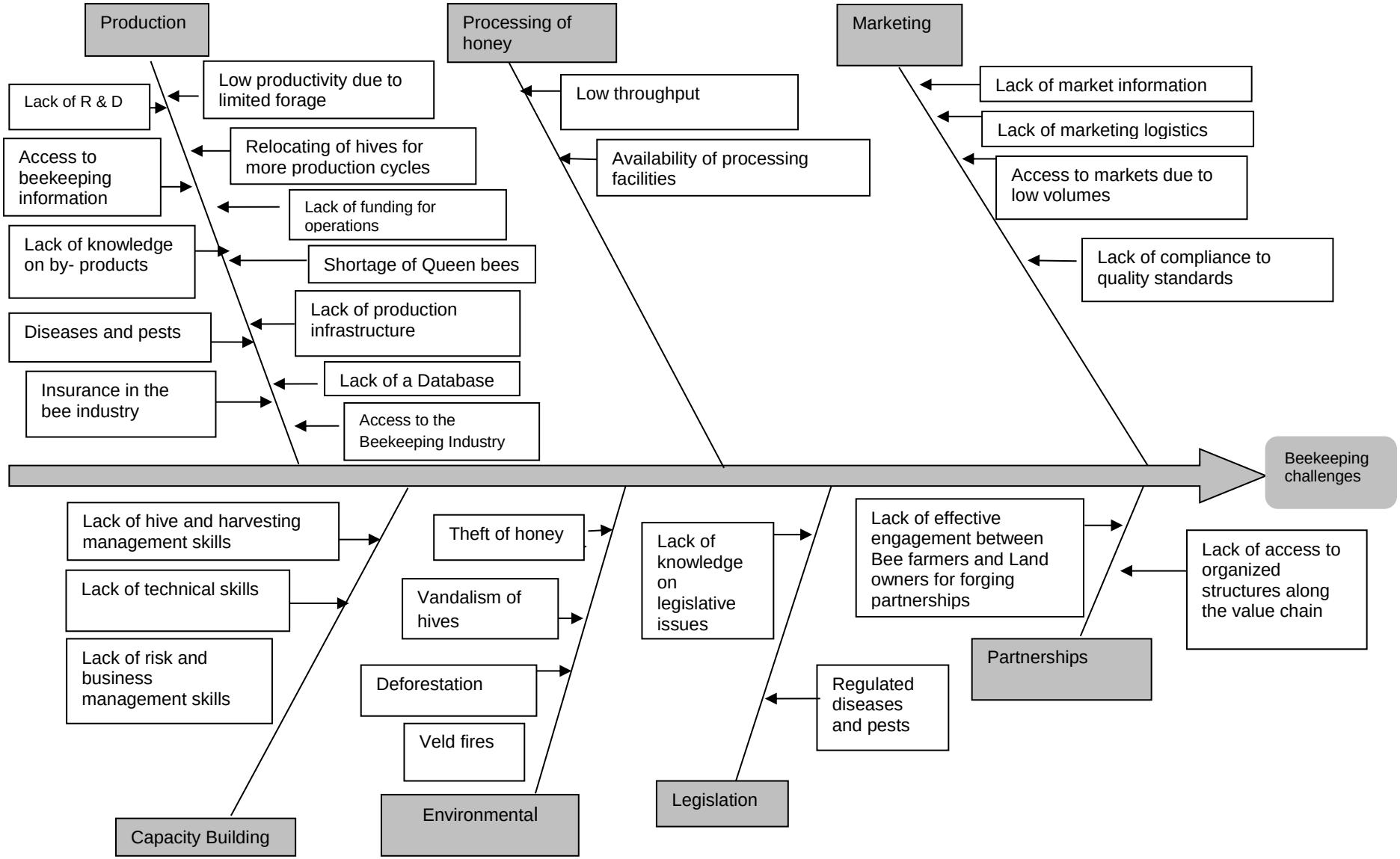
The Food and Agricultural Organization (FAO)Beekeeping Exchange Group (2011) also identified the following major obstacles for smallholder beekeepers to engage in beekeeping:

- Lack of knowledge about advanced beekeeping methods;
- The unawareness about the profitability of beekeeping;
- Limited access to markets;
- In many cases, the supply chain is not efficient, no proper infrastructure such as transport, processing facilities or certain equipment exist for smallholder beekeepers; and
- Certain projects experience absconding and low hive occupation rate, hindering beekeeping to turn into a commercial activity.

2.13.3. Illustration of the major categories of challenges and root causes identified by DAFF

During 2013 DAFF mapped out major categories of beekeeping challenges and root causes. These challenges were mapped out along the honey value chain, i.e. from production to marketing. This is illustrated in Figure 2 below.

Figure 2: Illustration of the major categories of challenges and root causes



Source: Department of Agriculture Forestry and Fisheries (DAFF) (2013)

2.14. NATIONAL SMALLHOLDER BEEKEEPING SUPPORT PROGRAMMES

2.14.1. The ARC's beekeeping for poverty relief program

The Beekeeping for Poverty Relief programme was initiated by the ARC's Plant Protection Unit in 2001. It was envisaged as an empowerment programme that would enable rural communities to enter into beekeeping and honey production as a sustainable and viable economic activity. It was conceptualized following a market study on the honey industry in Southern Africa, where it was established that:

1. The region has vast potential for honey production that is currently under-exploited;
2. Despite the region's production potential, most of the honey consumed is imported from outside Africa (all the countries in the region, except Zambia, are net honey importers); and
3. The organization of existing beekeepers was weak and needed to be strengthened.

To unlock this opportunity in South Africa, the ARC adopted a sustainable, market driven model for empowering producers and creating employment. More efforts have been focused on the Eastern Cape due to favourable production conditions and the extreme levels of poverty in the region.

Over R10 million in funding has been developed and invested in the programme through various stakeholders. The programme has trained over 2000 individuals in beekeeping and successfully established in excess of 5000 hives. The majority of beekeepers who have been trained in beekeeping are women (approximately 70%). These beekeepers are estimated to be producing over 100tonsof honey annually. This production goes towards reducing the production shortfall that currently exists in South Africa.

The ARC, through its Beekeeping for Poverty Relief programme, continues to support and empower rural communities with the capacity and capabilities to enter into beekeeping as a sustainable economic activity that can facilitate their upliftment from poverty, thus integrating them into the formal economy. This national programme is involved in the promotion of rural beekeeping as an alternative economic activity for rural communities and in securing the funding required to expand its reach into new vulnerable communities. The programme, through its fund raising efforts, aims to support the operations already established through investments in the institutional support structures required and the development of improved market linkages.

However, the efforts of the programme and its returns on investment are still running short of showing significant commercial impact as the sustainability of the operations established is still to be realized. This is due to the fact that some of the beekeeping projects supported through this programme have been collapsing and or had to be resuscitated by other institutions.

2.14.2. New farmer and entrant development and support

According to NAMC (2008), the development of new entrant farmers is vital for the domestic beekeeping industry. The methodologies and support structures to ensure that suitable people are identified, that accredited training and mentorship are made available, that financial support is available

and that products produced are properly marketed, need to be set in place.Table9 below provides a summary of the elements necessary for successful new farmer, entrant development, support and the responsible institutions.

Table 9: New farmer and entrant development and support

ITEM	KEY OUTCOMES	STAKEHOLDERS
Economic models for beekeeping	▪ Proven beekeeping enterprise budgets ▪ Investment guidelines	▪ SABIO ▪ DAFFand Provincial Depts. of Agric.
Training programmes and Accreditation	▪ Recognized prior learning guidelines ▪ Accredited learning materials and modules ▪ Skills training ▪ Academic qualification (NQF 5+)	▪ ARC ▪ SABIO ▪ AgriSETA ▪ FET / Community Colleges ▪ Universities ▪ Beekeeper “Winter Schools”
Apiary sites	▪ Access to land for apiary sites ▪ Registration of sites ▪ Aligned to relevant legislation	▪ Dept. of Land Affairs ▪ Local authorities ▪ DAFF ▪ Legislation “godfathers”
Extension and Advisory Service	▪ Farm extension programme ▪ Industry guidance ▪ Mentorship accountability	▪ SABIO ▪ NDA and Provincial Depts. of Agric. ▪ ARC
Value chain	▪ Participation at levels of supply chain ▪ Co-operative processing ▪ Label identification ▪ Links with retail trade	▪ SABIO ▪ Retail trade ▪ Processors and Distributors
Funding	▪ Access to state funding mechanisms ▪ Local Economic Development initiatives ▪ “Label supply clubs”	▪ NDA ▪ Dept. Land Affairs ▪ Provincial initiatives ▪ Land Bank ▪ DBSA ▪ Commercial Banks

Source: NAMC (2008)

2.15. OVERVIEW OF BEEKEEPING PROJECTS IN LIMPOPO

Limpopo Province is estimated to have over 600 smallholder beekeepers. The majority of these beekeepers are largely concentrated in the Vhembe district. This is due to the high potential of beekeeping in this district. Both commercial and smallholder beekeepers are found in the province. According to (NAMC, 2008), with the exclusion of beekeeping development groups, Limpopo Province is estimated to have 60 beekeepers. Unlike other provinces, Limpopo province does not have a provincial beekeepers association. The 60 beekeepers stated by NAMC operate in various regions of the province and are not linked through any provincial coordinating body.

2.15.1. Commercial and hobbyists beekeepers in Limpopo

According to SABIO, Limpopo province is estimated to have 60 beekeepers. This number is assumed to be made up of both commercial and hobbyist beekeepers. There are very few prominent commercial beekeepers in the province with over 1 000 beehives. This includes very experienced beekeepers, some with international experience in beekeeping, having been involved in the industry for over 17 years. Some view beekeeping as a numbers game, where one needs a lot of hives to be able to make a good living from bee keeping. It is also believed that honey production can be more than the 27 – 30kg per hive per annum if the bees are healthy.

2.15.2. Smallholder beekeepers in Limpopo

Traditional beekeeping or honey hunting has always being practiced by some rural areas of the Limpopo province. People were keeping bees in old clay pots, old car tires, and tree trunks or hunting wild bees in the forest. Two types of African bees are found in the province, i.e. stinging bees and stingless bees. The province is estimated to have over 600 smallholder beekeepers. The promotion and support to smallholder rural beekeeping projects in the province initially came through Limpopo Department of Agriculture (LDA) in partnership with institutions such as Agricultural Research Council (ARC) and Bee Foundation.

The previous research identified Vhembe and Mopani districts as suitable areas for beekeeping. Beekeepers were initially provided with initial beekeeping skills training and start up beekeeping production inputs such as beehives and protective clothing. It was later discovered that the plastic hives which were initially provided were of poor quality and not suitable for the area. Through the partnership between Limpopo Department of Agriculture and Agricultural Research Council beekeepers were later assisted with proper wooden langstroth beehives and additional protective clothing.

Limpopo Department of Agriculture has provincial and district officials who are coordinating beekeeping projects. These officials provide technical and extension support to beekeepers. In Vhembe district where most smallholder beekeeping projects exist, beekeepers have access to dedicated beekeeping extension officers who provide technical advice to beekeepers on apiculture related aspects.

Two districts in the province, namely, Vhembe and Mopani were identified as having high potential for beekeeping due to high percentage of forage and nectar source. Hence, the highest number of smallholder beekeepers is found in the Vhembe district.

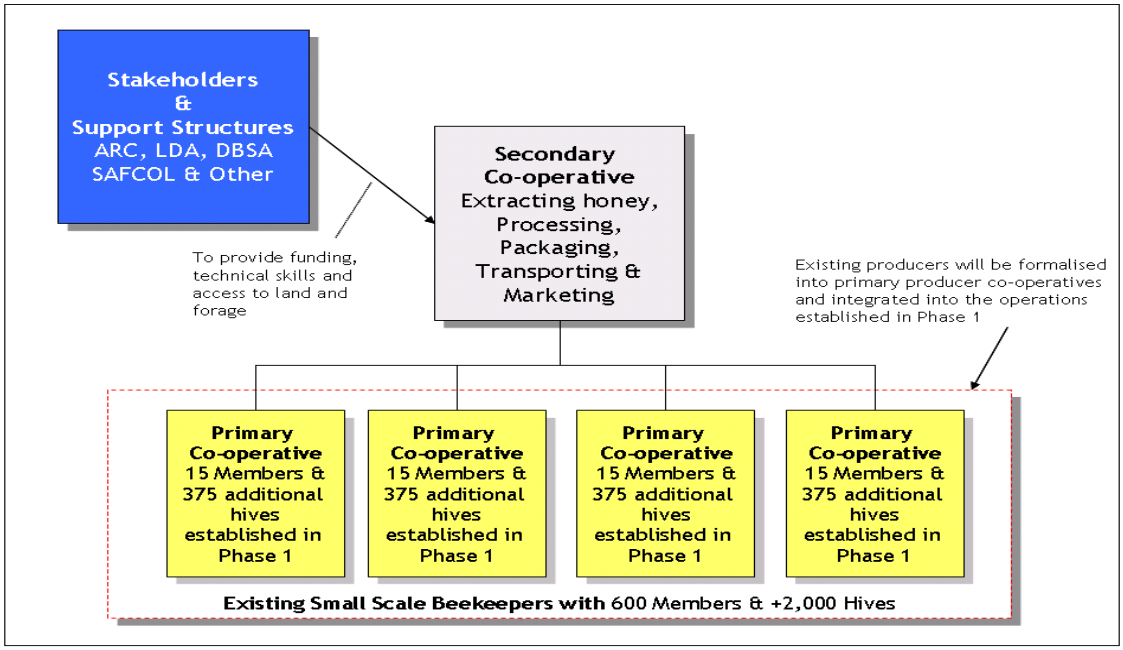
Unlike other provinces, Limpopo does not have a provincial beekeepers association. Most rural based smallholder beekeeping projects are organized into community groups and co-operatives. As a result, the level of collaboration and networking among beekeepers in the province appears to be weak or ineffective.

2.15.3. Smallholder beekeeping projects in Vhembe district

The support and expansion of beekeeping projects in Vhembe district was made possible through a grant funding leveraged by the ARC in 2008/09 from the Limpopo Local Economic Development (LED) Programme. This initiative aimed to identify 60 individuals, from the established 600 smallholder beekeepers in the region, to receive intensive training in beekeeping. According to the business planfor the Expansion of the Beekeeping for Poverty Relieve Program into the Vhembe district that was used to secure funding, these beneficiaries were to be ultimately established as mentors to other beekeepers in the region, with the facilities and operations established shared by all producers. The support also included a purchase of 1 500 beehives and two vehicles.

As illustrated in Figure 3 below, which illustrates the operational structure, these primary producer co-operatives were to share a common extraction and processing facility which will be owned and managed by the secondary co-operative. This secondary co-operative was to be made up of the four primary co-operatives, as well as other smallholder beekeepers active in the region. Two light commercial vehicles were to be purchased and used for the management and movement of the hives and in the provision of pollination services to commercial farmers in the region. These vehicles were to link producers to the extraction facility and the facility to markets. The operations established were projected to produce between 37 tons and 52 tons of honey per year once fully operational. The extracted honey was expected to have a wholesale value of between R925 000.00 and R1 300 000.00 (2008/09 prices). The bulk of this money would then flow into the local communities producing the honey, supporting the jobs created and injecting the much needed income into the local economy.

Figure 3: Operational structure of Vhembe beekeeping project



Source: ARC - Business Plan for the Expansion of the Beekeeping Programme for Vhembe District, 2008/09

The 1 500 additional hives established in Phase 1 for the 60 beneficiaries were estimated to produce 22 tons of honey once fully operational, at 15kilograms per hive, per year. An additional 15 to 30 tons of honey was expected to be produced by the established 600 small scale beekeepers with their 2 000 hives already in operation. This would be in addition to 1 000 hives purchased by the Limpopo Department of Agriculture. About 1 000 hives were also to be ultimately utilized for pollination services, with these hives having to be transported twice a year to the pollination sites. These sites were to be on commercial farms in the region.

Various other products were also to be produced by the operations established, with the most important being bulk beeswax and hand-made beeswax candles made at the processing facility. The central extraction facility was planned to have the capacity to extract and process the 37 - 52 tons of honey produced and prepare it for the market. The processing centre was also to provide smallholder beekeepers with administrative and logistical support.

To date the Vhembe district alone comprises 569 beekeepers who own estimated total of 8 535 beehives. Beekeepers are organized into primary co-operatives at the local level which are affiliated to a secondary co-operative. Three local municipalities in Vhembe district, namely, Thulamela, Mutale and Makhado were found to be conducive for beekeeping. This is due to the prevalence of high potential bee forage trees such as big forests, eucalyptus plantations, and subtropical orchards as well as water availability. It is also believed that various fruits and vegetables are of high quality due to pollination done by bees in the area. Table 10 below shows the number of beekeepers in Vhembe district per category, while Table 11 provides a brief summary on Vhembe beekeeping projects.

Table 10: Number of beekeepers in Vhembe District per category

	Number of bee keepers				
Name of municipality	**Male**	**Female**	***Youth***	**Total**	**Number of beehives**
Makhado Municipality	95	25	*12*	**120**	1 800
Mutale Municipality	65	75	*45*	**140**	2 100
Thulamela Municipality	249	60	*15*	**309**	4 635
TOTAL	**409**	**160**	***72***	**569**	**8 535**

Source: Limpopo Department of Agriculture- Vhembe district (2014)

Table 11: The summary information on Vhembe beekeeping projects

Beekeeping skills, training and capacity building	○ Most farmers were practising beekeeping traditionally as a hobby. They were keeping bees in old clay pots, old car tyres, on tree trunks and in holes on the ground. ○ With the support from Limpopo Department of Agriculture in partnership with the Bee Foundation and Agricultural Research Council, beekeepers were provided with formal training on beekeeping. ○ Existing skilled beekeepers mentor other beekeepers.
Institutional arrangement	○ Most beekeepers are full time beekeepers with an average of 15 hives per beekeeper and are highly committed despite the challenges. ○ Beekeepers in each local municipality formed individual primary co-operatives, which are affiliated to the mother body called Vhembe Secondary Co-operative. ○ The beekeepers were previously affiliated to SABIO.
Beekeeping production inputs, assets and processing equipment	Beekeepers were supported by Limpopo Department of Agriculture and Agricultural Research Council with: ○ Beehives and protective clothing. ○ Two Nissan bakkies. ○ A house for honey processing (*but some beekeepers still process their honey using traditional methods).* ○ Processing machine (honey extractor).
Marketing arrangements	○ 75%is sold to local traditional healers and Indian retailers. ○ 15% is sold to Highveld honey farms (based in Gauteng); ○ 10% is sold to Fruit and Vege City.

