

*Full Length Research Paper*

# Promoting micro, small and medium enterprises in beekeeping in Zambia's Central Province: Making a case for the adoption of business incubation strategy

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Received 13 May, 2017; Accepted 4 July, 2017

Beekeeping has been a thriving enterprise among farmers in selected parts of Zambia. However, despite its enormous potential for transforming rural communities and through income generation, the beekeeping sector has experienced stunted growth for many years (or has not experienced meaningful growth for many years). Therefore, this study investigates the nature of beekeeping in selected parts of Zambia's Central Province in order to identify the challenges being faced and the possibility of establishing a business incubation centre at Mulungushi University if the current supporting facilities are not optimal. The study reveals that there is a growing interest among the farmers to venture into beekeeping and the majority regard it as an alternative venture for income generation. Although, the production levels are not high as expected, there is great room for growth if the current setbacks are dealt with. The main challenges cited include inadequate financial support; lack of markets, charcoal burning, land conflicts, water challenges, knew knowledge and modern technology among others. The main recommendation of this study is for Mulungushi University to establish a business incubation centre to act as a conduit for support an exchange of knowledge with the beekeepers. The beekeepers also need sustained financial and material support from the government and cooperating partners. Lastly, there is need for the key stakeholders to converged and put their efforts together.

**Key words:** Capacity building, beekeeping, Central Province, Zambia, business incubation.

## INTRODUCTION

The beekeeping sector is made up of various players who include beekeepers, honey processing firms,

individual sellers, bulk buyers and individual buyers. The beekeepers can be categorized into two categories wild

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honey gatherers, and individual beekeepers (IUCN, 2015). Generally, the beekeeping industry in Zambia operates on a small-scale basis and thus most entities in this industry can be categorised as micro, small and medium enterprises (MSMEs). World over, MSMEs play a critical role in employment creation, poverty reduction and economic development. Beekeeping provides an array of opportunities for economic growth through alleviation of poverty, bringing in the much needed foreign currency in the country as well as creating a framework for forestry management (Nyatsande et al., 2014) and climate change adaptation. Beekeeping can also create vital linkages with other sectors of the economy, yet the reality on the ground is that little attention is being made to promote the viability of the sector. It can be noted that beekeeping in most parts of Zambia's Central province had remained at low level, in comparison to North-Western Province, with majority of farmers using traditional methods (Mickels-Kokwe, 2006). In general, beekeepers are lacking capacity to expand their activities. It is against this backdrop that this study sets out to investigate the factors inhibiting its growth and viability on one hand and on the other hand explore the utility of business incubation in promoting capacity building among the beekeeping MSMEs in Zambia with special focus on the selected areas in the Kabwe, Kapiri-Mposhi and Chisamba.

This study advances that matching beekeeping and business incubation will have invaluable benefits not only to the beekeeping MSMEs but also to other enterprises that use honey and its by-products for different purposes. It is envisaged that business incubation will increase the survival rate of MSMEs thereby creating employment opportunities and economic growth. Furthermore, the incubation will contribute to a sustainable environment by promoting an environmental friendly source of income among farmers and other rural dwellers. Hence, Fischer (1993) observes that a successful beekeeper accumulate wealth and establish networks through trading of honey. According to Nyatsande et al. (2014), the advantages are beekeeping is that it requires low investment, does not compete with other farming activities for resources and there are no sophisticated machinery or equipment needed.

In order to unpack the utility of business incubation as a capacity building tool for micro, small and medium enterprises, this paper explores the beekeeping activities in Kabwe, Kapiri-Mposhi and Chisamba with a view to identify the opportunities and challenges in the beekeeping sector. This entails largely examining how the beekeeping is done, the methods of marketing and the support being availed to the beekeepers. The paper also presents an analysis of the challenges facing those engaged in beekeeping activities. Understanding these overall issues about beekeeping in Kabwe, Kapiri-Mposhi and Chisamba created the foundation for making a case for the adoption of business incubation as a capacity

building for promoting MSMEs in the beekeeping and honey production industry. Among other things, the recommendation section examined how Mulungushi University can play a pivotal role in making the incubation strategy a success and the need for active stakeholder involvement in the bee sector such as the Zambian Government and Cooperating Partners.

## CONCEPTUAL FRAMEWORK

The concept of business incubation can mean different things to different people depending on the purpose it seeks to serve. According to the neurodegeneration with brain iron accumulation (NBIA, 2008), it is an economic development tool designed to accelerate growth and success of entrepreneurial company through an array of business support resources and services by nurturing the development of entrepreneurial companies, helping them survive and grow during start-up period, when they are most vulnerable. Following this definition, this study conceives of business incubation as a place where business entities are offered an organised resource rich environment and various supporting services dedicated to emerging enterprises in order to strengthen their development. In this regard, business incubators are buildings or structures that accommodate companies during their initial phases of development. Besides, it is a knowledge sharing nursery where entrepreneurs can share experiences. Accordingly, business incubators are established to help entrepreneurs to overcome business challenges associated with starting and sustaining a business enterprise. More specifically, the idea is "to help small companies to graduate or leave an incubator in a financially stable state and be able to operate on their own upon graduation" (NBIA, 2008: 16).

The support received by small companies from incubators includes both hard and soft services which ranges from physical or office spaces, equipment, shared services, business and legal and entrepreneurial advice as well as financial inputs. In fact the services that incubators can offer are many and cannot be exhausted. What is important is to structure the incubation in a flexible manner in order to be responsive to tenant companies' needs. The services offered by incubators can be regarded as remedies for set setbacks that SMEs encounter during their growth process. It is because of the challenges that the SMEs face during their formative stages that developed and some developing countries have introduced the concept of business incubation.

The concept of business incubation is being implemented in countries such as United States of America (USA), Japan, China, Nigeria, South Africa and Uganda (Bubou and Okrigwe, 2011). These countries adopted business incubation to help SMEs to ward off business tides associated with start-up period. In some instances, business incubation offers management

assistance, mentoring access to finance flexible and low-cost leases, office services and subsequently promotion of development of new and qualified SMEs (Gwiza and Hamauswa, 2015). The general benefits of business incubation include but not limited to high economic growth, creation of employment opportunities, reduction of poverty, and the promotion of innovation and entrepreneurship spirit (Bubou and Okrigwe, 2011). In light of this, adopting this strategy will go a long way to assist the existing beekeeping SMEs as well as setting a firm foundation for the development and growth of the future enterprises.

