ZAMBIA

ROAD MAP FOR DEVELOPING & STRENGTHENING THE HONEY SECTOR

DECEMBER 2014
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ROAD MAP FOR DEVELOPING & STRENGTHENING THE HONEY SECTOR IN ZAMBIA

Prepared for International Trade Centre
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- ZHC for their support and assistance
- Ms Michele Andermatt, Junior Consultant Value Chain, ITC
- Mrs Frédérine Derlot-Copy, Programme officer Fresh Fruits & Vegetables, ITC
Dear Reader,

Zambia remains largely dependent on copper exports for its foreign exchange earnings. This exposes the country’s economy to external shocks due to volatility in international commodity prices. To address this challenge, the Government of the Republic of Zambia has embarked on the diversification of the economy and the promotion of Non Traditional Exports (NTEs) across sectors. To this effect the Government has mandated the Zambia Development Agency (ZDA) to among other things enhance the country’s export earnings through the promotion of NTEs in the regional and international markets.

Apiculture is among the NTE sectors that have been identified with great potential to enhance economic growth and poverty reduction among many Zambians. With an estimated annual production of more than 1200 metric tonnes, the apiculture sector has the potential to contribute to the diversification of the economy through the export of bee-products thereby generating income for thousands of beekeepers, processors and traders.

Currently, there is a reduction in the supply of bee products on the World market due to bee diseases such as Colony Collapse Disorder, forest fires and extreme winters in certain parts of the world. In contrast, there is an increase in the demand for bee products partly attributed to the belief that these products possess medicinal properties that meet the health needs of consumers. The reduction in the supply of honey globally coupled with the fact that Zambia is 66% forest and woodlands is an opportunity for the country to position itself strategically to increase honey production for the world market. Zambia is one of the few countries with the capacity to produce pure and organic honey free of pesticides or chemicals due to its vast forest areas. It is therefore important for Zambia not only to increase volumes of production but also meet local, regional and international quality standards.

The significance of meeting required standards cannot be overemphasized as all bee products which include honey, beeswax, propolis, pollen and royal jelly need to be of a certain acceptable standard if they are to be promoted on the international market. Therefore, any intervention to improve the apiculture sector should aim at improving the quantity and quality of these products.

The ongoing project being implemented by International Trade Centre, Zambia Development Agency and Zambia Honey Council aims at addressing these two issues as it formulates a road map on strengthening the Apiculture Sector by building capacities of market players with the objective of improving trade among the value chain actors and fostering research and development.

This report therefore gives a background of the Apiculture Sector, highlighting the challenges and opportunities that currently exist. It further goes on to suggest strategic actions that should be taken to ensure that Zambian honey is visible on the world market. The report goes a step further to appreciate the byproducts of honey and highlighting their importance. The marketing of these byproducts can also increase export volumes significantly as they fetch relatively high prices compared to that of honey. Only when this happens will the sector fully realize its full benefits which can then be distributed among all the value chain actors.

Thank you.

Patrick D. Chisanga
DIRECTOR GENERAL

ZAMBIA DEVELOPMENT AGENCY
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ACRONYMS

Unless otherwise specified, all references to dollars ($) are to United States dollars, and all references to tons are to metric tons.

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<td>ABF</td>
<td>Agri-Business Forum</td>
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<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
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<td>CBO</td>
<td>Community Based Organisations</td>
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<td>CCD</td>
<td>Colony Collapse Disorder</td>
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<td>CIFOR</td>
<td>Centre for International Forestry Research</td>
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<td>COMESA</td>
<td>Common Market for Eastern and Southern Africa</td>
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<td>CSO</td>
<td>Central Statistical Office</td>
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<td>EIF</td>
<td>Enhanced Integrated Framework</td>
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<td>European Union</td>
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<td>FD</td>
<td>Forestry Department</td>
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<td>Forest Resource Management Project</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GFSI</td>
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<td>GRZ</td>
<td>Government of the Republic of Zambia</td>
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<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<td>ITC</td>
<td>International Trade Centre</td>
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<td>MCTI</td>
<td>Ministry of Commerce, Trade and Industry</td>
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<tr>
<td>MMLNREP</td>
<td>Ministry of Lands, Natural Resources and Environmental Protection</td>
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<td>MRL</td>
<td>Maximum Residue Levels (MRLs)</td>
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<td>MT</td>
<td>Metric Tonne</td>
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<td>NGO</td>
<td>Non-Governmental Organization</td>
</tr>
<tr>
<td>NISIR</td>
<td>National Institute for Scientific and Industrial Research</td>
</tr>
<tr>
<td>NIU</td>
<td>National Implementation Unit</td>
</tr>
<tr>
<td>OECD</td>
<td>The Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OIE</td>
<td>World Organization for Animal Health</td>
</tr>
<tr>
<td>OPPAZ</td>
<td>Organic Producers and Processors Association of Zambia</td>
</tr>
<tr>
<td>PSDRP</td>
<td>Private Sector Development Reform Programme</td>
</tr>
<tr>
<td>SADC</td>
<td>Southern African Development Community</td>
</tr>
<tr>
<td>SNV</td>
<td>Netherlands Development Organisation</td>
</tr>
<tr>
<td>TIPEC-ZAS</td>
<td>Trade and Investment Project for Enhanced Competitiveness of Zambia’s Apiculture Sector</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>UNIDO</td>
<td>United Nations Industrial Development Organization</td>
</tr>
<tr>
<td>UNOPS</td>
<td>United Nations Office for Project Services</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>VAT</td>
<td>Value Added Tax</td>
</tr>
<tr>
<td>WTO</td>
<td>World Trade Organisation</td>
</tr>
<tr>
<td>ZARI</td>
<td>Zambia Agriculture Research Institute</td>
</tr>
<tr>
<td>ZDA</td>
<td>Zambia Development Agency</td>
</tr>
<tr>
<td>ZHP</td>
<td>Zambia Honey Partnership</td>
</tr>
<tr>
<td>ZHC</td>
<td>Zambia Honey Council</td>
</tr>
</tbody>
</table>
RELEVANT DEFINITIONS

Apiary  A place or site where several honey-bee hives are kept. The hives may be scattered over an area or concentrated either in a bee yard, bee house or shelter.

Bee  Insects known as Apis mellifera scutella and Apis mellifera adansonii, and other stingless species that make honey.

Bee colony  A unit of bees comprising three castes or types namely the queen, workers, and drones. These bees play distinct roles.

Bee disease  Medical disorders of bees such as American Foul Brood and European Foul Brood.

Beehive  A natural or man-made structure where bees live.

Beekeeper  The person who manages bees in beehives for domestic and commercial purposes.

Beekeeping  The art of managing honey-bees in beehives.

Bee products  Products made by bees and used by humans, including: honey, beeswax, pollen, propolis, bee venom, brood and royal jelly.

Bee Reserve  A land area designated for the purpose of sustainable management and development of bees

Beeswax  A natural wax product produced in the bee hive of honey-bees.

Bee venom  The poisonous liquid which is produced by honey-bees when they sting.

Biodiversity  The total variety of all living organisms, including their genetic constituents, inter-relationships and habitats, together with the ecosystems and landscapes of which they are a part.

Brood  The development stages of the honey-bee from egg, including the larva and pupa found in the honeycomb.

Conservation  The wise use and management of nature and natural resources for their inherent value and for the benefit of present and future generations of mankind.

Deforestation  The cutting down and removal of all or most of the trees in a forested area.

Drone  Male bee in the colony with role is to mate with queens during the breeding season.

Ecosystem  A complex of communities of organisms and their non-living environment which interact as a self-sustaining entity.

Environment  A complex set of physical, geographic, biological, social, cultural and political conditions that surround an individual organism and ultimately determine its form and nature of survival.

Honey  The sweet substance produced by the honey-bee from the nectar of blossoms, or secretions of or on living parts of the plant. The latter is also known as honeydew.

Honey-bee  An insect known as Apis mellifera species.

Pest  A subspecies of known harmful to bees and other insects or parasites such as red ants and termites. Honey badgers are also considered a pest.

Propolis  A resin type substance that honey-bees collect from tree buds and wounds of trees and other plants that is mixed with beeswax to seal cracks and repair cells.

Pollen  Fine coarse powder consisting of the male gametes produced by plants and collected by bees

Pollination  The transfer of pollen from the anther of a stamen to the stigma of a pistil of the flower, resulting in fertilization. This service can be natural or be done by insects like bees or by wind.

Royal jelly  A highly nutritious secretion from the pharyngeal glands of bees which is fed to very young larvae and to bees destined to be queens.

Queen  The female bee that lays eggs and is the mother of all bees in the colony. It has a much larger body than the other bees in the colony. A colony has only one queen.

Sustainable Forest Management  The management and use of (forestry) natural resources in a way that will support the beekeeping sector for both present and future generations.

Worker bee  Underdeveloped female bee found in the bee colony that does most of the tasks including feeding and caring for the brood and queen; building new combs; foraging for pollen, nectar and water; and defending the colony.
EXECUTIVE SUMMARY

The global landscape of honey supply and demand and the resulting economic impact is changing and Zambia is in a good position to benefit from these changes. The global demand for honey continues to grow while production has had some difficulties with Colony Collapse Disorder (CCD) and global climate change impacting the countries which produce honey and how much they produce. Decreased production and import bans into the EU of Chinese honey have in the past several years created a dynamic upheaval of global honey supply and demand and the resulting and shifting equilibrium in both price and flow of honey from production to consumption.

Zambians have been collecting honey and keeping bees for centuries. Trapping and keeping of bees in hives was first recorded in the Angolan part of the Miombo belt, among the Mbunda in Eastern Angola, in 1594. Traditions run deep in the communities that collect honey and keep bees. Beekeeping in Zambia has traditionally been a male dominated occupation due to the risks involved with hive placement, falling and stinging risk, and the long distances travelled to collect the honey. Since as early as the 1970’s there have been numerous NGOs, foreign and domestic governments and private sector actors working to commercialize Zambian honey production and marketing. This report touches upon some of the history surrounding the external and internal support for Zambian apiculture.

Despite recent and ongoing challenges from development of the mining, forestry and agricultural industries in Zambia there remains sufficient flora and natural areas to allow Zambia to capture a greater share of the global honey market. In fact, if Zambia can capitalize upon the natural elements in the areas where the honey is produced they can achieve significant global market as a natural honey and, with the proper effort and support, certified organic honey. In Zambia the honey is produced from a total area of 9 million hectares of forest and woodland. Much of this land remains “natural” without the influence of agro-chemicals, degradation from mining or other commercial endeavours. This vast area of natural flora allows for significant increases in Zambian apiculture activities.

Apiculture is a source of income open to nearly all who are willing to learn the skills to achieve success. The fact that apiculture has relatively low financial, technical and other resource barriers to entry allows for participation from those who have limited income and livelihood options. Additionally beekeeping is a productive activity that contributes to the protection of environment, it requires a moderate investment, it has a high return rate and it allows multiple family members and both men and women to work in a productive and safe venture.

The greatest way to achieve governmental support for Zambian apiculture to establish laws and to protect the natural resources, is to create greater value in the sector. There is a direct link between sales, jobs created and governmental and private sector support for the Zambian apiculture industry. As the industry grows so will its visibility and support for protecting and expanding the resources necessary for the industry to succeed.

The International Trade Center (ITC) is a UN agency, its mission is to foster sustainable economic development and contribute to achieving the Millennium Development Goals in developing countries and countries with economies in transition through trade and international business development. The ITC mission and objectives includes strengthening TSIs, enhancing policies, and building export capacity at the enterprise level, mainstream inclusiveness and sustainability and aid for trade. All of these objectives will be integrated and active in the current project supporting the Zambian apiculture industry.
ITC is the implementation agency for the Eastern and Southern Africa project funded by the Ministry for Foreign Affairs of Finland. The project aims to contribute to inclusive and sustainable export-led growth in Kenya, Tanzania and Zambia by improving the competitiveness of their producers, SMEs (Small Medium Enterprises) and TSIs (Trade Support Institutions).

The efforts to be undertaken by the Zambian apiculture industry with the support of the International Trade Center (ITC), Zambia Development Agency (ZDA), Agri Business Forum (ABF) and Zambia Honey Council (ZHC) addresses issues ranging from the enabling environment that allows the Zambian apiculture industry to thrive to market linkages and connecting Zambian producers with local, regional and global buyers.

To allow for the efforts of the ITC to be sustainable upon the completion of this project the ITC will work on measures which will build the capacity of SME honey processors to achieve international quality standards for food safety and traceability of their products. To ensure sustainability of the administrative and support infrastructure of the industry the ITC will work with the managerial and operational capacities of TSIs servicing the SMEs in the apiculture sector strengthening relevant trade support services.

The purpose of creating this road map is to outline the opportunities for expanding trade of Zambian apiculture products and to provide a strategy for expansion. The road map has been developed in cooperation with the Zambia Development Agency (ZDA), the Zambia Honey Council, the Agri-Business Forum representing the Zambia Honey Partnership Platform and representatives of the Zambian honey industry including producers, processors, traders and exporters.

Zambian apiculture is at a crossroads of opportunity and challenge. There are many infrastructure issues that need to be addressed in favor of apiculture in order for the industry to thrive. These issues include protecting resources, training beekeepers and collectors, establishing Zambian standards which are acceptable to the regional and global buyers, developing financial schemes that effectively allow beekeepers, SMEs and honey buyers and traders to finance the improvements of the supply chain and efficient and quality production and handling of honey.

Zambia has focused almost exclusively on honey as the only source of revenue for the beekeepers. This report touches upon other products of apiculture which can be developed to achieve greater success in the industry. The products include products as simple as wax and as complicated as dried pollen. While changes in the industry will need to occur for Zambia to capture significant income from these additional products it is important that the industry understands that honey is just one source of income from the apiculture industry. Additional revenue streams and profit centers are available which could be achieved with adjustments to the value chain and investment in processing, handling and associated training.

This document provides a blueprint which addresses the top concerns and provides recommendations on how to address these issues. The concerns and recommendations expressed in this document are derived from numerous interactions between ITC consultants and the Zambian honey sector stakeholders including the Honey roundtable meeting held on Lusaka in July of 2014. At that event, trade representatives, government agencies, honey processors and ITC interacted and discussed the state of the industry and the various efforts to advance the industry. The contributions from the honey roundtable stakeholders have been included in the road map in the implementation plan, whose keys issues are described below.
The issues are as follows:

1. Marketing and Trade

**Recommendation 1**: Increase sales of bee products by improving quality of honey, packaging, offering additional bee products, and providing finance mechanisms to meet international standards and utilize best practices.

2. Environment

**Recommendation 2**: Establishment of a provision of state protected beekeeping reserves in the key honey production areas to ensure that beekeepers do not lose out to other competing land uses such as mining and agriculture including registration of beekeepers, licensing, and extension and better protection of forest reserves.

3. Training & Capacity Building

**Recommendation 3**: To promote the development and strengthening of extension service, training and education in bee keeping.

4. Research and Development

**Recommendation 4**: To promote research and development in beekeeping to enhance performance of the sector and its contribution to economic development.

5. Organization, participation and cooperative planning

**Recommendation 5**: To ensure broader participation of stakeholders at all levels of the Zambian honey value chain.

The Zambian apiculture industry has had decades of support and millions of dollars put into it by both internal and external sources. The results to date have been less than anticipated with reports from the 1990’s stating that within a few years’ exports will be several times what they were in 2013 and expected to be in 2014. This project endeavors to be different by addressing the above factors from a trade perspective supporting the development of the industry through the concept of Aid for Trade. A sustainable industry will result when buyers, sellers and society benefit from increased apiculture returns.
INTRODUCTION

1. THE PROJECT

1.1. PROJECT INTRODUCTION

The Promoting Intra-regional Trade in Eastern/Southern Africa Project funded by the Ministry for Foreign Affairs of Finland and implemented by the ITC; aims to contribute to inclusive and sustainable export-led growth in Kenya, Tanzania and Zambia by improving the competitiveness of their producers, SMEs (Small Medium Enterprises) and TSIs (Trade Support Institutions). The three year project (2014-2016) promotes participation of SMEs in selected agri-food sectors in regional and global value chains. It is addressing value chain inefficiencies combined with measures to strengthen TSIs in all three countries. The intervention will result in increased income and employment for stakeholders along the entire export value chain.

In Zambia the project aims first at building the capacity of SME honey processors to achieve international quality standards for food safety, organic certification and traceability of their products. Secondly, the managerial and operational capacities of TSIs servicing the SMEs in the apiculture sector will be strengthened by improving and extending the range of relevant trade support services, including the dissemination of trade intelligence, creation and promulgation of national packaging standards. This objective will be achieved by increasing the capacity of TSI’s (ZDA) and SME’s to enable them to make better informed decisions and build their competitiveness.
1.2. PROJECT PURPOSE

The project is strengthening the capacity of SMEs and TSIs in order to increase value addition in agri-food products and related services and to expand trade within the region and exports to international markets.

It covers three beneficiary countries Kenya, Tanzania and Zambia - and focuses on the agri-food value chains including honey and non-flower horticulture (including chilies) in Kenya, honey, mango and spices in Tanzania and honey in Zambia. The project aims to address gaps that prevent SMEs from effectively participating in product and services value addition. The project will contribute to regional trade integration efforts by enhancing vertical and horizontal connections between various actors in the selected agri-food sectors and accessing new markets in Africa. The project’s approach includes direct assistance with product and market development for selected sectors/products in each of the three countries and addressing gaps in the selected value chains.

The project targets two groups of beneficiaries:

1. Producer groups, SMEs as well as service providers along the selected value chains; and
2. Sector Associations and other Trade Support Institutions (TSI).

1.3. BACKGROUND AND CONTEXT

One of the main priorities of intra-Africa trade development (2012–2020) is to improve market-led participation of African businesses in value chains. According to the Organisation for Economic Co-operation and Development (OECD)’s Global Review of Aid for Trade (2013) the most important issue to be addressed by aid-for-trade solutions is the development of effective forms of public-private partnerships (PPP), which offer technical assistance in line with the three tenets of value-chain capacity building:

- To develop vertical linkages in the value chain;
- To enable multi-sector participation in the value chain in order to include support services to value chain operators; and
- To enable connectivity among participants in the value chain for a given sector or product, at both national and international levels.

In all three countries targeted by this project, the development of the agri-business sector has been defined as a priority area for national economic growth planning due to its impact on poverty reduction. Consequently, all three countries are eager to improve the capacity of SMEs to participate competitively in local and regional markets. The African Union’s (AU) “Boosting Intra-Africa Trade” agenda aims to promote intra-regional trade by strengthening sectorial or product-based institutions and building the competitiveness of enterprises, amongst others, in agri-food value chains. In addition to country-specific recommendations, this agenda includes an aid-for-trade component, which aims to prioritize value-chain connectivity within regions. The main hurdle for these smallholder producers, however, is an inability to meet the requirements of buyers such as retailers, intermediaries, or food processing companies in the area of quality, consistent quantity, packaging and product sanitation standards. Another major obstacle identified in all three countries is the lack of integration of SMEs from the informal sector into existing, cross-border value chains. This project is a joint response by the government of Finland and ITC to a request for technical assistance to develop inclusive economic value chains and foster trade integration.
The proposed project is supporting the AU’s agenda for intra-regional trade by strengthening trade support or sector institutions, to be achieved by improving the competitiveness of services in both supply and value chains. It thus combines each country’s objectives for helping SMEs participate in global value chains while also advancing the objectives of Regional Economic Communities (SADC, EAC and COMESA) for growth in regional trade.

1.4. NEEDS ASSESSMENT

Studies show that any gains to SMEs from the development of sustainable value chains such as this project aims to promote stem either from endogenous assets (technology, market access, relationships with downstream players) or from exogenous and developmental solutions (policy, infrastructure, and financial support). Consequently, the needs assessment carried out by ITC was, in part, a validation exercise aiming to determine these factors at product and sector level and to identify the priorities of the partner organizations. Working with existing TSI organizations during the needs-assessment stage allowed ITC to identify existing, locally managed supply- and value-chain initiatives and pinpoint the gaps hampering efficiency and competitiveness at product, service, and institutional levels. This also provided ITC with a better understanding of the role of TSIs in achieving greater exports at the regional level and their possible function in trade integration.

The table below presents the sector/products selected and the objectives to be supported by the project according to the identified gaps and needs.

<table>
<thead>
<tr>
<th>Country</th>
<th>Sector/products</th>
<th>Objectives</th>
<th>Gaps/needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZAMBIA</td>
<td>Honey</td>
<td>Diversify bee products and destination markets, increase exports</td>
<td>Post-harvest management, Improve processing technologies and packaging materials, Increase product diversification, Quality management systems and quality standards certification (ISO, HACCP, etc.), Market research study: feasibility of certification (organic, fair trade, etc.)</td>
</tr>
</tbody>
</table>

The major cross-cutting issue affecting all three countries in this project and subsectors is the inclusion of youth and women in value chains. There is already a limited number of youth who are both active in production and keen to climb the value chain and become involved in the intermediation of products between farm gate and exporters. Women and to a lesser extent, youth, also account for a significant proportion of those employed in the selected sectors; the objective is to build capacity either in services or the processing stages of value chains to ensure greater involvement of both. In addition to the objectives listed above, the needs validation exercise also revealed the following existing challenges:

- Supply-side constraints due to sub-optimal access to agricultural inputs;
- Lack of economies of scale and weak organizational capacity of producers, as well as a lack of innovative and productivity-enhancing technologies;
- Limited access to finance (working capital) and financial services (including insurance and pre-shipment finance) and insufficient knowledge of how to access these instruments;
- Insufficient product differentiation and value addition by SME processors;
- Poor compliance with safety, SPS, quality, and environmental standards, exacerbated by insufficient certification facilities;
- Limited availability of organized access to commercial and institutional services supporting supply chain performance (e.g. storage, transport, distribution);
- Poor access to updated and reliable market information for producers and traders (both formal and informal);
- Limited access to commodity exchanges and lack of understanding of their role in connecting buyers and sellers via ICT platforms; and
- Impediments to cross-border trade and lack of harmonized business systems.