Source: Profile of Vhembe smallholder beekeepers: compiled by Limpopo Department of Agriculture- Vhembe district (2014)

Challenges faced by smallholder beekeepers in Vhembe

Despite the support provided to the beekeepers in the Vhembe district, the profile of the district's smallholder beekeepers identified the following challenges that affect the development of smallholder beekeepers in the area:

- Some wooden bee hives are of poor quality.
- Theft due to unfenced apiary sites.
- Shortage of bee hives due to high prices.
- Some farmers require training.
- Lack of advance beekeeping training for coordinators as they only received basic training.
- Shortage of protective clothing.
- Destruction of bee hives by the Honey Badger.
- Insufficient transport (two bakkies are not covering the whole area).
- Branding of honey bottles.
- Processing house has no electricity.
- Cheating by some potential honey buyers.
- Lack of processing equipment (one processing machine is not sufficient for the whole Vhembe district).

- No linkages between smallholder beekeepers with commercial beekeepers.
- Fluctuation of honey prices.
- Deforestation and veld fires.
- Accreditation of potential beekeepers to become bee removal agents.

2.16. SUCCESSSTORIES OF RURAL BLACK BEEKEEPING INITIATIVES

2.16.1. Upcoming black commercial beekeeper in the Eastern Cape, South Africa

Mr. Gonmais a commercial black beekeeper based in the Eastern Cape. He started beekeeping around 2003 with funds from the Department of Science and Technology (DST). He started out with a group of 11 farmers in Frankfort, but over the years the others all dropped out. ARC came along with funding for training in basic beekeeping and a donation of 10 beehives. There were disagreements within the group which made them to go separate ways. In June 2005, after realigning the business and gaining more knowledge on beekeeping, Gonma had his first harvest of 175kg, worth R7 000 from only 14 supers. In December of the same year, he had another harvest and made a profit of R24 000. In 2008 Government assisted 12 beekeepers in villages around Bisho to the tune of R750 000. All these farmers belong to the Eastern Cape Honey Producers Association (ECHOPA), including Gonma. Growth continued since then, to the point where Gonma owns 450 beehives. Gonma was robbed 180 hives worth an estimated amount of R700 000 in 2009. *This setback however, did not discourage him from his passion of keeping bees.*

Marketing and management

Mr. Gonma started by selling his honey to government employees, and local retail shops. In summer he inspects his bees twice a month and once every two months in winter. In 2008 he received an award from the National Beekeeper's Association for an experiment he conducted successfully. Mr. Gonma also uses his honey in the village for medicinal purpose and makes candles from the beeswax. He had apiary sites in three locations, far away from one another. He is an advanced beekeeper who also mentors other beekeepers.

Equipment

Gonma started operating from a room in his property where he extracted and stored his honey and also turned it into an office. By 2009, with 450 beehives Gonma did not see himself as an established beekeeper since he didn't have a bakkie (vehicle) or a permanent structure. He was also still in need of a honey house, four honey extractors (processing machines) and a storage room.

Vision

In spite of challenges facing the industry, Gonma plans to grow his beehives to 20 000 by 2020

Source: Farmers Weekly, November 2009

2.16.2. Upcoming black commercial beekeeper in Kwa-Zulu Natal, South Africa

Nodongo Apiaries Co-operative

Nodongo Apiaries Co-operative is a black-owned commercial beekeeping enterprise, led by Mr Bethuel Sithole. The co-operative is based in Mtunzini, Kwa-Zulu Natal province. Mr Sithole together with his other two partners, graduated from being employees of the KZN's biggest honey producer, Peels Honey to become commercial black beekeepers. They were trained by Peels Honey to manage all the production of honey that took place in Zululand, and in the process they gained very valuable knowledge and expertise in beekeeping and honey production. They worked for Peels Honey for over 10 years, since early 2000. Peels Honey then left Zululand, after which they continued producing honey in the Mondi forests.

Nodongo Apiaries Co-operative received support from Mondi which provided them with beehives, protective clothing and processing equipment. It also received additional beehives from the DBSA as compensation for providing training to other beekeepers based in Limpopo. Nodongo Apiaries is the biggest black beekeeping project in KZN, managing over 500 hives and produces honey from eucalyptus forests owned by Mondi Forest.

Marketing

Nodongo Apiaries Co-operative sells bulk honey to other processors and Indian retailers based in the KZN. Although it produces enough honey than other smallholder beekeepers, they are still aspiring to grow their economies of scale and to venture into bottled honey in order to supply major retailers.

Challenges

Nodongo Apiaries Co-operative has also been victim of honey theft and vandalism of hives due to lack of secured apiaries.

Future plans

Nodongo Apiaries Co-operative aspires to expand its beekeeping operations to supply bottled honey and manufacture its own hives.

Source: Profiled by Nkwele Agribusiness (2014)

2.16.3. The Eswatini Swazi Kitchen Honey, Swaziland

Eswatini Swazi Kitchen Honey of Swaziland

The art of beekeeping has been embraced by vulnerable child and grandparent-headed homesteads in Swaziland as a means to generate income. The project was introduced by Manzini Youth Care, a faith-based non-profit organization. The project reinvigorated the honey industry's ability to create sustainable jobs. The training in beekeeping and honey production gives poor households a valuable income stream.

The project expanded its product offerings by manufacturing a range of gourmet jams, jellies, chutney and sources. It employs 50 people- predominantly women from under-privileged backgrounds, but it channels revenue into the community by buying vegetable from over 100 local farmers for processing. A range of other products such as wax, creamed honey, pure honey and cinnamon honey are being produced. The number of beekeepers supplying the factory increased from 200 in 2009 to 485 in 2012. The quantity of combed honey bought by the factory increased from 8 tons per annum in 2008 to 14 tons in 2009 and 28 tons in 2011. The project injects R546 000 into empty pockets annually.

Technoserve is an important partner. This partnership assisted the project to grow the formal market for honey, improve its marketing, production system and linkages to the local beekeepers. It also provided training to address number of challenges faced by rural beekeepers, such as poor apiary and hive management, low hive production, and marketing. Through this partnership a National Honey Council was formed in 2007. The Hazard Analysis Critical and Control Points (HACCP) compliant also gives the project access to international markets such as South Africa, Europe, US and Australia. About 500kg of honey and 100kg of wax are exported to South Africa. The training in beekeeping and honey production in Swaziland has transformed many lives. Most people were able to build homes, send their grandchildren to school and put food on the table using income from the bees.

Source: Farmers Weekly, 12 October 2012

2.16.4. Zambia's honey sector

Zambia has emerged as Africa's largest exporter of honey and bee products into the European Union (EU) and the United States of America (USA) with supply to these markets forecasted at 1 000 tons by the close of 2010. According to Felix Chizhuka (2010), Agri-Business Forum (ABF) executive secretary, the country is destined to expand its honey industry five-fold in the next five years. Currently, over 50 000 people derive sustainable livelihoods from honey and bee products in the country. The price of the commodity has attracted more people to the sector.

Source: Website, 2014

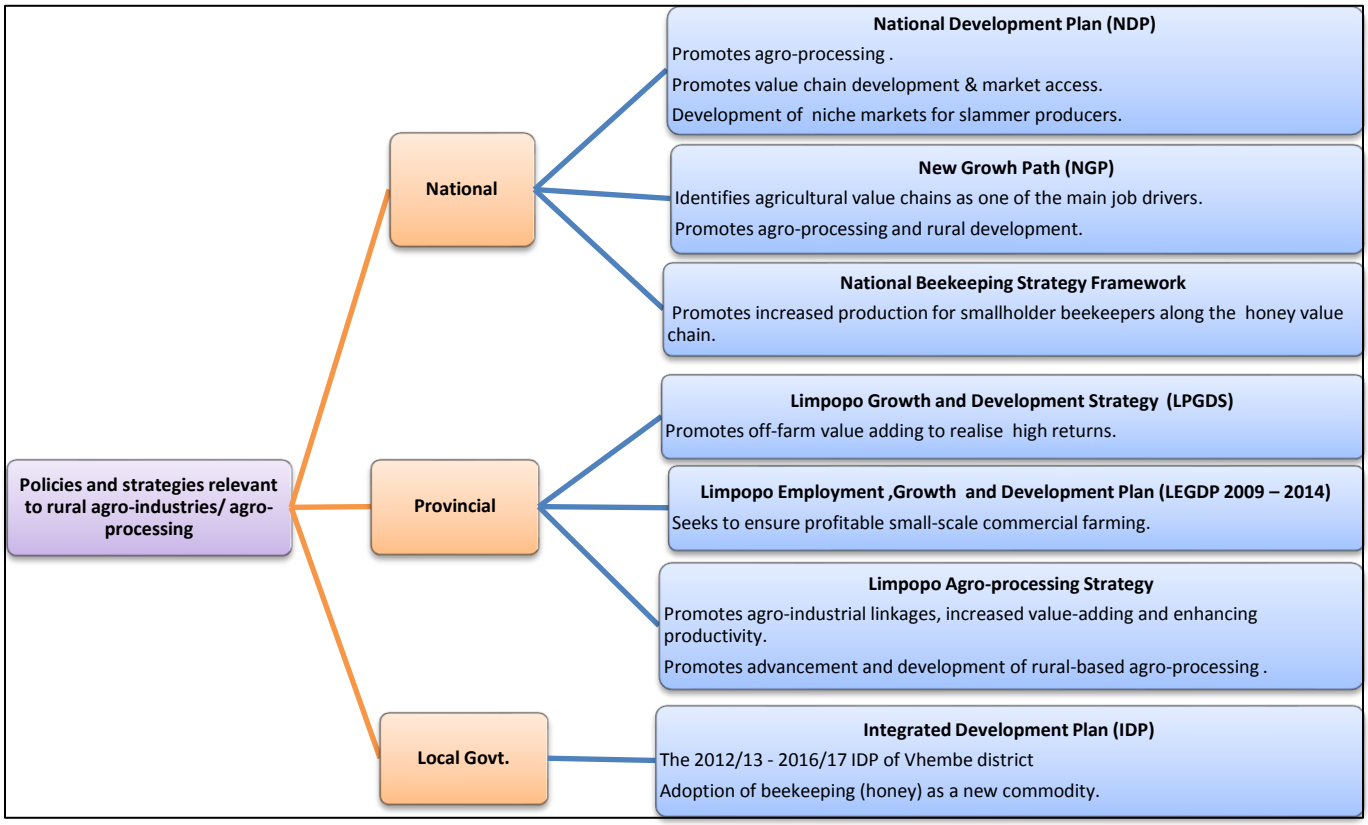
2.17. POLICY AND STRATEGY ALIGNMENT

This section focuses on national, provincial and local government policies and strategies relevant to the development of the apiculture industry in South Africa. The importance of beekeeping in terms of socio-economic benefits such as poverty alleviation, employment creation and incorporation in conservation programmes are well recognized and supported at the national and various provincial and local economic forums. The apiculture development projects initiated by the government aims at increasing the production levels of beekeeping and enhancing incomes and food security for most previously disadvantaged rural communities.

Although beekeeping industry is not specifically being mentioned or prioritized in most policies or strategies, a direct linkage exists where agriculture and agro-processing is being promoted. The apiculture development is well aligned with most national and provincial policies and strategies that promote agriculture and agro-processing to support rural-based smallholder producers. Beekeeping as one of the sub-sectors is well aligned with such policies and strategies.

The agro-processing industry is among the sectors identified by the Industrial Policy Action Plan (IPAP), the New Growth Path and the National Development Plan (NDP). It has been identified as having potential to spur growth and create jobs because of its strong backward linkage with the primary agricultural sector. Due to its nature of having the potential to create jobs, reduce poverty, create rural agro-industries, rural enterprises and rural development, the alignment of the apiculture industry is found in most policies and strategy documents, such as the National Development Plan, New Growth Path, Provincial Growth and Development Plans and Municipal Integrated Development Plans. Figure 4 below shows some of the policies and strategies that have alignment with the apiculture industry in South Africa.

Figure 4: National, provincial and local government policies and strategies relevant to the development of the apiculture industry in South Africa



Source: Nkwele Agribusiness (2014)

2.17.1. The National Development Plan: vision 2030

The National Development Plan (NDP) aims to eradicate poverty and reduce inequality by 2030. The NDP recognizes agriculture and agro-processing as having the potential to increase employment and growth. It has singled out the agricultural sector as an important creator of jobs in South Africa. Its alignment with the apiculture development lies in the fact that it proposes that job creation and rising agricultural production will all contribute to the development of an inclusive rural economy. The policy further states that industries such as agro-processing should be developed where potential exists.

The NDP recommends the following interventions which are found to be relevant for the development of smallholder beekeepers:

- Creation of new intermediaries, such as co-operatives, to assist small producers create economies of scale in processing;
- Developing strategies for economic cooperation or association that give poor producers greater collective market power in value chains and negotiate improved levels of market access and/or better terms of participation;
- Developing partnerships with other commercial players in the value chain; and

- Developing and incentivising the development of niche markets to promote smaller producers.

2.17.2. The New Growth Path

The New Growth Path (NGP) identifies agricultural value chains as one of the main job drivers that could create more jobs in the economy. It also recognizes the former Bantustans as the poorest regions with the highest unemployment rates and that agricultural value chains offer major opportunities in these areas for employment creation through smallholder farming, processing and sale of agricultural products.

The NGP proposes the following relevant interventions:

- Measures to enable small producers to enter formal value chains and take advantage of economies of scale;
- Government to identify viable new productive activities in the agricultural value chains;
- Detailing implementation plans for creation of employment through agriculture, agro-processing and rural development;
- Strengthening AgriBEE support for rural co-operatives; and
- Reviewing processing and retail to improve markets for small producers.

2.17.3. National Beekeeping Strategy Framework

The Department of Agriculture, Fisheries and Forestry (DAFF) has recently developed a draft National Beekeeping Strategy Framework. A national workshop was held in September 2013 to obtain inputs from the provinces to participate in the finalization of the framework. Once the national strategy is completed provincial departments of agriculture will be required to develop their provincial strategies to align with the national beekeeping strategy. The strategic framework seeks to achieve the following four objectives:

- To increase the current production of smallholder producers along the beekeeping value chain to 10% by 2019.
- To capacitate 200 current and 100 prospective smallholder beekeepers per annum.
- To increase the market share of smallholder beekeeping producers by 3% along the value chain by 2019.
- To promote cooperation and enhance integration between all participants and stakeholders in the beekeeping industry along the entire value chain by establishing 10 partnership agreements by 2019.

2.17.4. Limpopo Provincial Growth and Development Plan (PGDP)

Limpopo's Provincial Growth and Development Plan (PGDP) identifies agriculture, among others, as one of the main drivers of the provincial economy. The development of fruit and vegetable (horticulture) and forestry clusters earmarked in the Vhembe and Mopani districts will have direct positive impact to

the beekeeping industry in these areas. The PGDP's sector summit resolutions also recommended that black emerging agribusiness entrepreneurs must be involved in off farm value adding activities to realize higher returns on their investment.

2.17.5. Limpopo Employment, Growth and Development Plan (LEGDP 2009 - 2014)

Limpopo Employment, Growth and Development Plan recognizes the need to develop and implement a comprehensive strategy of rural development that aims to improve the quality of life of rural households, thus enhancing the country's food security through a broader base of agricultural production, and exploiting the varied economic potential that each region of the country enjoys. The plan further promotes profitable small-scale commercial farming through agricultural support interventions such as technical assistance, institutional support, communication and networking, marketing, and logistic and productive infrastructural support.

2.17.6. Limpopo agro-processing strategy

The Limpopo Department of Agriculture developed an agro-processing strategy in 2012 to contribute to the development of the key sectors of the provincial economy by strengthening agriculture and agro-industrial linkages, increased value-added activities and enhancing productivity. The strategy aims to create an enabling environment for the development and advancement of agro-processing in the province, enhancing value addition activities as to increase local revenue and create sustainable livelihoods in rural areas**.** A number of commodities such as citrus, subtropical fruit, nuts, industrial crops, grains, oil and protein seeds crops, and forestry that were identified in the strategy will have positive impact towards the development of the apiculture industry due to their bee dependent nature for pollination.

2.17.7. District Integrated Development Plans (IDPs)

With the exception of the Vhembe district, beekeeping is not specifically adopted in most district integrated development plans of Limpopo Province. The 2012/13 - 2016/17 IDP of the Vhembe district municipality has, however, adopted bee farming as a new commodity. The district further identified theft or unlawful harvesting of honey and shortage of beehive equipment as the main problem encountered by bee beekeepers in the district.

2.18. LEGISLATIONS AFFECTING THE APICULTURE INDUSTRY IN SOUTH AFRICA

Apiculture industry is a well legislated and regulated industry in South Africa. There are several legislations in place to regulate the beekeeping industry in the country. These pieces of legislations cover, among other things, issues related to production, processing and marketing of honey and related products. Some relevant legislations include, but are not limited to, Agricultural Products Standards Act - No. 119 of 1990; Health Act - No. 63 of 1977; Foodstuffs, Cosmetics and Disinfectants Act - No. 54 of 1972, Agricultural Pests Act - No. 36 of 1983, Conservation of Agricultural Resources Act - No. 43 of 1983 (CARA) and the National Environmental Management of Biodiversity Act (NEMBA) as well as the Stock Remedies Act of 1936. These legislations and their application are illustrated in Table 12 below.