## LITERATURE REVIEW

MSMEs have been playing a major role in promoting economic growth world over and Zambia is not an exception especially considering that the economy has continued registering sustained growth in the past decade. The existence of MSMEs and their contribution to the national economy in Zambia has a strong history which dates back to the colonial period (XXX). Unfortunately during the colonial period MSMEs among the black majority were not given adequate attention and support. Following the attainment of independence in 1964, successive governments in Zambia have shown considerable efforts and commitments towards supporting the activities of MSMEs. The growth of MSMEs can largely be attributed to the liberalisation policies introduced in the early 1990's that resulted into large scale privatization of state-owned enterprises and subsequent proliferation of the informal sector, mainly attributed to considerable job losses (XXX). As such the recognition of MSMEs as engines for employment creation, economic growth and poverty reduction is unequivocal. Zambia's long term plan, the Vision 2030 also extols the importance of MSMEs towards economic growth, employment creation and poverty reduction.

### Benefits of beekeeping

It can be argued that MSMEs focusing on beekeeping can be engines that propel socio-economic development in Zambia because globally, the demand for honey and other bee products has been increasing in the recent years (ITC, 2015). This is particularly because of the increasing awareness of the significance of these products to individuals and the economy at large. The beekeeping sector provides a variety of products such as honey, wax, royal jelly, propolis, venom, among others (Hilmi et al., 2012; IUCN, 2015; Kumar, 2010). Honey provides nutrients to individual well-being in form of carbohydrates, minerals and vitamins. In Zambia, honey has also been used to brew a local beer called mbote. The wax is used to make candles, floor polish and

cosmetics (Mickels-Kokwe, 2006). While the other products like propolis and venom are used in the pharmaceutical industry to make medicines. Further, the bees play an essential role in the process of cross pollination (Hilmi et al., 2012).

Moreover, the significance of the honey sector lies in its potential to contributing towards the country's foreign exchange earnings and reducing poverty through job creation (SNV, 2010). Other than providing beneficial products to society, the sector provides self-employment and income to the people involved the value chain (Hilmi et al., 2012; Teferi et al., 2011; Singh et al., 2016; Mickels-Kokwe, 2006; Teferi et al., 2011; Moniruzzaman, 2009). The income generated keeps beekeepers out of poverty as it enables them to buy food, acquire social services, meet school fees, buy clothes, build houses, buy assets and attend to other family issue (Mwakatobe and Machumu, 2010).

Besides economic gains, the beekeeping sector significantly contributes to the protection of the environment through preservation of forests. This entails that beekeepers would not engage in environment degradation activities such as cutting trees and burning forests. This implies that if the beekeeping industry becomes viable, it would be conceivable to change the mind set of charcoal burners and convert them into beekeepers. Moreover, farmers are encouraged to plant fruit trees like mango and pawpaw trees and other beneficial trees like Moringa tree to boost the bees' potency of honey production. Despite all these advantages, the current status of beekeeping business in Zambia particularly in Kabwe, Kapiri-Mposhi and Chisamba has not been explored. There is need to unpack opportunities and challenges being faced in order to determine the actual capacity of beekeeping industry in alleviating poverty as well as contributing to the national economy. Therefore, it has been argued that beekeeping has the potential to provide sustainable livelihoods to many small-scale farmers and other rural and non-rural people (Hilmi et al., 2012).

It has been noted that in Zambia, most of the beekeeping enterprises operate in the informal sector and fall in the category of micro enterprise (employing up to 10 employees and having total investments excluding land and Buildings of K80) (MCTI, 2009; Husselman, 2008), with few in the small enterprise category (employing between 11 and 49 employees and having total investments excluding land and buildings of between K80 and K200) enterprises. Businesses in this category face a lot of challenges which contribute to their high death rates. The challenges they face include access to capital, access to markets, business management skills, deforestation, and access to soft and hard infrastructure among others (Husselman, 2008; Simukoko, 2008).

In order to enhance their growth and enable them effectively contribute to employment, poverty reduction, foreign exchange earnings and support industrial growth

and sustainable development, key strategies and interventions have to be put in place to address the impediments. One key intervention to address the technical and management skills deficiencies would be to offer the beekeepers training in management and marketing skills to encourage use of sustainable methods of beekeeping and improve the knowledge and capacity of small-scale farmers (Hilmi et al., 2012). It is envisaged that this would enhance the success and growth of the beekeeping enterprise. According to Ramesh et al. (2012), beekeeping training imparts knowledge which has a positive impact on the development of the beekeeping enterprise and the generation of employment opportunities to the unemployed youth and rural people. In addition, business incubators should be established to help address the other impediments and ensure success of these enterprises.

Furthermore, Zambia has a conducive environment for beekeeping and has the potential to be one of the leading exporters of honey and honey related products (Husselman, 2008). This is evidenced by the increased production and export of the honey and comb honey. Food and Agriculture Organisation (FAO) estimates indicate that honey production in Zambia has increased from 520 tonnes (valued at \$1 304 000) in 2007 to 750 tonnes (valued at \$1 882 000) in 2013 while beeswax has increased marginally from 25 tonnes (valued at \$234 000) in 2005 to 36 tonnes (valued at \$335 000) in 2014 (FAOSTAT Data, 2017). The North-Western province of Zambia is the major producer of the bulk of the Zambian honey and beeswax production. This is the most profitable province for honey production. The province is conducive for beekeeping because it is located in the region with high rainfall precipitation and is rich in the natural vegetation and the miombo woodlands, which are favourable for beekeeping. Beekeeping also takes place in other provinces, but at a lower scale relative to North Western province. These include Copperbelt rural, parts of Western, Luapula, Northern, Eastern and Central provinces. The beekeepers are categorized into group beekeepers wild honey gatherers, individual beekeepers (IUCN, 2015).

### **Regulatory and policy environment**

Currently, the beekeeping sector is regulated by the Forestry Department under the 2015 Forest Act. The Act allows for forest resource co-management between communities and government through JFM. Under this formal approach, communities, including beekeepers, may gain formally recognised user rights to forest areas and increase incomes from forest products through controlled harvesting (Mickels-Kokwe, 2006). The regulatory framework provides an opportunity for strengthening the viability of the beekeeping industry because it encourages community participation. This is

cardinal in sustainable development because it creates a sense of ownership and responsibility among the grassroots with regards to management and preservation of natural resources such as forests.