1.5. PROJECT OBJECTIVES

During a planning session during December 2013 the ITC met with stakeholders from the Zambian apiculture industry and the following list of project objectives was developed:

Table 2: project outputs

<table>
<thead>
<tr>
<th>Output 1.1</th>
<th>Project output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output 1.2</td>
<td>Managerial and export capacities of honey producers, processors and traders</td>
</tr>
<tr>
<td>Output 1.3</td>
<td>Capacities of selected service providers along the value chain</td>
</tr>
<tr>
<td>Output 1.4</td>
<td>Regional business contacts and networks/fairs, trade missions and buyer-seller meetings</td>
</tr>
<tr>
<td>Output 1.5</td>
<td>Market opportunities</td>
</tr>
<tr>
<td>Output 2.1</td>
<td>TPOs managerial and operational capacity</td>
</tr>
<tr>
<td>Output 2.2</td>
<td>TSI service portfolio and technical capacities</td>
</tr>
<tr>
<td>Output 2.3</td>
<td>TSI networks</td>
</tr>
<tr>
<td>Output 2.4</td>
<td>Advocacy and policy reforms</td>
</tr>
</tbody>
</table>

This roadmap is covered by output 1.1 in the project document.

Photo: (CC BY-SA 2.0) beepollenhub, Raw Bee Pollen Granules.jpg
PURPOSE OF THE ROAD MAP

2. BACKGROUND AND CONTEXT

The purpose of this road map is to outline the opportunities for expanding trade of Zambian apiculture products and to provide a strategy for expansion. The road map has been developed in cooperation with the Zambian Development Agency (ZDA), the Zambian Honey Council, the Agribusiness Forum (ABF) and representatives of the Zambian honey industry including producers, processors, traders and exporters.

This report provides a roadmap with specific actionable events and a time frame to attempt to move the industry beyond strategic planning to profitable long-term business and success for the Zambian honey sector. It can be seen as a tool to assist and lead the Zambian honey sector towards the outcomes and outputs of the project, along with the overall strengthening of the sector and of its actors.

The road map is based on existing documentations, such as the “strategy for developing the honey sector in Zambia” produced by the stakeholders of the sector in collaboration with the Ministry of Commerce, Trade and Industry and the International Trade Centre, Geneva back in 2007; and has been complemented by different studies and reports carried out for the purpose of the value chain analysis of the Zambian honey sector.

- The value chain analysis of the Zambian honey sector has been carried out by a local consultant. The purpose of this sub-report is to distribute and make available information on the manufacturing, processing and marketing of value added bee products. It is directed at beekeepers as well as non-beekeepers, small entrepreneurs, extension officers and those involved in small business development. It is hoped that the information provided can lead to more diversified and increased income for beekeepers. It is hoped also that this report will be of help to bee keepers and bee products businesses to create more opportunities to improve the health, nutrition and the economic situation within Zambia.

- An international demand analysis has been carried out to assess the current international markets for honey, along with current and future opportunities for Zambia in international markets, being regional and also international. The international survey also focused on identifying gaps that prompt implementation activities to enable greater competitiveness of the sector and greater export sales, regionally and internationally.

- An updated implementation plan with corresponding activities from the 2007 Zambian honey strategy, has been complemented from findings from the previously mentioned studies along with the key contributions of the sector main actors during the Zambian honey roundtable that took place in Lusaka, Zambia back in July 2014.

3. ROAD MAP KEY AUDIENCE & USE

The key audience of the work carried out is the honey producers and exporters as this value chain analysis would support them in understanding the local, regional and international market dynamic and also support those interested in value chain of the honey sector. However, the value chain analysis and mapping will also be aimed primarily at multiple stakeholders like decision makers, public policy makers and important stakeholders.
CHAPTER 1.

SECTOR OVERVIEW
CHAPTER 1. SECTOR OVERVIEW.

CONTEXT

4. STATUS OF THE BEE PRODUCTS SECTOR

Zambia's bee products sector has potential to contribute to income generation and employment creation and also to supplement other economic activities in the rural and urban settings. The Zambian forest resource is dwindling mainly due to charcoal burning; annual deforestation is estimated at 900,000 hectares indicating an urgent need to reduce the high rate of deforestation. Global experience documents that the best way to preserve forest assets is to create value in their preservation. The flora of the forest is critical to beekeeping and a strong and profitable beekeeping industry is a proven way to preserve forest assets. Beekeeping and sustainable trade in bee products can enable greater value to be derived from forest utilization and production, the threat of deforestation and its longer term environmental and economic consequences will be reduced and greater value will be placed on the existence of forests as a source of sustainable livelihood. Beekeeping is currently conducted by over 10,000 active beekeepers in the major honey production areas of North Western Province. There is also some production in Northern, Central, Copperbelt, Eastern and Western Province areas of Mpika, Mbaia, Chinsali, Isoka, Kaoma, Mpongwe, Luanshya, Kabwe/Kapiri Mposhi, Nyimba, Lundazi, Mfuwe, Petauke on a smaller scale. Additionally, available statistics indicated that there are over 6,000 honey hunters located mostly in Luapula, Central and Western Provinces.

Historical background: Between 1970 and 1990s, the beekeeping industry received substantial support from the Zambian government and donor agencies in terms of investments. However, after the 1990s, the Zambian beekeeping sector underwent deep restructuring. Whereas in the past, government was the main player in the honey sector involved in organizing the beekeepers and marketing honey and beeswax, the scenario changed thereafter. After a series of economic reforms, Government withdrew its direct support from the sector and gradually private sector players stepped in. The honey sector has been characterized by poor sector organization and lack of inter-professional communication during the period the private sector has been the key driver of the honey sector. Government and the private sector have to find a suitable platform for dialogue. In 2003 the Zambia Honey Council was formed to organize the honey sector in terms of establishing and strengthening beekeeper groups. For the last few years the AgriBusiness Forum (ABF) has given business development input to the sector and is the secretariat for the Zambia Honey Platform, an informal alliance of all stakeholders in the honey sector, including Government, which meets once a year to discuss and plan action on issues important to the honey sector.

National consumption: It is estimated that annual domestic consumption of honey in Zambia is 300 metric tonnes (MT) and 700 MT are used for beer brewing. (Agribusiness, 2006). About 50% of the domestic honey trade is consumed by rural populations, 36% is sold to traders, 8% is sold on the roadside, and 6% is traded in urban areas. The local trade of table honey is mostly informal and the formal sector comprises an increasing number of processing companies who supply, mostly, shops in urban areas. A number of NGOs also buy honey from beekeepers in their project areas (GoZ 2013). People currently active in the honey sector say that beer brewing may have been more dominant in the past but now that there is an improved market; beekeepers prefer to sell their honey.

1. Extract from the Tier II ‘Honey Sector Productive Capacity and Competitiveness Enhancement Project’.
The commercial beekeeping industry in Zambia is concerned with the marketing and sales of honey and limited beeswax. Local craft markets are reported to sell candles and some propolis items, however, other than these craft markets no other bee products are known to be sold locally or internationally.

5. SIGNIFICANCE OF THE HONEY SECTOR TO THE ZAMBIA’S ECONOMY

A successful apiculture industry can be a key component in the fight against poverty in Zambia. Production of honey and other bee products is an industry with low entry barriers and one which can be done on a scale from one hive to thousands per producer and with traditional hives, low start-up investment of currency. The low barriers to entry allows for empowerment of the economically disadvantaged producers to move themselves out of poverty through market driven activities. The low entry cost and ability for those at the bottom of the income pyramid to perform the duties of a beekeeper allows for a wide range of economically challenged individuals and communities to profit from apiculture.

Earlier studies have clearly identified that apiculture can provide poor individuals, families and communities with a market driven means of moving beyond poverty to higher income opportunities. The export sales and regional demand will contribute significantly to the GDP while helping those at the bottom of the economic pyramid.

Currently, the industry has an estimated 20,000 beekeepers throughout the country producing around 1200 MT with a range from 600 to 1200 currently being estimated. There appears to be no Zambian apiculture products beyond honey and limited shipments of wax that are marketing outside of Zambia. Domestically there is a market for small scale produced lip balm, candle and other wax based products. There have been some wax exports to Germany and the USA from Zambia, however, this has been sporadic and relatively of little impact on the industry or economy.

Table 3: Zambia wax exports 2013

<table>
<thead>
<tr>
<th>Importers</th>
<th>Exported value 2013 (USD thousand)</th>
<th>Trade balance 2013 (USD thousand)</th>
<th>Share in Zambia’s exports (%)</th>
<th>Exported quantity 2013</th>
<th>Quantity unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>33</td>
<td>29</td>
<td>100</td>
<td>23</td>
<td>Tons</td>
</tr>
<tr>
<td>Germany</td>
<td>31</td>
<td>31</td>
<td>93.9</td>
<td>22</td>
<td>Tons</td>
</tr>
<tr>
<td>United States of America</td>
<td>2</td>
<td>2</td>
<td>6.1</td>
<td>1</td>
<td>Tons</td>
</tr>
</tbody>
</table>

(Trademap, 2013)

Higher value apiculture products including royal jelly, propolis, and pollen are not currently harvested or marketed in Zambia. Honey Beer is the major domestic use for honey and due to the nature of the production of honey beer much of the honey produced never sees the market and therefore statistics may under count the production of honey. This internal demand places a high demand on honey which keeps supply/demand equilibrium at a high price.

These higher value apiculture products are not currently harvested or marketed at their full potential in Zambia because of several factors including – education, quality, market information and ability to collect from traditional hives.
HARVEST, PROCESSING, PRODUCTION & PACKAGING

6. ORGANIZATION OF THE HARVEST

6.1. HARVEST SEASON AND SEASONALITY OF COMPETITORS

Beekeeping in Zambia is supported by the Miombo woodlands that are dominated by Brachystegia [musamba] and Julbernardia [mutondo] tree species. These provide an excellent source of nectar for the bees. Brachystegias flower from September to give the October/November honey flow while Julbernardias flower from February to give the May/June honey flow. Zambia has a most conducive environment for beekeeping owing to an abundant forest cover, and indigenous knowledge and skills. Undoubtedly, Zambia has great potential to establish itself as the biggest supplier of organic bee products in Africa considering the country’s endowment of a significant resource base with plenty of land experiencing good ecological factors. The honey is produced from a total area of 9 million hectares of forest and woodland and North-Western Province has remained the major honey and beeswax producing area in Zambia.

Most commercialised honey in Zambia is produced by traditional bark hive beekeepers. The two main honey flows in Zambia are October-November and May-June. Harvest should start immediately after the honey flow. The two seasons produce a different colour honey because of the specific flora in bloom at the time of the honey flow. The May-June season produces a golden colour honey from the predominant Julbernardia tree and the October-November season produces a dark amber honey from the predominant Brachystegia spp. The dark honey is valued as being more medicinal in many parts of Africa. Quality is improved by training and by purchase of comb honey which is processed in factory conditions and sold in bulk to export markets and in retail packaging for local and export markets.

In terms of seasonality of competitors: Zambia is the only country in the region which does not import honey on a regular basis. The Kenyan season: Jan-Mar and Aug-Oct, is slightly later than the Zambian honey seasons and Kenya is not exporting to Europe as they have lost their 3rd country status for honey (see on EU requirements below). Tanzania and other SADC countries have similar seasons to Zambia. Ethiopia exports throughout the year from different parts of the country (Ethiopia straddles two climatic zones) and could be considered a competitor but has such an enormous in-country market and there is such a big global market for quality honey that competition with Zambia is unlikely.

2. Small-scale woodland-based enterprises with outstanding economic potential; "The case of honey in Zambia" G. Mickels-Kokwe; Published by Center for International Forestry Research, Jl. CIFOR, Situ Gede, Sindang Barang, Bogor Barat 16680, Indonesia, Tel.: +62 (251) 622622; Fax: +62 (251) 622100; E-mail: cifor@cgiar.org; Web site: http://www.cifor.cgiar.org
6.2. ORGANISATION OF HARVEST

Beekeepers registered and trained by buyers are distributed with buckets with well closing lids. They are trained in better harvest techniques including the minimal smoking of bees, not to smoke the honey but rather smoke themselves, particularly to disguise the smell of a sting which excites the bees to sting more. Harvesters are encouraged to segregate the different colour combs into different buckets. Beekeepers with hives deep in the forest might camp there during harvest and could use bicycles to help bring the filled buckets out. This is usually a group activity with many from a family or village involved in the harvesting.

6.2.1. Absconding Bees

Zambian bees tend to abscond but this is also thought to give them their health. However, absconding is exacerbated by use of too much smoke and disturbance of harvest, even if the brood is left in the hive. Local thought is that Zambian bees may have an absconding gene. They are strong and not docile. In other regional countries it has been documented that proper hive management can minimize absconding.

6.2.2. Quality Management

Poor quality honey (unripe, high moisture, containing pollen or brood, smokey flavour or odor) is rejected by most buyers. Such honey easily ferments. Apart from potential rejection, it is not known for a premium to be paid to beekeepers for better quality. Additionally Fair Trade certification would return a premium to be used for development by the beekeeper group. Mpongwe Beekeeping Enterprise (MBE) does indicate in their Organic procedures manual that an organic premium paid would also benefit the beekeepers. However this is not an organic certification requirement.

Rivendell Enterprise (Bee Sweet brand) based in Luanshya have a system of beekeeper outgrowers who are being supplied with improved top bar hives which naturally separate brood from honey. The beekeepers agree to be assisted with harvest by trained mentors paid a percentage of honey bought. The hives are placed high in trees with simple and fast pulley system. Honey filled top bars are cut into the buckets with no handling of combs. Buckets are immediately sealed, weighed and taped with details of beekeeper and harvester, ready for transport to the Rivendell processing factory. This system is one of the ways to optimise the quality of the honey produced.

6.2.3. Sustainable harvesting protocols

In a Top Bar hive only full honey combs may be cut off the bars, and the bar not yet capped should be moved towards the brood. The other bars with less honey or less comb drawn should follow and the empty (just harvested bars) should be placed at the far end. During this action beekeepers are instructed to use as little smoke as possible in order to minimize contamination of the honey with a smoky flavor.

The fully capped combs are then placed in a dish or container. These are ready for extraction.

The beekeeper is instructed to leave enough honey for the bees to continue their production of honey. Towards the end of the honey flow beekeepers leave at least two fully capped combs for the bees as well as all the unfinished combs further away from the brood section.

It is good practice in obtaining top quality honey to leave capped honey comb for an extra week (or two) so the bees can dehydrate the honey better. The disadvantage is that the beekeeper must regularly empty top bars otherwise the bees may find there is not enough storage space and they may stop collecting or even abscond. This process disturbs the colony and disrupts nectar collection.
Frame hive. When using Frame hives the best practice is to keep on adding supers (the Supers are the additional boxes added to Langstroth hives as needed to increase honey production capacity and quality. The queen is prevented from accessing the upper chambers (supers) and therefore there is no brood in the combs, which creates a better quality honey than when the queen can access all parts of the hive, above the brood box (with queen excluder) until the end of the major honey flow. The beekeeper is instructed to add an empty super when the last one is filled for 2/3 rds. The great advantage here is that the colony is the least disturbed thus able to continue their hard work of harvesting nectar and producing honey. Once the honey flow has stopped the beekeeper may now collect the supers in their totality, ensuring to leave at least one super for the bees to survive the winter (limited flora) months. The supers can be taken by using a bee escape board thus allowing as many bees to be undisturbed and survive as possible.

Traditional hive. When harvesting traditional hives the beekeeper opens the hive at the far side away from of the entrance. The beekeeper proceeds to cut away comb with honey only. Once they reach brood combs they stop the harvesting and close the hive immediately as tightly as possible. The disadvantage here is that the harvester has to cut away newly drawn comb not yet filled with honey, honey comb with young honey not yet capped and s/he may even (unintentionally) cut away brood-comb. The colony is most disturbed when residing in this type of hive. As a result the harvested quantity may be low; the bees may get very aggressive and/or abscond.

Moving bees. For efficiency and to minimize aggravating the bees they should be moved in the early hours of the evening when the entire colony is inside the hive, busy with cleaning, making honey, drawing out comb and ventilation. The opening should now be closed preferably with a single newspaper sheet. The hive with its contents should be moved at least 3 kms from its original place. The newspaper can then safely be removed from the entrance and the bees will wake up in a new and hopeful nectar rich environment. If a hive needs to be moved within the apiary/compound one can move the hive 1 meter every other night until the final destination has been reached.

6.2.4. Modern hives versus traditional hives?

The fact that apiculture has positive impact on the environment through the benefits of bees to the ecosystem, the benefits of market driven conservation of available forest resources, decreased forest devastation through the use of modern hives versus traditional hives and the economic benefits of “organic certified” production adds to the social benefits of apiculture. Increasing efficiencies of the apiculture industry in Zambia by utilizing modern hives rather than traditional hives could eliminate the existing negative impact of bee keeping in Zambia. (The primary negative impact of beekeeping in Africa is a result of killing the trees through production of traditional hives.) Therefore the movement to modernization increases incomes of producers while also positively impacting the environment, truly a win for business and a win for the environment.

Zambia appears to be at a crossroads with a fundamental question to be answered by the stakeholders; what is the best way to grow the industry – modern hives or traditional hives. The greatest challenge to the industry is the question if century old traditions and villager who have learned the old ways would have an interest to be trained to be modern bee keepers, or even if that is what would be of the greatest benefit to society and the economy?

Many factors influence the answer in the debate over modern hives versus traditional hives and processing technique including:

c. Will Zambian bees accept modern ground level hives?

d. Will Zambian beekeepers adapt to modern beekeeping techniques?

e. How can the transition to modern beekeeping be funded?

f. What are the organizational and individual roles in advancing integration of modern hives in Zambia?
While these factors impact the adoption rate of modern hives, the economic benefits of modern hives are well documented and with the expansion of the use of modern hives, apiculture can be a gender-neutral industry with women and men participating at all levels of the value chain. The largest issue to face is overcoming tradition and pre-conceived ideas about modern hives.

There is a handful of leading honey processing companies in Zambia and during the Honey Road map Workshop, the consensus was that a consistent supply was a major hindrance to the export expansion of Zambian honey. Modern hives would overcome the inconsistency of supply, but only if adopted and accepted by bees and beekeepers alike. Please see below pictures of bark hive production.

Figure 1: Bark hive production

This report includes an example of a potential for a public private partnership (PPP) (see Annex document) that would include a potential commitment from an international buyer to not only provide technical assistance and modern hives to Zambian producers, but most importantly, providing a standing purchase order to purchase their output at a globally acceptable price. This therefore provides a situation where the producers are producing product that has a ready buyer rather than producing a product that they hope to sell at an acceptable price. Many development projects teach producers to produce more products without fully understanding the market and without direct involvement from buyers. The roadmap for this program teaches producers to produce to the market demands and includes all of the steps, tools, training and funding to accomplish this objective. Having the buyer committed to purchasing the product and working with all levels of the value chain also eliminates or minimizes capital requirements for honey purchases as this would be funded by the buyer through the mechanism of the transactions.
7. **STORAGE**

7.1. **STORAGE AND PROCESSING EQUIPMENT**

Beekeepers are encouraged to bring their buckets to a bulking/collection centre (there are more than 100 such centres in Mwinilunga district of North Western Province). Some bulking centres have been built with donor support through NGO’s. Some are built by or rented from beekeepers and dedicated to honey storage. They are usually just a room built of bricks with tin or thatch roof and lockable door. However beekeepers may start by keeping their buckets at home and bring them to the bulking centre when sufficient buckets are known to have been filled for the beekeeping group leader to call in the buyer. In accordance with organic traceability requirements and programs requiring traceability, beekeepers are expected to bring the filled sealed buckets directly to the supervised collection points. To obtain organic certification the beekeepers are annually internally inspected and this includes any homestead processing or storage. The exporting companies prefer to buy comb honey and process at their factories for better management of quality. At purchase of comb honey moisture testing is done with a refractometer, honey must be ripe and buckets are checked that they do not include brood or pollen.

Processing: Some projects have distributed presses and centrifuges to beekeepers and there is a small amount of home pressing or more traditional types of honey and wax extraction using heat of sun or fire. Too much heat destroys the enzymes of honey and causes it to reflect badly in the HMF testing. (HydroxyMethylFurfural is an aldehyde, which can be used as an indicator of honey quality).

Some projects such as ZHC organise the pressing at the bulking centres. Beekeepers are trained in quality processing methods through the training, but it is not clear how quality would be monitored at bulking centres. At the factories there are usually facilities for controlled warming below 40 degrees, dripping or pressing or centrifugal extraction, settling and filtering processes for honey and wax washing, heating and processing. Samples of Honey for export are usually sent for HMF testing in the buyer country and the better the HMF results, the better the export price offered. The Zambia Bureau of Standards now has HMF testing facilities but their labs are not yet accredited.