Table 12: Legislations related to production, processing and marketing of honey and related products in South Africa

Act and regulation	Relevance and application to the apiculture industry
Agricultural Product Standards Act (Act No. 119 of 1990); and Agricultural Product Standards Amendment Act (Act No. 1216 of 1998)	Regulates grading, packing and marking (labelling) of honey and mixtures of bee products intended for sale in South Africa (i.e. Honey quality standards). *Has an effect on all bee products for sale in SA such as liquid honey, creamed honey, comb honey, chunk honey and mixture of bee products.*
Foodstuffs, Cosmetics and Disinfectants Act (Act No. 54 of 1972) *Regulation No. 1600 of 1983* *Regulation 2034 of 1993* *Regulation No. R908 of 2003*	Regulation No. 1600 of 1983- regulates imported honey and Irradiated Foods Regulation 2034 of 1993- regulates labelling and advertising of foodstuffs. Regulation No. R908 of 2003- regulates issues related to: ▪ *HACCP compliance.* ▪ *Honey production and further processing, e.g. premises for bottling.* ▪ *The powers and duties of Inspectors and Analysts on inspections and investigations conducted on foodstuffs and food premises.* ▪ *The detection, sampling, seizure, condemnation and disposal of honey which is unsafe for human consumption.* ▪ *Prohibition of sale, manufacture or importation of any foodstuff that does not comply with the Act.*
Health Act, 1977 (Act 63 of 1977) and; Foodstuffs, Cosmetics and Disinfectants Act (Act 54 of 1972)	Regulates and governs general hygiene requirements for food premises and the transport of food. ▪ *Regulates hygiene requirements at food premises where honey extraction and/or packing takes place.* ▪ *Ensures hygienic handling and prevent contamination of foodstuffs.*
Agricultural Pest Act (Act No. 36 of 1983)	Regulates the control and movement of African and Cape bees (dividing line). ▪ *Compulsory destruction of hives (in case of disease outbreak).* ▪ *Marking of hives and sites.* ▪ *Registration of beekeepers.*
Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1983); and *Govt. Notice No. 7032 of 30 March 2001*	▪ Promotes preservation of the natural vegetation. ▪ Regulates prohibition on plants declared as weeds and invader plants.
National Environmental Management of Biodiversity Act (NEMBA)	▪ Promotes preservation of the natural vegetation which is the economic base of the bee industry as prime nectar and pollen sources. ▪ Regulates prohibition on plants declared as weeds and invader plants.
Application for rebate permits in terms of the International Trade Administration Act – No. 71 of 2002; and Government notice 1824 of 2006	Regulates issues related to: ▪ *Application for rebate permits for imported honey.* ▪ *Applicable volume and conditions as determined in terms of Notice published in Government Gazette.*
Govt. notice R 1013 of 26 May 1989	Regulates importation of honey and wax, packing and irradiation of honey and honey products.
Administrator's Notice 1452 of 9 December 1970	Regulates beekeeping by-laws in urban areas.

Source: NAMC (2008)

2.19. CONCLUSION

This provided an overview of the South African apiculture industry in general, including opportunities and challenges for smallholder beekeepers. The report further provided an overview of beekeeping in the Limpopo province. The success stories of smallholder beekeeping projects were also reviewed. The report further reviewed national, provincial and local government policies and strategies that are relevant to the beekeeping industry. It then culminated with legislations affecting the apiculture industry in South Africa.

CHAPTER 3

LIMPOPO APICULTURE SURVEY

3.1. INTRODUCTION

This report presents and discusses the main findings of the apiculture survey conducted in the Limpopo province during November and December 2014. The findings of the survey include the analysed results from data collected through interviews held with beekeepers. These findings and analysis were also linked with the literature reviewed in the situation analysis report. To achieve the study objectives, the findings analysed existing beekeeping initiatives in the province in order to:1) establish and verify their existence, their locations and geographic spread, 2) to understand how beekeepers operate and manage their beekeeping enterprises, 3) to assess the extent to which they are resourced and equipped, 4) to evaluate their production capacity and yield levels from indigenous and commercial nectar sources, 5) and to asses honey processing technologies and methods as well as marketing arrangements. These factors are necessary to assess the economic potential of beekeeping in the province.

An insight was gained into the way beekeeping industry is structured in the province, the capacity in which beekeepers are resourced and challenges they are facing which impacts on their development. This analysis further undertook resource, training and capacity building needs assessment for rural beekeepers in province. The report also identifies and recommends areas of intervention required to assist the beekeepers and develop the beekeeping industry in the province. The recommendations and the identified opportunities and challenges will be used among other things as building blocks in developing a provincial apiculture strategy for the province.

3.2. SUMMARY OF FINDINGS

The apiculture survey examined the apiculture industry in Limpopo province. The survey utilized data from 72 beekeeping projects collected through face-to-face interviews using a structured questionnaire containing both open-ended and close-ended questions. Where possible site visits to the apiary sites and honey processing facilities were undertaken for verification and observation purposes. The other data were captured through pictures. The data collected through questionnaire were captured using MS Excel spreadsheet in order to develop tables, charts and graphs. Only people actively involved in beekeeping were interviewed.

The survey conducted shows that the majority of smallholder beekeepers in the Limpopo Province are concentrated in the Vhembe district. This is due to the high potential and favourable and climatic condition for beekeeping and mostly the support and partnerships from the Government (Limpopo Department of Agriculture), Government Agencies (Agricultural Research Council) and private sector (Bee Foundation) which targeted beneficiaries from this region. The majority of smallholder beekeepers benefited from the support initiative introduced by these three institutions. Almost all of the hobbyists and commercial beekeeping enterprises belonging to the first economy class of people were self-funded.

Through observation and direct communication with beekeepers, most factors affecting the development of the smallholder beekeepers are: lack of production resources, lack of processing equipment, lack of processing facility (premises), lack of transport, theft and vandalism as well as inadequate training and skills. As a result of these challenges some smallholder beekeepers have located their apiaries in their own back yard and farms or orchards; making use of self-made beehives; employing traditional honey processing methods; and selling locally to informal markets. For most smallholder beekeepers, beekeeping appears to be a secondary source of income, integrated with other agricultural activities. This is believed to be due to a lack of resources and the seasonal nature of beekeeping.

The survey identified training and capacity building needs along the honey value chain. These include practical training on basic and advanced beekeeping, honey processing, business management and marketing. The study also identified a number of intervention measures such as training and capacity building of beekeepers, provision of adequate production and processing equipment and marketing arrangement for smallholder beekeepers. These interventions are necessary and would contribute significantly towards the development of rural beekeepers and the apiculture industry in the Limpopo province.

3.3. METHODOLOGY

Methodology focuses on aspects such as the study area, target population, sampling methods, sample size, data collection instruments and data analysis methods. The data collection and analysis applied both the qualitative and quantitative methods. The quantitative method involved the analysis of the numerical data while the qualitative method involved the analysis of data such as non-numerical responses (words) from respondents and pictures. The rationale behind this approach was due to the fact that the survey involved collection of data through one-on-one interviews to collect both numerical and non-numerical data from respondents (i.e. beekeepers) and observations from site visits.

3.3.1. Study area

The survey was conducted in the Limpopo province of South Africa. Limpopo Province is South Africa's northern-most province and has a total area of 125 755 square kilometres. It is the 5th largest province of the nine provinces, and covers 10.3% of the total country's land area. Limpopo has a population of 5.4million people. The principal home languages are Sepedi, spoken by 52.9% (more than half) of the population, followed by Xitsonga, representing 17% and Tshivenda which represents 16.7% of the population.

Limpopo province is in the savannah biome, an area of mixed grassland and trees generally known as bushveld. The bushveld is a cattle farming area where extensive ranching operations are often supplemented by controlled hunting. About 80% of South Africa's hunting industry is found in Limpopo. The province is a summer-rainfall region. Winter is mild and mostly frost-free. The northern and eastern areas are sub-tropical with hot and humid summers and mist in the mountains.

Agricultural crops such as sunflowers, cotton, maize and peanuts are cultivated in the Bela-Bela and Modimolle areas. Modimolle is also known for its table-grape crops. Tropical fruits, such as bananas, litchis, pineapples, mangoes and pawpaws, as well as a variety of nuts, are largely grown in the Tzaneen and Makhado areas. Tzaneen is also at the centre of extensive tea and coffee plantations. The province produces the majority of country's mangoes, papayas, avocados and tomatoes. Thousands of tons of potatoes, citrus, bananas, and litchis are produced within the province in abundance. Extensive forestry plantations are also found in the region, including hardwood for furniture manufacture. In addition to commercial agriculture, subsistence farming is the mainstay of a large section of the province's rural population. Over 45% of the more than R2 billion annual turnover of the Johannesburg Fresh Produce Market comes from Limpopo. The province produces about 75% of South Africa's mangoes, 65% of its papayas, 36% of its tea, 25% of its citrus, bananas, and litchis, 60% of its avocados, 60% of its tomatoes, 285 000 tons of potatoes, 70% of its mangoes and 35% of its oranges.

Figure 5: Map of the Limpopo Province

Source: Internet

The survey was conducted in all the five districts of Limpopo Province, namely, Capricorn, Mopani, Sekhukhune, Waterberg and Vhembe districts. The Capricorn district covers about 21 705 square kilometres. Limpopo's capital, Polokwane, lies in the heart of this district. The Mopani district, which covers about 20 011 square kilometre, is a category C municipality located within the north-eastern quadrant of the province. The Greater Sekhukhune district is also a category C municipality and lies in

the south-eastern part of the province. Agriculture in the Vhembe district is one of the main economic drives that contribute to the whole province and the nation at large. The Waterberg district is geographically located on the western part of the province. Being predominantly rural, most of the district is suited for livestock production, but also with some major cropping taking place in cotton, sunflower, tobacco, and soya bean production.

3.3.2. Respondents identification criteria and sample size

The identification of beekeepers to be interviewed was done in consultation with the Limpopo Department of Agriculture (LDA) at the Head Office and departmental district municipality officials. Briefing and planning meetings were held with the officials from the Livestock and Enterprise Development Divisions of the LDA Head Office and officials from Livestock Divisions of all the LDA district offices. The purpose of the briefing and planning meetings was to brief and strategize with the departmental officials on the data collection process to be used and identify respondents.

From the consultation meetings with the Limpopo Department of Agriculture it was evident that various sampling methods had to be applied due to the complex nature of the way beekeeping projects and enterprises are structured and spread across the province. For instance, other districts such as Vhembe had more rural beekeepers, and as a result a selection had to be done on the respondents that have to be interviewed while other districts had very few beekeepers and no selection was done since all beekeepers known by LDA officials and researchers were included in the survey.

The selection and number of respondents therefore varied from region to region, depending on the concentration of beekeepers per region. The number of respondents was high in the regions with more beekeepers than regions with few beekeepers. In the Vhembe district, which has the highest number of beekeepers than all the other districts, identification and selection of respondents was done in a manner that creates a balance between small, medium and large beekeepers. In the districts with only few beekeepers all beekeepers known were interviewed. The selection also depended on the availability and willingness of the respondent beekeepers to be interviewed. The survey needed to obtain information from the most relevant respondents, i.e. beekeepers who are actively involved in beekeeping. The selection had to be intensively discussed during the consultation sessions with LDA officials and Extension Officers who work closely with these beekeepers in order for Nkwele Agribusiness to gain in-depth knowledge of the study area and beekeeping activities in the target research area.

According to the literature reviewed in the situational analysis report, the Limpopo province is estimated to have approximately 600 smallholder beekeepers and 60 beekeepers falling under hobbyists and commercial beekeepers category. The smallholder beekeepers are mostly organised into groups or co-operatives and are operating less than 100 hives. Most of the hobbyist beekeepers operate approximately 200 hives and very few commercial beekeepers operate over 1000 hives.

A total of 72 beekeeping projects (respondents) were interviewed. These beekeeping projects had a total of 136 project beneficiaries or beekeepers. This sample size represented just over 10% of the

estimated population of the beekeepers in the province. The survey covered beekeeping projects or enterprises operated by individuals or sole proprietors, co-operatives, companies, and community based organizations.

3.3.3. Data collection

Data were collected through questionnaires, pictures and observations. Face-to-face interviews were held with beekeepers to collect data using semi-structured questionnaire and site visits were also undertaken to apiary sites to verify the existence of beekeeping activities and honey production, and to observe the conditions under which beekeepers operate. Data were collected from all five districts of the Limpopo province to ensure inclusivity and to avoid bias. Table 13 below shows the number of respondents per district. The Vhembe district comprised 47 respondents, 12 from Waterberg, 5 from Mopani, 5 from Sekhukhune and 3 respondents came from the Capricorn district. The reason why the Vhembe district dominates is that it has the highest number of beekeepers than all the other districts in the province.

Table 13: Number of respondents per district

District	Number of respondents
Vhembe	47
Waterberg	12
Mopani	5
Sekhukhune	5
Capricorn	3
Total	**72**

Extension officers from Limpopo Department of Agriculture also participated and assisted with the identification of beekeepers and data collection. In the Vhembe district unemployed youth were appointed as research assistants to assist with the data collection. The research assistants were trained in advance to equip them with skills to conduct the interviews and in order to capacitate them to be able to explain the questions thoroughly to the respondents and to provide all the information concerning the survey and to answer questions that respondents might have. Provision was also made to enable the researchers to collect some information which might have been left out of the questionnaire. Only participants directly and actively involved in beekeeping were interviewed. The data were collected from the first week of November 2014 to the first week of December 2014. Each district was allocated one week for the data collection. During the data collection, the research team also assisted some beekeepers with harvesting. Nkwele Agribusiness also donated honey buckets, hive tools and smokers valued at R5 000.00 to beekeepers as a token of appreciation for their time and availability.

3.3.4. Data analysis

Microsoft Excel spreadsheet was used for capturing the data and in developing tables, charts and graphs. Incomplete questionnaires were discarded. Only data from completed questionnaires were

captured and analysed. The data analysed focused among other things on the following study objectives:

- To evaluate the production potential of indigenous and commercial nectar sources in order to gauge the economic potential of beekeeping in Limpopo;
- To understand the production and processing methods and technologies used by the rural beekeepers in the province;
- To assess the existence and geographic spread of rural beekeepers in Limpopo;
- To determine the honey production levels and marketing channels for rural beekeepers based in Limpopo;
- To identify challenges faced by rural beekeepers in Limpopo; and
- Identify resource and training needs for rural beekeepers in Limpopo.

3.4. RESULTS AND DISCUSSION

3.4.1. Demographic data of beekeepers participated in the survey

Table 14 shows that the 72 beekeeping projects (respondents) interviewed comprised a total of 136 beneficiaries. Out of the total of 136 beekeepers (project beneficiaries) 92% were black and 8% were white, and 59% of the project beneficiaries were males while 41% were females. About 25% of the beekeepers are aged between 46 and 55 years and 24% of them are over 65 years; and youth (aged 18 to 35) comprised 18% of the project beneficiaries. The beekeepers who completed or reached tertiary level dominated by 31%, followed by 24% of those who completed or reached primary school; 23% reached high school and only 18% reached or completed matric. Due to its seasonal nature, beekeeping is used as the secondary source of income derived from agriculture. As a result, 57% of the beekeepers depend on other agricultural activities to earn a living while only 1% of them have no other source of income apart from beekeeping. The results also show that 33% were getting pension, and 28% of the beekeepers obtained salaries outside agriculture.

Table 14: Summary profile and demographic data of beekeepers participated in the survey

Number of projects (respondents) participated in the survey		72
Total number of project members or beneficiaries		136
Race	Black	92%
	White	8%
Gender	Male	59%
	Female	41%
Age group	<18	1%
	18-35	18%
	36-45	12%
	46-55	25%
	56-65	21%
	>65	24%
Educational level	None	1%
	Primary	24%
	High school	23%
	Matric	18%
	Tertiary (Diploma/ Degree)	31%
Source of income apart from beekeeping	Non agriculture	28%
	Agriculture	57%
	Pension	33%
	Government grant	9%
	Family member	4%
	None	1%

3.4.2. Beekeepers and beekeeping operations

Table 15 shows that the 72 beekeeping projects (respondents) interviewed have been involvement in the beekeeping for at least 10 years. These beekeepers manage a total of 9 022 hives. The majority of smallholder beekeepers falling under the previously disadvantaged individual category owned between 1 hive and a maximum of 80 hives each. Most of the beekeepers from the second economy class owned between 10 and 200 hives and only two commercial beekeepers within this class owned a maximum of 4000 hives.

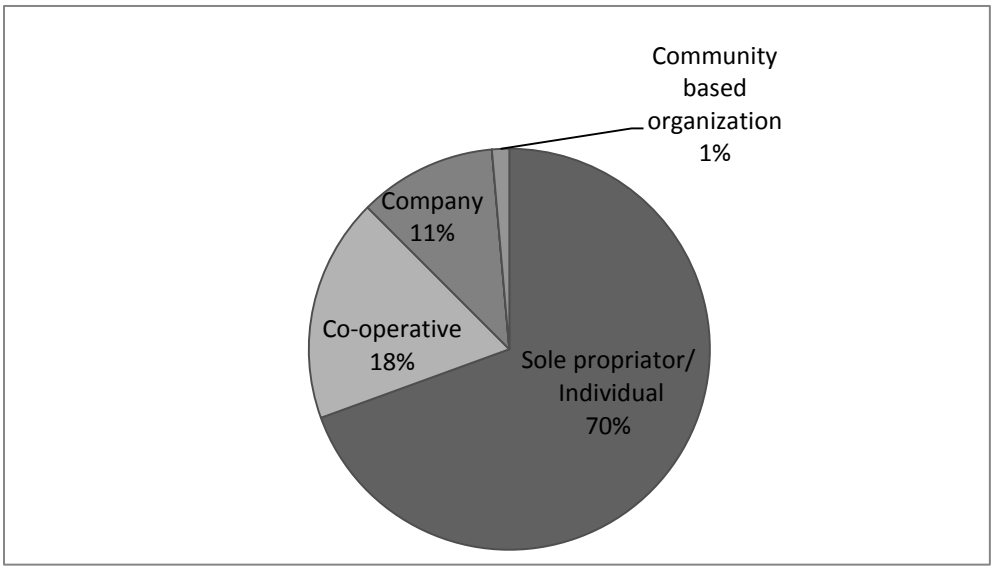
Table 15: Beekeepers and beekeeping operations

Beekeepers and beekeeping operations	**Number**
Average number of years in beekeeping	10
Number of hives owned by beekeepers who participated in the survey	9 022
Minimum number of hives owned per smallholder beekeeper	1
Maximum number of hives owned per smallholder beekeeper	80
Minimum number of hives owned per hobbyist/commercial beekeeper	10
Maximum number of hives owned per commercial beekeeper	4 000

3.4.3. Type of legal entity used to undertake beekeeping

Figure 6below shows that 70% of the beekeepers were operating as individual or sole proprietors, 18% as co-operatives and 11% have registered companies. Co-operatives were more prevalent in the Vhembe district both at local and district level.