## **METHODOLOGY**

### **Study setting and design**

This study was conducted in Central Province of Zambia in the districts of Kabwe, Chisamba and Kapiri Mposhi. In carrying out this study, the research employed exploratory and descriptive research designs where both qualitative and quantitative approaches were used to collect and analyse data.

### **Study population and sampling design**

The primary target population were men and women engaged in beekeeping in Central province and who were members of the beekeeping groups. Both the beekeeping groups and respondent for the survey were selected through a convenient sampling method (Figure 1).

### **Data collection**

#### **Key informant interviews**

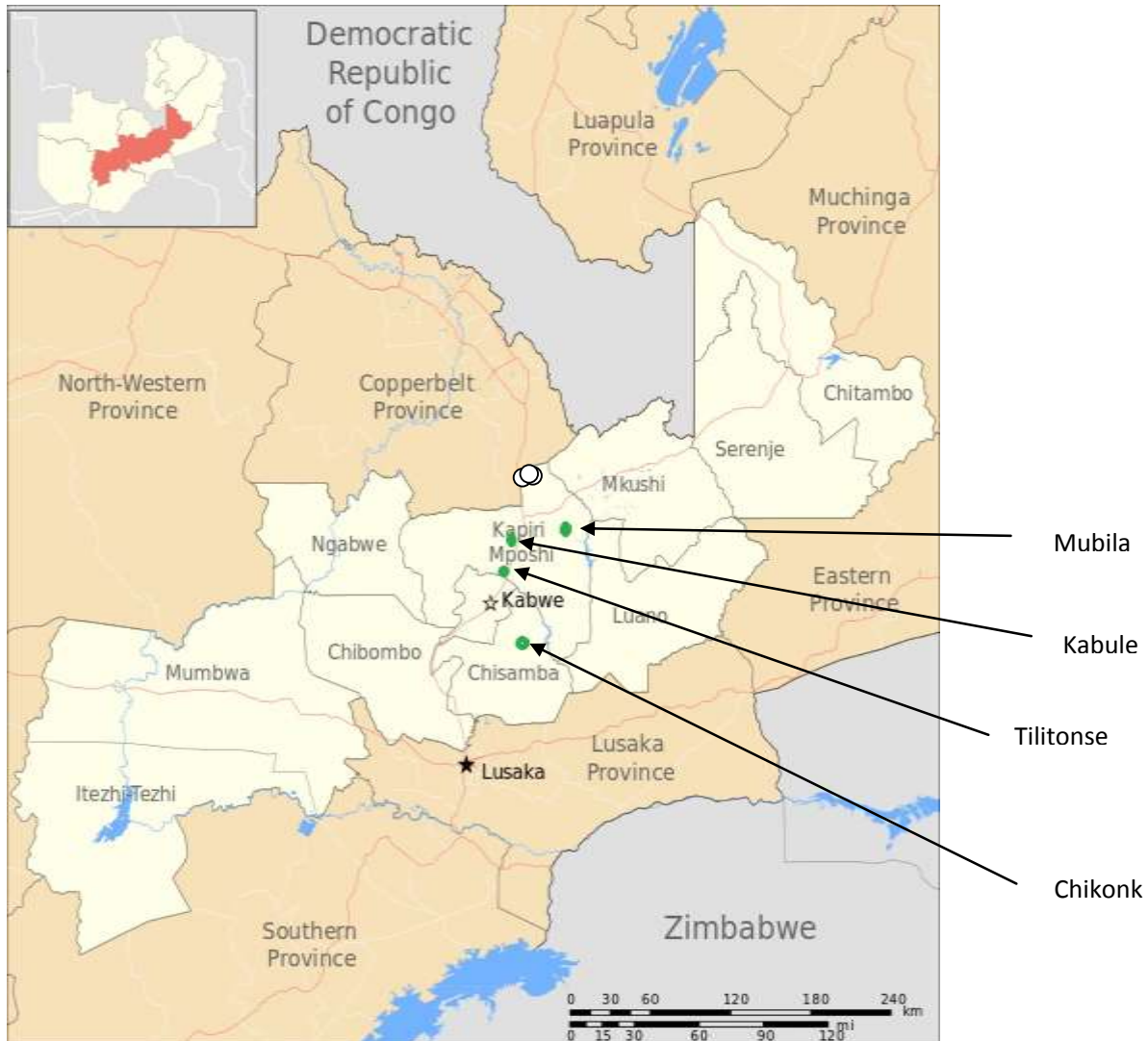
Key informant interviews were conducted to collect information from respondents who had special information about the nature and dynamics of beekeeping in the Central province. In this regard five key informant interviews were conducted with representatives from the Forestry Department, Agricultural Extension Services and academic experts in the area.

#### **Focus group discussions (FGDs)**

FGDs were conducted with the purpose of understanding the perspectives of the communities with regard to the status of beekeeping enterprises in the studied areas. In this regard, a focus group discussion guide was utilised as a data collection tool. In total of four FGDs were conducted. These groups included Tilitonse beekeepers in Luanshimba-in Kapiri-Mposhi, Mubila Youth Multi-purpose Beekeepers in Kapiri rural, Chikonkomene Beekeepers in Chisamba, and Kabule Women beekeepers in Kapiri-Mposhi. Throughout the FGDs the participants explained how they started beekeeping as well as the challenges they have been facing. Field notes and electronic devices were used to capture the information during the discussions. Focus group discussions were conducted in local languages with the four beekeeping groups.

#### **Documentary search**

Documentary search involved the collection of relevant data from already published materials. These included books, book chapters, journal articles, newspapers, reports from government departments and other Non-Governmental Organisations (NGOs). The information from published materials was important in understanding the historical developments as well as contemporary developments with regard to beekeeping in the Central province and Zambia in general. Through documentary search it was also possible to identify lessons that beekeepers in Zambia can learn



**Figure 1.** Map of the Central Province of Zambia with the surveyed areas (green dots) (chalochatu.org).

from other countries such as Tanzania and Kenya.