7.2. **ORGANIC STORAGE MANAGEMENT**

Beekeeping organic training includes that storage should not allow contamination of organic honey and it must be separated by time or place from non-organic honey and possible contaminates. At the bulking centres a group representative is in charge of the storage area and will ensure it is kept clean and dedicated to honey storage. At the honey processing factories the raw material is stored separately from finished product. Cleaning of storage areas or shared equipment must be recorded before use by organic products. Therefore storage management for organic requirements requires dedicated storage by place or time and recorded cleaning of storage areas. In line with organic traceability requirements from hive to final buyer, stock must be recorded into and out of raw and processed storage, including name of the buyer of finished product.
8. PRODUCTION

8.1. PRODUCTION CAPACITY

Traditionally, Zambian engagement in bee keeping has been a part-time affair mainly practiced off the farming season as an alternative source of income. Increasingly, however, communities have recognised that bee keeping can in fact be a fulltime activity with potential to greatly uplift the living standards of the many communities. As such, many are now treating bee keeping as a business. The honey industry now engages well over the estimated 20,000 beekeepers country wide and additional 6000 honey hunters referred to in the report, A Road map for Developing the Honey Sector of Zambia, 2007

The major commercial bee products in Zambia at the moment are honey and limited beeswax amount while the production and trade of the other bee products such as royal jelly, pollen, venom and pollination services are yet to be promoted and exploited. However, globally these products are highly sought after for medicinal and pharmaceutical uses. The provincial submissions at the Annual Zambia Honey Partnership (ZHP) forum meeting of 2012 revealed that there were about 22,438 active beekeepers (producers) and sold 1,407 and 5 tonnes of honey and beeswax respectively in the 2011/2012 period.

Although Zambia is estimated to have honey production capacity of over 30,000 metric tons, official statistics indicate that 600 metric tons of honey was produced in 2008. It is universally acknowledged that this number is not accurate due to the informal honey market and the sales for the honey beer industry. Export earnings from the sector were about US$670,000, depicting a meager 0.03% contribution to overall exports of goods from Zambia, and 0.06% of global honey exports. North-Western Province has remained the major honey and beeswax producing area in Zambia and it accounts for at least 90-95 per cent of commercial domestic production and 100% of honey exports. Other notable areas of production especially for the local market include Western Province, Central Province, Eastern Province and Northern Province on a small scale basis. Furthermore, according to the International Trade Centre COMTRADE statistics, Zambia’s honey exports represented 0.03% of the world exports in 2008.

In the Report ‘A Road map For Developing The Honey Sector In Zambia’, produced by the stakeholders of the sector in collaboration with the Ministry of Commerce, Trade and Industry and ITC (International Trade Centre, Geneva), February 2007, it is reported that Zambian beekeepers have the potential of increasing the honey product officially marketed from around 1,000 metric tons of honey annually to at least 2,500 metric tons of honey within three years. Given this level of growth estimates, it is anticipated that the beeswax production yield would constitute 200-300 metric tons realized from each 1,000 metric tons of honey produced annually. Thus the Honey sector is of great importance to the Zambian economy in that it not only contributes to foreign exchange generation but also to poverty reduction by generating employment. Community based bee enterprise also enables its members greater capacity to mitigate against the shocks of extreme climate changes that renders most agricultural enterprises inactive, and incentivizes community lead environmental conservation of the natural resources, from which bee products are derived.
Much of the honey in Zambia is produced in traditional Bark hives whose management and practices are basic and subsistence without involving any manipulation or supplemental feeding of the colonies. However, this type of beekeeping is destructive to forests as it involves the debarking of trees; hence the need to promote alternative hives such as Top bar hives and Langstroth frame.

The practice of queen breeding to increase bee colonies has also not been promoted widely hence repeated incidences of low yields due to the absence of sufficient and strong colonies to occupy hives.

The lack of designated areas for beekeeping has also been a hindrance in the development of the sector with most good beekeeping forest areas being encroached upon by other competitive land uses such as agriculture, infrastructure and resettlement, fuel wood, mining, timber and others which contribute to deforestation. Therefore there is need to designate some forest areas as bee forest reserves for beekeeping which can be sustainably managed and protected from plant pest attacks and diseases, late fires, deforestation, pollution and pesticide application. The other challenges affecting production in general are lack of quality and affordable beekeeping equipment such as modern hives, protective clothing, honey presses and cropping tools. While most of these are locally sourced, it is important to ensure that quality standards are prescribed and maintained.

Furthermore the choice bark utilized for traditional hives comes from larger (older) trees and therefore the expansion of traditional hives has a negative impact on the forest through the necessity to kill larger trees to produce the desired hives.

The existing assumption is that Zambia has suitable environmental conditions for beekeeping and that the sector therefore has great future potential to positively contribute to Zambia’s economic growth and poverty reduction. However, for Zambia to exploit the potential it currently has requires a far more pragmatic approach to redressing the constraints affecting the sector’s different stages of the honey value chain.

8.2. PRODUCTION CHANNELS

As a matter of description there are basically three production channels operating in Zambia; (i) individual subsistent production, (ii) communal production and (iii) commercial production channel. It is difficult to get data showing percentage of honey produced by these channels, but in most channels beekeeping is carried out mostly by using traditional hives, at household level and account for the subsistent production channel.

i. Honey is produced at household level as subsidiary income generation activities. This channel accounts for large percentage of honey and beeswax produced in Zambia.

ii. Communal production system is another form of production channel practiced by groups of beekeepers. Hives are owned communally by all members. The practice is intended for commercial production as honey produced is for selling; but on the other hand, the level of production per individual is still very low as to be considered subsistent.

iii. Commercial channel of production is emerging in the country. Individuals beekeepers and to a small extent groups of beekeepers are embarking into commercial beekeeping. Few large scale commercial bee product companies have developed over recent years and are responsible for the total export volumes and most of the formal retail honey within the national market. However, the informal/unofficial market supplies the greatest percentage of national and regional honey consumption.
9. PROCESSING CAPACITY

Good management practice and food safety are big issues that include everything from thatch roof to epoxy floor. The factories of the two traditional exporting companies Forest Fruits and MBE visited are well built large buildings with floors that can be regularly cleaned by mopping. These two facilities have capacity of 1000 ton and 500 ton respectively. There is a 60 ton capacity processing factory at COMACO in Eastern Province. There is a processing factory at Kabompo in North Western Province (condition and capacity not yet established) used in the past by North Western Beekeepers Project. However, reports of recent rejection for food purposes of a container of honey to UK from Kabompo might mean that the facility, equipment or processing technology needs upgrading. Kaoma in Western Province under Forestry Department have a well-equipped factory but it is not in use because Forestry does not currently have a budget for honey purchase. There is a recently refurbished GRZ Forestry Department factory at Mwekera, In Kitwe, Copperbelt Province (capacity 30-50 ton if they manage to get new processing equipment). Also on the Copperbelt is Bee Sweet factory with 300 ton capacity at Luanshya which they plan to expand. There is also a processing facility in Lusaka under Ubuchi, capacity about 250 ton when current automated equipment just arriving is installed. Northern Province Lua Lua Cooperative has a processing facility with manual presses which can produce 1 ton per day during the season. They are producing about 8 ton per year currently because not enough honey is being produced by their beekeepers.

The on farm processing by beekeepers is not conducive to quality processing procedures, using wood fires or sun for warming and processing or even home presses. Furthermore conditions are usually dusty or sandy with no control on equipment washing. EDZ are producing about 80 ton at their Kitwe facility, most of which is being exported to Zimbabwe. They want to move their processing to Kabompo in North Western Province and would like to access improved processing equipment.

Just as beekeepers need training in quality management of honey harvesting, processing also has quality parameters which need to be learned and applied. One of the problems with honey presses is that often bees or bee matter gets pressed along with the combs. Another issue is that heat needs to be controlled below 40 degrees or quality is lost.

These issues are not well known across the industry and there is need to share information with producers in the region as to the most cost effective equipment and procedures that can produce the highest quality.

10. MAIN PRODUCTION AREAS

A report from 2009 by Kommerskollegium titled “National Board of Trade Report – A Case for Zambian Honey Exports” includes the following section:

Among the formal honey buyers are also the NGOs that buy honey from producers in their operational areas, e.g. Kaloko Trust in Masaiti, Mpongwe Beekeeping Enterprise in Mpongwe and Environment & Development in Kitwe. These NGOs have started as projects or service providers to community projects and have evolved into semi-private enterprises. Most of them obtain a subsidy for their operations, mostly indirectly through free premises, subsidised transport and/or work force. These NGOs attempt to establish partnerships with community-based organisations and donor agencies to develop their business, often a form of “contract bee-farming”. The NGOs operate on a principle of introducing “modern beekeeping” using the frame or top bar hives.
These companies grade, filter and bottle the honey and distribute them under the trade name of Zambian Forest Honey to retail outlets in the U.K. In 1994, NWBP passed the Body Shop “Trade Not Aid” assessment, which opened a market for organic honey and beeswax in the fair traded cosmetics industry globally. In May 2003, NWBP obtained fair trade status also in Germany (May 2003). NWBP is currently not a market player as it went under. However, North Western Bee keepers Association does exist up to now but the beekeepers are not currently organic or fair trade certified.

10.1. NORTH WESTERN PROVINCE

This province produces most of Zambia’s honey and predominantly from the centuries old bark hive tradition. Trapping and keeping of bees in hives was first recorded in the Angolan part of the miombo belt, among the Mbunda in Eastern Angola, in 1594.

The North Western Province is currently producing 1000-1200 tons into local, regional and international markets. Usually more than 50% of this is exported, the bulk of which is organically certified. Forest Fruits and Mpongwe Beekeeping Enterprises (MBE) who are organic and in conversion certified respectively, get their organic honey from this region. Also main suppliers of the local retail market like Ubuchi, EDZ, Cupem Investments, Munati, and Mesh get their honey from this province, buying direct or through traders. Ubuchi has started to also export to Europe (Germany) and EDZ and MBE are also exporting to the region (Zimbabwe, Botswana and South Africa). If one included locally...
produced honey beer/wine the production figure from the province is likely to more than double. However, beekeepers would sell or use the lower quality harvest for this market. Within this province, Zambezi district has not developed its production potential (according to Forest Fruits and North Western Beekeepers Association (NWBKA) Manager) mainly because of distance and poor roads.

Typically, organic certified operations require formation of beekeeper groups and always clearly documented traceability of the honey from forest to final customer. Northwestern Beekeepers Association (NWBKA) were the first beekeepers to be certified Organic (Soil Association) and Fairtrade (FLO) in 1984. “In 1987 NWBP organised the beekeepers into groups in each of 350 villages and trained them to comply with international export standards of hygiene. The beekeepers were also issued with buckets and honey presses. At the end of the honey harvest NWBP dispatched 4WD trucks to negotiate the long sandy tracks leading to isolated villages. The honey was purchased in buckets and transported back to Kabompo where it was graded and packed into 300 kg drums for export.” (NWBP profile – Tropical Forest Products Ltd, UK, 2011).

It was reported by ZHC during this study that NWBKAssociation and NW Province District Councils (except Solwezi) have shares in NWBProject which was set up to be the management company of NWBKAssociation, to manage the Kabompo factory and buy and market the honey. The beekeepers are in charge of the bulking centres and can sell to anyone. Apparently there can be clashes in the field between buyers, especially if one of them has distributed buckets. This study has not managed to ascertain the exact current situation with NWBKA except that for some years the management company, NWBP, has not been functioning and the beekeepers are no longer Organic and Fairtrade certified.

Forest Fruits Zambia Ltd. (FFZ) is a private company, based in Mwinilunga. An interview with the MD for this study revealed the following: “The company started buying honey in Eastern Mwinilunga in 1996 and gradually spread its purchasing network. A road map which has helped Forest Fruits to grow stronger over more than 10 years in Mwinilunga District of North Western Province is the mobilisation of beekeepers into groups, training, internal quality control mechanisms, and consistent reliability in purchasing the honey from the beekeepers at harvest. Optimal quality is maintained by centralised processing and certified organic product is dispatched in bulk and retail packs to both export and local markets. (FFZ has obtained organic certification within an area covering most of Mwinilunga district. Certification is done by the South African office of ECOCERT, a French company and therefore is widely recognized as legitimate.). This medium to long term approach that focuses on building the capacity of beekeepers and the company’s success is as a result of investing in its own beekeepers. This road map takes much time and cumulative resources to develop and maintain at the beekeeper level and has required determination despite knocks like erratic local currency fluctuations and other buyers who come into the region with donor subsidised funds to purchase a limited amount of honey at a higher price without having invested in organising the beekeepers. It is an impossible challenge for a buyer purchasing from thousands of beekeepers with trade finance to change price mid-season. NGO involvement which purchases product above the market price disturbs and distorts the market and provides only a short time advantage to those they buy from while penalizing the free market and creating unrealistic expectations. Forest Fruits feels that production should be driven by the buyer who must develop credibility with the beekeepers, provide training and production grows.

Forest Fruits added that “there should be a functioning processing unit at Kabompo under control of North West Beekeeping Project Company. However a recent revived attempt to import a container of honey from NWBP by David Wainright of Tropical Fruits, UK (a previously long standing customer of NWBP for organic honey) found the HMF level too high and the container was rejected as food and sold to Lush as body product. As a result, FF is reactivating its zone 6. Zone 6 is a Forest Fruits defined area of Mwinilunga District which borders on Kabompo District. Forest Fruits states that they do buy honey from Zone 6 when they are able. When they have not it has usually been due to donor interference in the marketplace.”
10.2. WESTERN PROVINCE

Kaoma has a very well equipped facility under management of Forestry Department. However it is not in use and their attempt to let private sector use it was not successful. This area has however not been successful for buyers to procure much honey, as mentioned previously.

Forest Fruits invested 2 years in Kaoma in Western Province but has pulled out because the province is too influenced by cotton and tobacco production. Ubuchi has also tried to develop a production base in Kaoma and Lukulu in Western Province but say there is not much honey. The forests are thick but the hives are mostly empty. Zambia Honey Council concurs that production is low in this Province.

10.3. NORTHERN PROVINCE

Lua Lua Cooperative based at Kasama has to travel 150-250 km to Mpulungu and Mpika to collect honey from beekeepers who they ask to form groups. There are about 1000 farmers but most are honey hunters or have traditional bark hives. Lua Lua also trains beekeepers and makes hives when they have an order. Lua Lua has managed to train about 200 in top bar hive management. They manage to purchase about 8 ton per year and say there is shortage of honey. At Kasama, Lua Lua Coop has a facility which can process 1 ton per day during the season using manual presses and filtering. They are currently processing only 8 ton per year, the limitation is a shortage of honey from their producers.

Provinces suggested by Forest Fruits to be in need of development of apiculture are Northern, Muchinga and parts of Southern. These have had little access to markets. The recent MBE baseline study under the EIF programme commented that many of the beekeepers in Northern Province are also honey hunters and the quality of their honey is poor. For baseline information from the ongoing EIF project please refer to annex document.

10.4. EASTERN PROVINCE

COMACO (Community Market for Conservation) trains farmers in agricultural production, purchases surplus for processing and markets within Zambia under the “It’s Wild” label. According to local sources they are currently buying about 60 ton of bee product and have recently purchased 1000 top bar hives from Rivendell Enterprises in Luanshya with plans for more.

They have the following number of organised beekeepers in the following districts: Nyimba = 3000, Lundazi = 800, Mfuwe = 1200, Petauke = 400. They process annually 35-60 tons of honey and 3-5 tons of beeswax. The main aim of COMACO is to increase farmer livelihoods through agriculture in order to reduce poaching from the national Luangwa Game Park. COMACO have not yet started to market their wax.

COMACO has processing facilities at Lundazi and Mfuwe (warming, honey presses and filtration).

10.5. COPPERBELT AND CENTRAL PROVINCE

This study finds that a total quantity of 50 -75 ton of honey comes from the Copperbelt and Central Province, particularly areas like Ndola rural, Mpongwe, Masaiti, Mkushi.

The GRZ Forestry Department Mwekera Forestry Factory, Kitwe was recently refurbished with Government funds and they intend to restart the purchasing and processing of honey as was done pre liberalisation in 1990. Their capacity is estimated to be 30-50 ton.
There is currently a big rollout of hives and training in the rural parts of the Copperbelt by Rivendell Enterprises (Bee Sweet brand) and production is anticipated to grow significantly from the 57 ton they produced last season.

Bee Sweet is the brand of Rivendell Enterprises based in Luanshya. They train beekeepers, supply top bar hives and have formed groups totalling initially 1750 beekeepers certified organic in 2013 and currently in the one-year conversion to organic required under organic beekeeping standards. They plan to eventually reach 20,000 beekeepers. They have in the last 2 years started distributing hybrid top bar hives and a pulley system to put these hives high in trees. This is thought to reduce absconding of bees. In 2013 they produced 57 ton (the 1st year which included harvests from the hybrid top bar hive) and estimate to produce 150 ton in 2014. In 2013 they sold to Forest Fruits 1.5 tons of wax. Their HMF testing result is good and they report that there is a good export and local demand for their honey.

Mpongwe Beekeeping Enterprises (MBE) based at Mpongwe has been involved in hive making, training, buying and bulk and retail selling since the 1990s when they were initially trained by professional beekeeper Horst Wendorf. (Horst Wendorf now partners Rivendell Enterprise and manages the Bee Sweet brand). MBE buy honey in Copperbelt, Central and North Western Provinces. MBE process in-conversion-to-organic and non-organic honey at their Mpongwe factory.

**Figure 3:** Rivendell Enterprise’s “Hybrid” modern top bar hive combined with traditional high hive placement and simple pulley hoisting system using a rope, bamboo pole with curved hook and flat iron bar which hooks hive over the branch.

**Table 4:** The MBE Baseline Report for EIF: included Table 4.0: Show the constraints/challenges hampering production in Northern and Copperbelt Provinces:

<table>
<thead>
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<th>Constraint/Challenge</th>
<th>Mbala (%)</th>
<th>Mpika (%)</th>
<th>Kasama (%)</th>
<th>Mpongwe (%)</th>
<th>Masaiti (%)</th>
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<td>2. Honey Badger</td>
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<td>3. Lack of know how</td>
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<td>16.7</td>
<td>45</td>
<td>16.3</td>
<td>13.3</td>
</tr>
<tr>
<td>4. Lack of equipment &amp; inputs</td>
<td>34.5</td>
<td>33.3</td>
<td>45</td>
<td>16.3</td>
<td>13.3</td>
</tr>
<tr>
<td>5. Lack of storage facility &amp; accessories</td>
<td>11.9</td>
<td>25</td>
<td>5</td>
<td>6.1</td>
<td>20</td>
</tr>
<tr>
<td>6. Organisation</td>
<td>7.1</td>
<td>0</td>
<td>0</td>
<td>4.1</td>
<td>0</td>
</tr>
<tr>
<td>7. Low price</td>
<td>0</td>
<td>8.3</td>
<td>0</td>
<td>28.6</td>
<td>13.3</td>
</tr>
<tr>
<td>8. Charcoal burning</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9. Poor market</td>
<td>21.4</td>
<td>16.7</td>
<td>0</td>
<td>28.6</td>
<td>13.3</td>
</tr>
</tbody>
</table>
11. CONTEXT

Domestically Zambia honey is mostly used as a beverage (fermented into an alcoholic beer or wine), as a sweetener and as a medicinal product (often mixed with other herbs and spices, such as a sore throat and cough cure). Very small volume is used as an ingredient in pastries and by pharmaceutical manufacturers. There are a small number of SMEs who use honey as an ingredient in the making of lotion, hair pomade and in soap. These non-traditional uses are not yet well established. A relatively small proportion of the population (mainly in the growing urban middle classes and the elite) consumes table honey. This means vigorous consumer sensitization and lower retail prices will be needed before a turn-around in this behavioral practice is achieved. Changes in cultural behaviour take time and it will be quite a while before noticeable increases in domestic consumption occurs. As referred to above, in the national market, sale prices are similar or higher than international prices which are Euros 1.8-2.5 for table honey – depending on quality.

The only honey by-product currently commercialised in Zambia is wax. Organically certified producers export their wax to organic export markets (see Table 11 this report). About 20 ton wax from organic beekeeping was exported in 2012 to Europe. According to conventional producers interviewed, wax has been exported to countries like South Africa (5 ton by MBE in 2013) and regionally to Tanzania (EDZ). Ubuchi has wax stored waiting to send it to not yet established market. It is also used locally for floor polish. Many of the beekeepers are not yet aware of the market demand for this by product. Other by products being produced on a very small scale, mainly for craft markets, include propolis tincture, lip balm, and candles. Products such as bee venom, royal jelly are not collected or marketed in Zambia. Mpongwe Beekeepers in the past produced honey beer/wine for the local market but produce very little currently. Honey beer is produced in most beekeeping communities for local consumption.

12. PRODUCT DESCRIPTION

Value addition of bee based products plays an important role in employment creation and enterprise development. In Zambia some of the value-added products are used for example in candles, health-care and body-care product ranges and Nutraceuticals. Please find a full description below of the different marketed bee products.