Figure 6: Type of legal entity



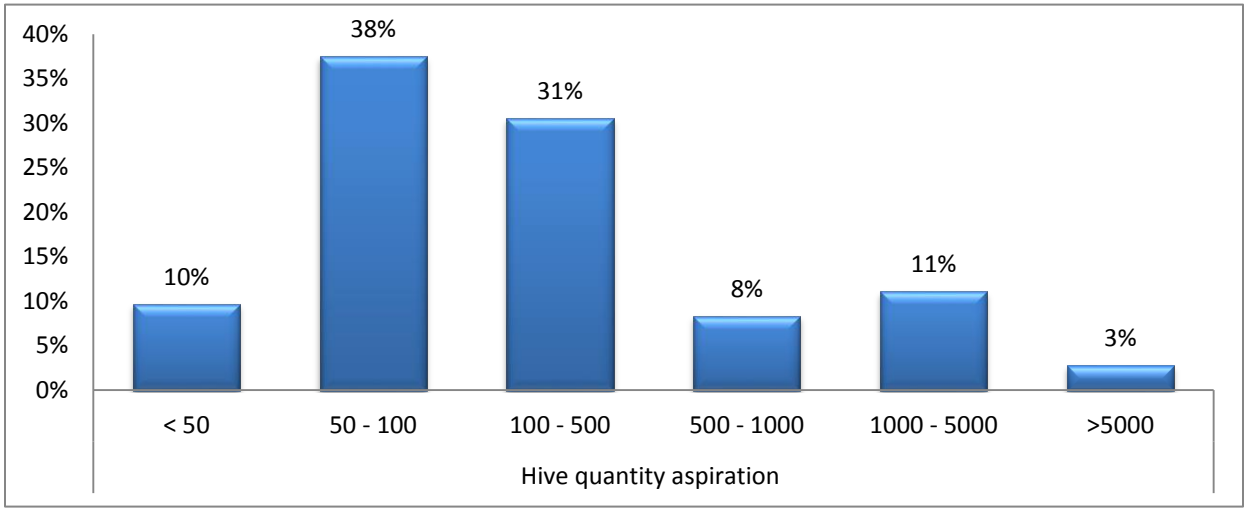
3.4.4. Effectiveness of existing co-operative structures

Although most of the smallholder beekeepers are affiliated to Primary Beekeepers Co-operative at local municipal level and Secondary Beekeepers Co-operative at district level at Vhembe, each beekeeper is allocated and manage their own beehives. The project management responsibilities and operations such as honey production, processing and marketing are the sole responsibility of each beekeeper and in most cases decisions are made independently from the existing co-operative structures. Although this system is effective in distinguishing the more committed and hardworking smallholder beekeepers from the rest of the group, it appears to make the co-operative structure less effective both at local and district level.

3.4.5. Expansion aspirations of the beekeepers

Figure 7 indicates that 38% of the beekeepers aspired to have 50 to 100 hives, 31% of the beekeepers aspired to have 100 to 500 hives, while 8% wished to own about 500 to 1000 hives and 11% aspired to own 1000 to 5000 hives. The majority appear to have not yet reached their target. From the survey there were only two respondents with more than 1000 beehives each; the biggest producer operated about 4 000 hives.

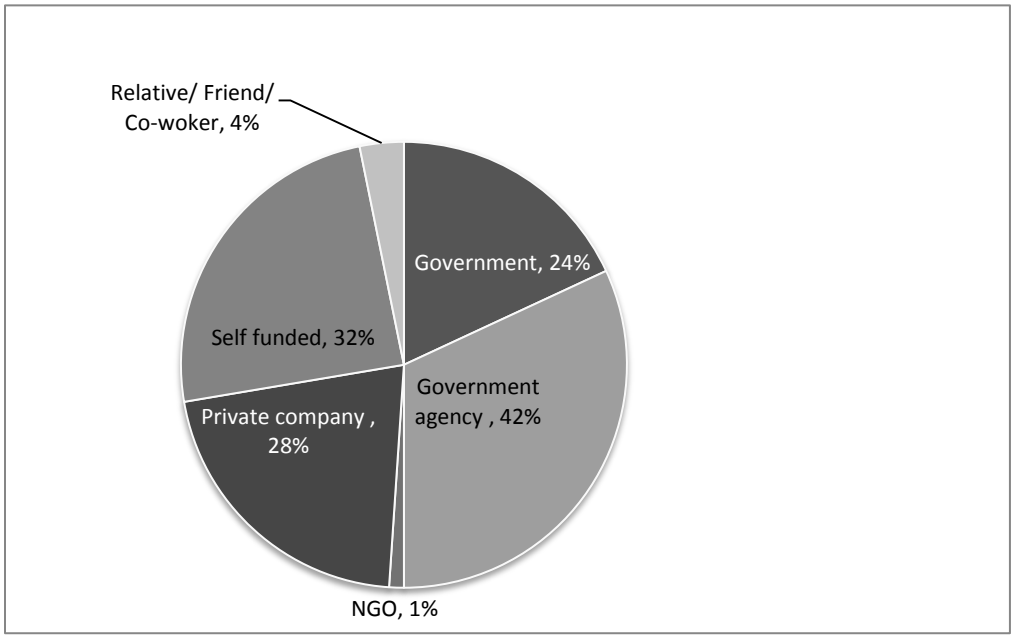
Figure 7: Hive quantity aspirations



3.4.7. Initial project funder or supporter

Figure 8 shows that 42% of the projects were assisted by the government agency, i.e. Agricultural Research Council; 24% of the beekeepers were assisted by the government (Limpopo Department of Agriculture); 32% beekeeping projects were self-funded and 28% of the projects were assisted by a private company such as Bee Foundation.

Figure 8: Institutions that assisted or funded the project



3.4.8. Training, mentorship and access to technical advice and information

Figure 9 shows that 85% of the beekeepers received initial beekeeping training, while 15% did not receive any training on beekeeping. The Agricultural Research Council, Honey Badger and Bee Foundation were mentioned to be the three institutions which played a significant role in the provision of beekeeping training to the beekeepers. The average number of days trained was 10 days. Although most rural beekeepers received initial beekeeping training, from the observations and discussions with beekeepers it was evident that most of the trainings courses were offered in class (not on site) with little or no practical. The type of training offered was also very basic (beginner's beekeeping course) and not practical enough to equip rural beekeepers with adequate skills to operate independently and run sustainable beekeeping enterprises. In most cases no skills audits were undertaken and the training manuals were written in English and were not translated in the beekeepers own language, hence rural beekeepers find it difficult to use them as reference material after training.

Most of the beekeepers who did not receive training reported that they obtained beekeeping skills and knowledge through self-learning. Others indicated that they have learned from their fathers who were involved in the beekeeping, and they also developed interest in the beekeeping and took over when their fathers got older or after they have died.

Figure 9: Initial beekeeping training

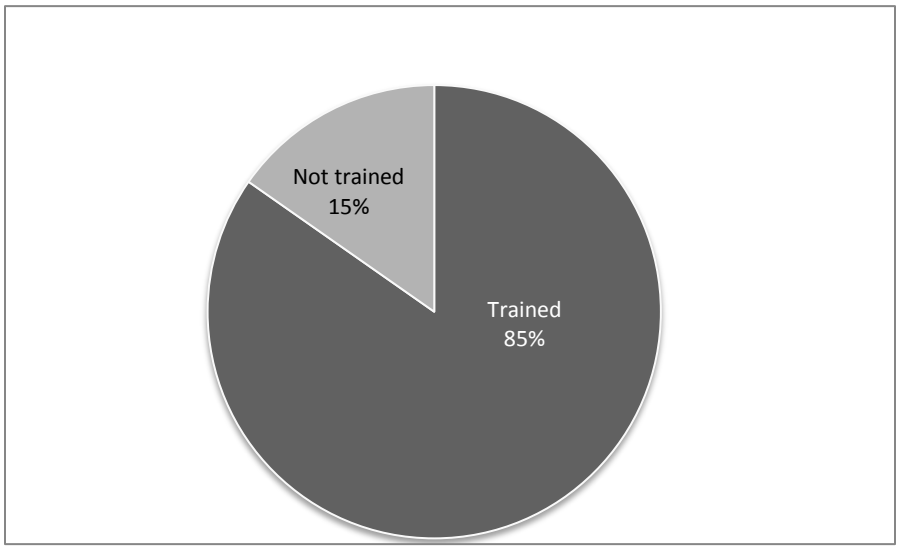
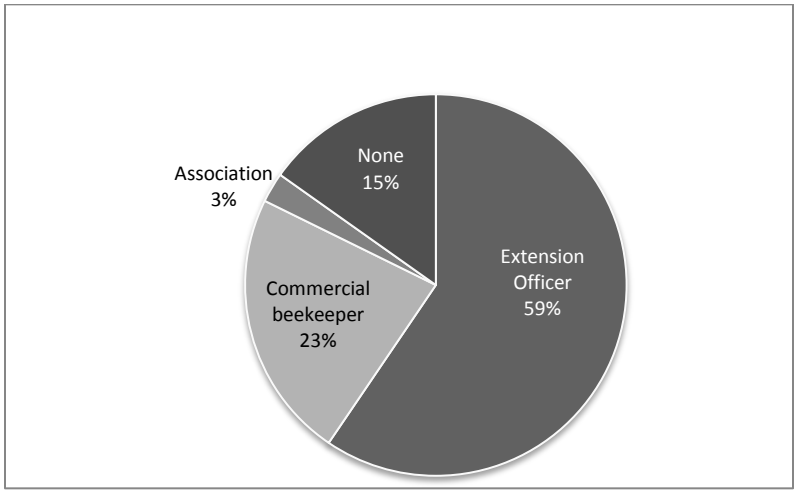


Figure 10 below shows that 59% of the beekeepers access technical advice and information on beekeeping from their local Agricultural Extension Officers. This is mostly the casein the Vhembe district were Extension Officers appear to be playing a significant role in providing technical advice and information to beekeepers. About 23% of the beekeepers reported to be relying on commercial beekeepers for technical advice related to beekeeping. Some commercial beekeepers who act as mentors also buy honey from rural beekeepers for further processing and bottling. Mentorship offered

by such commercial beekeepers is mainly limited to those rural beekeepers who supply them with honey.

About 15% of the beekeepers have no access to any technical advice and information on beekeeping. Only 3% of the respondents indicated that they access technical advice and information from their respective Beekeepers Association. This is due to the fact that very few beekeepers were affiliated to the SABIO; hence they do not access technical advice and information from the Association.

Figure 10: Access to technical advice or information on beekeeping



Lack of mentorship and coaching deprive rural beekeepers from practical and hands on training and skills transfer. This is confirmed by Figure 11 which indicates that 65% of the beekeepers did not receive any beekeeping mentorship while 35% of the beekeepers had access to mentorship on beekeeping. The mentorship and coaching programme could address the lack of adequate beekeeping skills resulted from inadequate training.

Figure 11: Access to mentorship

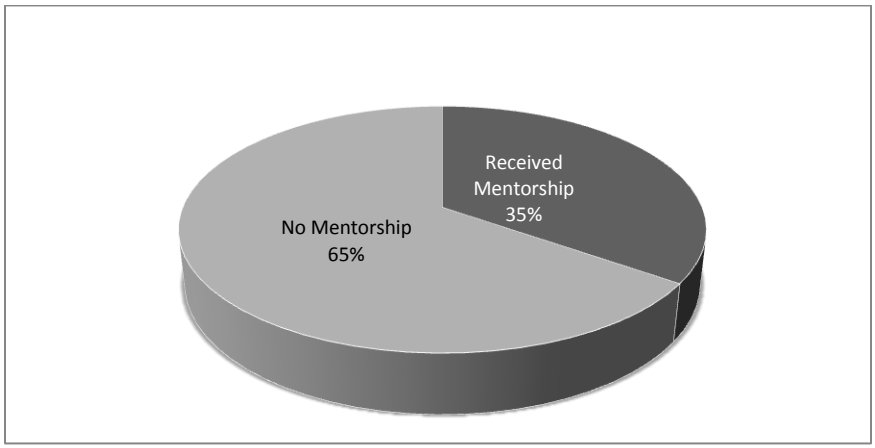
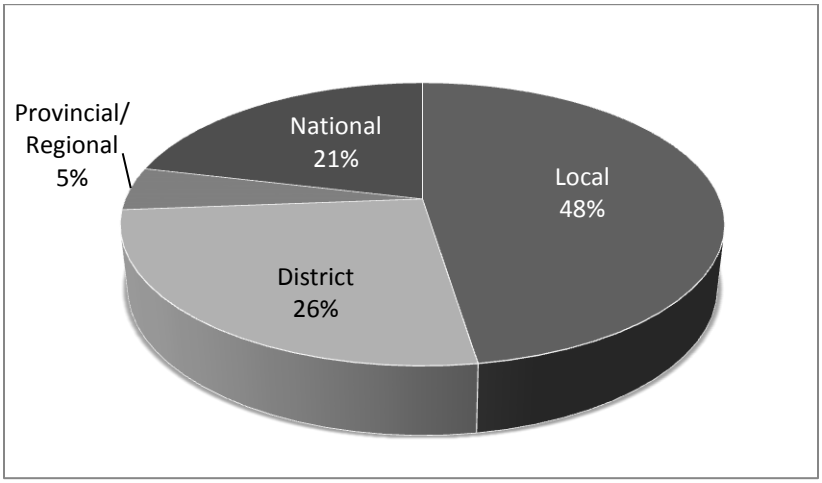


Figure 12 shows 48% of the beekeepers were affiliated to the local association/commodity group or producer co-operative and 26% were members of the district association/ commodity group or producer co-operative. Only 21% of the respondents indicated to be members of the National Beekeepers Association such as the South African Bee Industry Organisation (SABIO). Only 5% of the projects are affiliated with the Regional Beekeepers Association, i.e. Transvaal Beekeepers Association. Smallholder beekeepers the Vhembe district belong to the local co-operative groups and District Beekeepers Co-operative.

Figure 12: Association membership



3.4.9. Honey production and marketing

Figure 13 below shows that the local informal markets constitute the biggest market channel (68%) for the honey for most rural beekeepers. This is also due to the fact that most of them produce low quantities and do not see the need to explore other market channels since they are able to sell the honey to their local communities. About 14% of the respondents sell their honey in bulk to other large commercial producers or honey processors who process and supply major retailers while 18% of the beekeepers sell bottled honey directly to the retail stores such as Spar, Fruit and Veg City, Farm Stalls and other local shops. The amount of honey produced by the 72 projects yielded about 61.617 tons of honey in their previous season or harvest. The average yield per hive super was 9 kg of honey and on average most beekeepers harvest at least twice a year from one hive super.

Figure 13: Marketing channels for honey

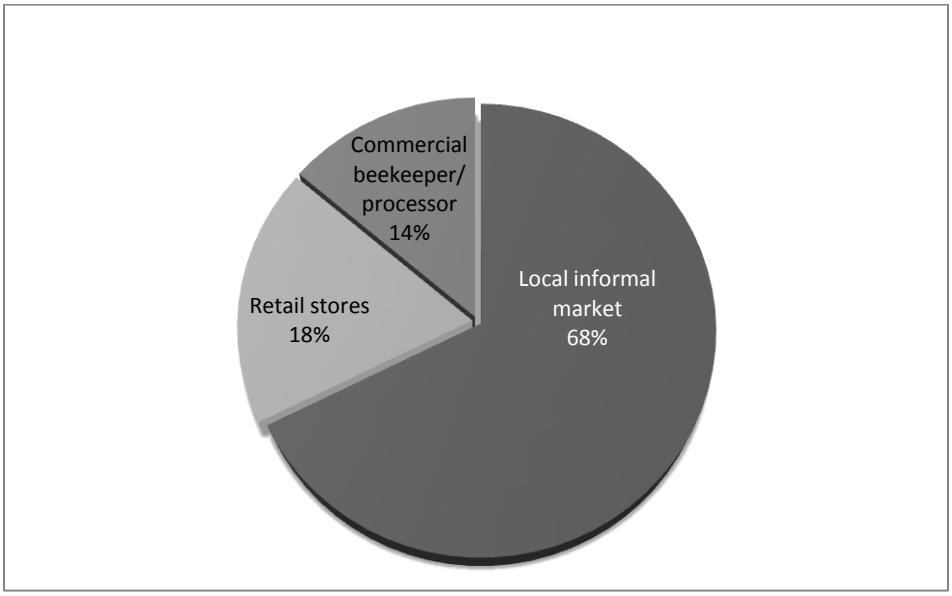


Figure 14 shows that the honey produced by beekeepers is being packaged and sold in various categories in line with the needs of the target market or customers. The prices also vary depending on whether the beekeeper sells directly to consumers, supply retailers or other large producers and processors who further process and supply retail markets. The processed honey is commonly packed in 500 gram bottles and the average price paid to the beekeeper was R42.00 per bottle. If the total 61.617 tons of honey produced was only sold in 500 gram bottles this could have generated an equivalent of R5 175 828.00 in revenue for the beekeepers. The total 61.617 tons of honey, if sold as bulk honey at an average price of R40.00 per kilogram (kg), could have generated an equivalent income of R2 464 680.00 to the beekeepers while the same quantity of bottled honey selling at an average price of R79.00 per 1 kilogram could have generated R486 7743.00. There is a huge income difference between 1 kilogram bottled honey with an average price of R79.00 per kg and the same quantity of honey sold as bulk honey with an average price of R40.00 per kg. The bulk of honey is normally sold to honey bottlers or processors who supply bottled honey to major retailers. In some instances rural beekeepers also sell their honey to other commercial beekeepers that process and supply either large honey bottlers or retailers.

Figure 14: Average prices of honey paid to beekeeper (direct sale, wholesale and retail)

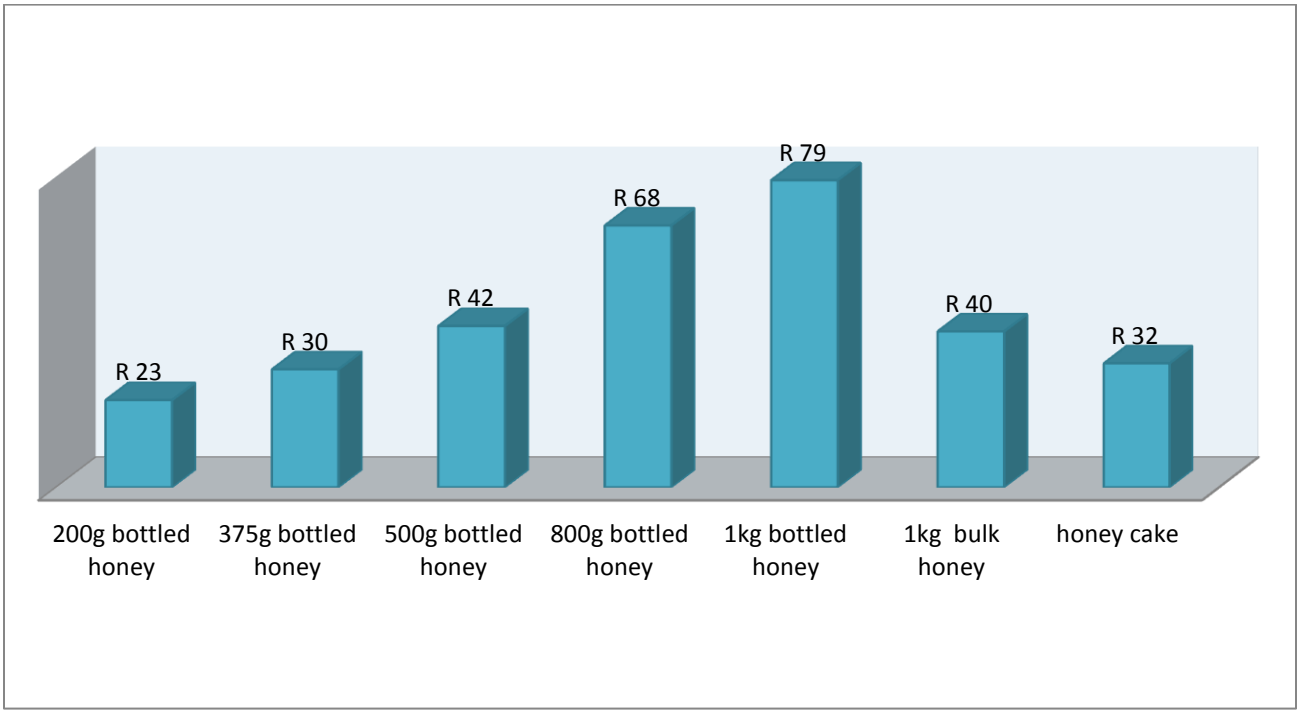


Figure 15 shows that 45% of the beekeepers sell their honey in the form of bottled honey, 38% sell cake or combed honey either in bulk or in small packs and 17% supply bulk honey to other large producers and processors who further process and supply retail markets.