**Personal observations**

Personal observations were also used to collect important information for the understanding of beekeeping activities in the Central Province of Zambia. During the field visits, it was observed that beekeepers are now conscious of protecting the forests. Through observations, it was possible to identify the types and quantities of beehives being utilised by the farmers. Cameras were used to capture important information and photographs that were vital for the study.

**Survey**

Quantitative data were collected through semi-structured questionnaires with the help of research assistants and focal persons. Questionnaires were distributed to ninety bee-keepers and only eighty-eight were collected. The survey was meant to

complement information collected through the aforementioned qualitative methods.

**Data analysis procedure**

Quantitative data were entered, coded, and analysed using SPSS for windows version 21.0. Descriptive statistics were analysed to describe the proportions in the characteristics of the beekeepers. The qualitative data were analysed through the use of thematic approach. The thematic approach of data analysis helped determine the common factors that affect the beekeeping sub-sector.

**Presentation, analysis and discussion of findings**

Here entails the presentation and analysis of the major findings from the data that were collected in parts of Kabwe, Chisamba and Kapiri Mposhi districts. The

collected quantitative data were analysed using percentages, while the qualitative data were analysed and organised into emerging themes depicting the status, challenges and opportunities of beekeeping enterprises in the aforementioned districts.

### **Beekeeping in Zambia's Central Province: A synopsis**

In order to understand the nature of beekeeping enterprises in the Central province, the study examined the current situation, the motivational factors for engaging in beekeeping, the nature of support, if any, from either government or other development partners and the challenges being faced. As explained earlier, this study also examined the general production output, processing, and marketing strategies being employed. The findings from our study indicated that men dominate the beekeeping sector in Zambia's Central Province. As illustrated Figure 2, 71.3% of the beekeepers interviewed were men while 28.7% were women. Although men continue to dominate the sector 28.7% show that beekeeping is no longer a preserve for men. Thus, there is an indication that women are increasingly becoming involved in the beekeeping business. This is a positive development because in most societies women have been excluded from economic activities. The women who were interviewed indicated that beekeeping has changed their lives and one woman from Kabule highlighted that she managed to buy a cow using the proceeds from selling honey. This also shows that there could be factors that inhibit women to participate in this industry at the comparable level with men hence need to identify those factors and incorporate strategies that will encourage more participation from the women.

This study reveals that the elderly people have dominated the beekeeping sector in the Central Province of Zambia. As shown in Figure 3, the majority of the beekeepers are over 40 years of age (62.5%), while only 21.3% are between 15 and 30 years old. Although the elderly dominate the sector and it is interesting to note that the youthful ones are also involved as well. The involvement of the youth provides a strong case for provision of training and other supporting facilities for the beekeepers. There is also need to assess the perception of youths with regards to the beekeeping industry. This is cardinal because the sustainability of the industry depends on the youths driving it.

As illustrated in Table 1, the main occupation of most beekeepers interviewed was crop farming (96.3%). Thus, the majority of farmers are taking beekeeping as an alternative source of income alongside crop farming. Although almost all farmers mentioned crop farming as their main farming activity, a significant number indicated that they would want to make beekeeping the main farming activity. These findings agree to those noted by other researchers (Fisher, 1993) who noted that beekeepers allocate more time to other farm activities at

the expense of beekeeping. From the responses shown in Table 1, it can be noted that about 78% indicated their desire to expand their beekeeping enterprises. In pursuit of this aspiration, some beekeepers have gone to the extent of consulting the respective government departments on how their products such as honey can be certified and approved even for exportation. This is because most of them felt that honey and other related products can bring more income as compared to other crops such as maize. In addition, the beekeepers acknowledged that beekeeping was a less costly venture compared to crop farming which requires many inputs. The desire by farmers to expand the beekeeping industry provides an opportunity for growth and contribution to sustainable development support can be provided by stakeholders like relevant government institutions and NGOs.

### **Categories of beekeepers**

In general, there are two categories of beekeepers in the areas under consideration, namely, individual beekeepers and loosely coordinated groups. However, even though groupings do exist there is a general inclination towards individual beekeeping. Out of the four beekeeping groups, it was established that only three beekeeping groups seemed to be doing well in terms of working together and registering growth of beekeeping enterprises. Those groups that are doing well have shown signs of strong leadership skills with the leaders playing critical roles in encouraging other people to venture into beekeeping. This provides an opportunity for the Department of Cooperatives to mobilise farmers and develop the beekeeping industry to viable levels and enhance sustainable socio-economic development.

### **Motivation for beekeeping**

There is growing interest among the farmers in the visited areas which include Chikonkomene, Luansimba, Kabule and Mubila. The majority of members heard from friends about the potential in beekeeping while some generally developed the interest and saw the potential. Other farmers were attracted to beekeeping because it proved to be a lucrative enterprise. Hence, the majority of the respondents, about 90% stated that they are into the beekeeping business to generate income for their livelihoods. This is against 7.5 and 2.5% who started beekeeping for leisure and that it has been a family practice. The chairperson of Tilitonse beekeeping cooperative started as a bee hunter, then was offered help by Heifer International with a modern beehive. From the focus group discussion, it emerged that the same chairperson was instrumental in influencing others to join beekeeping enterprise. In other areas such as Kabule some farmers learnt about beekeeping through the some

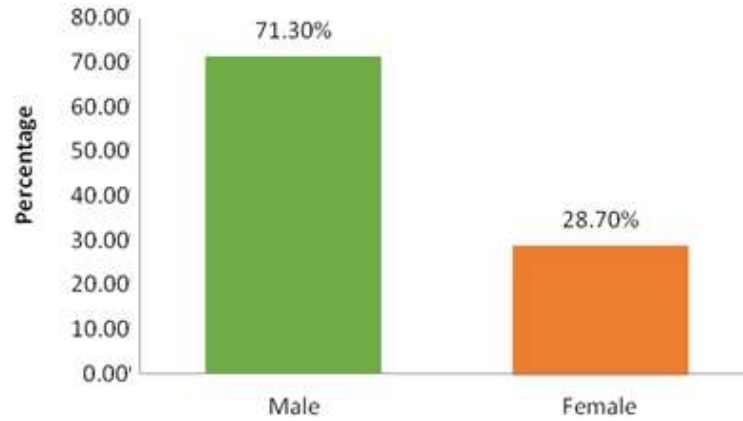


Figure 2. Gender distribution of the beekeepers surveyed.