8.– Only Germany and France imported – and apparently 1 container load as it was 13 tons and 16 tons respectively in 2012 with total wax exports of 30 tons and only 23 in 2013 with Germany at 22 and the USA at 1 ton.
Table 5: Description of the different marketed bee products

<table>
<thead>
<tr>
<th>Bee Product</th>
<th>Production methods</th>
<th>Processing methods</th>
<th>Packaging</th>
<th>Markets and retail</th>
<th>Price guide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honey</td>
<td>From traditional /intermediate /modern hives. Or wild harvested</td>
<td>Centrifuge (manual and electrically operated). Crushed (for national and local markets only). Gravity method Refining processes (such as straining or water jacketed settling tanks operated at 25-30 degrees C). Vacuum line and automated systems are used by medium and large enterprises.</td>
<td>For export bulk market the processed honey must be stored in sterile, hermetically sealed suitable containers: steel drums, Polypropylene etc. In limited circumstances export of retail packed honey is possible. High quality packaging materials are required and will need to be imported into Zambia (proposed use of EPZ facility to reduce tax).</td>
<td>Markets range from local (village shops, roadside, market), national (grocery stores, supermarkets, health food shops) to international (mostly bulk sales of at least 20 tonne (container load) consignments). Retail packaging: 20/ 50/ 500 and 1000 gm jars (most commonly in 350 gm(16 oz imp.) jars in international markets) noting that the US market may require it supplied to its own imperial system, but include metric to for any shipping to Canada.</td>
<td>Bulk table grade honey average C&amp;F is Euros 1.30-1.40/kg and Euros 1.90-2.50/kg for organic certified up to 3.20/ kg for single flora organic fairtrade,* (Minimum FLO price Euros 1.30/ kg). The current UK price from smaller scale importers for single flora is C&amp;F bulk price Euros 2.10 to 2.40/ kg and multiflora at Euros 1.80-2.30/ kg. Prices are affected by quality, flora and volume. In Europe in the retail packed form honey sells at Euros 7-15/ kg. In Zambia crushed honey locally retailed sells at equiv Euros 1.20-3.50/ kg</td>
</tr>
<tr>
<td>Table grade honey</td>
<td>As above</td>
<td>As above</td>
<td>As above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comb honey</td>
<td>As above</td>
<td>As above</td>
<td>As above</td>
<td></td>
<td></td>
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<tr>
<td>Liquid honey</td>
<td>As above</td>
<td>As above</td>
<td>As above</td>
<td></td>
<td></td>
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<tr>
<td>Creamed honey</td>
<td>As above</td>
<td>As above</td>
<td>As above</td>
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</tr>
</tbody>
</table>

* As a food ingredient

It may be worth exploring/ researching any indigenous trees/ flowers that could provide health benefits and claims for a particular honey. The dark color of most Zambian honey may indicate a high level of mineral content which would provide some health benefits from its consumption. This needs to be tested. It could follow the example of Manuka Honey from New Zealand which is sold at a high premium globally due to its health benefits

Locally, nationally and internationally through trader and wholesalers and pharmaceutical suppliers

To be determined based upon what health benefits are documented through scientific study and publication of results.

* Another example of prices derived from the Parodi company (large international honey buyer), stated that the market price which is currently $3.50 USD per kg for organic Fairtrade FOB in Ethiopia which is Euros 2.74 per kg – FOB.
<table>
<thead>
<tr>
<th>Bee Product</th>
<th>Production methods</th>
<th>Processing methods</th>
<th>Packaging</th>
<th>Markets and retail</th>
<th>Price guide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mead/ wine/ beer</td>
<td>As above</td>
<td>Brewing process. The honey can be pasteurized and added to the beer mixture at the beginning of the process. Unpasteurized it can be added towards the end.</td>
<td>Retail packaging – glass bottles</td>
<td>Markets ranging from local to national and potentially regional market also.</td>
<td></td>
</tr>
<tr>
<td>Medical applications such as treatment of wounds</td>
<td>As above</td>
<td>As above</td>
<td>As above</td>
<td>Markets including local villages and hospitals and nationally and internationally through traders and wholesalers. Local retailers and supermarkets and health food stores, also nationally and internationally. Pharmacies</td>
<td>To be determined based upon what health benefits are documented through scientific study and publication of results</td>
</tr>
<tr>
<td>Beeswax</td>
<td>From traditional/ fixed comb or moveable comb hives</td>
<td>Wax is taken off the honey comb frame by hot water extraction/ steam extraction/ centrifugal extraction either manually or powered/ solar wax extraction/ squeezing or pressing method. Most methods can be used by small to medium enterprises. Wax melted at 62-70 degrees and poured into moulds. Dry and tap out.</td>
<td>Bees wax must be stored in sealed grease proof packaging to restrict moisture contact. High quality packaging not particularly needed to sell in bulk/ export. Retail packaging can be adapted for the market i.e. pretty material from local batiks or paper.</td>
<td>Markets range from local – i.e. Local villages, roadside market, to national – pharmaceutical suppliers and traders, wholesalers, retailers, manufacturing to international – pharmaceutical suppliers, retailers of natural products and manufacturing. Sales can be of any size to retailers from 25 kg up.</td>
<td>In global markets beeswax prices range from euros 2.50 – 8 per kg for light-coloured wax, occasionally peaking at Euros 10-15 kg. Prices on organic beeswax not readily available though it has been reported to fetch a premium of 30-40%. In Europe the pelletised organic beeswax retails at Euros 25 per kilo. World price is currently around US $ 4-10 / kilogram. There is as yet no registered Fairtrade beeswax in Zambia currently.</td>
</tr>
<tr>
<td>Candles</td>
<td>As above</td>
<td>Production/ Extraction as above. Can be mixed with unrefined coconut oil/ Paraffin Wax and poured into moulds around a wick (cotton is commonly used). Essential oil and perfume fragrance scents can also be added as can dyes to produce different colours. All methods are very suitable to small and medium enterprises.</td>
<td>No exact packaging needed but selective retail packaging can be used depending on the market.</td>
<td>Markets – local and villages, local, national and international retailers. The catholic and Orthodox church. Local tourism such as hotels and safari lodges. Online options such as Amazon and Ebay.</td>
<td>There is a large market for beeswax candles and varying prices from local to international. An example is a small church pillar candle retails at approximately Euros 6.00 per candle.</td>
</tr>
<tr>
<td>Bee Product</td>
<td>Production methods</td>
<td>Processing methods</td>
<td>Packaging</td>
<td>Markets and retail</td>
<td>Price guide</td>
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<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Cosmetics</td>
<td>As Above</td>
<td>The beeswax would probably be taken by a trader to be used in the manufacturing of cosmetics. It could also be used in small scale manufacture for local sale in e.g. Creams.</td>
<td>No exact packaging needed but attractive packaging needed for local sales.</td>
<td>Markets range from local small scale and sale into tourist avenues or road side stalls to sale to traders/wholesalers/ pharmaceutical suppliers nationally and internationally.</td>
<td>Cosmetics market hard to penetrate due to significant legal requirements and would need to be done through a representative and traders.</td>
</tr>
<tr>
<td>As a food ingredient</td>
<td>As above</td>
<td>As above</td>
<td>As above</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very hard to get into the international market due to the legal requirements for food grade wax and would need to be done through a representative and traders.</td>
</tr>
<tr>
<td>Raw propolis</td>
<td>Collected from any type of hive. Easiest if a collection grate is used in the hive. The propolis can be scraped out of the hive using a simple knife or spatula. The average global production of propolis per colony per year is 10-300g</td>
<td>Can be used raw. Needs to be cleaned of wax and debris. Can be extracted using solvents/ alcohol to make a tincture. All methods can be used by small to medium enterprises.</td>
<td>Should be packaged in dark, air tight containers to prevent UV and moisture damage and kept away from direct heat. No exacting packaging needed. Attractive retail packaging would be needed for local sale, though local demand does not exist currently due to lack of knowledge and therefore demand</td>
<td>Markets range from local and roadside stalls and local tourism, to national and international cosmetics and health food. Also local and national/ international retailers</td>
<td>International prices for raw propolis are currently between Euros 18-25/ kg. In Kenya currently selling for as much as 4,750 Kenyan shillings/ kilo. There is no registered Fairtrade propolis as yet.</td>
</tr>
<tr>
<td>Herbal Supplements/ tinctures</td>
<td>As above</td>
<td>The processing would be undertaken by another company</td>
<td>As above</td>
<td>Markets are generally national through sales through wholesalers and traders and also internationally</td>
<td></td>
</tr>
<tr>
<td>As an food ingredient</td>
<td>As above</td>
<td>The processing would be undertaken by another company</td>
<td>Markets are generally national through sales through wholesalers and traders and also internationally</td>
<td>Very hard to enter the international market due to the legal requirements and would need to be done through a representative and traders.</td>
<td></td>
</tr>
<tr>
<td>Bee Product</td>
<td>Production methods</td>
<td>Processing methods</td>
<td>Packaging</td>
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<td>Price guide</td>
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<td>--------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Pharmaceutical applications</td>
<td>As above</td>
<td>The processing would be undertaken by another company</td>
<td>Markets are generally national through sales through wholesalers and traders and pharmaceutical suppliers also internationally through the same channels</td>
<td>Pharmaceutical market costly to penetrate due to significant legal requirements and would need to be done through a representative and traders.</td>
<td></td>
</tr>
<tr>
<td>Pollen</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Raw pollen pellets</td>
<td>A trap can be set up in the entrance to the hive which takes the pollen off the bees’ legs. It is then collected in the trap. In humid climates this trap needs to be emptied daily. This is nearly impossible with traditional hives placed high in the trees over a large geographic area.</td>
<td>Care needs to be taken that the pollen is not contaminated by pesticides. Which means that it is best to produce in a certified organic region. The pollen needs to be dried – this is achieved by using a normal light bulb suspended over the pollen, loosely covered with foil to avoid heating to over 45 degrees centigrade. All methods can be used by small to medium enterprises.</td>
<td>Should be packed in dark containers to protect from UV light. Such containers may need to be imported into Zambia to ensure quality.</td>
<td>Markets range from local roadside stalls and tourism such as hotels to national through sales through wholesalers and traders and pharmaceutical suppliers also internationally through the same channels. Also local national and international wholefood and health food retailers.</td>
<td>Dried pollen in the USA ranges from euro 15 per kilo wholesale to euros 12 – 25 per kilo retail. There is no registered Fairtrade pollen as yet.</td>
</tr>
<tr>
<td>Health food supplement</td>
<td>As above</td>
<td>The processing would be undertaken by another company</td>
<td>Markets range from local traders and wholesalers to national and international wholesalers and traders.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmaceutical applications</td>
<td>As above</td>
<td>The processing would be undertaken by another company</td>
<td>Markets range from local, national and international pharmaceutical traders.</td>
<td>Pharmaceutical market hard to penetrate due to significant legal requirements and limited production</td>
<td></td>
</tr>
<tr>
<td>Bee Product</td>
<td>Production methods</td>
<td>Processing methods</td>
<td>Packaging</td>
<td>Markets and retail</td>
<td>Price guide</td>
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</tr>
<tr>
<td>Royal jelly</td>
<td>From moveable comb hives. Some hive modifications may be needed. Produced commercially by stimulating colonies to produce queen bees outside the conditions they would normally be produced in. May need expert personal and is more time demanding.</td>
<td>Larvae are removed to access the jelly. Jelly then filtered using a very fine net of i.e. Nylon. The extraction needs to be done by specifically trained individuals but this is within the remit of small to medium enterprises.</td>
<td>Glass vials or food grade plastic containers. Avoid excessive exposure to air and keep refrigerated and away from sunlight. Containers may need to be imported into Zambia to ensure quality.</td>
<td>Markets range from local and roadside to national and international</td>
<td>China is currently the largest supplier. Currently based on this, the prices are Euros 50-80 per kilo. Local prices in different countries can vary considerably and be much higher – euros 100-180 per kilo. There is no registered Fairtrade Royal Jelly as yet.</td>
</tr>
<tr>
<td>Health Food Supplement</td>
<td>As above</td>
<td>As above and then sent for processing via traders</td>
<td>Markets range from local traders to national and international traders and wholesalers.</td>
<td>Markets range from local traders to national and international traders and wholesalers.</td>
<td>The price increases once processed and in tablet form and varies significantly depending upon final product</td>
</tr>
<tr>
<td>Food ingredient</td>
<td>As above</td>
<td>As above</td>
<td>Markets range from local traders to national and international traders and wholesalers.</td>
<td>Markets range from local traders to national and international traders and wholesalers.</td>
<td></td>
</tr>
<tr>
<td>Cosmetics</td>
<td>As above</td>
<td>As above</td>
<td>Markets range from local sales via roadside stalls as creams etc. or bulk via traders to national and international pharmaceutical suppliers traders &amp; wholesalers</td>
<td>Markets range from local sales via roadside stalls as creams etc. or bulk via traders to national and international pharmaceutical suppliers traders &amp; wholesalers</td>
<td>Pharmaceutical market hard to penetrate due to significant legal requirements and would need to be done through a representative and traders.</td>
</tr>
</tbody>
</table>
## Bee Product

<table>
<thead>
<tr>
<th>Production methods</th>
<th>Processing methods</th>
<th>Packaging</th>
<th>Markets and retail</th>
<th>Price guide</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bee venom</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Pure bee venom</td>
<td>Produced by stimulating the bees to sting a glass plate either by placing the plate over the top of the hive so the bees sting it as they cannot get out. In Asia it is normally extracted by placing a small electric current through the glass plate or using positive and negative electrodes that the Bees touch, however this method is untested and unknown to work for the African Bee. It can take one million stings to produce one gram of venom. The venom is left to dry on the plate and venom is scraped off the glass using a razor blade or very sharp edged small knife. No processing is needed and it can be added to products following a formula. The production methods can be done by small to medium enterprises providing they have laboratory scales and are very careful in handling due to the minute quantities.</td>
<td>Packaged in dark containers, preferably glass to protect from UV. Containers may need to be imported into Zambia to ensure quality.</td>
<td>Bee venom is best sold via a representative or trader to a pharmaceutical or cosmetics company as it is a highly specialised product. Venom can produce allergies and needs testing. It can be placed in products for local use but the warning of an allergic reaction needs to be clearly given.</td>
<td>There is no comprehensive data for the prices of bee venom currently and it is a relatively new up and coming product to the market. There is an opening for African bee venom as it has been shown to be more effective. There may be opportunity for processors and producers in Zambia to learn the techniques for the processing of the venom. There is no registered Fairtrade bee venom as yet.</td>
</tr>
</tbody>
</table>
13. RETAIL FINISHED PRODUCTS  
(CANDLES, BODYCARE AND HEALTHCARE PRODUCTS)

There are several forms of retail honey and honey products sold in the Zambian market and globally. This section explores some of these products and discusses how they are packaged and sold.

13.1. HONEY:

Diversification of retail packed honey is one way to expand demand and specialize in niche marketing for Zambian honey. Methods to achieve the line extension for honey may include the following:

a. Different varieties of honey, such as; single floras, winter and summer varieties, comb-honey, and flavoured honey (vanilla, ginger, and cinnamon).
b. Different colored honey reflecting different flora, regions, flavors and health benefit profile
c. Nutraceutical honey with added propolis or other ingredients.
d. Products appealing to children including fruit juice drinks in cartons sweetened by honey.
e. Non-alcoholic adult refreshments and health drinks
f. Different jar designs squeeze bottle for children and small desert spoon sized plastic squeeze packs for school lunches, honey sticks and confectionary products.

The following are general bee products recipes. Much information can be found via the internet on suitable recipes for the national market, such as the FAO report found on www.fao.org/docrep/w0076e/

13.1.1. Honey beer

Is easier and faster to make than mead. It cannot be stored for more than a few hours but once it has become flat, it may be revitalized by addition of more honey. Across Africa there are many ways of successfully preparing honey beer.

13.1.2. Honey liqueurs:

In most case the alcoholic portion of honey liqueur is not derived from honey fermentation, but through the addition of alcohol as in the pure form or as a distilled beverage such as gin, vodka, rum, etc.

13.1.3. Fruits/nuts in honey:

Fruit or nuts in honey are easy forms of developing confectionaries from honey. For fruit in honey, sun-dried fruits with as low a moisture content as possible should be used, but they should still be soft in order to utilize osmosis to absorb the honey into the dried fruit. They can be placed directly into the honey, whole, chopped or pureed. After the honey is poured off the process can be repeated two or three times until the honey is no longer diluted. Then the fruits can be mixed with the final batch of honey and bottled. This process is necessary since the juice in the fruit will add too much water to the honey. Pasteurization of both fruits and honey will improve hygiene and storability and will reduce the risk of fermentation, but may affect the flavour. The diluted honey which is removed during the process can be used as fruit syrup preferably after being pasteurized. Nuts in honey are prepared in a similar way. Since a nut and honey mix can vary according to appeal (light coloured, liquid, slow crystallizing honey, etc.). The correct ratios need to be adjusted for each nut type. Nuts should be tightly packed so that they cannot float to the top and leave a pure honey stratum at the bottom.
13.1.4. **Medicinal Honey with additional pollen and propolis added, fruit marmalade and honey spreads:**

The ingredients are mixed with the liquid honey or they are mixed after the crystallization has been completed.

13.2. **BEESWAX**

13.2.1. **Candle:**

Beeswax candles have been used as lighting throughout the world for many centuries. Around 20 percent of the beeswax trade is used for candle making. In the past church candles had to be made of 100 percent beeswax and this is still followed in some religions. However, beeswax has been largely replaced by petroleum based wax as it is cheaper and more available – can be mass produced. However, bees wax candles are very popular today in the international market due to their special properties: they do not produce the toxins or soot common to commercially produced paraffin candles. Beeswax candles are longer lasting and cleaner burning than paraffin candles, they are naturally fragrant with a honey scent, and if the wax is fully cleaned by filtering they produce a bright, clear, and steady flame. Even for sale in the local market, beeswax candles can be promoted using these characteristics and therefore prices at least 50% (even 300% in urban markets) higher than petroleum candles (FAO, 1990). Candles can be further value added by using attractive moulds, and by adding fragrance or insect repellents (such as; tea tree, citronella, lemongrass essential oils and neem oil). Pure cotton thread is the highest value wick. Commercially produced candle wick can often be purchased via the internet or from specialty shops. The wick needs to be in the centre of the candle for even burning. There are various pigments available from specialty suppliers for colouring wax and some natural dyes will also work. Regular paint pigments are often insoluble in fat or burn incompletely and so should not be used. Normal food colouring does not work very well as it will leave residues, might clog the wick or produce stains. If only applied as a thin outer layer it may be acceptable but special fat soluble pigments give much better results.

13.2.2. **Bodycare products:**

The African market for bodycare products is immense, being a fundamental part of the culture and traditional practices. The national and regional demand for high quality natural ingredients based, well formulated bodycare products is increasing apace. There are already successful bodycare product enterprises operating in Zambia that incorporate beeswax and honey in their product formulations. One example is Technotan that is exporting a limited range of products (soaps, body cream and massage oils) to the UK. The majority of ingredients for a small range of bodycare products can be sourced locally (from honey, beeswax, indigenous aloe, and other herbs). For youth owned enterprises producing natural bodycare products for the local market processing equipment is relatively inexpensive. There are already a number of SMEs in Zambia producing bodycare products for the local markets that include honey and beeswax within their ingredients. However, the majority are largely poorly formulated and packaged.

Most skin creams are used to keep the skin moist and for replacing some of the oils of the skin. A basic cream therefore contains water, oil and a wax to make the mixture creamy and allow even distribution of the water. The proportions of the ingredients can vary but not more than 6.8% borax, on the weight of wax, should be used.

13.2.3. **Polishes and varnishes:**

There are many ways of preparing a wood finish or polish suitable for particular application. The wax content can range from 5 to 50%. The consistency of the paste or oil may change by making adjustments to the proportions of the main ingredients.
13.2.4. Swarm lure:
Worker bees scouting for new home sites in preparation for, or during swarming, apparently react positively to the presence of wax and propolis. Smearing or melting beeswax inside a bait hive or swarm trap makes it more attractive.

13.2.5. Topical ointment for burns:
A useful ointment can be made simply by melting beeswax in a water bath, adding paraffin, and mixing until melted. Borax is mixed into boiling water; cool down to the same temperature as the wax, then stir while cooling. When the mixture starts to solidify, add some aloe extract. The ointment should be stored in a refrigerator as it lacks preservatives. It is better to make very small batches frequently than to make a large batch occasionally. By adding a few drops of propolis preservation will be prolonged and healing of wounds improved.

13.2.6. Veterinary wound cream:
A base cream for treating wounds and skin diseases in animals can be made with beeswax and mineral oil plus 2% pine gum resin. The mixture is filtered and powdered calcium carbonate added before cooling. Addition of propolis extract (1-2%) may improve the efficacy of this cream.

13.2.7. In beekeeping:
Beekeepers use large quantities of beeswax for making beeswax comb foundation. For apiaries using modern Langstroth style hives foundations sheets are required for each of the frames. This means that with the increasing up-take of modern hives in Zambia there is a growing market for foundations sheets. The foundation sheets can be made simply in two ways: Tray-style foundation press: Molten beeswax is poured into the press, which is moulded on each side with the pattern of foundation. The presses can be made of metal, plaster of Paris, or plastic. Roller methods: A flat sheet of wax is run through embossed rollers. The roller method can produce a thinner sheet (FAO). Beeswax is also used to attract swarms to empty hives, or trap hives, and is one of the most effective attractants for bees.

13.2.8. Healthcare/apitherapy products:
Apitherapy is one of the most useful therapeutic approaches adopted worldwide and free from side effects. A number of products in the pharmaceutical industry apply honey, propolis, bee venom and wax as key ingredients. Today the international market for apitherapy products is expanding. It is used in both the naturopathic and allopathic sectors, as prescription medicine and retailed as natural supplements. Apitherapy has a high potential demand in the national and regional marketplace. Although apiculture has been used traditionally within the household, it has not, as yet, been developed commercially in Zambia as a health product range.