Figure 15: Form in which honey is sold or packaged

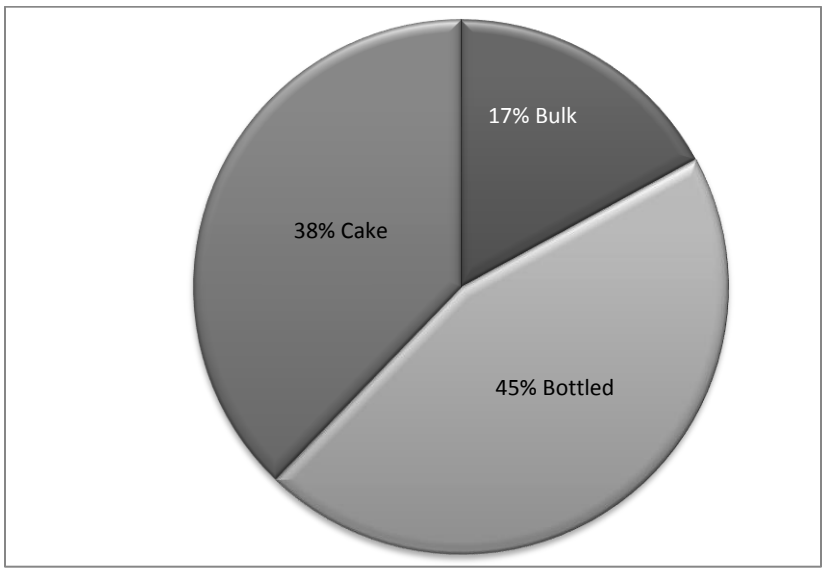


Figure 16 show that only 31% of respondents keep records of their honey production and sales whereas 69% of the respondents do not keep records of sales.

Figure 16: Record keeping

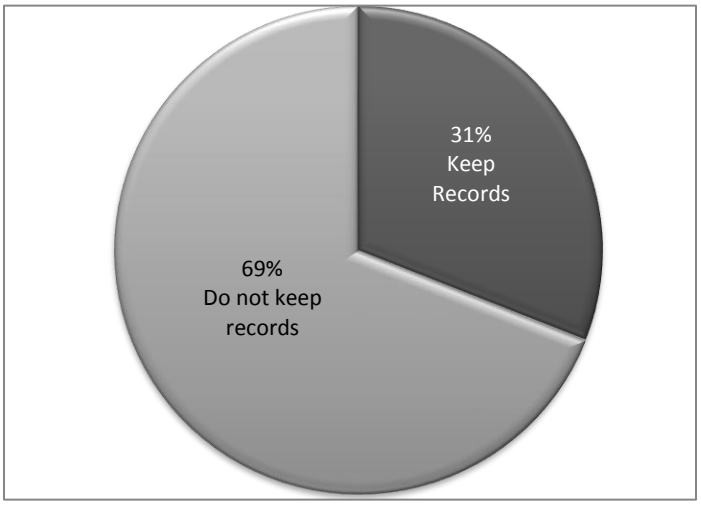
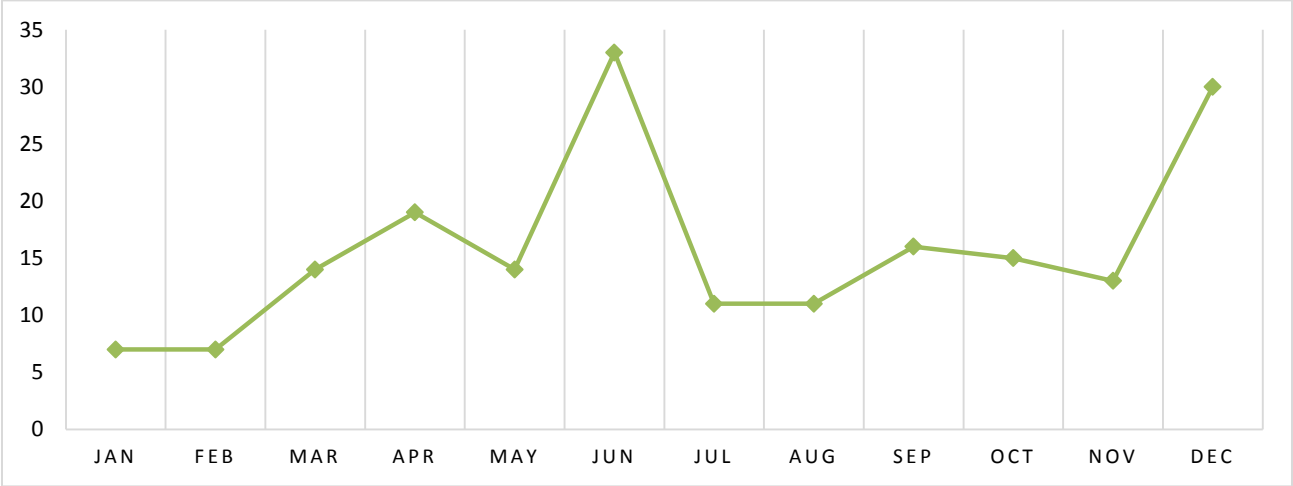


Figure 17 depicts June and December as the peak season during which most beekeepers harvest their honey crop. Due to varying climatic conditions and flowering patterns different beekeepers around the Limpopo province are able to harvest honey throughout the year.

Figure 17: Harvesting periods



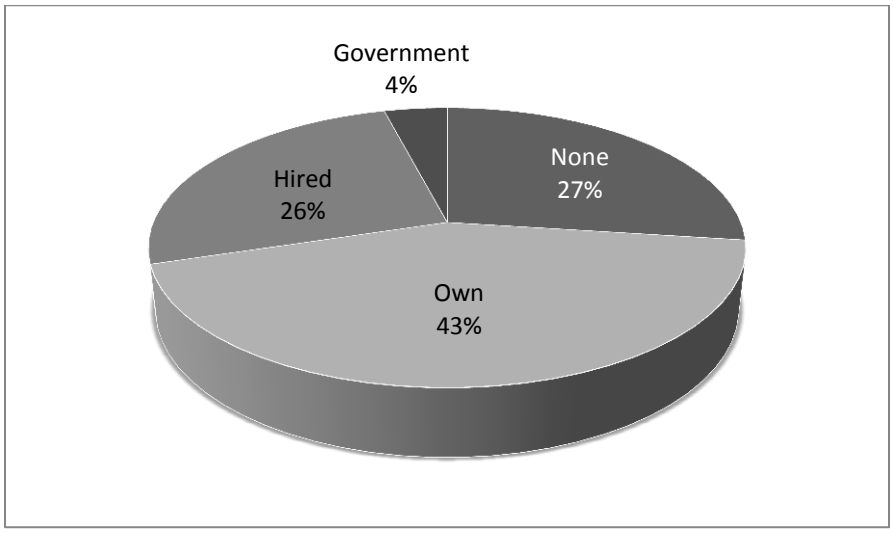
3.4.10. Honey production and processing equipment

The majority of black rural beekeepers appear to be very much under-resourced. Most of them lack basic beekeeping equipment such as good hives, protective clothing, smoker, hive tool. They only rely on those which were donated to them by the projects sponsors such as Bee Foundation, Agricultural

Research Council and Limpopo Department of Agriculture when the project was initiated, which are currently very old and need to be replaced. They also lack honey processing equipment such as honey extractor, uncapping fork or knife, honey tank, and buckets. Most, if not all of the beekeeping and honey processing equipment are not available within the Limpopo province and the beekeepers do not even know where to buy them. Some beekeepers have resorted to make use of self-made hives since they cannot afford to purchase new ones and they do not even know where to buy them. Approximately 50% of the respondents do not know how to make their own beeswax which is used to attract bees into the hives.

Figure 18 shows that 27% of the respondents do not have transport to move their beehives from one place to another and to transport their honey to the market, while 4% rely on government transport. Only 43% of the respondents have their own transport while 26% rely on hired transport.

Figure 18: Mode of transport



3.4.11. Bee forage and nectar source

Figure 19 shows that 28% of the respondents place their beehives in their backyard or ploughing fields and 61% use their own farms or orchards. Around 17% of the respondents negotiated with other farmers who own orchards to place their hives on their farms while only 8% place their hives in eucalyptus forests. Indigenous forest constitutes only 1% as the apiary side for these beekeepers. This is associated with the high level of theft and vandalism if hives are placed in indigenous forests.

Figure 19: Location of apiaries

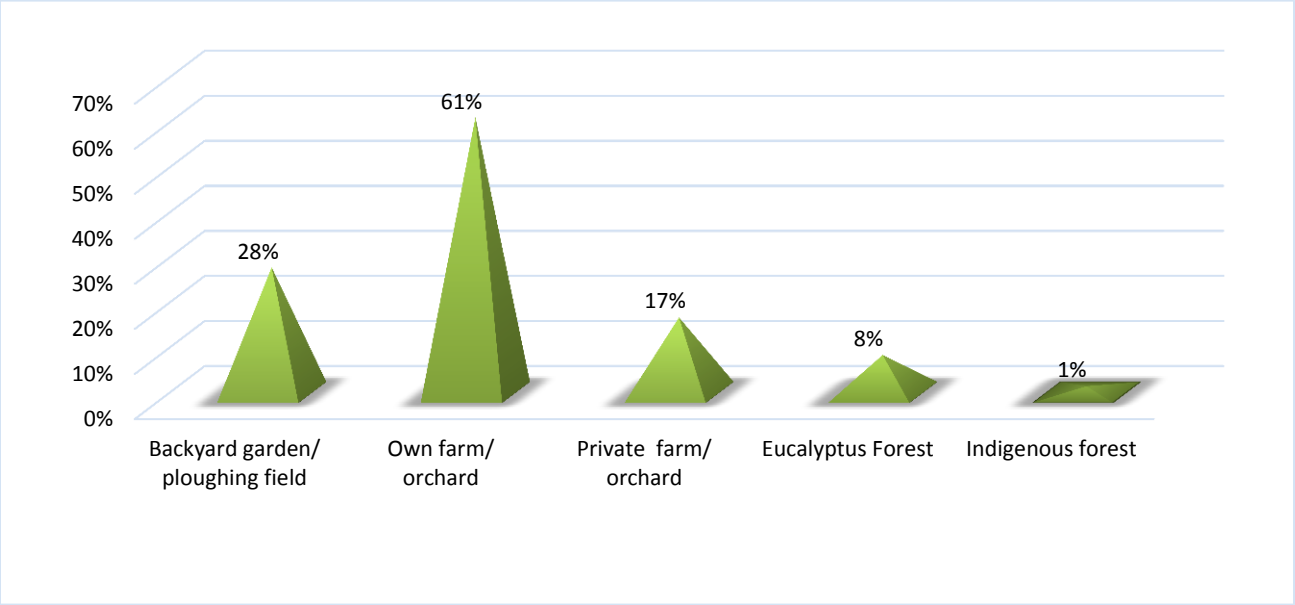
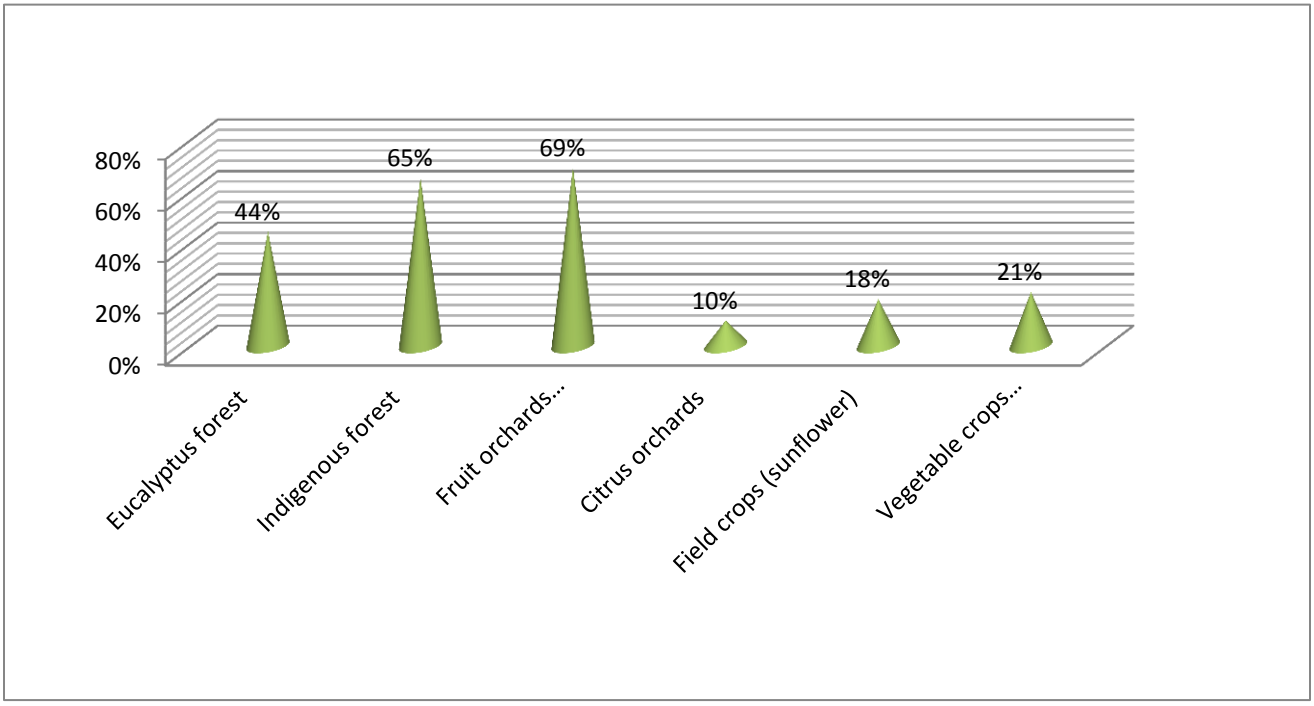


Figure 20 further shows that orchard trees such as avocado, litchis, mango, macadamia, and peaches (especially in the Vhembe and Mopani districts) serve as the most common source of forage and nectar. Indigenous trees also play an important role in providing nectar to bees. Eucalyptus forest mostly in the Vhembe district serves as an important source of forage and nectar for bees. However, the potential of eucalyptus trees as a source of forage and nectar source for bees is still being under-utilised.

Certain fruit/vegetable crops such as butternut, watermelon and tomatoes also provide food to bees. Sunflower production in the Waterberg district is also one of the important field crops that produce more nectar for bees. The low utilization of citrus as a source of nectar is due to the spraying of citrus trees by farmers which has a detrimental effect on bees. This discourages most beekeepers to move their hives to such farms. This practice has a negative impact on both the citrus farmers and beekeepers since citrus trees depend on bees for pollination and bees get nectar while pollinating.

Figure 20: Bee forage and nectar source



3.5. Type of beekeeping practiced

Figure 21 also shows that 75% of the respondents practise stationary beekeeping, while 25% of the projects practise migratory beekeeping. Stationary beekeeping appears to be more appropriate in the Vhembe and Tzaneen regions due to favourable climatic conditions for beekeeping, while other regions such as Capricorn, Sekhukhune and Waterberg require migratory beekeeping and supplementary feeding of bees during the off season to complement for the low productivity.

Figure 21: Type of beekeeping practice

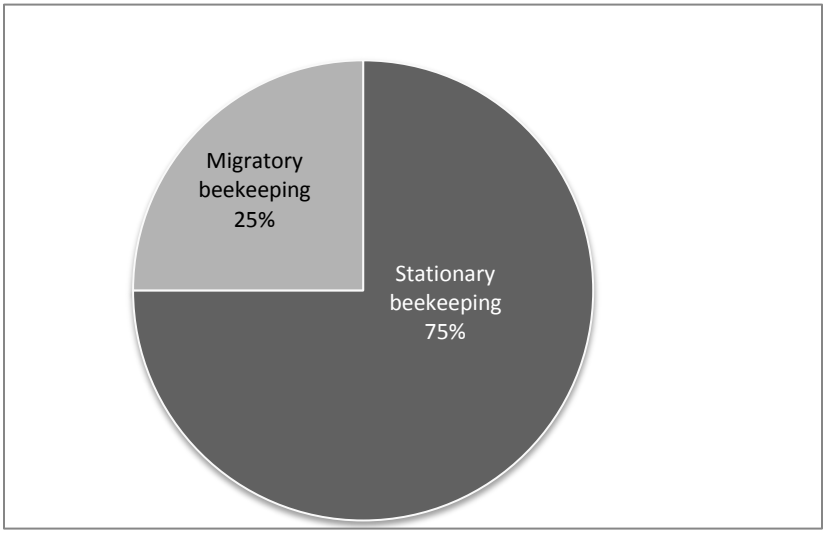
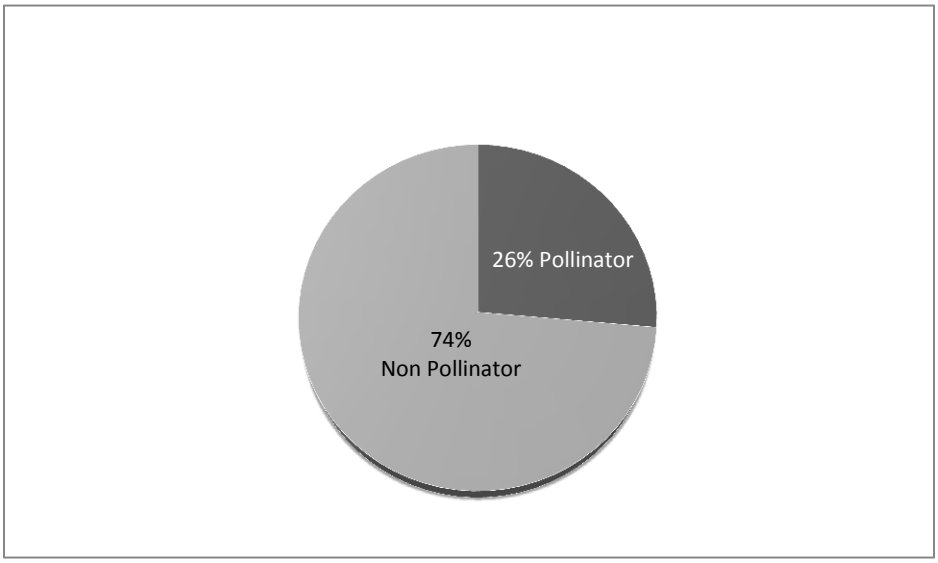


Figure 22 shows that 74% of the projects do not provide pollination service, while 26% of the respondents did not provide pollination. This also shows that there is a positive correlation between the migratory beekeeping and provision of pollination service since most of the beekeepers that provide pollination services have to move their hives from one place to another. Beekeepers that provide pollination services do it either through a mutual arrangement or at an agreed pollination fee (per hive or per period) between the beekeeper and the crop owner.