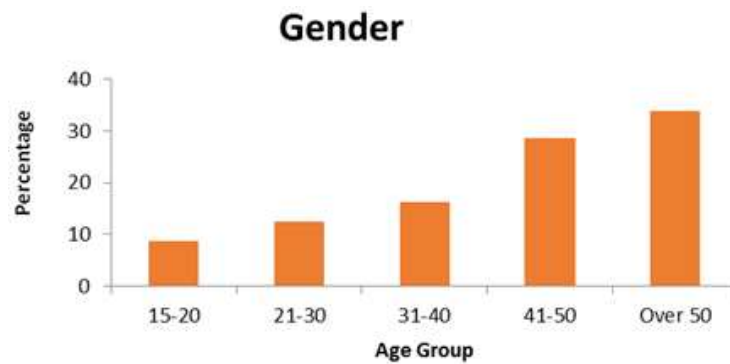


Figure 3. Age distribution of the beekeepers interviewed.

Table 1. Occupation of the respondents.

| Item                     | Percentage |
|--------------------------|------------|
| <b>Occupation</b>        |            |
| Farming                  | 96.3       |
| Government employee      | 1.3        |
| Farm employee            | 1.3        |
| Not employed             | 1.3        |
| <b>Growth aspiration</b> |            |
| Yes                      | 73.8       |
| No                       | 26.3       |

radio programmes, while others grew up in families that were engaged in beekeeping.

**Nature and levels of production**

The current honey production levels are not as high as

expected but they are impressive in that they indicate great potential. As indicated in Table 2, most of the beekeepers (47.5%) have been producing above 50 L of honey per year. Those producing 20 L and below constituted about 26.3% of the respondents. The production levels are in line with the type and number amount of beehives being used. On the number of

**Table 2.** Nature and level of production.

| <b>Number of hives</b>     | <b>Percentage</b> |
|----------------------------|-------------------|
| 1-5 Hives                  | 53.8              |
| 6-10 Hives                 | 26.3              |
| 11-15 Hives                | 15                |
| Above 15 Hives             | 5                 |
| <b>Beekeeping training</b> |                   |
| Yes                        | 41.3              |
| No                         | 58.8              |
| <b>Honey output</b>        |                   |
| 0 to 20 L                  | 26.3              |
| 21 to 30 L                 | 7.5               |
| 31 to 40 L                 | 18.8              |
| Above 50                   | 47.5              |

beehives, 53.8% has between 1 and five beehives and only 5% had more than 15 beehives while those with 6-10 beehives constitute 26.3%. It is worth noting that there are two harvesting season with the first one beginning in May while the second spans between November and December. The honey production fluctuates and to a large extent unpredictable. However, the highest yield of honey is between May to July.

Due to financial challenges, farmers are more inclined to traditional methods especially on processing. Traditional beehives are still in use. For example at Tilitonse, Chikonkomene and Kabule beekeeping cooperatives farmers still use traditional beehives made from tree barks. However, there is a strong desire to shift from the traditional to the modern methods of doing beekeeping. It is worth noting that traditional beehives are an impediment to the growth of the business since they lead to the destruction of the trees which are necessary for beekeeping. Further, the traditional beehives give very low yields compared to the modern hives. In addition, traditional beehives are very susceptible to attack by ants.

### **Beekeeping support in the area**

Beekeeping in Kabwe district has been receiving considerable support from the government in partnership with the donor community. The Zambian Forestry Department is one of the departments that represented the government in supporting beekeeping in the country. The government's support for beekeeping is based on the need to reduce pressure on the country's forestry by reducing deforestation. The beekeeping initiatives are meant to enable live side by side with the forestry without being a threat to their continued existence.

### **Materials and infrastructure support**

Much of the support given to the beekeepers was in form of materials and infrastructure. This support was in form of modern beehives, honey processors and bulk processing centres. For example beekeepers at Chikonkomene farming community beekeepers indicated that they received support from ZAMSIF. They were given 150 beehives as well assistance on building a bulk centre. While farmers in Kabule and Mubila pointed out that they were helped by SNV with 60 and 150 beehives, respectively. The beekeepers also said that SNV also helped with the construction of bulk processing centres and honey pressers or processing machines in both groups. Besides, key informants indicated that SNV was engaged by the Government of the Republic of Zambia to provide this support after they received funding from the World Trade Organisation (WTO). Respondents said that Heifer International also supported the Tilitonse group with modern beehives. This study has noted some weaknesses in this support. While these farmers received this support, the supporting organisation did not put in place monitoring and evaluation mechanisms to track whether the businesses were growing or not and see whether the objective of the support was being achieved. Moreover, the Kabule reported that they were not taught how to use the bee processing machine donated to them. They have not since used the machine and have continued to use traditional methods of processing, that is crushing and sieving. The beekeepers expressed desire to embrace new technology in beekeeping.

Unfortunately, moreover, beekeepers indicated that the assistance from ZAMSIF was a once off support and the organisation never came back to make follow ups or evaluate the impact of their support. They also reported that SNV has been supporting beekeepers in various



**Table 3.** Challenges and the needs of beekeepers.

| <b>Operational challenges</b> | <b>Percentage</b> |
|-------------------------------|-------------------|
| Market                        | 12.5              |
| Financial                     | 22.5              |
| Training                      | 23.8              |
| Processing and packaging      | 41.3              |
| <b>Support needed</b>         |                   |
| Training                      | 25                |
| Processing and packaging      | 36.3              |
| Connections                   | 13.8              |
| Quality assurance             | 25                |
| <b>Sales outlets</b>          |                   |
| Highway market                | 67.5              |
| Nearby towns                  | 20                |
| Local markets                 | 11.3              |
| Own shop                      | 1.3               |

number of areas through training and provision of modern beehives. However, it was reported that the NGOs were no longer supporting beekeeping projects, for their support was based on a specific project whose life span has ended.

### ***Training support***

Beekeepers interviewed indicated that they have received some training on beekeeping. In all 41.3% of the beekeepers have received some form of training in beekeeping. However, the training has not been continuous and uniform as it differed from one group to the other. For instance, members of Tilitonse beekeeping cooperative received support from Heifer International. They were trained on how to live side-by-side with the environment; although, there has been no follow up to review the success of the training. Besides, beekeepers received some training from agriculture extension officers from time to time. They also reported that Mulungushi University also supported the members through a workshop on beekeeping which was meant for knowledge exchange and sharing. In addition, the Zambian Government Forestry Department also offered training to other beekeepers.