Honey and beeswax are widely used in the manufacturing of pharmaceuticals which can be used to treat cough, stomach ailments, burns, ulcers, wounds, throat complaints and others (Nuru A. and Eddossa N., 2004). Honey, the natural food of the honeybee, is composed of fructose, glucose and water, also contains small amounts of at least 22 sugars, trace enzymes, minerals, vitamins and amino acids (FAO, 1990). Honey varies in taste; aroma and color according to its plant source (Nuru A., 1996).

Propolis extracts are beneficial if included in normal formulations of all kinds of creams, ointments, lotions, shampoos, lipsticks, anti-cellulite and anti-wrinkle preparations, mouth and nasal sprays etc. As a general guideline, propolis can be added to a product at 1 to 3% by weight in the form of a 50% propolis-ethanol solution, i.e. 0.5 to 1.5% of extracted propolis. Up to 10% of less concentrated solutions are recommended by some authors which represents essentially similar amounts of extracted propolis dry weight. Only a few applications will benefit from much higher concentrations. If the final product
is an oil or fat-based product, a propolis solution prepared with highly concentrated ethanol will blend well with the final product. Glycol or less concentrated ethanol may be used for extracts that will be added to products which contain some water.

*Royal jelly* can be easily added to any creams or lotions, usually at a concentration of 0.1 to 1% fresh or 0.03 to 0.3% freeze-dried royal jelly. The formulations generally do not have to be changed and thus any agreeable recipe can be adapted. Since royal jelly is already an emulsion, it can also be added to any existing cream providing the cream is not solely oil-based. Mix the royal jelly with a small quantity of the cream first and then add this mixture to the rest. The proportions of royal jelly in a dietary product are usually adjusted to provide a dose equivalent to 200 to 300 mg fresh weight of royal jelly. Preparations such as soft gel capsules require higher and more expensive technologies (not usually suitable for small enterprises).

*Bee venom*: For national markets, ointments can be prepared by mixing bee venom with petrolatum jelly or melted animal fat, and salicylic acid, in the ratio of 1:10:1. The salicylic acid softens the skin, increases its permeability and is a treatment for rheumatism even on its own.

Please see Annex Document for some ideas of retail product formulation using beeswax.

*Pollen* can be added to a variety of foods and snacks. It does not involve any special adaptation of recipes, because the pollen is usually added in small quantities. However, pollen has a distinct flavour of its own and is usually slightly sweet. It has a delicate flavour and can even be detected in products with stronger flavours. Considering the sensitivity of pollen, its inclusion in products requiring processing (particularly heating) may cause a significant loss of beneficial effects. Since pollen can easily be included in most recipes, only a few are provided here which might be marketable by small enterprises, including beekeepers.

**For the local and national market**, specific medicinal plants could be sustainably wild harvested and/or domesticated, to develop a range of honey and wax based herbal remedies and supplements to target the associated diseases and disorders. There is wide natural abundance of medicinal plant materials in Zambia and a long tradition for its use for the majority of ailments and disorders. These can be simply processed and packaged for retail through community based naturopathic pharmacies. This type of enterprise would require the involvement of youth in wild harvesting and domestication of the selected medicinal plants, as well as in the processing and packaging activities. Establishment of sustainable harvesting levels and protocols, and organic and/or FSC certification will be a very necessary component of a commercial venture.

**Table 6: Some potential plant species for commercialisation for honey and beeswax based medicinal products**

<table>
<thead>
<tr>
<th>High value</th>
<th>Medium value</th>
<th>Non-indigenous</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wild harvest:</strong></td>
<td><em>Carissa edulis,</em> <em>Urtica massaica,</em> <em>Achmella calthiza,</em> <em>Bidens pilosa,</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Ajuja remota,</em> <em>Plectranthus barbatus,</em> <em>Rubus keniensis,</em> <em>Withania somnifera</em></td>
<td></td>
</tr>
<tr>
<td><strong>Domestication:</strong></td>
<td><em>All those above</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Prunus Africanus</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Warburgia ungandensis</em></td>
<td></td>
</tr>
</tbody>
</table>

| **Wild harvest:**   | *Lippia kituiensis,* *Asparagus africanus,* *Psiadia punctulata,* *Plectranthus pseudo marrubioides,* *Euclea divinorum* |                      |
| **Domestication:**  | *All those above* *Hypoxis Rooperi Centella Asiatica,* *Wild Yam,* *Etc.*       |                      |

| **Cultivation:**    | *Echinacea,* *Valérian,* *Stevia,* *St John Wort,* *Etc.*                      |                      |
Semi-processing of the plant materials for developing a range of apitherapy products, based on honey/wax/pollen/propolis etc., for sale in local and national markets will involve primarily drying and milling. Modified solar driers can be simply constructed (using thermostat, solenoid switch, fan and baffles) for the production of medicinal plant materials. A commercial maize mill with variable sieve sizes can be purchased for the grinding of the dried medicinal plant materials. The semi-processed products sampling and analysis will be required. To ensure and maintain product efficacy this will need to take place on a regular basis. Full processing of the dried and ground plant products into retail packed products (capsules, press powder tablets, tinctures, ointments and creams etc.) can then been made at dedicated processing centers. Manual processing is both efficient and affordable/replicable for serving local markets. Simple hand presses can be purchased for pressed-powder tablets, capsule filling by hand, and creams, ointment and tinctures require inexpensive food processing equipment (catering grade). The packaging materials will be the main item that will need careful evaluation regarding sourcing appropriate type, at a viable cost and reliable supply. For the production of retail finished products for the national and regional markets, as creams/lotions, capsules and pressed powder tablets, ointments, tinctures and infusions, this could be developed through a partnership with a commercial company providing sufficient supplies of raw materials can be maintain in order to secure the necessary economies of scale to allow the operation to be commercially viable.
DISTRIBUTION CHANNELS

- **Local**: producer-processor-retail.
- **Regional**: Producer-Processor-regional packer-retailer;
- **International**: importer-broker-packer-retail.

**Figure 4**: Honey Sector Value Chain below from the ITC-JITAP 2007 study still largely represents the value chain in 2014, except that the box indicating local independent beekeepers should also indicate “contracted beekeeper groups”.

Business and Trade support services

- Market Access (MCTI)
- Overtland Sea Transport
- International/National Phytosanitary Inspection
- National Requirement Custom zSPA
- National Requirement Standards Chemical Analysis (Laboratories)
- Transport and Communication (Drums)
- Insurance
- Finance
- Utilities (Energy)
- Technical Assistance and Capacity Building
- Organic / Fair Trade Certification

Value Chain

- **International Consumers EU JAPAN ETC**
- **International Retail Chains / Fair Trade**
- **National Urban Consumers Supermarkets - Lusaka (Formal)**
- **Roadside, small shops, Kiosko (Informal)**
- **Traders / Exporters**
- **Packers**
- **Integrated Beekeepers (Production/Processing/Retail) Producers**
- **Local Beekeepers Producers (Independent)**
- **Large Companies (NWBP, FF) (Processors and Exporters)**
- **SMEs (Processors and Exporters)**
- **Regional Consumers SADC**
- **Drums**
- **Beehive suppliers**
- **Jars / Bottles**
- **Buckets**
14. PACKAGING AND EXPORT TRANSPORT

14.1. PACKAGING

In the majority of case the national production of honey is harvested into non-dedicated containers (recycled plastic cartoon and drums, jerry cans, etc.) and sold locally. In more organised environments the honey is transported to the villages or nearby collection centre for further processing or selling. Honey that is sold locally is packed in 2.5 litre containers, 1 litre containers, 500 ml and 350 ml (460 gms) jars. At village level, beekeepers who process honey pack their product in 20 litre buckets ready for transporting or for buyers. Processed beeswax is usually made into cakes. Honey is produced at household level by beekeepers. Production areas are characterized by poor roads, remote locations, and lack of knowledge of their market options.

For organised producer/beekeepers connected to commercial bee products companies/operations the beekeepers are supplied with dedicated collection buckets with lids for the harvested honey comb. This is then delivered to collection centres and processed by the company. Honey designated for export is packed in food grade drums of 210 litres capacity. Epoxy resin or plastic bag lined drums and plastic buckets and Small jars for retail markets are available within Zambia. Some companies import glass jars which are often superior quality to what is available in Zambia. The majority of small and medium honey packers do not have specialized machine for retail packaging of product. Without this equipment the honey is scooped and poured into jars manually or by draining the drum via a tap from a tank into jars directly. The draining via a tap is better sanitation due to less handling by individuals.

Honey imported into Europe is usually shipped in bulk in standard epoxy-lined (poly bag) steel drums that can contain 300 kg of honey. Food grade plastic drums are also commonly used. Importers often have requirements regarding the minimum batch size. Industrial users of honey require different packaging methods from consumers. These methods vary from full truckloads of 25,000 kg (for food industry and honey packers), “cubitainers” of 10,000 kg, and drums of 300 kg, to plastic buckets of 25 kg or 12.5 kg.

In the US and Middle East markets, food quality and hygiene standards are not as high as for the EU statutory requirements, and there is demand for retail packed as well as for bulk honey, once product quality is seen to be adequate and there is sufficient buyer confidence.

When retail demand opportunities exist for product packed and labeled in Zambia one option is for the honey to be packed in glass jars with metal screw caps and a tamper proof or tamper evident seal attached. Depending upon buyer demands pet bottles are also an attractive option and provide a lighter shipping weight than glass while maintaining quality and product image when design and presentation are addressed for the market demands. The sizes of these jars are specified by the buyer, mostly range from 250 grams to 1,000 grams.

The basic packaging requirements are as follows:

1. **Containers**: Need to package honey in glass jars with metal lids. Or can be food grade Polyethylene terephthalate (pet) bottles.
2. **Labels**: attractive designs and general branding techniques
3. **Security Seals**: Most containers did not have the tamper resistant seals but most will have tamper evident lids like the tape pictured on the above photo which bridges the line from the lid to the jar. If this jar had been opened the paper seal would be broken and evident to the buyer
4. **Markings**: Basic legal labeling and marking requirements.
Example of a feasible packaging option for honey for national, regional and export markets:

There is a reliable supply of glass jars from Nairobi: the local glass manufacturing company has the capacity to produce more than 100 million bottles in a year. The generic jars presently available in Nairobi are all round shaped and available in the following sizes: 370 ml, 500 ml and 720 ml. The glass jar manufacturing companies import the lids to fit their bottles. In Kenya the lids are presently available in golden colors only but can be availed in other colour options and designs if ordered according to customer bulk order requirements to match the required bottles. There is also a major bottle manufacturer in Mombasa which can export to Zambia when opportunities arise.

The type of label utilized will depend upon the equipment utilized at the bottling facility. For small scale and manual production the recommended label material is CRACK-BACK self-adhesive material 80g size with white colored peel-off material and supplied in single units. These labels should be printed in full colour on one side. To provide an upscale label UV varnish or gloss lamination will be applied on the printed side. If the product is targeted or likely to be exported basic statutory labeling information and marking requirements to suit both local and international markets must be included on the label. If the product is to be exported it is not necessary that the label meet local requirements but care must be taken to ensure that the label meets the destination market requirements. It is essential that the buyer be consulted on their local label requirements and that they approve, in writing, the label to be utilized. This avoids confusion and problems in the event the label does not meet local requirements.

Material Specifications:

- Paper Stock: 80gsm crack back self-adhesive paper label
- Printing: 4 Colors with offset Litho varnish
- Size: As per artwork and samples to be supplied for approval

Security seals are simple neck and top sleeves that can be applied using basic manual operations and as well as through on-line heat sealing and shrinking tunnels. This should be emphasized on as a matter of priority to all processors and packers of table honey as it guarantees the consumer that the product has not been tampered with prior to their purchase and opening the jar. Security seals are available in Kenya. Tamper Resistance Seal specifications:

- Material Specifications: 40 Microns BOPP
- Printing: 1 Colour as per sample
- Size: To fit the diameter of the lid.

Beeswax needs to be kept out of moisture and sealed so moisture cannot get in to the packaging and can be packed in wax or grease proof paper. It is best when stored in stainless-steel containers. It should not be packed in metal as this can cause it to discolour. Containers made from other metals such as aluminum, zinc, or copper can make the beeswax dark and must not be used. It can also be packaged in plastic for example polypropylene.

High temperatures during storage and transport should be avoided due to their impact and effects on deteriorating the quality of the beeswax. To preserve the quality of refined beeswax, it is best to wrap the wax in special paper or plastic foil and place it on shelves or in stainless-steel containers.

Stored and transported honey can suffer from what is known as Beeswax Bloom. This is a powdery appearance which naturally forms on the surface most beeswax after a period of time. The time it takes to appear depends on the storage conditions. If stored above 15 deg C, bloom will take several months to appear and may not appear at all. The appearance of the bloom can be removed by warming the beeswax. Bloom is
a cosmetic appearance event and has no detrimental effect on the beeswax. Comb foundations which have bloom on their surface are readily accepted by the bees with no effects. The shelf life of beeswax is often recorded in literature as three (3) years but it has been quoted to have an indefinite shelf life in many sources.

**Propolis:** Propolis is fairly stable but proper storage and packaging is important. Propolis and its extracts should be stored in airtight containers in the dark and preferably at less than 10-12 degrees centigrade and away from excessive and direct heat. It has a storage life of about 18 months and alcohol extracts of approx. 48 months, but it needs to be determined for each product.

**Royal jelly:** The commercial production of royal jelly requires a methodical approach, good organization and precise timing. Constant attendance is essential as one day off can eliminate two days of production. These techniques are suitable for both small and quite large enterprises with modern hives; traditional hives would require too much travel and attention to be utilized with hives miles apart. The production and marketing of Royal jelly is complicated by its limited shelf-life. Although freeze-dried jelly is the most stable form of royal jelly, some changes still take place. Refrigeration of royal jelly at 0 to 5 °C is the most commonly used to preserve quality. The average recommended storage time after production is 18 months under refrigeration. For products frozen at minus 17 degrees centigrade storage can be extended to 24 months. After defrosting and packaging the product should not be stored in a refrigerator for more than 12 months. Packaging should be airtight and inert. i.e., plastic.

**Pollen:** Fresh pollen stored at room temperature loses its quality within a few days. Fresh pollen stored in a freezer loses much of its nutritive value after one year. To store it at room temperature so that it lasts for several months it should be dried to less than 10% moisture content at less than 45 degrees centigrade and stored out of direct sunlight. It may also be refrigerated at 5 degrees centigrade for at least a year or frozen to minus 15 degrees centigrade for many years without quality loss. It should be packaged in dark glass containers or dark plastic containers as sunlight (UV radiation) destroys the nutrient value of pollen and the other more subtle characteristics probably suffer worse damage.

**Bee venom:** Even dried bee venom should be stored refrigerated or preferably frozen and it should always be kept in dark bottles in the dark. Dried bee venom can be kept frozen for several months, but should not be kept refrigerated for more than a few weeks. Liquid venom and diluted venom can be stored for similar periods if maintained in well-sealed, dark glass containers.

### 14.2. EXPORT TRANSPORT

The transportation mode of the exported honey depends on destination and quantity exported. Honey is exported to neighboring countries in jerry cans or plastic pails. These containers are transported by means of a road in trucks or buses.

Large export shipments are packed into 210 kg epoxy resin or poly bag lined metal drums loaded into a 20’ container at origin or at the port and carried by ship or air. A typical 20’ ocean container handles 18 MT of product. Air shipments are expensive and therefore are limited to specialty niche products or time sensitive products. Honey has an indefinite shelf life and therefore either ships in full 20’ container loads (FCL) or in less than container load (LCL) consolidated shipments. These shipments are handled by freight companies and steamship lines that provide rates from the port and various inland points.
PRICING AND COSTING (VALUE CHAIN COST ANALYSIS)

15. CURRENT RANGE OF PRICES ALONG THE VALUE CHAIN

In Zambia the local current range of prices for beekeepers’ comb honey is between K4 and K8/ kg (July 2014). The price varies depends on timing of purchase, availability of honey, buyer agreements and demand. Liquid honey from beekeepers ranges from K6-K8/ kg at current exchange rate. At processing facilities centrifuge processing costs more than press processing. Most processors sell in retail packs K15-K19.5 on supermarket shelves for 500 ML. Only one imported brand retailing at K48 was noticed during recent supermarket survey at Game store which was recently purchased by Walmart. Retail price less VAT 17% and 25-30% Supermarket markup varies significantly. Price depends how it is packaged and quality. Variables in costing are vast.

Current export prices are ranging from 2.50-3.50 USD/ kg for honey depending on quality and certifications. Quality wax exports can fetch $4.50 or more per kg. South Africa is buying irradiated honey from Zambia at $2/ kg and $3.50/ kg for wax.
16. HONEY STANDARDS AND QUALITY GUIDELINES FOR ACCESSING INTERNATIONAL MARKETS

16.1. BUYERS’ QUALITY PARAMETERS

Producers need to consider their buyers quality requirements when producing product. While buyers may have different requirements there are certain globally accepted standards for honey ranging from the Codex standards for honey http://www.fao.org/docrep/w0076e/w0076e30.htm to Hazard analysis and critical control points or HACCP. It is important that anybody that handles honey understand these principles and work to exceed expectations and quality standards as outlined in these documents.

In addition to global and market standards companies will have their own standards and parameters. The parameters most frequently controlled by enterprises which receive honey for further processing are the condition of containers, cleanliness, the homogeneity of the shipment, organoleptic characteristics (taste and aroma), colour, moisture content, degradation of honey measured by diastase and HMF content, composition of principal sugars and microscopic examination for the determination of botanical and geographical origin. Many large enterprises have their own laboratories while smaller manufacturers can only perform simple measurements themselves such as colour, taste and moisture determinations and have to rely on outside laboratories for more detailed analysis.

16.1.1. Overall requirements

- Reliable quality
- Reliable quantities
- Conformation to conditions of supply
- Traceability
- Fulfilment of all organic certification protocols (for organic buyers)
- Consistency in specification

16.1.2. Quality systems

- Food quality standards at the processing stage (i.e. Good Manufacturing Practice (GMP)/Good Agricultural Practice (GAP)/ISO 9000/HACCP)
- Documented Quality Manual and Procedures
- Relevant quality control and assurance systems in place
- Product Specifications
- Stability assurance
- Quarantine and positive release system
- Foreign body control
- Supplier audits
- Aseptic processing areas
- Traceability system operating effectively
The buyer also requires that the supplier’s products meet the statutory standards in the importing country, as well as the buyer’s own quality standards.

16.1.3. Analysis

- Identification
- Microscopic characteristics
- Microbiological
- Level of active ingredient
- Water soluble extractive
- Percentage of foreign matter present, e.g. dirt, other plants, infestation, etc.
- Nutritional data
- Moisture content
- Level of chemical contaminants, e.g. pesticides, heavy metals
- Toxins/Aflatoxins

Analysis is a must for all product consignments designed for the export market. First, identify areas on which the buyer requires information. Then sample must be send to an accredited laboratory.

16.1.4. Quality testing

In general, importers first require a sample of honey from their suppliers. This sample is tested for a number of parameters. The following components are usually examined:

- Sensorial testing, in which taste, smell, appearance, and mouth feel are evaluated colour
- Microscopic analysis of the pollen for verifying the geographical and botanical origin declared by the supplier
- Residue testing on veterinary drugs (various antibiotics) and acaricides (pesticides used to control mites) repellents used during harvesting of the honey standard compositional analysis, such as diastase, HMF, moisture, foreign dextrins, invertase index, and sugar profile (specifying the quantities of the various types of sugar)
- Conductivity
- Proline
- Parameters linked to fermentation, such as ethanol, yeast, and glycerine

The sensorial evaluation of honey is a done by people experienced in tasting honey (as in coffee). Because of the wide variety of honeys, there are no strict rules on how a honey should taste. There are, however, undesirable or off-flavours which should be absent. The colour of honey is often measured with the Pfund Grader. This machine measures the transmittance of the honey against a metric scale. The scale starts at 0mm for colourless honey and runs to 140mm for black honey.

The USDA scale of honey colors is internationally used:

**USDA honey colour scale:**

<table>
<thead>
<tr>
<th>USDA colour designation</th>
<th>Range Pfund scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water white</td>
<td>0-8 mm</td>
</tr>
<tr>
<td>Extra white</td>
<td>£ 17 mm</td>
</tr>
<tr>
<td>White</td>
<td>£ 34 mm</td>
</tr>
<tr>
<td>Extra light amber</td>
<td>£ 50 mm</td>
</tr>
<tr>
<td>Light amber</td>
<td>£ 85 mm</td>
</tr>
<tr>
<td>Amber</td>
<td>£ 114 mm</td>
</tr>
<tr>
<td>Dark</td>
<td>&gt; 114 mm</td>
</tr>
</tbody>
</table>

The sugar profile, and more precisely, the fructose/glucose ratio, determines whether a honey is classified as clear or creamed. Although there is no single rule, a good indication is the following:

- fructose/glucose ≤ 1.15 is classified as creamed
- fructose/glucose > 1.15 is classified as clear

African honey sometimes has a poor reputation in international trade. It is said that it has an inferior taste and that the colour is “too dark.” The inferior taste is often related to the smoky flavour of some African honeys which is a result of smoking traditional hives for harvesting. The colour of African honey can be very dark, which is also not appreciated by most Western consumers, since dark honey is associated with a strong taste and old honey.