Figure 22: Provision of pollination services



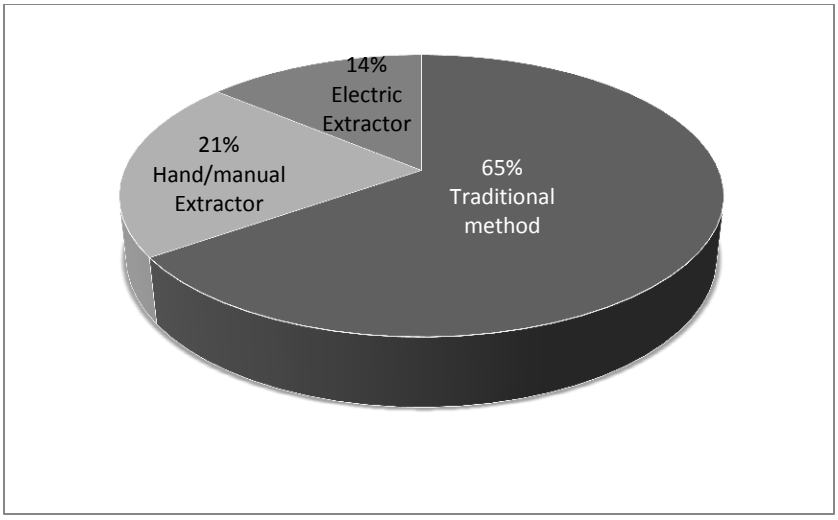
3.5.1. Honey extracting/processing

Figure 23 shows that 65% of the projects use traditional methods to extract or process their honey, 21% use hand or manual extractor and 14% of the beekeepers use electric extractor to process their honey. The following traditional honey extracting/processing methods are commonly used by most rural beekeepers:

i. Squeezing honey cakes (combed honey) through a sieve to filter the liquid honey to remove wax and solid material.
ii. Squeezing honey cakes (combed honey) covered with a clean sack of orange fruits (or clean cloth) to filter the liquid honey to remove wax and solid material. *Either a clean white cloth or a clean sack of orange fruits is used as a filter.*
iii. Cooking honey cakes (combed honey) to allow it to melt and then filter the liquid honey through a sieve to remove wax and solid material.
iv. Putting the honey cakes (combed honey) in a bucket or container and leaving it for a while in the sun to allow it to melt and then filter the liquid honey through a sieve to remove wax and solid material.
v. Putting the honey cakes (combed honey) in a smaller bucket or container and put the container inside the bigger container or pot of boiling or hot water to melt the honey cakes (combed honey) and then filter the liquid honey through a sieve to remove solid material.

The extent to which the solid or foreign material is effectively removed and the cleanliness of honey extracted or processed using these methods depends on the cleanliness of the extracting equipment or material used as well as the acquired skill of the beekeeper.

Figure 23: Processing method used

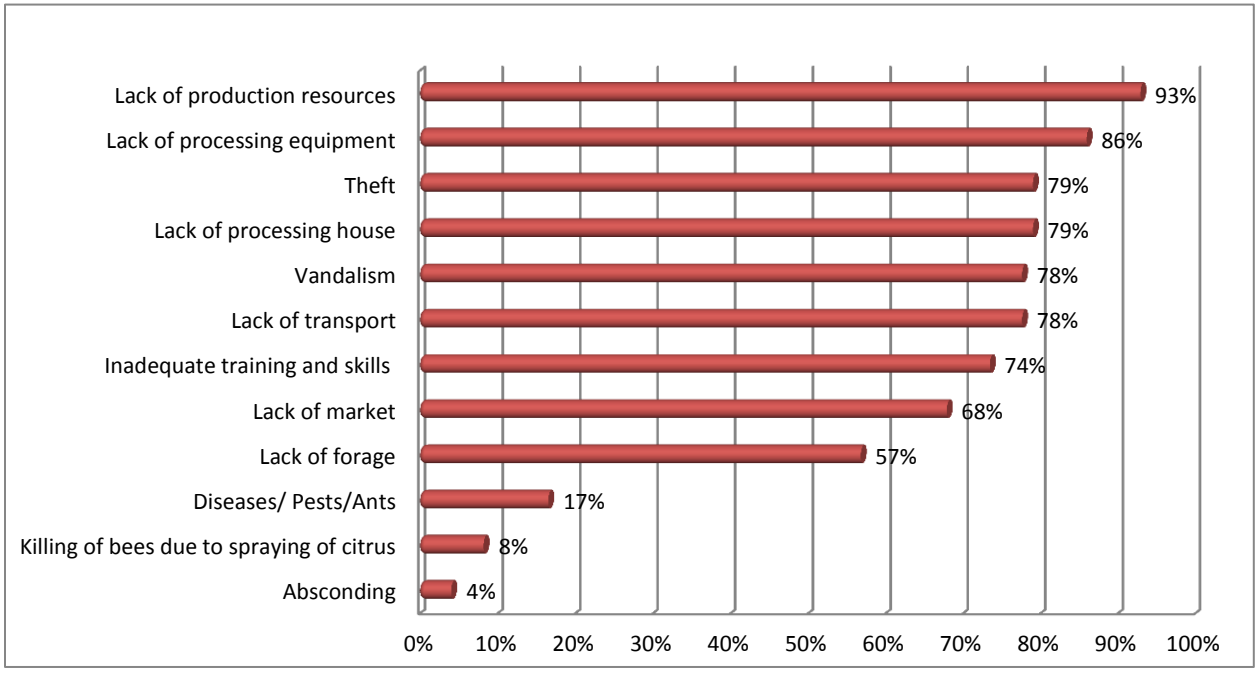


3.5.2. Challenges faced by beekeepers

Figure 24 reflects the challenges faced by beekeepers that participated in the survey. These challenges were ranked in terms of major, medium and minor.

Major challenges: The number one biggest challenge faced by the beekeepers was identified as lack of production resources sources such as beehives, protective clothing, smokers, etc. According to the analysis, smallholder developing beekeepers have the average number of 13 hives per individual, while the majority of hobbyists beekeepers have approximately 200 hives per beekeeper. The majority of smallholder beekeepers only depend on old hives and protective clothing which were initially donated by the project sponsors such as Limpopo Department of Agriculture, Agricultural Research Council and Bee Foundation. They do not replace the worn out equipment with new ones and are looking for further support from government or government agencies or from any sponsor.

Figure 24: Challenges faced by beekeepers



Lack of processing equipment is the second major challenge identified. Lack of processing house and lack of transport were among the major challenges faced by beekeepers. Theft and vandalism of beehives by people who steal honey and the honey badger were also identified as one of the major challenges affecting beekeepers. Inadequate training and skills is also another major challenge which hampers the development of most rural beekeepers.

These challenges prove that most rural beekeepers in the Limpopo province are under-resourced and lack adequate production and processing equipment to develop. Due to lack of resources such as beehives and processing equipment, most smallholder beekeepers resort to self-made hives and

traditional processing methods. These challenges significantly affect the quantities and the quality of honey produced by most smallholder beekeepers in the province.

Medium challenges: Lack of market and lack of forage are ranked as medium challenges faced by the beekeepers in the Limpopo province. Most beekeepers sell their honey within their local communities and in the informal markets and do not have access to formal markets. They are also limited by low production and lack of transport to explore other market channels. Lack of forage, although is ranked as a medium challenge, is in fact the big challenge to other beekeepers located in other regions, due to unfavourable geographic location and climatic conditions under which they operate. Most parts of the Vhembe district and Tzaneen appear to have high potential for beekeeping than other regions where honey production is highly seasonal and might require migratory beekeeping.

Minor challenges: The challenge of bee diseases or pest or ants was identified as a minor challenge. The other problem is the spraying of citrus orchards which has a detrimental effect on bees. It is for this reason that citrus farms are still not potential apiary sites and forage and nectar source for bees despite their dependence on bees for pollination.

The killing of bees due to citrus spraying hampers a mutual relationship between beekeepers and citrus farmers who can both benefit from pollination services and honey production. Absconding was identified as a minor challenge. Absconding of bees normally happens due to lack of food and water, as well as prevalence of pests and ants which harass bees.

3.5.3. Training and resource needs assessment

Despite the initial beekeeping training being offered to beneficiaries at the inception of the project, most smallholder beekeepers still display limited beekeeping skills and knowledge ranging from hive and apiary management, honey harvesting and processing. Figure 25 shows that 56% of the respondents indicated that they did not feel they had all the skills and knowledge required to run the successful beekeeping enterprise, while 44% were confident. Inadequate training and skills emanate from poor training methods used such as classroom type training with little practical training, absent of skills audit before training and lack of post-training mentorship and coaching programme.

Figure 25: Level of confidence on acquired skills and knowledge

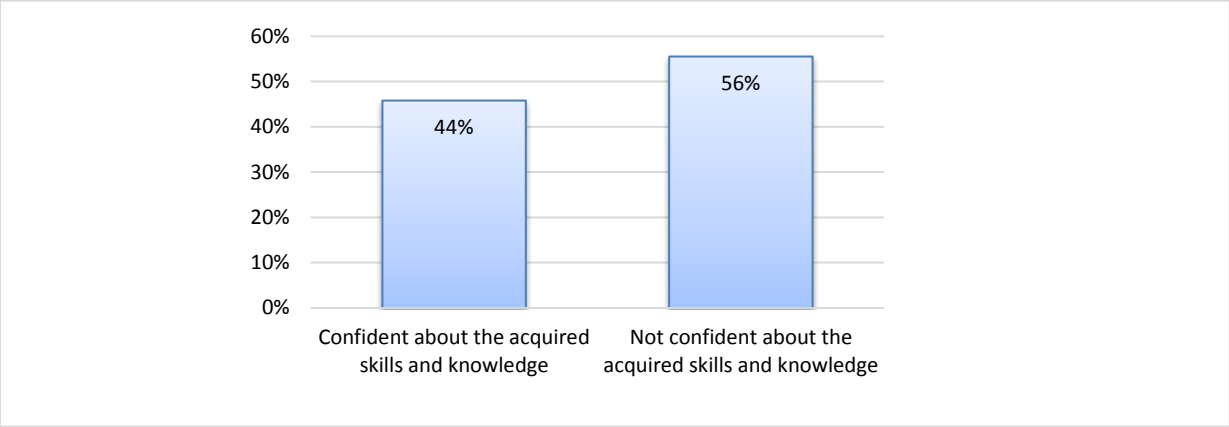
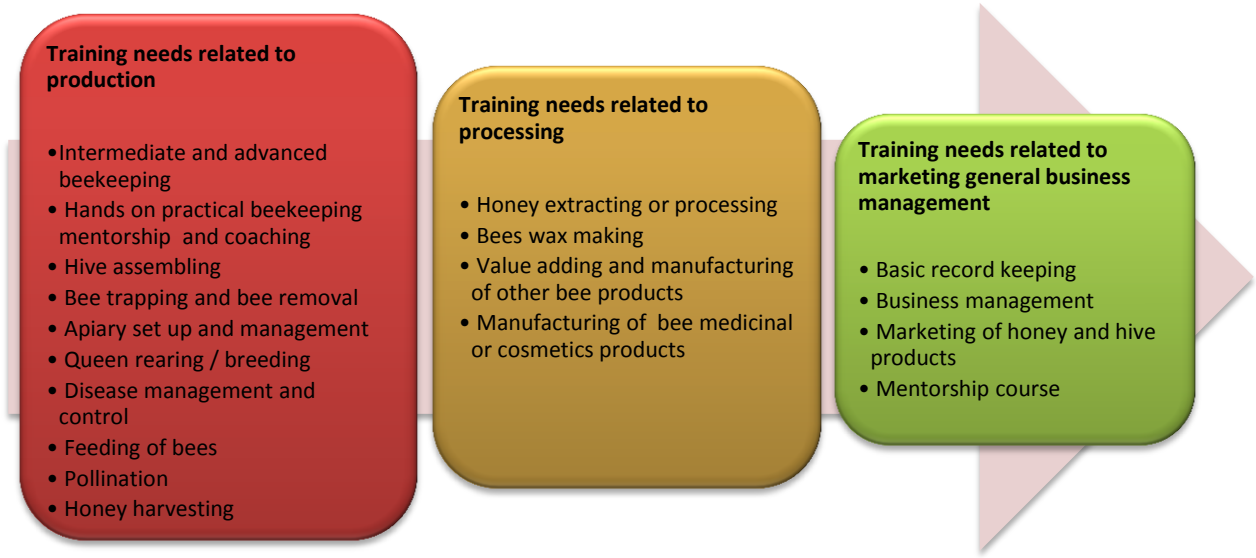


Figure 26 depicts training needs along the honey production value chain as identified by the respondents. These skills gap varies from project to project.

Figure 26: Training and capacity building needs



3.6. CONCLUSION

The apiculture industry contributes positively to the agribusiness industry and the economy of South Africa through its direct and indirect impact. The direct impact results from the employment and revenues generated along the honey value chain. The other direct impact results from the contribution of beekeeping to other sectors such as fruit and crop industries which benefits from bee pollination. Hive products also contribute to other sectors such as pharmaceutical industries. Partnerships with other relevant stakeholders and industry players are crucial in addressing the bottlenecks along the honey value chain.

The report presented the analysed data from the smallholder beekeeping survey conducted in the Limpopo province. The analysis showed that the majority of smallholder beekeepers based in the province are historically disadvantaged individuals and most of them are situated in the Vhembe district. Most of the smallholder beekeeping projects in the province were supported by the Agricultural Research Council in partnership with the Limpopo Department of Agriculture. The initial support included provision of training, beehives and protective clothing.

Like most agricultural development support programmes, most rural beekeepers are only assisted with primary production resources and assistance beyond primary production is overlooked. Despite the initial support provided by these institutions, most smallholder beekeepers still face a number of challenges; they are very much under-resourced with adequate production and processing equipment and still need further training and capacity building for them to run sustainable beekeeping enterprises.

It was also evident that due to limited beekeeping skills and knowledge most rural beekeepers, particularly blacks were not exposed to adequate hands-on practical training and mentorship to ensure sustainability. The use of experienced and commercial beekeepers and mentors could assist in closing the skills gap. Despite these challenges most smallholder beekeepers aspire to expand and operate at the commercial level. A list of intervention measures were identified which are necessary to develop beekeepers and grow the apiculture industry in the Limpopo Province.

3.7. RECOMMENDATIONS

Based on the results of the survey, it is obvious that the smallholder beekeepers and the apiculture industry in the Limpopo province need to be supported. The development of rural beekeepers and support intervention should focus on areas with favourable climatic conditions and potential for beekeeping. Most if not all the respondents interviewed want to develop and expand their beekeeping enterprises, and over 95% of the smallholder beekeepers aspire to become commercial beekeepers and grow beyond their current level. This is a vision which they wish to achieve over the next five years.

In order for rural beekeepers in the Limpopo Province to develop and operate commercial beekeeping enterprises, a number of interventions need to be implemented. Firstly, the challenges identified need to be addressed and rural beekeepers need to be supported and strengthened at all levels of the honey value chain; secondly, the existing potential for honey production need to be exploited to develop and grow the apiculture industry in the province; thirdly, smallholder beekeepers need to be supported and strengthened at all levels of the honey value chain. The following intervention measures have been identified and are recommended in order to grow and develop the apiculture industry and smallholder beekeepers in the province.

i. Smallholder beekeepers need to be supported with production resources such as beehives, protective clothing, smokers etc. Lack of these resources limit the production capacity for most smallholder beekeepers;
ii. Apiaries for smallholder beekeepers need to be properly fenced to prevent theft and vandalism which limit their production capacity.

iii. Smallholder beekeepers need to be assisted with proper processing equipment as well as proper honey processing premises;
iv. Beekeeping requires transport to be used to move hives to areas with good forage and nectar source, during harvesting and to send their produce to lucrative markets;
v. Smallholder beekeepers need to be equipped with practical hands on (on-site) training. The once-off training programme offered by the service providers have proven not to be effective in transferring required skills and knowledge to uneducated rural people since they are provided for a specific period. The introduction of adult basic education and training (ABET) to rural beekeepers is very crucial since most rural beekeepers are not educated and cannot read and write, hence do not keep records.
vi. Mentorship and capacity building is crucial to assist smallholder beekeepers to operate sustainable beekeeping enterprises. Government needs to partner with experienced and commercial beekeepers to mentor smallholder beekeepers in order to close the skills gap.
vii. The co-operative structures need to be strengthened and capacitated for economies of scale and collective bargaining power.
viii. Smallholder beekeepers need to be supported with market access facilitation to address the marketing constraints.
ix. Transparent value chain partnerships and collaborations are needed to address the bottlenecks along the honey supply and value chain.
x. Apart from technical capacity building, smallholder beekeepers need to be equipped and assisted with other business management skills and support services to run sustainable beekeeping enterprises. Strategic partnerships could play an important role in this regard.
xi. A provincial bee forage and nectar assessment study is required to determine the carrying capacity and number of hives to be allocated per region.
xii. A comprehensive apiculture development strategy is required to guide the development of the apiculture industry in the province.