### ***Financial support***

The study discovered that all the beekeeping groups have received some form support from various organisations. Beekeeping was part of the promotion of the Forestry Action Programme which was funded by the Government of Zambia and the Government of Finland.

The funding had a beekeeping component which was used as a pilot study. Various groups of people were given the financial support to start up the beekeeping business. However, beekeepers reported they were not asked to write any reports regarding the utilisation of the funds. The Forestry Department's support also came under the auspices of the government of Zambia's Poverty Reduction Strategy (PRS). Through this funding, beekeepers were given some start-up funds to work in groups. The idea was to create satellite beekeeping zones. The beneficiaries reported that they worked well until the funding was withdrawn. However, there is little or budgetary allocation towards the beekeeping sector in the 2017 national budget. However, the Kabwe Forestry Department no longer include beekeeping in their financial budgets.

## **CHALLENGES AND NEEDS OF BEEKEEPERS**

Beekeepers face various challenges which negatively affect the growth of the business and the sector at large. These challenges cover the beekeeping production, processing, marketing and access to finance affect issues of business sustainability. Table 3 contains the percentage distribution of the challenges facing beekeepers in the Zambia's Central Province and their needs.

During an interview, one of the key informants noted that the project aimed at supporting beekeepers was void of sustainability because most of beneficiaries disappeared (after receiving support or were not traceable after receiving support from the Government). Out of the beneficiaries (how many/kindly indicate the number) of the project, about two individuals seem to

have continued with the beekeeping business. In this regard, sustainability of beekeeping project was found to be the major challenge.

Moreover, land conflicts are threatening beekeeping in Zambia and Kabwe and particularly in Kapiri Mposhi in particular. The Kabwe District Forestry Department respondents observed that there is a fierce contestation for the control and utilisation of land among various government departments. For example some reserved forests are now being targeted for occupation by the traditional leaders and for the expansion of Kabwe town. Such developments are threatening the existence of forests which will in turn threaten beekeeping projects.

Further, due to economic challenges compounded by dwindling employment opportunities in Kabwe and Kapiri-Mposhi, squatter settlements on reserved forests are on the increase. The reserved forests are also the major catchment areas for the rivers in Kabwe or Kapiri-Mposhi. The town expansion is negatively affecting water bodies through tree cutting and land clearance for infrastructure development and farming activities. Consequently, this adversely affects the hydrological cycle. Since bees thrive where there is water, if there is little or no water, the beekeeping business gets negatively affected. Additionally, charcoal burning and wild bee hunters who tend to cut trees or put the beekeeping business at risk thereby causing a serious challenge to the beekeeping industry. This was also observed by Jumbe et al. (2008).

### Marketing problems

All the beekeepers have indicated that they have problems with the markets. The marketing challenges are actually multifaceted. Firstly, the prices for the produced honey are not attractive and the beekeepers feel they are being short-changed when selling their products to wholesalers. Ultimately, the beekeepers are not realising the anticipated profits from their products which would help move the business forward. For instance, one of the agricultural extension officers noted that unattractive prices could be one of the many reasons why the number of active beekeepers has declined in Luashimba area in Kapiri-Mposhi. These results are consistent with those of Hilmi et al. (2012) who noted that poor road infrastructure, lack of transport, and lack of access to credit for example can all hinder access to markets.

Secondly, the erratic availability of reliable buyers is another problem. In this regard, some producers who are close to the Great North Road sell their products on the roadsides commonly known as highway markets while those far away from the highway sell their products to marketers and the local community. This study revealed that about 67.5% sold their honey by the road sides of along the highway (Figure 4). This shows that the beekeepers do not have viable and reliable markets. In Luanshimba, Kapiri-Mposhi, organised buyers would

come from Kabwe and Lusaka. Also Chikonkomene on the other hand take their honey to Kabwe and Lusaka or sell within their local community. Farmers from all the visited farming communities indicated that, the prices being offered by the buyers are not attractive as the wholesalers were deemed to be exploitative. For example, the 2016 prices ranged from 60 to 120 Kwacha per 2.5 L of honey. By and large the common problem is that there were no reliable markets offering attractive prices for bee products.

Thirdly, the beekeepers in Zambia are relying more on the informal local market which is unreliable and does not offer lucrative prices. This is mainly because their products have not been certified by the Zambia Bureau of Standards (ZABS) to enable them penetrate the formal local and international market. Even though some of the beekeepers would want to have their honey approved by ZABS, the prices being charged certification charges are too exorbitant for the small scale farmers. Therefore, the fees being charged are either affordable nor being discriminatory and not supportive to the farmers. As a result the farmers are unable to access lucrative markets within as well as outside the country.

Furthermore, the packaging materials being used are not making the honey from small scale farmers attractive. The majority are using standard 2.5 L plastic containers of the packaging companies. However, there are no branded labels on their products. The containers are just plain white. For the smaller quantities below 2.5 L, the farmers and marketers are using empty drink bottles. These containers make the honey unattractive to buyers and raises quality concerns. This is because the consumers are now conscious of the hygiene issues related to packaging of foodstuffs. Therefore, in terms of challenges, processing and packaging (41.3%) were the most dominant challenges identified by the beekeepers, while 12.5% mentioned access to the market for the products. As such 36.3% needed support in the area of processing and packaging, 25% felt that they needed support in form of beekeeping training and quality insurance.

The other issue is that the road side marketers supplement the supplies from the local people with honey from outside Central province for example, from the North Western province. The respondents noted that the other problem is that the honey from the other areas is of lower quality when compared with the one produced in Luashimba in Kapiri-Mposhi and other surrounding areas. In other instances, these sellers buy rejected honey from North western province and its rumoured that they add water and sugar syrup to it before selling it. As a result, the image of the honey produced in Central province is being tarnished. More so the highway marketers on the roadside buy comb honey or unprocessed honey because it is cheaper and process it themselves thereby benefitting from both the honey and other by-products at the expense of the beekeepers.