In the German market, however, there may be a niche for even dark honeys, provided they meet the quality parameters. This is because traditional German honey is from the Black Forest and is therefore similar in color and flavour to many African honeys.

**Packaging materials:** Most traders prefer dedicated new 300 kg drums approved for foodstuff.

**Minimum quantities:** Normally a minimum of 18–20 tons or one container (68 drums of 300 kg) is needed in order to ensure price competitiveness due to maximization of efficiencies on freight

### 16.2. FOCUS ON EU MARKETS REQUIREMENTS

The EU market offers considerable opportunity for Zambian honey. In order to export to this market it is critical that the industry understand and address quality issues in line with the EU standards. We talk about these standards here.

**EU Legislation:** Honey is subject to both horizontal and vertical product legislation. Horizontal legislation includes legislation on food safety, products of animal origin, contaminants, additives, and flavourings. This set of legislation applies to all (animal) products. There is one piece of specific (vertical) legislation for honey, which is called the honey standard. All legislation mentioned in this chapter can be consulted on the website of the European Union (http://europa.eu.int/eur-lex/).

The honey standard (Council Directive 2001/110/EC) defines the characteristics of honey and the requirements for placing it on the EU market. All honey intended to be sold in the EU market needs to adhere to the directive, which covers the definition of honey, classifications of honey, labelling, and compositional criteria. The regulation makes a distinction between table honey and baker’s honey. Honey that is intended to be sold as table honey may not contain any added food ingredients or any organic or inorganic matter foreign to natural honey. Unlike table honey, baker’s honey may have a foreign taste or odour, have begun to ferment or have fermented, and have been overheated. This regulation also describes the rules for the labelling of honey.

In Europe most companies blend domestic or regional honey with imported honey. This is done to maintain or achieve price, color and flavour profiles that their customers expect. All honey traded in Europe needs to be labelled using the appropriate indication.

- “blend of EC honey”;
- “blend of EC and non-EC honey”;
- “Blend of non-EC honey”.
This directive also sets limits for several compositional criteria of honey, including sugar content, moisture content, water-insoluble content, electrical conductivity, free acid content, diastase activity, and hydroxymethylfurfural (HMF) content. Of specific interest for tropical honey are HMF and moisture content.

- **HMF content** may not be higher than 40 mg/kg for retail honey sold in the EU. Exceptions are made for baker’s honey and honey from declared origins from regions with tropical climates. Honey of declared origins from tropical climates may have a HMF content not higher than 80 mg/kg. The list of declared countries of origins can be found in annex document.

- **Moisture content** may not be more than 20 per cent. Exceptions are made for heather and baker’s honey, which may contain up to 23 per cent moisture.

The quality control of honey has two principle purposes: the first being to verify its genuineness i.e. to reveal possible frauds such as artificial honeys, adulteration etc., and to determine its quality in respect to the needs of the processor and the market. The composition limits of the natural product are defined internationally by the Codex Alimentarius Commission (Codex Alimentarius, below, summary see Annex document) which also mentions the officially approved analytical methods. In many countries more restrictive laws and regulations exist to which one must refer if marketing in these countries is intended. Legal quality standards serve to protect the consumer, be it the processor or the end consumer. As a starting point Zambia should conform to and comply with the CODEX standards.

The **CODEX** standard that applies to honey is **CODEX STAN 12-1981** which outlines the minimum international standards related to the naming, chemical properties, level of contaminants, and labeling of honey, and other characteristics. The regulations generally aim to preserve the purity of honey as an unprocessed raw agricultural material, with limited modifications to its chemical composition. The EU has outlined its specific minimum product standards for honey regarding labeling, quality, and contaminant levels most comprehensively in Council Directive 2001/110/EC. The requirements are detailed: the directive defines honey and related products, and provides the minimum composition criteria for human consumption, such as sugar and moisture content, as well as chemical properties and disease activity. Compliance with these standards is ensured through the conformance to a Residue Monitoring Plan by “third country” exporting countries, with product verification taking place in approved laboratories. Other directives related to the import of products of animal origin and the use of veterinary medicinal products also apply. However, despite varying consumer preferences and price for different honey varieties (color and flavor), there are no criteria specified to distinguish between them as different grades. While the CODEX standards EU’s Council Directive 2001/110/EC provide specific guidance related to the labeling of honey, other general laws and regulations related to the labeling and packaging of imported food products to the EU also apply to honey imports. Regulations specific to honey include labeling honey products according to country of harvest. Council Directive 2001/110/EC also outlines the EU’s standards on the processing of honey, and aligned to the CODEX standards. Please see Annex Document. Broader EU regulations related to the packaging and transport of imported food products also apply to honey.

The US provides specific standards for the grading and classification of honey according to characteristics similar to CODEX and the EU, though also provides a mechanism to grade honey according to quality, clarity, and flavor. The 74 FR 32389 the stipulate that honey bearing a USDA-issued grade standard must include information on the country of origin.
Honey is a product of animal origin. All legislation, therefore, regarding animal products applies to honey. Most of the legislation concerns the use of veterinary medicines, determining maximum residue levels (MRLs) in the final product. Important laws regarding MRLs are the following:

- Council Regulation 1990/2377/EEC, specifying the maximum residue level of veterinary medicines in products of animal origin
- Council Directive 86/363/EEC, on the fixing of maximum levels for pesticide residues in and on foodstuffs of animal origin

Both of these laws have been amended numerous times (CBI 2005a).

Honey may only be exported to the European Union if it comes from an establishment approved by the European Commission to export*. To become an approved establishment, the national authorities (i.e., the governments) in the non-EU country should be able to demonstrate that certain fundamental principles regarding animal health, the use of veterinary medicines, and control of diseases are respected. The rules regarding imports of products of animal origin are laid down in Council Directive 92/118/EEC on animal-health and public-health requirements. The list of selected countries is laid down in Commission Decision 2002/337/EC. More information on the subject of import conditions can be obtained at the website of the European Commission, Directorate General Health and Consumer Protection.

In summary, honey imports into the EU market need to:

- Come from a country approved to export honey to the European Union (Zambia is approved).
- Come from an establishment registered by the competent authority of the exporting country and approved by the European Commission.
- Be accompanied by a commercial document—typically invoice, packing list, and bill of lading.
- Enter the European Union through a border inspection post, where veterinary checks are carried out.
- Honey is subject to both horizontal and vertical product legislation. For further information concerning the European Union access the website www.europa.eu.int/eur-lex/
- A standard for organic beekeeping is available at the website of Naturland: "Naturland Standards for Organic Beekeeping".

16.3. ADULTERATION

In many countries it is customary to call any sweet syrup “honey”. Corn, cane or rice syrup and even molasses can be seen labelled as honey. Thus it may be legal to call things honey which, according to international standards, is not. It is in the interest of the local beekeepers to have laws that define honey more precisely or at least reserve the name bee’s honey for a product conforming to international standards.

Most simple adulterations of honey can be detected if certain characteristics exceed the legal quality standards, for example by a high sucrose content (>8%) if simple cane or beet sugars are added, or high HMF values if acid hydrolysed corn syrup is used. The latter has fructose/glucose ratios similar to honey (HMF > 200, White). If however, the high fructose corn syrup is used, which is produced by enzymatic processes and contains fructose/glucose ratios similar to honey, the detection of $^{13}$C isotopes...
(White and Doner, 1978) or thin-layer chromatography (White, et al., 1979) are required. This high fructose corn syrup is not yet readily available in many developing countries, however. The isotope method can detect adulteration with any kind of cane sugar or corn syrup; even in products allegedly containing honey only as a minor ingredient (Donor et al., 1979).

Simple field methods for detection of adulteration without laboratory equipment are based on taste, viscosity (most adulterated honey is thinner than true honey, however, this may be a false positive since honey with a high moisture content is also thinner) or its solubility in cold water. If a droplet of honey poured into cold water stays together without dissolving rapidly, it is most likely pure honey. This can be observed best against the light with a dark background. If the edges of the droplet or the thread start dissolving during pouring, the honey is likely to have been adulterated or has very high water content. In any case it should be kept separate from other honey until more precise tests can be carried out.

16.4. FOOD SAFETY & HYGIENE

Since the well-known food scares such as dioxin contaminations, BSE, and foot-and-mouth disease, the European Union has worked hard on legislation that should guarantee the safety of all the food sold in its territory. In 2002, Council and Parliament Regulation 178/2002/EC was adopted. This regulation, also known as the General Food Law, contains general provisions for traceability, which concern all food and feed business operators in the food chain except primary producers. This traceability means that the origin of the food has to be known at all stages in the food chain. Importers are also affected, because they will be required to identify from whom the product was bought in the country of origin. This regulation should facilitate the recall of unsafe products from the market. *In practice this will mean that the European Commission approves the proposal received from the competent national authorities in the exporter’s country. The European Commission will not normally inspect the exporter’s premises directly. In addition to the General Food Law, all legislation regarding food hygiene matters of the European Union has been revisited. These new requirements, called the EU hygiene package, were published in April 2004. In the hygiene package, general hygiene laws are laid down for all food products in Parliament and Council Regulation 852/2004/EC, and specific requirements for a selected number of animal products are laid down in Regulation 853/2004/EC. Regulation 852/2004/EC, on the hygiene of foodstuffs, defines certain specific hygiene requirements for food imported into the European Union. Under the regulation, primary producers are not required to implement the HACCP system, although encouraged to do so.

16.5. THE GLOBAL FOOD SAFETY INITIATIVE (GFSI)

The Global Food Safety Initiative (GFSI), coordinated by CIES - The Food Business Forum, was launched in May 2000. The GFSI Foundation Board, a retailer-driven group, with manufacturer advisory members, provides the strategic direction and oversees the daily management of the programs. Under the umbrella of the GFSI, major retailers have come to a common acceptance of GFSI-benchmarked food safety schemes.

GFSI Objectives:

1. Achieve convergence between food safety standards through maintaining a benchmarking process for food safety management schemes.
2. Improve cost efficiency throughout the food supply chain through the common acceptance of GFSI recognized standards by retailers around the world.
3. Provide a unique international stakeholder platform for networking, knowledge exchange, and sharing of best food safety practices and information.
Many retailers are requiring its supply chain to comply with a GFSI standard, including Wal-Mart, Wegmans, Metro, Migros, Ahold, Carrefour and Tesco. As more retailers accept a GFSI benchmarked standard as proof of compliance to a food safety system, manufacturers could reduce the financial burden of multiple audits. The manufacturers can choose to implement a system based on the benchmarked standard of its choice. Certification processes vary depending on the standard owner, and different accredited registrars can provide the certification audits.

All benchmarked standards follow a guidance document set by GFSI, and should at minimum contain the following requirements:

- A Food Safety & Quality Management System
- Good manufacturing practices
- HACCP principles
- Testing and Sampling Requirements and Procedures

Under the proposal accepted by the European Union, handlers must follow a certain testing and sampling protocol with respect to the frequency of testing and the compounds that must be monitored. Each sample drawn must be tested for the compounds listed below at one of the two certified labs.

Sampling Frequency: For raw product/bulk, one sample is drawn from each 10 drums including at least one sample from each producer represented in the load. For finished goods one sample per container load of finished goods including, at minimum, at least one sample from each producer or variety represented in the container load. The sample size is 250 grams or as specified by test laboratory used.

For Compound testing requirements please see Annex Document.

17. HONEY BY-PRODUCT STANDARDS AND QUALITY GUIDELINES (BEESWAX)

Beeswax is a natural product and no additives are permitted. The quality of beeswax is based on the colour, odour, and chemical properties. Beeswax should be pale yellow to yellowish brown.

Old beeswax has a darker colour than young beeswax and is valued less. The beeswax should have a honey-like smell and should not be sticky. Most of the beeswax is tested for adulteration with other waxes such as carnauba wax. There is no maximum allowable residue levels (MRLs) defined for beeswax (since it is not consumed as food). However, since beeswax is used in cosmetics, which are applied to the human body, the cosmetic and pharmaceutical industries do not allow high levels of residues. Most common contaminations found in beeswax are from chemicals used in bee-keeping (Bee World 2004).

17.1. WAX DEFECTS AND HOW TO PREVENT THEM

*Wax darkening:* Do not heat at too high temperatures and for a too long time may damage the wax and darken its colour. Wax should not be heated in containers made of iron, zinc brass or copper vessels because these metals make the wax turn dark. Do not use lead containers because of contamination. Stainless steel or aluminium, is suitable, but can be attacked by oxalic acid. Wooden containers can be suitable, if acid treatment is involved.

*Wax off odour:* Do not melt combs containing fermented honey.
Contamination by *Paenibacillus larvae*. Larvae heat-resistant spores of *Paenibacillus larvae* are not killed by boiling of wax in water. Only heating under pressure (1400 hPa) at 120°C for 30 minutes kills all spores.

*Water-wax emulsions.* 1. The wax-water appears milky, due to the presence of calcium or iron in the water. Use 2-3 g of oxalic acid per kg wax and 1 l of water to bind calcium, prevent emulsion and to brighten wax at the same time. 2. Wax absorbs a greater amount of water, heat wax at 105°C to remove water.

*Wax has a crummy structure:* This is due to saponification of wax. The process can be reverted by boiling wax with sulphuric or oxalic acid. Use soft water to prevent this, e.g. rain water. Water with a low mineral content should be used if such problems arise. However, in some cases, water/wax emulsions can occur, even with soft water. In such cases, raw molten wax in contact with water should be kept below 90°C.

*Incorporation of water:* Water is often incorporated in the process of wax manufacture. Surplus water can be removed by heating at about 105°C. Prevent foam building by de-foaming agents (e.g. silicon). When no more bubbles rise, the wax is free of water.

*Impure wax:* After melting the wax is not pure enough. For additional cleaning heatable water tanks from high-grade steel are suitable. The wax should remain for longer time in the water bath at a temperature of 75-80°C (best overnight). Since wax is lighter than water, it floats. The dirt sinking at the lower part of the wax must be scraped off after cooling. Under industrial conditions liquid wax can be cleaned by filtration with heated chamber filters. Wax can also be purified by hot filtration.

### 18. HONEY BY-PRODUCT STANDARDS AND QUALITY GUIDELINES (POLLEN)

Only a few countries, such as Switzerland and Argentina, have legally recognized pollen as a food additive and established official quality standards and limits. Though sold in many health food stores, pollen is not considered an additive by the US FDA (Food and Drug Administration) and it does not have to comply with special standards. It is, however, in the producer’s own best interest to maintain the highest standards of cleanliness for his product.

The Argentinean standards require microbiological characteristics of not more than 10^5*UFC/g aerobic microbes, 10*UFC/g fungi and no pathologic microorganisms. The moisture content should not exceed 8% (controlled by vacuum drying at 45 mm Hg and 65°C). Other limits include a pH of 4-6, protein content of 15-28% Kjeldahl (N x 6.25) of dry weight, total hydrocarbons of 45-55% of dry weight and a maximum ash content of 4% of dry weight (determined at 600°C).

Pollen used for cosmetic purposes should have the same, if not a better quality than that destined for consumption as food. The first quality control is assessment of gross contamination with foreign substances, i.e., parts of bee and hive debris. Further controls might include measurement of moisture content and a bacterial count. Determination of various agrochemicals, including drugs used inside bee colonies are possible and may be required in some circumstances.

As there are no criteria for establishing “safety” limits for product activity, storage and shelf-life should be kept as brief as possible. For products sold in Europe, the average recommended storage time after production is 18 months under refrigeration. For products stored at –170°C, storage can be extended to 24 months. After defrosting and packaging, the product should not be stored in a refrigerator for more than 12 months.
Standards and Quality Guidelines

Propolis comes in many colors, odours and composition so exact quality guidelines are difficult.

The proportions of propolis should generally fall in the following guidelines:

**Table 7: Propolis Proportion Guidelines**

<table>
<thead>
<tr>
<th>Substance</th>
<th>RSFSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extractable substances</td>
<td>21.93 ± 2.22%</td>
</tr>
<tr>
<td>Oxidizability value</td>
<td>17.08 ± 5.52%</td>
</tr>
<tr>
<td>Resinous-balsam substances</td>
<td>46.18 ± 1.15%</td>
</tr>
<tr>
<td>Waxes</td>
<td>27.11 ± 7.68%</td>
</tr>
<tr>
<td>Polyphenols</td>
<td>14.66 ± 2.34%</td>
</tr>
<tr>
<td>Pysaccharides</td>
<td>2.26 ± 0.32%</td>
</tr>
<tr>
<td>Mechanical impurities</td>
<td>9.76 ± 1.81%</td>
</tr>
<tr>
<td>Iodine number</td>
<td></td>
</tr>
</tbody>
</table>

19. HONEY BY-PRODUCT STANDARDS AND QUALITY GUIDELINES (ROYAL JELLY)

Freeze-dried royal jelly and royal jelly based products are generally stored at room temperature, sometimes for several years. Freeze-dried royal jelly is certainly more stable than the fresh product.

Like all other bee products, royal jelly has its own microbiological protection and presents few microbiological storage problems when it is in its natural state. This protection however is not absolute and certain hygiene precautions must be observed during production and storage. Hygienic working conditions and clean containers are a minimum requirement, and airtight containers should be used to provide additional protection not only against contamination but also against oxidation.

20. HONEY BY-PRODUCT STANDARDS AND QUALITY GUIDELINES (BEE VENOM)

Photooxidation risk must be minimised by the storage in dark jars in a dark storage area.

There is as yet not set standard for quality control but this would be done by trained chemists in a laboratory.
CERTIFICATION  
– NON-PHYSICAL VALUE ADDITION  

Certification of the product can provide non-physical value addition to the product and serves more purposes than control of compliance alone. The certificate communicates to the consumer that certain standards have been met in the production and provides buyer confidence in the supply chain. Certification therefore can be a useful tool in creating a niche and capturing targeted demand creating loyal customers and building partnerships along complex and international supply chains.

21. ORGANIC CERTIFICATION  

21.1. REGULATION  

With the growing market for organic products, many countries have developed national organic regulations to be able to protect producers and consumers against misleading organic claims. Certification documents quality, process or standards and provides transparency and traceability. Because it documents that certain standards were met throughout the supply chain it is required that producers large and small, and the entire chain of custody from processor to the consumer must be recorded and operated to the specific certification standards. If the certificate is for processing all processing equipment and storage facilities must be included in the inspection process. An organic certificate relates to the land on which the product is grown or harvested and the processing and supply system involved. For small scale producers to be economically certified an internal control system must be developed and managed, as mentioned below.

In most importing countries description of goods as organic requires formal certification in accordance with legislation. Import regulations for organic produce apply in most companies handling the organic product – for example, an EU importer must be both certified by an accredited certification body and also registered with the national organisation responsible for organic legislation. The importer must then obtain a permit covering each product to be imported from each source, unless the country of origin and the relevant certification has been accepted by the EU as equivalent – achieved by few developing countries. Exporters should confirm with their customers that the necessary registrations are in place before shipment. Details of specific regulations affecting organic imports into target markets can generally be obtained from the importer’s organic certification body and should always be confirmed with the buyer and their requirements.

In the European Union the basic regulations on organic food products are set out in Council Regulation (EEC) Nos. 834/2007 and 889/2008, as amended (formerly No. 2092/91). The administration and enforcement of organic standards are carried out by national authorities. A consolidated version of the EU Regulation is at http://www.ifoam-eu.org/en/organic-regulations/list-eu-organic-regulations. This regulation and subsequent amendments establish the main principles for organic production at farm level through to the end buyer (the consumer). See also the International Federation of
Organic Agriculture Movements www.ifofm.org and the earlier (1973) and largest UK certifier Soil Association at www.soilassociation.org. In the United States, the National Organic Program (NOP) came into effect in October 2002, and is administered by the US Department of Agriculture. More detailed information on the NOP is available at the USDA NOP web site www.ams.usda.gov/nop. Organic regulations for plant based products took effect in Japan in 2001. Organic products must carry the mark of the Japanese Agricultural Standard (JAS). In general, the regulations require the registration of certification bodies, as well as the certification of operators by registered certification bodies based on the technical criteria for certification. For details see www.maff.go.jp.

It is important to access up to date organic regulations for the destination market. Regulations change periodically and have recently become stricter for grower group certification. The NOP regulation now requires that all new producers added during the year since the last annual certification be externally inspected. Therefore, to avoid the higher cost of an extended certification inspection, it is advisable to have the number of beekeepers anticipated for the enterprise registered before the first NOP certification at which a square root + risk factor of beekeepers will be inspected. The EU regulation permits this calculation of inspections to continue for subsequent annual certification. However, both EU and NOP regulations require that 100% of producers undergo a documented internal inspection under the Internal Control System (ICS) every year before the annual certification. See 9.3 below for more information on the ICS.

21.2. ZAMBIAN ORGANIC STANDARDS

Zambian organic standards were developed with OPPAZ and other stakeholders guided by ZABS and finalised in 2009. Organic certification for the local Zambian market is however yet to be formalised. It took AFRISCO of South Africa 7 years in a joint company with ECOCERT to become an internationally accredited Certification Body. It is also a costly process. There are two locally based organic inspectors in Zambia for internationally accredited organic certification companies – the French company ECOCERT and the South African company AFRISCO (African Farms Certified Organic). Being locally based helps to reduce certification costs and they can also give advice to new companies. However, an inspector who gives advice or training is not permitted to be an inspector for the operation for at least two (2) years after the consulting period is over, or as required by the Certification Body.