The next chapter outlines the apiculture development strategy for the Limpopo province. The proposed strategy provides a road map for addressing the challenges identified earlier. The identified strategies also include project activities to be implemented over time and intervention measures to develop the apiculture industry in the province.

CHAPTER 4

APICULTURE DEVELOPMENT STRATEGY FOR LIMPOPO

4.1. INTRODUCTION

The apiculture development strategy that is outlined in this chapter emerged from three processes. Firstly, the situational analysis was used to develop a general understanding of the issues, constraints and opportunities facing the apiculture industry in the Limpopo province and in South Africa in general. Secondly, the survey was undertaken to obtain an in-depth understanding of the issues, constraints and opportunities faced by the beekeepers in the Limpopo province. Thirdly, inputs were also obtained from various consultations with beekeepers, industry experts and stakeholders within and outside the province. These inputs were obtained through direct consultations, interviews, meetings and project site visits.

4.2. FACTORS CRITICAL TO REALISING THE APICULTURE POTENTIAL IN LIMPOPO

Based on the studies and survey conducted on the current status of beekeeping in Limpopo, the potential for apiculture development in the province exists mainly because of the following key factors:

4.2.1. Diversity and seasonal availability of bee forages

The plantation types found in the five districts of the Limpopo Province provide a variety of bee forage and nectar source. Beekeeping is possible provided adequate water and forage are available all year round and attention is paid to hive management. However, due to the diverse climatic conditions and natural endowment which vary from one region to another, other districts have high potential for beekeeping than others. The major honey flow season is from April, June and December. The diverse climatic conditions also allow honey production to take place almost all year round across the province. The province is also well known for fruits and horticulture production. Thus, integration of apiculture development in the agriculture production system has a huge advantage for pollination.

4.2.2. Market access

Honey produced by various rural beekeepers and within smallholder planted forests is sold mainly within the communities, directly to retailers and road side market stalls in surrounding towns and to other large commercial producers or processors. The indications are that the honey to be produced in Limpopo will be readily marketed. Market outlets for honey are available locally, but there is a need to create market access support measures for beekeepers. There is a need to better organize marketing and for further development of the markets to give incentives for increased production as the beekeepers would be assured of markets. Local and regional honey buying, processing, packaging, marketing and distribution facilities and centres should be established in the province. Establishment of the apiculture commodity cluster could play a significant role in this regard.

4.2.3. Readiness of beekeepers to take up commercial beekeeping

The existing producers are very interested and ready to embark on commercial beekeeping. They are of the view that if assisted with the necessary inputs, such as adequate production and processing equipment, advanced practical training, mentorship and coaching they could take up beekeeping as a full time business. During the study it was learned that there are other aspirant beekeepers, individuals who were formally trained in beekeeping but never practised beekeeping due to a lack of resources. Other community members who were never trained are also keen to explore beekeeping as an income generating activity.

4.2.4. Institutional support for beekeeping

The importance of beekeeping in terms of social and economic benefits such as poverty alleviation, employment creation and incorporation in conservation programmes are well recognised and supported in various local economic development objectives and strategies. In the Vhembe district and the rest of Limpopo, beekeeping has been identified as one of the agricultural sub-sectors with potential for local economic development investment opportunity. Further evidence is the number of beekeeping projects funded by the provincial Department of Agriculture and other institutions such as the Agricultural Research Council and Bee Foundation.

4.3. POTENTIAL CONSTRAINTS TO APICULTURE DEVELOPMENT IN LIMPOPO

Several factors have been identified as potential constraints to apiculture development in Limpopo. These include:

4.3.1. Limited knowledge about the potential of the area

The main challenge to the beekeeping development in the Limpopo Province is that the relevant government offices have limited knowledge about the natural potential of beekeeping in their respective districts. There is little information and knowledge about the potential of the forage, the floral and honey flow patterns that would guide the siting and management of apiaries.

Although the existence and locations of most beekeepers are known, in other districts there was limited information about when, how and how much they produce, the frequency of the harvest, their challenges, what they do with their produce, market linkages and marketing systems, prices etc. The survey undertaken, however, managed to answer most of these questions.

4.3.2. Lack of knowledge and skills on beekeeping

During the survey, the research team encountered some apiaries which are managed badly by the beekeepers**.** Some of the problems observed were hives not placed properly, hives remaining unoccupied for long periods and low hive yields. Some of the problems arose from limited knowledge and skills due to inadequate training. Management of beehives is one of the areas that need attention

and improvement. Smallholder beekeepers in Limpopo should be aware that migratory beekeeping and supplementary feeding is needed for bees, especially during the dry season or dearth of forage.

4.3.3. Marketing constraints

Low productivity, poorly processed honey and lack market information are the major economic impediments for the development of market-oriented rural beekeeping in Limpopo. In most cases rural beekeepers are price takers and lack full understanding of the market. However, at the same time due to the consumption of honey which exceeds supply there are easily accessible markets for honey and its by-products.

4.3.4. Absence of an organization for collective action

There is generally a lack of organisational or local structure/s that represent the beekeepers and which would be the forum for reaching the beekeepers to mobilise their participation, disseminate information, and be the voice for their concerns and collective action for market development in Limpopo.

4.3.5. Lack of established and coordinated support systems for beekeeping

There are very few trained and dedicated beekeeping extension workers who could render important advisory services to the beekeepers. The beekeepers have no relationships or networks with other beekeepers operating in other regions, and marketing institutions which may help them, promote their production systems and markets their products.

4.4. LESSONS FROM OTHER BEEKEEPING PROJECTS

There are several lessons from other beekeeping projects in South Africa and elsewhere in Africa and other developing countries outside of the continent that can guide the development of the apiculture industry in the Limpopo province.

4.4.1. Facilitator organization for project implementation is vital to ensure success.

There is a need for the project facilitator with practical experience in implementing market-driven apiculture development for the smallholder beekeepers. Public sector organizations alone may not be ideal if they have no commercial or business experience, and project implementation is one of the many activities that they have to undertake. The other limitation for the public sector is that the relevant officials may not have the time to be fully and directly involved in the day-to-day operation of the beekeeping enterprises.

The involvement of the project facilitator has proven to be a success in other African countries:

- Eswatini Swazi Kitchen Honey in Swaziland is a project that was introduced by Manzini Youth Care, a faith-based non-profit organization. The project reinvigorated the honey industry's ability to create sustainable jobs. A range of other products such as wax, creamed honey, pure honey and cinnamon

honey are being produced. The number of beekeepers supplying the factory increased from 200 in 2009 to 485 in 2012. The quantity of combed honey bought by the factory increased from 8 tons per annum in 2008 to 14 tons in 2009 and 28 tons in 2011.

- Swaziland Honey Council also has a mentorship programme whereby lead beekeepers provide practical mentorship training to other smallholder beekeepers.
- Zambia has emerged as Africa's largest exporter of honey and bee products into the European Union and the United States of America with supply to these markets projected at1 000 tonnes by the close of 2010. Over 50 000 people derive sustainable livelihoods from honey and bee products in the country.
- The Zimbabwe Farmers' Development Trust organized and stimulated smallholder beekeepers to increase honey production that entered the mainstream honey industry.
- The Honey Care Company in Kenya was instrumental in organizing smallholder beekeepers to supply high income consumers markets, thereby obtaining better prices that made beekeeping viable and sustainable, which in turn stimulated increased production.

4.4.2. Organized marketing systems must be in place to motivate beekeepers.

Any beekeeping intervention should facilitate marketing of honey and bee products. With improvements in production, processing methods, packaging and product hygiene, larger profits should be possible to guarantee. In order to help beekeeping entrepreneurs to make more economic gain from beekeeping, reliable markets for honey, beeswax and other hive products need to be established and facilitated. With assured organized honey markets offering guaranteed prices, beekeepers will be motivated to increase production to supply such markets.

4.4.3. Business model for commercialized honey production

It is now recognized that group or community-based beekeeping projects may not be ideal business models for commercial or market-oriented beekeeping and honey production enterprises. This is because of the so-called "moral hazards" in which some members of the group may not apply themselves for efficient production, or group dynamics may interfere and constrain the commercial focus. Individual beekeepers are better motivated by profit gain that accrues exclusively to them than groups where the profits are normally shared equally even with those that do not apply themselves.

Related to the above, it has been shown that beekeeping projects initiated by development agents generally fail because of lack of ownership and commitment by the intended beneficiaries. Similarly, beekeeping projects based on grants with little or no contribution to the costs by the beneficiaries tend to undermine the profit incentives that motivate market-driven commercial beekeeping.

A provincial producer-owned entity in partnership with honest and experienced strategic business partner/s could be established to assume the responsibility of buying honey from beekeepers for processing, packaging, branding and marketing. This could create the economies of scale which would enable the entity to secured supply contracts with established retailers across the Limpopo province, South Africa and beyond.

4.4.4. Effective producers' organization for collective action

An effective organizational structure to reach beekeepers is crucial if the relevant information and material are to reach out to the smallholder beekeepers in the most effective way possible. Issues of quality honey and markets can easily be handled if beekeepers unite into cohesive commodity groups. The beekeepers should be organized into collective action groups such as co-operatives (primary, secondary and tertiary) and associations to empower them to effectively participate in the honey value chain. The producer groups would become vehicles to advocate for support targeted at the smallholder beekeepers' business such as access to markets, reduced transaction costs to the individual beekeepers, to finance for inputs, information on markets and better prices, beekeeping and processing technologies as well as a forum for sharing knowledge and expertise derived from practical experience. An umbrella body such as "Limpopo Beekeepers Association" needs to be formed to coordinate learning and industry knowledge, meetings, seminars, workshops, and informal home-based meetings where members share information and experience. This association and their members should become affiliates of the SABIO at the national level.

4.4.5. Hands-on training and mentorship by experienced beekeepers

To be proficient in beekeeping, the smallholder beekeepers need to learn and acquire bee and hive management skills, knowledge of bee behaviour (e.g. swarming, absconding, etc.) as well as relationship between honey flows and forage nectar production patterns. These are best acquired through hands-on training and practical exposure to the beekeeping skills covering several honey flow seasons. Short-term beekeeping training has proven not to be adequate and effective enough. The skills are best acquired through training followed by a mentorship and coaching programme with long-term practical experience in all beekeeping aspects. To be effective, the mentors should have the right attitude and understanding of the culture of the mentees and be motivated by the desire to impart knowledge.

4.4.6. Study group or circle learning approach

Throughout the world, beekeepers learn from each other through sharing experience and comparing practices which result in adopting or adapting those experiences and practices that are considered superior in improving or maintaining hive productivity. This is the essence of the study group or circle learning approach. This is in effect what members of the established commercial beekeeping associations do through their association activities as outlined above. The study circle approach is more effective if there is a proper leaning programme in place as well as appropriate learning materials.

4.4.7. Business plan for business growth and personal development

Commercial beekeeping should be guided by markets with respect to honey quantity and quality demanded and prices obtainable in the target markets. The beekeeper must understand the market, develop and implement appropriate or relevant production and marketing plans. This suggests that business plans must be prepared for smallholder beekeepers using participatory business planning approaches.

4.4.8. Timeframe for supporting beekeeping projects

Most beekeeping experts highlight that new beekeeping enterprises generally will start to yield positive returns after 18 – 36 months of establishment. This implies that funding beekeeping projects should be sustained for at least 18 - 36 month period. Furthermore, as honey production is influenced by climatic conditions which have a bearing on forage and honey flow, beekeeping projects are not necessarily risk free. Accordingly, beekeeping projects are not, as generally perceived, an easy way for income generation.

4.4.9. Institutional arrangements for mobilizing project support and effective coordination

The project should be based upon a participatory approach to improve implementation of activities. Active participation will include different stakeholders in all aspects of project design, implementation, monitoring and evaluation. Active participation ensures that stakeholders enjoy ownership of the project and will therefore increase its success and realisation of objectives set. These stakeholders include beekeepers, community based organizations and non–governmental organizations, public entities and government technical administration at both the central, district and community level.

Lessons drawn from beekeeping projects undertaken in South Africa, other developing countries in Africa and elsewhere highlighted the need for:

i. Organized and guaranteed markets to stimulated increased production;
ii. Market-driven business approach for organizing beekeeping enterprises including business plans;
iii. Effective collective action based on ownership of the development process and participation in honey value chain by the beekeepers;
iv. Hands-on training and mentorship by experienced beekeepers as well as a business coaching programme;
v. Long-term investment support including easy access to finance; and
vi. A dedicated project facilitator, with experience in implementing market-driven commercialization programmes, to drive the implementation process.

The key issue of low productivity of hives is due to the fact that most smallholder beekeepers do not have access to essential hive management information. There is no unifying body through which to provide essential technical and marketing services to the smallholder beekeepers spread throughout the province. There is no organized framework for addressing these challenges and developing a model for sustained growth. A sustained programme of direct technical assistance in beehive management and marketing would be required in order for the apiculture sector to grow.

4.5. THE CONTEXT OF THE RURAL APICULTURE DEVELOPMENT STRATEGY FOR LIMPOPO

In view of the above, it is proposed that a 3- 5 year apiculture development programme be adopted and implemented to address the above outlined challenges and issues. The proposed programme envisages using a market-driven model that incorporates the success factors and addresses the weaknesses of past efforts. The programme is outlined in the next section.

A short, medium and long-term comprehensive apiculture development programme is recommended for smallholder beekeepers in the Limpopo Province. The aim of the programme is to implement a coordinated honey production, processing, branding, marketing and distribution strategy to empower and create sustainable jobs for most unemployed rural people in the province. The outcome of the strategy will be improved quantities and quality of a provincially branded honey produced and marketed by smallholder beekeepers in the province.

This goal will be attained by implementing a set of integrated programmes guided by targeted markets, which include, *inter alia*, training of beekeepers in matters related to honey production and processing, introducing modern production and processing technologies and facilitating beekeepers to be organized into associations and co-operatives so that they can collectively achieve adequate volumes of marketable honey and bee products, develop marketing strength and have easy access to inputs required for the production of honey.

4.5.1. Vision, goal and objectives

Vision

The vision is that within five years all beekeepers in the Limpopo Province will operate market-driven commercial beekeeping enterprises supplying a significant market share of honey and honey by-products produced and distributed in the country.

Goal

The overall goal is to increase incomes from beekeeping and honey production guided by markets, at the individual and co-operative levels, through honey market development, training and mentorship, coordinated institutional support, establishing and strengthening local producer groups and to contribute to national efforts in the promotion of beekeeping, processing and marketing of honey and the development of the apiculture industry in South Africa.

The specific objectives

The initiation and implementation of the programme will be intensively phased over 36 months. The objectives for each phase are detailed below:

Short-term objectives (Phase 1: 1 – 12 months)

a. Compile a detailed database of active emerging beekeepers, their location, production levels and marketing arrangements;
b. Undertake a provincial bee forage and nectar assessment study to determine the carrying capacity and number of hives to be allocated per region in terms of bee forage and nectar source and flowering patterns;
c. Facilitate provision of an advanced beekeeping training to existing beekeepers in all aspects of beekeeping so that they are proficient and better equipped to operate and manage their apiaries;

d. Facilitate provision of additional beekeeping production inputs to existing beekeepers and leverage additional financial resources from other funding institutions to expand honey production capacity of existing beekeepers;
e. Facilitate formation of beekeeping co-operatives and business registrations for individual beekeepers;
f. Mentor and coach the smallholder beekeepers on intermediate and advanced beekeeping techniques for good apiary management as well as on business management skills;
g. Establish marketing arrangements for honey and beehive products that are currently produced as well as to be produced under the proposed project;
h. Establish central honey buying/collection points in each district;
i. Facilitate and secure markets for bottled and bulk honey for emerging beekeepers;
j. Develop business plan for establishing larger-scale honey processing and bottling plant in a centralised location to be identified through a participatory approach; and
k. Facilitate establishment of provincial project monitoring and evaluation and stakeholder forum representing all key stakeholders of the project.

Medium-term objectives (Phase 2: 13 – 24 months)

a. Facilitate the formation of local and provincial Beekeepers Association, and Secondary Beekeepers Co-operatives in regions where smallholder beekeepers operate;
b. Provide resources required to be used in the provision of support services and project monitoring and supervision in the honey producing regions;
c. Establish monitoring system to survey the existence and impact of bee pests and diseases on bee population and hive productivity, and provide control measures;
d. Train and facilitate the Beekeepers Associations/ Secondary Co-operatives to assume responsibilities in the operations of honey and bee products processing and marketing centres;
e. Facilitate applications and secure exhibition spaces in local and national trade fairs to market honey produced by Limpopo beekeepers; and
f. Secure local and national markets for honey produced by smallholder beekeepers.

Long-term objectives (Phase 3: 25 – 36 months)

a. Establishment of a producer-owned entity/company, to manage the input supply (beehives and beeswax), production, processing and marketing of honey and honey by-products;
b. Transfer management and skills to the producer-owned honey collection and marketing centres; and
c. Facilitate the expansion of the project to support new aspirant beekeepers.

4.5.2. Strategies, activities and expected outcomes

The objectives will be achieved through nine interrelated strategies and activities as outlined below.

Strategy 1: Establishing an institutional framework for project implementation

- Facilitate and obtain buy-in of the project and implementation plan from representatives of the beneficiaries and all stakeholders.
- Allocate provincial Project Coordinators.
- A Project Support Team made up of representatives of organizations that provide support services to beekeepers and farmers will be constituted to offer coordinated focused services to the rural beekeepers.
- A Project Monitoring and Evaluation systems and Project Steering Committees (PSC) will be constituted.

Strategy 2: Understanding the current beekeeping activities and obtaining buy-in

- A detailed database of active beekeepers, their location, production levels and market arrangements.
    - The database will be used to know about existing beekeeping projects, utilization of forage and performance levels. These will become baseline indicators for the project.
    - The database will be used to identify currently active beekeepers, who will be adopted as project participants/ beneficiaries as well as for the mobilization of the beekeepers in the formation of beekeepers associations and co-operatives in each region.
    - The database of active beekeepers will be used to identify potential locations for establishing honey buying or collection points and for locating the honey processing, packaging and marketing centres to motivate those already in beekeeping and honey production to produce more and participate in the project.
- A provincial bee forage and nectar assessment study to determine the carrying capacity and number of hives to be allocated per region in terms of bee forage and nectar source and flowering patterns.
- Business plans will be developed for the establishment of the centralised honey processing, packaging and marketing facilities.