**Figure 4.** Roadside honey seller at Luanshimba with Mr Hamauswa (Picture by authors).

### **Lack of sustained support**

Beekeepers expressed concerns over the lack of sustained support from the government and other development partners. In terms of extension services, the agricultural extension officers who were interviewed noted that they do not have specialised skills in beekeeping. As a result they are limited in offering relevant advice to the beekeepers within their jurisdiction. Instead, farmers have been receiving training arrangements from the Forestry Department and at times from Mulungushi University though on an ad hoc arrangement due to lack of proximity. The agricultural extension officers also lack adequate resources to reach out to the beekeeping farmers. The other missing link is that where the agricultural extension officers operate from, the land is small such that they are not able to set up demonstration facilities for the purposes offering practical lessons to the farmers.

### **Inadequate to non-existent financial support**

Beekeepers lack financial support services. In the case of beekeepers from Luashimba, farmers and their representatives such as the Zambia Honey Council (ZHC) have tried to lobby for financial support to no avail. The issue is not necessarily the unavailability of organisations which can give the financial support, but also that the farmers are lack proper organisational structures. It was also apparent from the interviews that the beekeepers have not explored other avenues such as the Citizenship Economic Empowerment Commission (CEEC), Youth Development Fund (for youth

beekeepers) and Women Empowerment Programmes (for female beekeepers).

### **Inadequate modern beehives or lack of new technology**

Another problem related to the financial challenges is lack of new technology in general and inadequate modern beehives in particular. The beekeepers explained that the modern beehives are expensive because as of 2016 one beehive was pegged at K400.00 which translates to about US\$40.00 at the spot exchange rate prevailing at that time. As a result most beekeepers were using a mixture of modern and traditional beehives while others utilise mostly on traditional beehives made out of tree barks. The disadvantage of traditional beehives is that they give poor yields when compared to modern hives. Their life span is also short because they are exposed to adverse weather conditions. In addition, traditional beehives are susceptible to various wild animals and insects that attack bees. A study by Tesfaye et al. (2017) also identified lack of modern beehives and insect infestation as some of the major challenges faced by beekeepers. Moreover, this method encourages deforestation as trees have to be cut to remove the bark. Figure 5 shows an example of a traditional beehive.

### **Charcoal burning and bee hunters**

In all the areas covered by the study, beekeepers expressed concern over charcoal burning. It was identified as a major threat to the survival of the



**Figure 5.** Traditional beehive in Chikonkomene (Picture by authors).

beekeeping sub-sector, our personal observation concurred with these sentiments. It was observed that charcoal burning is a thriving business in the areas. Rampant tree cutting for charcoal burning causes deforestation which later forces the bees to migrate to other areas. Deforestation also negatively impacts the catchment area of the nearby water sources.

#### **The unpredictable nature of bees and beehive invaders**

Another problem common to all was the fact that beehives tend to be invaded by the ants, mice and bee-killers. Further, water is a necessity for bees to produce honey. Most water bodies dry up around September and October. These factors may cause bees to migrate causing production to go down. Various researchers (Lijalem et al., 2017; Tesfaye et al., 2017; Chala et al., 2012) have highlighted that bee absconding poses as one of the challenges of beekeepers in Gomma district of Ethiopia.

#### **OPPORTUNITIES FOR GROWTH AND IMPORTANCE OF BEEKEEPING**

The study revealed several opportunities associated with the beekeeping industry as the following.

##### **Tree planting projects**

The Kabwe municipal council is working on a project to

be funded by the World Bank aimed at reforestation. The primary purpose is to reduce the adverse effects of the lead polluted soil around the former mining area. The tree planting project offers an opportunity for the beekeeping industry. However, as the Forestry Department representative suggested, there is need to make the tree planting project attractive to the local people. One way of doing this, is to combine tree planting with other projects such as beekeeping. Another tree planting project is being planned in the Chisamba district in the Chikonkomene farming area under the auspices of Green Living. One of the farmers noted that for the project to be successful, the farmers should be involved in identifying the type of trees to be planted in their areas. They said they would prefer those trees which would benefit them beyond the idea of preserving the forests. In this regard, fruit trees would get much support and their sustainability is assured because normally, the farmers would not cut them for other purposes. These trees would in turn provide nectar, a necessity for bees to produce honey.

##### **Level of knowledge among beekeepers**

The other opportunity for the growth and expansion of beekeeping in Zambia is based on the calibre of the farmers who have the zeal and interest in beekeeping. This was revealed by one of the key informants during an interview. He stated that the farmers in Luanshimba area for instance, are cognisant of the potential of beekeeping for improving their livelihoods. He also added that the Luanshimba area has not suffered much destruction to the environment especially the forests. Our own observations during the field research confirmed these

observations.

The majority of the beekeepers interviewed have some general knowledge on the essential factors necessary for beekeeping enterprise to thrive. The Tilitonse members noted that for beekeeping to thrive, there is need for availability of water. They also highlighted that type of trees such as Miombo tree and the Musamba tree, Mupundu, Mubanga are important for good quality honey. In addition, exotic trees such as sweet apple tree, Moringa can be planted to enhance honey production.

Despite understanding the essential conditions for beekeeping, the majority of the farmers interviewed indicated full awareness of the importance of bees in the ecosystem. They help with cross pollination and can help improve yields for various crops such as maize and sunflower.

### **Cost effectiveness**

Beekeeping is a cost effective venture because it does not require much farming and it is not labour intensive. This entails that the potential of yielding huge profits is high if production is done on a large scale.

### **Sustainable livelihoods and wealth creation**

The majority of beekeepers interviewed have a traceable record of how beekeeping enterprises have been instrumental as form of livelihood and helps in wealth creation. There is a realisation among beekeepers that the business is important for poverty reduction, employment creation, wealth creation among others. The study established that beekeeping is a very important business both to the individual beekeepers, the community and the country at large. Beekeeping provides employment and income to the dwellers hence sustaining their livelihoods. From the income generated, beekeepers are able to pay school fees for their children, buy food and can enhance wealth creation as people are able to buy assets like bicycles and even build houses. Further it supports, by providing inputs, to businesses involved in beekeeping products like honey producers, candle industry, wax polish and medicine among others. The results are in line with those of Hilmi et al. (2012) who noted that beekeeping is a source of income, improved nutrition as well as having curative properties.