21.3. EXISTING ORGANIC PRODUCTION

Three Zambian honey processors are currently engaged in organic certification. Two of these (Mpongwe Beekeeping Enterprise and Rivendell Enterprise) are new to certification and in the compulsory beekeeping conversion year. One operator (NWBKA) has dropped out but could be revived or absorbed. Forest Fruits has been organic certified since 2001 to date and has over 6000 registered organic beekeepers.

**Table 8: Forest Fruits production and export of organic certified honey and wax 2009-13**

<table>
<thead>
<tr>
<th>Year</th>
<th>Production/Raw</th>
<th>Export Honey</th>
<th>Export Wax*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>380 ton</td>
<td>151 ton</td>
<td>13 ton</td>
</tr>
<tr>
<td>2012</td>
<td>502 ton</td>
<td>302 ton</td>
<td>16 ton</td>
</tr>
<tr>
<td>2011</td>
<td>693 ton</td>
<td>367</td>
<td>16</td>
</tr>
<tr>
<td>2010</td>
<td>215</td>
<td>174</td>
<td>10</td>
</tr>
<tr>
<td>2009</td>
<td>750</td>
<td>551</td>
<td>16</td>
</tr>
</tbody>
</table>

*Forest Fruits wax has been exported to Germany, France, US.*
CHAPTER 1. SECTOR OVERVIEW.

MBE and Rivendell (Bee Sweet) are in compulsory 1 year conversion to organic. MBE has 400 registered in-conversion beekeepers and Rivendell has 1750. NWBKA and NWBP have not been Organic or Fair Trade certified for some years. Ubuchi have expressed desire to be organic certified.

Forest Fruits does not think it is worth pursuing organic certification unless exporting overseas. There is no organic premium in accessible African markets therefore it does not make economic sense.

Costs for organic production include not only payment of fee to 3rd party certification company, there is also the cost of hosting and transporting the inspector annually which in the case of Zambian beekeeping means traveling vast distances. There is also the cost of staffing and managing an Internal Control System of the beekeepers which involves registering, training, mapping of beehive areas, annual internal inspection of every beekeeper registered, and records which ensure traceability of buckets of honey from the beekeepers hives to the processing factory.

Since the management company of North Western Bee Products ceased operating, they and the NWBKA beekeepers are no longer certified organic or Fairtrade.

21.4. REGIONAL BARRIER FOR ORGANIC HONEY

South Africa irradiates all imports of honey because they fear import of disease, in particular American Foul Brood (AFB). Ironically they have more disease than any countries in the region. Zambia has to date had no American Foul Brood, see study done by MT Makulu Research Station. The South African irradiation requirement for honey means that the organic certified status is lost at the South African border and it is not possible to reach the better value and fairly substantial South African organic market.

22. FAIR TRADE CERTIFICATION

In the international market, fair-trade is an identified sector and products labels fair-trade often receiving price premiums and, in general, higher demand. The fair trade initiatives try to provide better market access and better trading conditions to small farmers. This includes a price premium for producers to be invested in social and environmental improvements. Some companies promote sustainable trade in bee products. Tropical Forest Products, a small honey and wax importer sourcing from countries in Africa and other developing nations,

The Fairtrade Labelling Organisation (FLO) is becoming the most well-known, marketed and promoted international fair-trade label in the global market. The Fairtrade brand is a registered brand by the FLO and is written as one word while the description “fair trade” can be used by others and is written as two words. FLO is mainly catering for food product labelling. Some certification agencies have arrangements for fair trade and organic inspections to be carried out together. An example of this concept is Bio Equitable in France (with fair trade inspections combined with Ecocert organic certification).

Fair-trade certification involves the training of the participating companies and producer associations, the lead farms in the communities and field staff in the necessary standards and protocols. Traidcraft and Max Havelaar are examples of private fair-trade certifiers.

There are no Fairtrade certified producers of honey in Zambia currently.
23. DEVELOPING THE INTERNAL CONTROL SYSTEMS FOR PRODUCER GROUP CERTIFICATION

The development of internal control systems (ICS) is necessary to fulfil the international requirements for the organic certification of producer groups. ICS also minimises the overhead costs of certification and provides a traceability system within the supply chain. Training in the setting up and management of Internal Control Systems for Producer Group Certification is required by most of the selected companies and associations. This same structure (ICS) can also be used for other certification systems such as for fair-trade and sustainable wild harvest.

23.1. PRODUCER GROUP DEVELOPMENT:

- Initial assessment for suitability for certification and realistic export potential
- Training of extension staff and lead farmers in the organic production and processing techniques/methodologies
- Demonstrations and field days
- Development of demonstration sites within each community/village and the producer group (in walking or cycling distance of all members).
- Nomination of internal structure to the group, with co-ordinator, and farm group managers (within each geographical area or village within the producer group).
- Training of extension staff, producer group co-ordinator, internal inspectors and lead farmers in organic certification and product development for the export marketplace
- Product selection if required. Training in detailed production/processing techniques for the specific products concerned
- Market contact established for the potential supply.

23.2. PREPARATION FOR CERTIFICATION:

- Training of extension staff, producer group co-ordinator, internal inspectors and lead farmers (group managers) in the set up and management of internal control systems.
- Intensive training of extension agent and government field officers as support agents if required.
- Extension staff and lead farmers (group managers) train their farmer groups (referred to as ‘pod groups’) in all techniques of production, processing, and certification criteria.
- Regular assessment (at least 4-5 times prior to first inspection) of progress by a ‘Training and Extension Manager’, if available, and additional group trainings inserted as required.
- Reporting structure identified and fully in place. The group manager, (if not literate but the most suitable and respected person for this post, then he/she works with a fully literate secretary) operating to collect information for each beekeeper/farmer and honey hunter member at village level (within the ‘identified group’) working with an extension agent (known as the ‘supervisor’, often working with the support of the Government field officer) collects information (maps of hive placement, number of hives, number of occupied hives, estimated production) and checks that each beekeeper’s hives are placed more than 3 km from any source of contamination such as urban dump sites or commercial agriculture and that there is adequate natural bee flora. The extension agent will conduct this activity with several other groups in his working area (numbers of groups he works with depends on the size of the area concerned and numbers within each pod group).
- Internal Inspectors are identified and trained. These can be lead producers or extension staff but conflict of interest must be avoided, i.e. the Internal Inspector must not inspect own community or relatives and friends. It is a certification requirement that 100% of producers undergo a documented internal inspection annually before the external certification inspection takes place.
23.3. PRE-CERTIFICATION ACTIVITIES:

- Preparation for first certification completed – accurate mapping of area concerned, and of each of the farms/holdings, field histories, forward cropping program, (crops, yields, harvest dates etc.) and a tight, transparent and traceable system in place to ensure the accurate translation of information from the field to the office for the total membership of the producer association.
- Information then collated in a recommended recording system by the producer groups co-ordinator.
- Preparation for the external inspection round of several producer groups to be inspected one after the other. The number is determined by a risk assessment carried out by the Certifier and will be not less than a square root of the total number of registered beekeepers. Transport and accommodation arranged to allow for time and motion efficient inspections (cutting down on overheads of time).
- Inspection reporting is supported by the Association’s or company’s management personnel to ensure that the information is well understood by the external inspector and the producer.
- Follow-up after the inspection to help the producer group managers and co-ordinators understand the certification decision document and to put in place any of the recommendations or to address the non-compliance items by the specified deadlines.
- Training up-dates continue in the year. The procedure of guidance starts again before the next inspection.

23.4. INTERNAL CONTROL SYSTEMS TRAINING COURSE:

Once the well-structured producer groups have been selected for organic certification, a 3 day training course is advised to develop the management required for the groups to set up and operate an internal control system.

1. To build technical knowledge of the field supervisors, field officers and Internal Inspectors to understand the ICS

2. To generate principles of practice on how the ICS in the context of the region, the products and the producer association/co-operative structure.

The training course should ideally target the following:

1. Overall Manager
2. ICS Field supervisors/extensionists
3. Producer group ICS data officers (existing producer group secretaries)
4. Producer group representatives (existing producer group chairmen)
5. Internal Inspectors
6. Purchasing officers
7. Receiving officers
8. Government staff
24. RESIDUE MONITORING REQUIREMENTS

In Europe an organization titled “Federation Europeeene Des Emballeurs Et Distributino d Miel” – European Federation of Honey Packers and Distributors (F.E.E.D.M)

F.E.E.D.M. therefore demands honey production without any use of antibiotic drugs and offers a close cooperation to the beekeepers to ensure that honey of a high quality is achieved. Any technical queries about EU requirements might be addressed to our secretary.

Commission decision 2004/432/EC of 29 April 2004 has drawn up a list of third countries from which the Member States of the European Union authorize the import of products of animal origin, like honey, subject to Council Directive 92/118/EC. This Directive lays down the animal health and public health requirements governing trade in and imports into the Community of products of animal origin.

Third countries which wish to export into the European Union have to provide the Commission with the necessary guarantees with regard to the monitoring of residues and contaminants covered by Council Directive 96/23/EC.

Zambia has met the requirements for 3rd country status into the EU.

To achieve this it is necessary to show that the nation has a ‘Residue Monitoring Scheme’ established for the analysis of honey for residues of antibiotics, sulphonamides, pesticides and heavy metals as defined in Decision 2001/159/EC and modified in 2001/487/EC. This legislation denies access to EU markets for most African countries, even though chemical residues are not a problem in African honey.

Producer groups and relevant government departments need technical awareness on how to set up cost effective monitoring schemes to meet the standard required by the legislation. In smaller exporting countries these can take the form of an industry self-regulating scheme, organised and monitored by a competent authority acceptable to the EU. It is not necessary for each exporting country to have its own laboratory for authentication and certification: only to establish an acceptable protocol and procedure for taking honey samples and submitting them to EU-accredited labs.

As mentioned previously, in Zambia this process is carried out through the Veterinary Department of Ministry of Agriculture and Livestock.

The Residue Monitoring requirement and HMF (hydroxymethylfulfural) testing of all honey exports to European market must be submitted annually in order to retain 3rd country status for Zambia. Once lost this is difficult to re-establish. This is currently being coordinated by private sector through Veterinary Department, and not as a Ministry initiative. Residue testing includes antibiotics, pesticides and heavy metal. All honey is tested on arrival in export markets.

Details from FAO Honey Marketing and International Trade FAO.org (2008)
25. ZAMBIAN HONEY STANDARDS

Zambia Honey Council and Zambian Bureau of Standards (ZABS) have worked to develop standards and a mark which retailers can display on their honey jars. It was agreed that ZABS would do inspections but according to some honey companies this was only done once when it was initiated by SHEMP. The same companies do not feel the mark adds value or is sufficiently controlled. The Licence fee to be paid annually is K1500 + transport and accommodation of inspectors. ZHC say the system is working and ZABS reinspect every year. ZABS say the honey standards and validity of the ZHC mark is defined by the Zambia Honey Council and ZABS only get involved as and when contracted by ZHC to do inspections. They submit their report and sample of the honey to ZHC. The standards for the mark do not currently comply with organic standards. The procedure and standards for this mark is described in the study circle manual published in 2013 by We Effect and Zambia Honey Council in 2013. In order for a “mark” to work it has to be supported by standards that the buyers have confidence in and can derive value from. The Zambian mark has failed to achieve this status.

In order to achieve recognition and success the Zambian honey standards must meet or exceed international standards, with CODEX being the starting point which should be focused upon.

26. ZAMBIA BUREAU OF STANDARDS (ZABS) UPGRADE

The Zambian Government through Zambia Bureau of Standards (ZABS) has recently managed to upgrade its facilities and expertise with assistance of UNIDO and can conduct tests useful to the honey sector like HMF tests needed for export. However the lab is not yet internationally accredited. They have applied and are awaiting the final external assessment. The present scope does not include the honey tests and other important tests like aflatoxin. However, once this assessment is complete they will apply to extend the scope. They say it is important that they are kept informed of industry needs. Bee Sweet has itself acquired an HMF testing facility for its own operation.

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QUALITY REQUIREMENTS TO ACHIEVE MARKET ENTRY

To export honey into global markets a number of requirements must be met.

(i) Viability of the bee product: The quality and the volume and price must be such that the product can compete with other bee products in the market place. Usually bee products are first consolidated by a processor, honey trader, exporter or co-operative. These exporters must have the finance, expertise and commitment to engage in honey export and sufficient resources to buy adequate volumes of honey.

(ii) EU listing as a third country eligible to export honey: For exporting honey to EU countries the country of origin has to have been accepted by the EC as a third country and have an active Residue Monitoring Plan (RMP) in place and operating effectively. National governments must identify a Competent Authority to take responsibility for managing a Residue Monitoring System and submitting the RMP annually to the EU. Zambia has, so far, maintained compliance, therefore Zambia can trade honey to all EU countries.

(iii) Clean honey: It is the responsibility of beekeepers to harvest honey that is free from residues and this is dependent on proper apiary management. In Africa this is rarely a problem as bee disease is mostly untreated and there are generally low levels of agricultural and industrial chemical in bee forage regions. This has been reinforced in Zambia where the government has allocated dedicated ‘Bee Reserves’ within existing natural reserves. As chemical and antibiotic contamination is a major problem for many other parts of the world, the market perception of the purity of Africa provides a big advantage in the global market.

(iv) Economies of scale and quality: Having sufficient quantities and high quality honey is the starting point when considering export. The buyer will need a sample that is checked against legal and subjective parameters (colour, texture and taste). If acceptable, negotiations will then follow. Good communication is essential and a level of professionalism that will convince the buyer that the supplier is well organised, and has the capacity and experience to complete the export.

(v) A traceability system: The majority of buyers will expect the honey exporter to implement a traceability system, which involves the full supply chain and requires that record-keeping is such that the honey can be traced back to source. Therefore, traceability systems start with the beekeepers and are maintained throughout the movement of the honey through the processing, storage and transport operations to the point of sale to the buyer. The Internal Control System (ICS) required for organic certification is a well-established and widely adapted system that can provide the necessary tractability and transparency and can be adapted to suit the market/buyer requirement.

(vi) HACCP and GFSI. HACCP (Hazard Analysis and Critical Control Point) plan shows the possible problems which may occur in producing, handling, storing and transporting honey have been considered and steps have been taken to prevent them from occurring. A buyer purchasing honey from an exporter may ask to see the HACCP plan for the processing factory from where the honey is sourced. The Global Food Safety Initiative (GFSI) is now becoming popular and some major retailers use GFSI as a benchmarked food safety.
Traditionally beekeeping in Zambia has been a male dominated industry. This is due to the fact that the hives require strength and climbing of trees which is not traditionally acceptable for women in the local culture. The strength required to climb the tree and the risk of falling are not something that is acceptable to women in the Zambian villages where honey collectors and beekeepers live.

Processing was also done by men as the honey is often collected over a long distance from the village and requires strength to carry the honey to the collection points.

Modern hives, including Langstroth and the hybrid Top Bar hive produced and promoted by Bee Sweet with its utilization of pulleys to place in the tree, will increase the participation of women in the industry both in apiaries and processing roles.

A number of baseline studies have been conducted by development agencies and the Zambian government on the number of women involved in the system. An example of the results of these studies is illustrated in the table below. This is representative of other studies with similar results.

**Table 9: Women involvement in the system**

<table>
<thead>
<tr>
<th>DISTRICT &amp; PROVINCE</th>
<th>MALES</th>
<th>FEMALES</th>
<th>TOTAL</th>
<th>MODERN HIVES</th>
<th>TRADITIONAL HIVES</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kapiri Mposhi, C.P</td>
<td>160</td>
<td>110</td>
<td>270</td>
<td>284</td>
<td>1,481</td>
<td>1,765</td>
</tr>
<tr>
<td>Kaoma, WP</td>
<td>674</td>
<td>361</td>
<td>1,035</td>
<td>458</td>
<td>17,779</td>
<td>18,237</td>
</tr>
<tr>
<td>Monze, SP</td>
<td>127</td>
<td>81</td>
<td>208</td>
<td>29</td>
<td>1,507</td>
<td>1,536</td>
</tr>
<tr>
<td>Kafue (Chiawa), LP</td>
<td>292</td>
<td>158</td>
<td>450</td>
<td>220</td>
<td>62</td>
<td>282</td>
</tr>
<tr>
<td>Mkushi, CP</td>
<td>139</td>
<td>55</td>
<td>186</td>
<td>234</td>
<td>518</td>
<td>752</td>
</tr>
<tr>
<td>Mumbwa, CP</td>
<td>342</td>
<td>168</td>
<td>510</td>
<td>173</td>
<td>439</td>
<td>612</td>
</tr>
<tr>
<td>Petauke, EP</td>
<td>400</td>
<td>172</td>
<td>572</td>
<td>628</td>
<td>2,676</td>
<td>3,304</td>
</tr>
<tr>
<td>Totals</td>
<td>2,034</td>
<td>1,105</td>
<td>3,139</td>
<td>2,026</td>
<td>24,462</td>
<td>26,488</td>
</tr>
</tbody>
</table>
28. POLITICAL SITUATION AND POLICIES

**Political stability:** Over recent year, Zambia has experienced political stability to the extent that no civil unrest and or international disputes interrupted project implementation. Economically, a higher local currency exchange rate saw the value of the kwacha fall against the dollar throughout the year. Inflation was consistently high and this resulted in higher costs of goods and services than expected. In addition, the Government of the Republic of Zambia passed a Statutory Instrument number 55 of 2013 which brought into force the Bank of Zambia (Monitoring of Balance of Payments) Regulations, 2013, effected in May, 2013. The main objective of the Statutory Instrument is to monitor Balance of Payments in a transparent and accountable manner.

**Control on the importation of foreign honey:** The government has stepped up control on the importation of foreign honey stopping the importation of foreign honey by major supermarkets. During the period under review, the government also imposed a temporary ban on the production of timber from Zambian forests which though aimed at reducing exports, created a shortage of timber on the market. The ban on the importation of foreign honey by major super markets could have increased the demand for honey produced locally. On the other hand the ban on timber affected the supply of wood for construction of beehives. Most suppliers contracted to supply beehives had challenges in meeting the targets on time and this resulted in erratic distribution of beehives.

**Levy on bee products:** The Government has passed the statutory instrument No. 52 of 2013, cited as the Forest Amendment act, which directly negatively impacts beekeepers by imposing a levy on bee products of K30 per kg of honey and bees wax, and K45 per kg of propolis.

**High exchange rates and inflation:** The higher exchange rates could have benefited the major exporting companies from the high value exports and this might have increased processing and production. However, higher inflation resulted in higher costs of goods and services than expected. This was evidenced in the rising cost of construction materials that affected the completion of bulking points in most designated areas. With regards to the Statutory Instrument which brought into force the Bank of Zambia (Monitoring of Balance of Payments) Regulations, 2013, with effect from 16th May, 2013, exporters of honey may have experienced delays in cash flows arising from this change.

**Developing and Implementing Chemical Residue Plan:** As per the EU Commission requirements that requires developing countries to submit to EU quality assurance measures which are taken to ensure production and exportation of safe and quality honey as per EU specifications, which include measures on chemical residue monitoring system for honey and other bee products for importation into EU member countries. Zambia developed and implements a chemical residue monitoring scheme; and submits these to the EU chemical residue monitoring reports for honey.
29. NATIONAL BEEKEEPING POLICY

In 2003, the Forestry Department with support from CIFOR embarked on a process of formulating a National Beekeeping Policy aimed at providing the necessary regulatory and legislative support for the development of the beekeeping industry. A series of stakeholder consultations were undertaken across the country culminating in the development and adoption of the first draft of the policy in 2008. However, due to various reasons, the process stalled before presentation of the policy to the Minister and subsequent adoption by Cabinet. In 2012, with support from the Netherlands Development Organisation (SNV Zambia), and following widespread demand from the sector, Stakeholders reinitiated the process of updating the draft which they passed on to the Ministry after validation by stakeholders in selected provinces. To date the Ministry has not responded with any sense of urgency to have the document adopted.

The justification for the policy is grounded on the premise that the major prerequisite for sound beekeeping is a well-managed forest resource base supported by a relevant legal framework. It is envisaged that this Policy, if well implemented by all relevant stakeholders, will ensure beekeeping development in the country. The new Policy will seek to enhance the competitiveness of Zambian bee products at local, regional and international levels by addressing quality standards to ensure food safety and increased market access. Market support will promote enterprise development, value addition, product diversification and increased incomes for beekeepers. The policy will also promote research into areas of bee product development, innovation and technology as well as pest and disease control with a view to ensuring that findings are disseminated and translated into actions for the benefit of all stakeholders. In addition, the Policy recognises and promotes the importance of training extension and education as the undergirding elements for sector development at the primary and meso levels of the value chain. Furthermore, the Policy addresses the need to ensure adequate participation of women and youth in the sector through the provision of equal opportunities for training and practice with a view to increasing household incomes and production volumes. The Policy also provides for a clear legal and regulatory framework that will guide the management and coordination of key stakeholders and players in the sector through the action of a national coordination and regulation agency. It is envisaged that with the aforementioned policy actions, the development of the sector will be better positioned to contribute to national GDP and wealth creation.

Legal Framework: Beekeeping in Zambia is regulated through the Forestry Act No 39 Cap 199 of 1973. In order to address the various emerging issues and concerns in the beekeeping sector, Government shall amend this Act. Zambia has preferential trade agreements under the COMESA treaty and SADC Trade Protocols that provide opportunity for cost effective trade in bee products.