Strategy 3: Establishing and linking beekeepers to honey markets

- Beekeepers will be linked with established markets in each province.
- Honey buying points will be established along routes traversing identified honey producing areas in each region.
- Relevant vehicles will be acquired to be used for collecting the honey from buying points to the processing centres.
- Honey processing centres will be established to process and package honey, beeswax and other by-products to standards that are competitive in existing and new markets, including niche market of value added bee products. The processing centres will be constructed and equipped with adequate

infrastructure (water, electricity, transport, etc.) and located in regions which are assessed to have high honey production levels compared to other regions.

In the initial stages (first 18 months) the processing facility will be under control of the proposed facilitator guided by the funding department or institution. The ownership and management will be transferred to beekeepers when fully developed. The beekeepers are expected to be more organized before such transfers are made.

Strategy 4: Establishing new market-oriented beekeeping projects and expanding existing ones in each district

- The project will assist both groups and individual beekeepers (including unemployed women and youth) to set-up proper apiaries in sites suitable for beekeeping. The choice of apiary sites will be guided by forage availability. The proper apiaries will be fully set-up in each region in 6-month phases over 18 - 36 months.

  The target beneficiaries are envisaged to include individuals, co-operatives and community based groups operating beekeeping projects. The choice of beneficiaries will be based on their beekeeping experience and training as obtained from the database and level of commitment as evidenced by their time and resource investment in their current beekeeping activities. It is envisaged that those to be selected to participate in the project would also include women and youth currently involved in beekeeping. These selected target beneficiaries will be supported to intensify honey production.

  The number of hives for each beekeeper will depend on forage capacity, to be assessed in each area. Each beekeeper will be required to have the maximum number of hives supported by the forage over an 18 - 24 month period. This will allow beekeepers enough time to gain practical knowledge and skills for fully commercialised production. Those currently active and with proven skills and beekeeping knowledge may be allocated the maximum number of hives within a shorter period.

- A scheme will be established for the currently practising beekeepers to increase the number of hives and practise commercial beekeeping.
- A bee-trapping service will be established to trap bees for setting up and expanding existing apiaries.
- Business plans will be formulated for beekeepers in a position to gradually practice beekeeping on the commercially oriented scale, i.e. 50 hives per beekeeper and more. These business plans will be presented to funding institutions that have programmes set up to economically empower citizens to generate incomes and create employment, i.e. public sector institutions (e.g. DTI, Department of Small Businesses, Department of Agriculture, Department of Rural Development, municipalities, etc.), development funding institutions, other private sector initiatives and public funded organizations, such as the National Development Agency (NDA), Small Enterprise Development Agency (SEDA), and Limpopo Economic Development Agency (LEDA), etc.

Strategy 5: Enhancing beekeeping knowledge and skill development

- Beekeeping training and business management skills will be implemented to enhance market-driven honey production systems. The training will include standardized training on beekeeping enterprise management, value addition, marketing, environmental conservation as well as provision of forage to the bees.
- Mentors will be selected from a pool of experienced beekeepers in each district.
- Business coaching programmes will be implemented to ensure gradual progression from emerging beekeeping into commercially oriented beekeeping culture.
- Training and mentorship will be provided to all the smallholder rural beekeeping projects to improve their management of commercialized honey apiaries to increase hive productivity and honey production so as to meet the targeted income and market demand. The increased yields will provide the processing centres with adequate supply of honey and therefore sustaining their business operations due to increased throughput.
- Identified and selected local beekeepers, with strong and entrepreneurial interest in beekeeping and already devote time to it, will be used as mentors, host demonstration leanings circles and pilot trials. Apiary demonstrations will be conducted for on-site training whereby model farmers will be sharing with other farmers on best beekeeping management practices.
- The study circle approach will be used for rendering training, demonstrations and information sharing/exchange among existing and new honey producers to improve their beekeeping knowledge and to standardise approaches on beehive management practices.
- Exchange visits will be used to facilitate information sharing and knowledge exchange between regions and communities.
- Central processing facilities will also be used as information sharing centres for information sharing and exchange among existing and prospective beekeepers and for accessing production and market information as well as inputs.

Strategy 6: Formation and capacity building of beekeepers associations for collective action

- The active beekeepers in each region will be facilitated, using the participatory approach to form local, district and provincial associations.
    - The associations are envisaged to play an effective role in the promotion of beekeeping, processing and marketing of honey and the development of the honey industry in a way that benefits the honey producers in their local areas.
    - The association will be a vehicle or platform for the participation and contribution of the beekeepers in the implementation of the project.
    - The local associations will be the centre for the provincial beekeepers' association that has been recommended to be formed.
- The leadership of the associations will undergo training in leadership, governance and project management to enhance their skills for leadership and capacity to effectively participate in the implementation of the project.

Strategy 7: Establishment and building institutional support for beekeeping development in each region

- Dedicated government officials need to be selected to undergo advanced training to acquire specialized skills on various aspects of beekeeping so that they are better able to offer up-to-date information and advice to the beekeepers.
- An efficient and effective extension service is required for each region to ensure that during the critical times of beekeeping seasons of swarm catching, apiary setting, hive inspection and honey harvesting, the extension officers are available to give the beekeepers assistance at any given time.

Strategy 8: Establishing up-to-date honey flow pattern, pest and diseases monitoring system

- Up-to-date information on forage and honey flow patterns, production levels, hive yields, swarming behaviour, pests and disease patterns will be collected using participatory research approaches whereby the beekeepers will be trained to capture some of the required data and information.
- Monitoring of pests and diseases and information on hive productivity are vital for the sustainability of the various beekeeping projects. For example, American Fowl Brood and the Varroa mites have been identified as the greatest threat to the bee population.

Strategy 9: Establishment of producer-owned companies/entities to manage input supply, production, processing and marketing of honey and hive products

- Develop business plans for establishing honey processing facilities in centralised locations;
- Agree on shareholding structures;
- Register the company;
- Constitute Board of Directors for the company;
- Hire management staff;
- Raise funding to operationalize the company;
- Put in place financial and management control systems, including systems for procuring honey and pay the suppliers;
- Identify customers for honey and secure market contracts to supply honey to them;
- Issue supply agreements to beekeepers in order to supply the purchase contracts;
- Organize procurement, processing and marketing of honey and honey by-products;
- Produce management accounts to the Board;
- Hold annual general meeting of Board to discuss and agree on dividend and bonus payments; and
- Disburse dividends to shareholders and bonus payments.

4.6. PROJECT IMPLEMENTATION

The project support should be for 3 years. This period will cover project initiation, implementation, exit and hand-over during 36 months of phased activities.

4.6.1. Phasing of project and beneficiaries participation

The beekeeping projects will be set-up and organized in each region in 6-month phases over 18 - 36 months as shown in Table 16 below.

Table 16: Phasing of project and beneficiaries participation

	Phase 1: 1st – 12th month	**Phase 2:** 13th – 24th month	**Phase 3:** 25th – 36th month
	Project inception and implementation	Full implementation	Full implementation, exit plan and project hand over
1. Total number of beneficiaries Individual beekeepers and group-based projects currently involved in beekeeping. ▪ To intensify, expand and commercialise beekeeping enterprises.	600	600	600
2. Total number of hives to be managed by beneficiaries. ▪ With 1% annual increase.	18 000	19 800	21 780
3. Estimated quantity of honey to be produced by beneficiaries.	270 tons	297 tons	327 tons
4. Percentage of annual increase in the number of hives and quantity of honey produced.	10%	10%	10%

4.7. PROJECT FACILITATION

The facilitation will involve:

- Designing and guiding the implementation process;
- Establishment and implementation of the beekeeping projects at individual and group levels;
- Development of honey markets to secure supply contracts;
- Facilitating the training, mentorship and coaching of the beekeepers;
- Facilitating the formation and organizational development of the beekeepers' associations and co-operatives; and
- Advising government and project sponsors on project implementation processes and requirements in relation to the development of the beekeeping industry in the province.

The facilitation will be over 36 months, covering the setting up of the project and implementation phase. The producer-owned companies will take over the full responsibilities of project management at the start of year 4. By then the project should be self-sustaining.

4.8. CONCLUSION

The draft rural apiculture development strategy for Limpopo provides a road map towards addressing the challenges which impact on the development and growth of the industry in the province. The next chapter presents overall conclusion and recommendations of the study.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

The study on rural apiculture development for Limpopo was undertaken to conduct research and develop an apiculture development strategy for the province. The study was able to outline situation analysis on issues related to the apiculture industry in the Limpopo province, South Africa and beyond. The literature was reviewed to gain insight into what has been done to date and the state of apiculture industry in the province and South Africa in general.

The Limpopo apiculture survey conducted during November and December 2014 revealed information on how beekeepers in the province operate, their production capacity, processing technologies and their challenges. The survey was conducted to collect, analyse and consolidate information and literature which were then used as building block towards the rural apiculture development strategy for the Limpopo province. The survey further confirmed the existence of challenges that were known to be affecting the development of smallholder beekeepers. Numerous intervention measures were recommended to develop the apiculture industry in the province. The identified challenges and existing opportunities were used as building blocks to develop an apiculture development strategy for the province.

The draft apiculture development strategy for Limpopo Province is comprised of nine comprehensive strategies and project activities that need to be implemented in phases over three years. The strategy aims to develop and empower beekeepers in Limpopo across all levels (from smallholder to commercial) and along the entire honey value chain. The draft strategic interventions and recommended project activities would assist beekeepers in Limpopo to become masters of their own destiny.

The draft strategy still requires broader stakeholder facilitation and consultation to obtain full buy-in, commitment and financial support for implementation from government, beekeepers, industry role players, potential sponsors and strategic partners.

REFERENCES

Agricultural Research Council and Dabchick Consulting (2008): *The Expansion of the Beekeeping for Poverty Relief Program into the Vhembe District of Limpopo Province*.

Department of Agriculture Forestry and Fisheries: *National Beekeeping Strategy Framework*.

Department of Economic Development (2008). *Honey Viability Assessment for KwaZulu Natal*.

Department of Water Affairs and Forestry: The Honey Trade: Forestry Sub-Sector Studies – Briefing 9 – January 2005.

Du Toit, A. (2007). Diagrammatic Schedule for the South African Honey Industry

FAO (2012). *Beekeeping for Smallholders: TECA Discussion Summary Report*: prepared by Michalczik L. on 6/9/2012.

Farming SA Magazine (November 2009, page 32). Success story of Mr Nkululeko Gomna.

Farmers Weekly Magazine (12 October 2012, page 58). Beekeeping: Swazi pots of gold.

Institute of Natural Resources (2003). *Sector Analysis: Honey Production in South Africa.*

International Trade Centre: COMTRADE Statistics. (2015). *Trade data of honey imported by South Africa from 2010 - 2014*. Website. http://www.trademap.org

Johannesmeier M. F. (Ed). 2001. *Plant Protection Institute: Beekeeping in South Africa*, 3rd ed. Agricultural Research Council.

KIT, Faida Mali and IIRR (2006). *Chain Empowerment: Supporting African Farmers to develop markets.*

Limpopo Department of Agriculture: *Beekeeping in Vhembe District*. Undated

Limpopo Provincial Government: *Limpopo Growth and Development Strategy (2004 – 2014)*

Limpopo Provincial Government: *Limpopo Provincial Employment Growth and Development Plan* (LEGDP 2009-2014 document 3.

Limpopo Provincial Government (2012): *Limpopo agro-processing strategy: 2012*.

National Agricultural Marketing Council(2008). *The South African Beekeeping Industry: A Section 7 Committee Investigation.*

National Development Plan: Vision for 2030 (2011). [Website]: http://www.ndpconline.co.za

New Growth Path (2010). The Framework. [Website]: http://www.gov.za

South African Apiculture Federation. (2014). [Website]: http://www.saafederation.co.za or www.saaf.org.za

South African Bee Industry Organisation. (2014). [Website]: http://www.sabio.org.za

South African National Biodiversity Institute (SANBI) 2012. *Pollinators of South African Crops*. [Website]

Vhembe District Municipality: Vhembe District Municipality: 2012/13 - 2016/17 *Integrated Development Plan.*[Website]: www.vhembe.gov.za

APPENDIX A: RESEARCH QUESTIONNAIRE

RURAL APICULTURE DEVELOPMENT FOR LIMPOPO

BEEKEEPERS QUESTIONNAIRE (INDIVIDUAL/ FOCUS GROUP)

Name of Interviewer: …….. Date: ……

INSTRUCTIONS TO THE INTERVIEWER

1. Please write clearly.
2. Indicate the correct or the most appropriate answer with an [X] where applicable.
3. Ensure that the whole questionnaire is fully completed before leaving each visiting point.
4. Please ensure that you explain the purpose of your visit before starting with the interview.
5. Please attach names of all beekeepers, co-op, group or company members at the at the end of the quetionnaire.

INTRODUCTION

Nkwele Agribusiness Planning and Investments has been appointed by Industrial Development Corporation (IDC) to do a study on beekeeping and develop a strategy to develop rural beekeepers in Limpopo province. As part of the project activities, we are conducting interviews with beekeepers, beekeepers associations, honey processers, beekeeping input suppliers, trainers, government officials, agricultural extension officers and other relevant institutions. We are visiting various beekeepers and beekeeping projects throughout the province to understand how they operate and the extent to which they are resourced and equipped. As a beekeeper/s, we would be happy if you can participate in this study by answering the questions that we will be asking you.

The questions will focus on:

- General information;
- Honey production, processing and marketing;
- Training; mentorship, and capacity building; and
- Challenges you face as beekeepers.

The questions we ask you will help us in developing a strategy to grow the beekeeping industry in Limpopo province and as a result we will appreciate if you can answer them to the best of your knowledge.

A. GENERAL INFORMATION

1. District: ..... Local Municipality: ..... Ward: .....

2. Name of Beekeeper/ Co-operative/ Project/ Company: .....

3. Legal entity: Indivudual: [___] Coope rative: [___] Company: [___] Trust: [___] CBO[18]: [___]

4. Number of people/ members belogning to the project/ business: .....

5. Contact person: ..... Position: ..... Contact no: .....

6. Gender classification

Male/s	Female/s

7. Age group *(if more than one indicate number of people correscponding to each age group)*

Under 18:	18-35:	36-45:	46-55:	56-65:	Over 65:

8. Highest level of education completed or reached *(if more than one indicate the number of people corresponding to their education level)*

Primary	High school	Matric	Diploma	University

Sources of income apart from beekeeping *(if more than one indicate the number of people corresponding to their sources of income)*

Source of income	Tick	How many
Salaries outside agriculture		
Agriculture		
Pension		
Child support grant		
Disability grant		
Family member		

[18] Community Based Organisation

B. BEEKEEPING

9. When did you start your beekeeping business/ project? .....

10. What motivated you to start your beekeeping project/ business?

.....

.....

11. How many beehives do you currently have? .....

12. How many hives do you wish to have in order for you to call yourself a successful beekeeper/s?

(tick one box)

< 50	50 to 100	100 to 500	500 to 1000	1000 to 5000	>5000

13. Who or which institution assisted you or funded you to start your beekeeping project/ business? (T*ick correct answer/s*)

Government	
NGO	
Government Agency *(e.g. ARC, etc.)*	
Private company	
Bank loan	
Self-funded	
Someone *(e.g. friend, relative, or co-worker)*	

14. Did you ask for this assistance? Yes [__] No[__]

if No please explain

.....

15. Do you employ other people to assist you in your beekeeping project/ business? Yes [__] No[___]

C. TRAINING AND MENTORSHIP

16. Did you receive any training on beekeeping? Yes [__] No[__]

a. If yes how long was the training? ……

17. Did you receive any mentorship on beekeeping? Yes [__] No[__]

If yes, for how long? .....

18. Who provides you with technical advice and information related to beekeeping?

Extension officer	Commercial beekeeper	Private company	NGO worker	No one

19. Do you feel you have all the skills and knowledge required to run a successful beekeeping business?

Yes [__] No[__]

20. What training or capacity building would you like to receive?

……

……..

……

……

D. HONEY PRODUCTION AND MARKETING

21. How muck honey did you produce in the previous season/ harvest?

    ……..

22. What was your average yield per super? ……

23. Where do you sell your honey?

    ……

24. At what price did you sell your honey in the previous season/ harvest?

    R…….per Kilogram (Kg) or R…….per bottle or R……. per cake

25. In which form do you sell your honey? Bulk [___] Bottled [___] Honey cake [___]

26. During which months of the year do you normally harvest honey?

    .....

27. How many times in a year do you harvest? ……

28. What other beekeeping products do you sell? ……

29. Do you keep records of your honey production and sales? Yes [____] No [___]

E. BEEKEEPING PRODUCTION AND PROCESSING EQUIPMENT

30. What mode of transport do you use for your beekeeping project/ business?

Own transport		Hired transport		Government transport	

31. What honey production and processing equipment do you have?

Name of Equipment	**How many**

32. Where do buy honey production inputs and processing equipment?

Within Limpopo province		Outside Limpopo province	

33. Do you know how to make beeswax Yes [____] No [___]

F. BEE FORAGE AND NECTAR SOURCE

34. Where do you put you beehives? ……

35. What is the most common source of nectar for your bees?

Eucalyptus trees [___]

Indigenous trees (state which type) [___]

Orchards (specify type) [___] .....

Other (specify) .....

36. Who owns the plantations where your bees collect nectar? ……

37. What is the arrangement between yourself and the plantation owner?

.....

38. Do you sometimes move your hives to where nectar source is plentiful? Yes [____] No [___]

39. Do you feed you bees? Yes [____] No [___]

40. Do you provide pollination services? Yes [____] No [___]

If yes do you charge for this service? Yes [____] No [___]

G. PROCESSING

41. What kind of processing equipment do you use?

Traditional method [___] please explain how……

Hand extractor [___]

Electric extractor [___]

H. NETWORKING AND LINKAGES

42. Do you belong to any beekeepers association? Yes [____] No [___]

If yes what is it a Local [__] District [__] Provincial [__] or National [__] association?

I. CHALLENGES

43. Please indicate if the following are the challenges you experience in beekeeping?

(Only tick challenges identified)

Challenges	**Tick**	Please tick if the challenge is		
		Small	Medium	Big
Theft				
Vandalism of beehives				
Lack of skills				
Inadequate training				
Lack of production resources *(e.g. hives, protective clothing etc.)*				
Lack of processing facility				
Lack of processing equipment				
Lack of transport				
Lack of market				
Lack of forage for bees				

44. What kind of assistance do you require for you to grow your beekeeping business?

……

……

45. Where would you like to see yourself as beekeeper/s in 5 years time? **(Vision)**

……

……

Thank the participants.

Notes for site visit:

1. Request them to show you where they put their beehives and process their honey.
2. Take pictures as they show you around.
3. Make notes of what you observed:

.....

.....

.....

.....

.....

.....

.....