In some cases they have used the money from beekeeping projects to purchase household goods, build houses, and buy assets like bicycles as well as paying school fees for their children. During a focus group discussion with the Kabule beekeepers, a female beekeeper noted that she bought a cow after selling honey.

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### **Potential for value addition**

There is great potential for the beekeeping business to create sustained linkages with other related enterprises such as candle making, soap making, and pharmaceuticals. This is because after processing the honey, the by-products can be used to make wax which will be used for making candles, polish and other things. In Chikonkomene, two farmers managed to bring their wax to the focus group discussion. While they can sell the wax to other buyer in nearby towns, the farmers noted that they are willing to use their wax to manufacture various products provided they are trained and given adequate support. Jumbe et al. (2008) made similar observations that production and processing technologies for honey and beeswax are still very basic in Zambia and there is a huge potential for improving production levels and value addition. Figure 6 shows a bucket with the wax by-products from the processed honey and a sample of semi processed wax produced from the wastes. It is worth noting that not all beekeepers are utilising the waste materials to form wax. Some throw away the by-products while others sell comb-honey or raw honey.

Apart from supplying raw materials for the manufacturing of other products, beekeeping is also in the Central Province is also important in supplying honey for the highway markers. The interviews with the marketers revealed that selling honey is a lucrative business because they can sell up to five 2.5 L bottles of honey per day. The only challenge the roadside traders are going to face is that their honey is widely condemned for not being pure and improperly processed.

### **Conclusions**

From the findings obtained in this study, it can be concluded that there is great potential for the growth of beekeeping business in the Central province. The potential stems from the zeal and insatiable desire for growth displayed by the majority of farmers. More so the farmers are conscious of the need to protect the forests. In fact, the forests in some of the areas are well protected and conserved. The availability of trees such as miombo also makes the area more conducive for beekeeping. The



**Figure 6.** Unprocessed and semi processed wax (Picture by authors).

study also concludes that beekeeping support in the area, either from the government or the development partners has been erratic leading to the high failure rate of various enterprises at the infant stages. As a result, no single enterprise has managed to grow from a small scale to medium scale enterprises. The majority of farmers are still operating mainly for subsistence purposes, hence the need to explore the growth of the beekeeping industry through the establishment of a business incubator. Consequently, beekeeping has remained a complementary activity to crop farming.

Therefore, with all the hitherto benefits realised by most farmers, and clear signs of potential for growth, beekeeping in the Central remains constrained and poorly supported. It is from this basis, the high potential for the growth of beekeeping and limited support, that the following recommendations are made.

## RECOMMENDATIONS

### **Establishment of business incubation centre at Mulungushi University**

This study recommends the establishment of a business incubation centre at Mulungushi University with special focus on promoting the local communities engaged in beekeeping. The success of business incubation in beekeeping will have ripple effects into other sectors such as biomedical studies, agricultural processes and marketing among others. Philips (2002) correctly observes that incubators are important for universities because they help setting up linkages with the commercial world making it possible for commercialisation of research and transfer of technology.

For the business incubation at Mulungushi to be successful, there is need for an effective administrator who organises support services well. The administrator will perform a number of duties including the identification

and selection of beneficiaries linking them with other key stakeholders such as donors and the relevant government departments.

The established incubator should also offer business services and assistance to the beekeepers. Such services can include marketing strategies, training on packaging and preservation of honey, customer care services and general business management skills. While the School of Agriculture will be running the incubation centre, there is need to work in collaboration with experts from other faculties and departments especially on marketing, and business management. It is argued that availability of management consulting services may be the most critical contribution the incubator can make to put the emerging SMEs on successful tracks.

### **Need for a strong beekeeping association and cooperatives**

For the beekeepers to succeed there is need for a strong beekeeping association. In this regard the ZHC needs to be reorganized in order to strengthen it. A stronger association will be able to push the agenda of its members in such a way that their concerns will no longer be ignored by various key stakeholders. A well organised association is also vital for setting up uniform standards to be followed by all the beekeepers in the country. Cooperation with other development partners and financial supporters can be much easier if there is a properly organised association.

The beekeepers can also organise themselves into working cooperatives that can be vital for improved productivity through shared responsibilities. The Kabule Women Beekeepers Cooperative was cited by the agricultural extension officers at Luashimba as a success story of that can be replicated in other areas. Our visit to Kabule reviewed that the cooperative is making some successes and they have traceable records of their

production and sales. However, their production levels as a cooperative are not impressive when compared to other beekeepers who are operating on individual basis.

### Sustained financial support backed by training

Almost all beekeepers interviewed are indicated that they were in need of support in the area of training. Therefore, there is need to for sustainable financial support anchored by training not only on beekeeping or production but on business management and entrepreneurship skills as well. These supporting services can be sustainable if there is strong working relationship between the beekeepers, Mulungushi University and other stakeholders in beekeeping industry.

### Support in material and infrastructure

Beekeepers pointed out the need for infrastructure development such as apiaries or bee processing houses to enable them standardise the processing of honey. Moreover, most of them lamented over the limitations of traditional beehives and showed quest for modern beehives. Therefore, there is need for various key holders to take keen interest in the beekeeping industry and revamp support activities in material and infrastructure provision to aid in making the beekeeping sector a robust industry.

### Stakeholder convergence

One of the major missing links in the beekeeping industry in Zambia is a well-coordinated approach which can bring all the stakeholders in the industry together. With the convergence of stakeholders, the support given to the beekeepers can be sustainable and possibly uniform without duplication of activities. In addition, the coming together of stakeholders is vital in ensuring that the farmers and technical institutions are consulted and given enough space to make their own contribution. In view of bringing all the stakeholders together, Mulungushi University can play a central role by creating avenues for potential linkages among the key partners and farmers. Some of the key partners that need to be brought on Board are is the Zambian Government particularly the Ministry of Forest, Agriculture, Commerce, Department of Cooperatives, the Citizens Economic Empowerment Commission (CEEC), the Zambia Development Agency and Zambia Bureau of Standards, NGOs, Donor Community and Mulungushi University to mention but a few.

### Processing and branding

Once a strong partnership has been established, it would

be possible to negotiate with the Zambia Bureau of Standards to offer beekeepers lower rates for standardising their products to enable them sell to well establish markets both locally and internationally. The partnerships would also assist beekeepers to find competitive markets both home and abroad.

### CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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