Registration of beekeepers is proposed along with designation of forest reserves to prevent activities like logging, commercial agriculture and mining from negatively impact beekeeping. As we are informed from Kokwe’s report, Zambia has historically swung from total Government control of the sector to a “hands off” approach. The new policy does anticipate involvement of all stakeholders in the effective management of this sector. Forestry does see a need for levies in this sector in order to finance their effective management of the resources. However entrepreneurs are worried that levies will lead to opportunities for circumvention. In what way is this document (Road map/strategy) linked to the draft policy that has been tabbed before Ministry of Lands.
CHAPTER 2.

STAKEHOLDERS, SUPPORT & SERVICE PROVIDERS FOR THE ZAMBIAN HONEY SECTOR
## MAIN ACTORS AND INTERMEDIARIES ALONG THE VALUE CHAIN

### BEEKEEPER
Makes or buys hive, baits, places, checks hive, harvests, sells comb honey OR processes and sells as liquid honey.

### ENTERPRISE MANAGER
Source trade finance, contract Certification Body, ensure documented traceability of operation, organise logistics, export permits, market linkage, staff recruitment, quality control, etc.

### BEEKEEPER FAMILY
Assists harvest, carrying, processing, beer-making.

### BUYER 1 (Organic)
mobilises beekeepers into groups, internal control system, collects occupied hive data, and distributes buckets, collection centres, agents, lead beekeepers.

### BUYER 2
Arrives during honey Season, purchases liquid honey at lowest price possible. Sells to Processor or direct to market.

### TRANSPORTER
B/C to processing Unit or Market, PU to port.

### COLLECTION/BULKING CENTRE MANAGER
quality control, register beekeepers, manage storage, communicate buyer.

### TRANSPORTER
B/C to processing Unit or Market, PU to port.

### DISTRIBUTOR
for local and Regional market

### PURCHASER
Weighs, records, pays beekeepers. Loads transport to factory, Processing, bulk and retail sales Local and export, export documentation, documented traceability hive to customer.

### FACTORY MANAGER
Receiving honey, ensures traceability, processing, packaging for bulk or retail, stock records, dispatch to market

### IMPORTER/ BROKER/ PACKER
International distribution to retail.
The exact number of beekeepers in all the provinces is not yet known although it is estimated to be 20,000. The number can only be established through a census (an interview of all the households in the provinces). It is estimated that the number of organized beekeepers in NWP is about 7,500 as of January, 2007 divided in 33 routes under Northwestern bee keepers association. There are also five (5) bee keeper groups in Mpongwe-Masaiti with a total membership of over 1000, mainly organized around Mpongwe bee keeping enterprises. In Northern Province, the total number of beekeeping groups and none members in SNV operational area is 503. The lowest number is in Mungwi with 40 beekeepers while the highest is 118 beekeepers in Isoka because of assistance from ASP and Forest Department, who funded the groups by providing production equipment.

Mpika is the second with 101 beekeepers because initially beekeeping was introduced in the early 2002 by Economic Expansion and in Outlining Areas (EEOA) and later Environmental Support Programme. Now ASP is supporting the same groups left by these two organizations. Mbala follows with 98 members, Kasama 96 members and Chinsali with 50 members. In western province there is an association of bee keepers in Kaoma. Generally most of these associations/cooperatives still lack adequate capacity due to low membership (fees), lack of auditing systems, bulking capacities and other logistical challenges.
CHAPTER 2. STAKEHOLDERS, SUPPORT & SERVICE PROVIDERS FOR THE ZAMBIAN HONEY SECTOR

Enterprises Active in Zambia

The main drivers in terms of marketing are the private companies although some NGOs are also providing some markets to bee keepers. Private companies actively engaged include, Forest Fruits, UBUCHI and Mesh Enterprises in North Western province, Mpongwe beekeeping, Rivendell Enterprises and Specialty Foods on the Copperbelt.

In Northern Province, there is currently only one organized buying company in the Province. Luá luá Beekeeping Cooperative based in Kasama. The cooperative buys both comb and liquid honey which it processes and bottles.

COMACO based in Eastern Province (previously linked to Wildlife Conservation Society) is now operating independently as an enterprise, trains beekeepers, purchases and processes honey for Zambian retail market.

A new company Greenbelt Enterprises has joined the trade as one of the major buyers and wholesalers.

Apart from Luá-luá there are other private individual traders who buy honey from the field and sells to Luá Luá Cooperative. North Luangwa Project buys and sells produce from its beekeeper groups.

The following firms are currently actively involved in apiculture across Zambia.
**Table 10: Main enterprises operating within the bee products sector in Zambia.**

<table>
<thead>
<tr>
<th>Company Name/“Brand”</th>
<th>Contact Person/Location Provinces/Area(s) of Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Fruits – “Zambezi Gold”</td>
<td>Daniel Ball – Lusaka, Mwinilunga North Western Province</td>
</tr>
<tr>
<td>Mpongwe Beekeeping Enterprise – “Miombo Forest”</td>
<td>Kenneth Chisenga – Mpongwe Copperbelt, Central, North Western</td>
</tr>
<tr>
<td>Ubuchi Capital Enterprises – “Ubuchi Liquid Gold”</td>
<td>Benjamin Kambafwile – Lusaka, NW Province</td>
</tr>
<tr>
<td>Cupern Limited (packer)</td>
<td>Emmanuel Mwelo – Lusaka Lusakamainly North Western</td>
</tr>
<tr>
<td>Meshearles Enterprises – “Manyinga Harvest Honey”</td>
<td>Misheck Moonga – Solwezi North Western</td>
</tr>
<tr>
<td>COMACO – “It’s Wild!”</td>
<td>Newlove Kanangwa – Lusaka, Lundazi, Mtwe Eastern Province</td>
</tr>
<tr>
<td>Environment and Development Zambia (EDZ)</td>
<td>Chipangile Musongole – Kitwe, Kabompo North Western</td>
</tr>
<tr>
<td>LuaLua Beekeeping</td>
<td>Ronald Mwamba – Kasama Northern Province</td>
</tr>
<tr>
<td>Miombo Forest Products/EDZ</td>
<td>James Mwenya Kitwe North Western</td>
</tr>
<tr>
<td>Kapenda mabula natural products ltd – “Luano”</td>
<td>Trevor Watson Lusaka, Kabwe Kabwe, Central Province</td>
</tr>
<tr>
<td>“Das Organic Honey” (packer)</td>
<td><a href="mailto:dashoney13@hotmail.com">dashoney13@hotmail.com</a> Lusaka, Lusaka Province</td>
</tr>
<tr>
<td>“Munati Foods”</td>
<td>Mrs Wamusheke Phiri Lusaka, Lusaka</td>
</tr>
<tr>
<td>Chankakwa Ltd. (packer)</td>
<td>Mrs Dorothy Eriksson, Kabwe Kabwe, Central Province</td>
</tr>
<tr>
<td>Rivendell Enterprises – “Bee Sweet”</td>
<td>John Enright – Luanshya District Copperbelt Province</td>
</tr>
<tr>
<td>LOCAL HONEY BUYERS – Northern Province</td>
<td>Location Area of Operation</td>
</tr>
<tr>
<td>Actor/Company</td>
<td>Kasama Mpulungu, Kaputa, Kasama &amp; Mbala</td>
</tr>
<tr>
<td>Lua-luo Co-operative</td>
<td>Kasama Munkonge-Chilufya-Kasama</td>
</tr>
<tr>
<td>Greenbelt Enterprises</td>
<td>Mpika North Luangwa</td>
</tr>
<tr>
<td>North Luangwa</td>
<td>Chinsali Chief Nkula &amp; Chibesakunda</td>
</tr>
<tr>
<td>PAM COMACO</td>
<td>M脉lungu Chibwika</td>
</tr>
<tr>
<td>Mr. Machangwa Kaoma</td>
<td>Kaputa Nsama</td>
</tr>
<tr>
<td>Mr. Kabwe Leonard</td>
<td>Mpulungu Chitimbwa</td>
</tr>
<tr>
<td>Mr. Daniel Kalumbi</td>
<td>Mtwe Chibwika</td>
</tr>
</tbody>
</table>
EXAMPLES OF COMPANIES ACTIVE IN SOUTHERN AND EASTERN AFRICA ENGAGED WITH BEE PRODUCTS

Please see Annex Document for a list of companies with contact website addresses.

30. CONTRACT MANUFACTURERS

Geraro Manco: The statement on their website: “We take the headache out of getting your product from raw materials to a shelf ready saleable item or any part thereof. We are small enough to care but big enough to deliver good volume and maintain quality with effective turnaround times”. Geraro Manco, established in 2004, provides a total manufacturing and development service to the cosmetics and personal care products industry. We have the ability, knowledge and facilities to offer a complete contract service, from product concept through to pilot batching and full scale manufacture. Geraro Manco is an innovative and vibrant company located in the centre of Alberton, Johannesburg with manufacturing facilities on site. Whether manufacturing personal care products, premium products for global market leaders, or developing brands and packaging solutions for young, dynamic niche products, Geraro Manco offers an industry-leading service, based on expertise, experience and innovation. http://www.geraromanco.co.za/

Marsing & Co Africa (Pty) Ltd is in essence a Manufacturer’s Representative, Importer and Distributor. Incorporated in 1994, the Company has been successfully supplying the African Pharmaceutical, Nutraceutical, Cosmetic, Healthcare and Animal Feed Industry. http://www.marsing-sa.com

31. LARGE RETAIL CHAINS IN SOUTHERN AND EASTERN AFRICA THAT PROVIDE POTENTIAL MARKETS BEE PRODUCTS

There are numerous retailers in Zambia that provide a viable domestic market for Zambian honey.

- Shoprite – South African based retail company which operates over 1,200 corporate and 270 franchise outlets in 16 countries across Africa and the Indian Ocean Islands. It also runs under the following brands: Checkers, Checkers Hyper, Usave and OK (this is a franchise division and runs under the names of OK Foods, OK Grocer, OK Megasave, OK Minimart, OK Value and Sentra).
EXAMPLES OF COMPANIES ACTIVE IN SOUTHERN AND EASTERN AFRICA ENGAGED WITH BEE PRODUCTS.

- **Woolworths** – A South African chain of retail stores and one of the largest in the country. It is modelled on Marks and Spencers in the United Kingdom. The brand now incorporates a series of food stores, some of which are attached to department stores while others stand alone or are attached to Engen petrol stations in prosperous urban areas. Woolworths’ goods are sold at 149 corporate stores throughout the rest of Africa and the Middle East and 69 South African franchise stores nationwide.

- **Makro** – based across Africa but mainly in South Africa. Makro can be found across the world.

- **SPAR** – This is an international retail chain and franchise with approximately 12,500 stores. This is a large company and is slowly making its way across Africa.

- **Nakumatt** – has stores in Kenya, Uganda, Rwanda and Zambia. It has plans to enter other African countries and to increase the number of stores in the countries it already has a presence.

- **Pick and Pay**

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32. OTHER INTERNATIONAL SUPERMARKET CHAINS WITH PRESENCE IN AFRICA

The top chains are (in order of turnover for 2013):

- **Walmart**: Global retailer who owns such brands as ASDA in the United Kingdom, Walmex in Mexico, Seiyu in Japan and Best price in India. It recently acquired a majority stake in Massmart Holdings Ltd in 2011. Massmart operates more than 350 stores in South Africa and 11 other sub-Saharan countries. They have a small farmer market access programme and in 2012, they launched their direct farm program, Ezemvelo, to develop and diversify their local sourcing capacity in fresh produce. The program provides small farmers access to markets and, since August 2012, they have sourced 514 tons of locally grown vegetables, including butternuts, peppers and green beans.

- **Carrefour S.A**: At the end of 2011 Carrefour had 1,452 supermarkets globally including a presence in Northern Africa.

- **Tesco**: They are currently not in Africa but according to Reuters they are looking to move into South Africa. Their global coverage includes stores in 12 countries across Asia, Europe, North America, Malaysia, Ireland and Thailand.

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33. ONLINE RETAIL

Online shops can be accessed from anywhere in the world and products can come from and be supplied from anywhere in the world. The company Go Organic in South Africa sources and trades in all mainstream and niche market certified organic and wild harvested products from retail fresh to industrial and processed. They call themselves International Organic Marketers. http://www.go-organic.co.za/

There are numerous bee products available on Amazon, Ebay (UK, USA and France,) Alibaba etc. If there are points of difference with African Bee products then this can be strongly promoted using this medium, (i.e. that African bee venom is stronger than European bee venom). The online market is now massive and a huge market to tap into for the products. The big advantage is that people can buy the products from anywhere from anywhere.

Online shops are easy to set up and run. You don’t even have to have your own – it can all be done via a shop on Ebay if need be. With mobile technology so big in Africa this can be the way to run an online shop as well. A website is now very easy and free to set
up on the internet using companies such as YOLA and Wicks. They are easily managed as well from anywhere in the world and can be developed for each product or SME or cooperative etc. Facebook and Twitter and blogging on such sites as Google Blogger also not only advertise the products but engage the consumer with the story of the product. They also serve to optimise the company and products on search engines as the more places the company name is the more it is found but the google and other search engine search 'bots'. Even if they are set up when companies/groups are in their infancy people and consumers now love to know and feel they are part of the full story as it develops.

Optimisation is key with all products on the web. Key search terms as used that then ‘rank’ top on search engines i.e. when you type in Beeswax in Google search engine certain companies and/or products will come out on top. This is because they know this key term is well used to search for certain products and have placed these words in many various ways across their site, Facebook page etc. It is worth using Google Adwords to see what search terms people use most for the product you are trying to promote. For example when searching for propolis, people may type in pure propolis. If you have researched this and placed these words on your pages, you will then rank higher up the search results page and become noticeable to consumers, investors, traders etc. This is well worth the extra effort in the online market. Google webmaster is a free service, and you can use it to track your websites performance and look up and research ‘trending’ search terms.
34. RETAILERS AND END CONSUMERS

SNV Zambia has focused development resources on creating improved, efficient flow of quality honey and bee products and related services through the value-chain resulting in the ability of the system to more competitively meet consumer demand. The state of the honey industry has dictated a greater emphasis of development funds on assisting farmers to increase production. This assistance needs to be continued while balancing the development emphasis on marketing and promotion as well as improving processing efficiencies throughout the farm-to-consumer system. Without market expansion, Zambia’s apiculture industry will have limited success in increasing economic development opportunities and expanding participation in the industry by stakeholders. When a value-chain’s linkages are improved, cost competitive, quality products and services are generated and move markets. Market expansion results in increased revenue that is funnelled back into the system as investment in new technology, capacity and hiring of employees – all necessary to meet new demand for products and services.

The Zambia Honey Council was set up in 2003 to be the national apex body for the bee product sector. The Zambia Honey Council, is active and has been sourcing core funding to provide services to its members who are mainly beekeepers. More recently ZHC has been complemented by the AgriBusiness Forum which assists in developing the sector value chain and is secretariat to the informal Zambia Honey Platform which represents the wider bee product sector, including Government.

ApiTrade Africa was set up in Uganda in 2008. According to the website it is a member-based non-profit company that promotes market development. Its current membership includes Kenya, Zambia, Uganda, Rwanda, Zimbabwe, Tanzania, Ethiopia, South Sudan, Madagascar, Cameroon, Nigeria, Ivory Coast, South Africa, Belgium and the UK. ApiTtrade is an active forum with the mandate to articulate African issues on apiculture.

A new African body, the Africa Apiculture Platform (AAP), has emerged through an AU initiative which is more embracing of the different stakeholders at continental level. It was launched in December 2014 in Kampala, Uganda. Forest Fruits Limited Zambia was elected the Southern Africa Private Sector representative on the Executive Committee.

35. THE DIFFERENT TYPES OF BUYERS

The Zambian honey industry has buyers classified in two general categories – formal and informal. The formal buyers assist honey producers with materials – hive support, training and materials for harvesting while the informal buyers are opportunists who don’t provide producers with this support however are in the market at harvest time to secure product. Due to the fact that the formal buyers have costs associated with supporting the beekeepers while the informal buyers don’t have investment in support of the beekeepers the informal buyers can pay a higher cost than those who have sunken investments in the beekeepers.
Since rule of law, contracts and long-term commitment of support are limiting factors in the forests of Zambia the loyalty that the beekeepers have to the buyers is more important than contracts, however, a higher price for product is an incentive for producers to sell to the informal buyers. This discourages large investments in training, hives and harvesting equipment by the buyers who cannot count on the loyalty of suppliers. This loyalty is a limiting factor in the advancement of the Zambian apiculture industry and must be addressed in order to encourage further investment by local and international buyers in the apiculture industry.

Forest Fruits is a pioneer and leader in the Zambian apiculture industry. They are a private sector organic certified buyer that has aggressively and successfully developed in North Western Province. They have an internal control system of approximately 6000 registered beekeepers through a process of cohesive group formation, training, collection centres, and continue to systematically improve processing equipment, procedures and capacity. They export bulk product to the European market and more recently packaging for retail locally, regionally and very recently completed an export of retail packed product to Canada.

There are a number of buyers who also make beehives, bee equipment, protective clothing and train beekeepers in top bar hive management, process and bulk sell honey and wax to the regional market and package for the local market. Some of these buyers have started the process to reach the organic export market. Mpongwe Beekeeping Enterprises (MBE) and Rivendell Enterprises (Bee Sweet) based on the Copperbelt and Community Market Company (COMACO) in Eastern Province.

Buyers who have limited processing capacity who mainly buy from Northwestern Province and sell to the regional and local markets. Some of the SME’s include Ubuchi, EDZ, Monati, and MESH. Ubuchi has started to export to Europe and is currently building processing capacity. There are traders who mostly buy liquid honey from beekeepers include Cupen Investments and Chankwakwa Ltd. Local nongovernment organizations which secure support to supply training, equipment and hives, to beekeepers and link the beekeepers to markets or purchase the honey themselves and supply the markets like Environment Africa, Green Living Movement, OPPAZ.

35.1. THE COOPERATIVES

- The NWBP was supported by GTZ in the 1980s to be the management, processing and marketing arm of the Organic and Fair Trade certified Northwestern Beekeepers Association (NWBSA). A cooperative model that currently is not optimally functioning because of the collapse of the management company.
- Community Markets for Conservation (COMACO) a not for profit trading company in Eastern Province purchases farmer products, processes and markets under its Wild label.

35.2. THE BUYERS & INPUT SUPPLIERS

- Buyers who also make beehives, bee equipment, and protective clothing and train beekeepers in top bar hive management, process and bulk sell honey and wax to the regional market and package for the local market. Some of these buyers have started the process to reach the organic export market: Mpongwe Beekeeping Enterprises (MBE) and Rivendell Enterprises (Bee Sweet) based on the Copperbelt.
35.3. THE CONVENTIONAL BUYERS

- Buyers who have limited processing capacity who mainly buy from Northwestern Province and sell to the regional and local market and may buy directly from beekeepers or from traders. Such SME’s include Ubuchi, EDZ, Monati, MESH. EDZ exports to the region. Ubuchi has started to export to Europe and is currently building processing capacity.

35.4. THE ORGANIC BUYERS

- The private sector organic certified buyer, Forest Fruits, has developed in North Western Province an internal control system of thousands of registered beekeepers through a process of cohesive group formation, training, collection centres, and continues to systematically improve processing equipment, procedures and capacity in order to deliver a bulk quality product to the overseas market and more recently packaging for retail outlets locally, regionally and very recently internationally (Canada).

35.5. THE TRADERS

- Buyers who are traders and who mostly buy liquid honey from beekeepers and pack for retail such as Cupen Investments, Chankwakwa Ltd, and Das Organic Honey. The latter is not certified organic.
CHAPTER 2. STAKEHOLDERS, SUPPORT & SERVICE PROVIDERS FOR THE ZAMBIAN HONEY SECTOR

GOVERNMENTAL ACTORS

36. GOVERNMENTAL SUPPORT AND INSTITUTIONAL STRUCTURE

In 2005 the government introduced the Forestry Development and Credit Facility Fund. This is a loan facility providing micro, small and medium loans for forestry enterprises development including Beekeeping development. So far the province has had 5 beneficiaries including one for beekeeping.

During the same period the government introduced Joint Forest Management Programme (JFM) where communities can jointly manage protected local forests with the government. This gives an opportunity for communities to utilize the local forest areas near them for beekeeping development.

By 2006 twelve beekeeping groups targeted at 30 households per group were established and trained. Two groups in following districts; Chinsali, Isoka, Mbala, Kasama, Luwingu and Mporokoso were established.

Institutional Structure: Key participants in the sector include the honey sector exporters and producers, the Ministry of Trade, Commerce and Industry, the Department of Forestry of the Ministry of Tourism, the Veterinary Department of the Ministry of Agriculture and Cooperatives, the Zambia Development Agency (ZDA), the Zambia Bureau of Standards, auditing companies and testing laboratories in Zambia, University of Zambia Food Science and Technology Department, national and international NGOs, such as SNV, SHEMP, Keepers Zambia Foundation, the Zambia Honey Council, Agri-Business Forum and the North Western Beekeepers Association, private sector banks, insurance companies, and international organizations, such as the International Trade Centre, UNDP or FAO, Zambia Environmental Management Agency, ZATAC, JICA, Caritas, Local Capacity Builders, Zambia Honey Council & Members.

Table 11: Institutional structures participating in the bee products sector:

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Government agencies</strong></td>
<td></td>
</tr>
<tr>
<td>Zambia Development Agency</td>
<td>Export promotion and development</td>
</tr>
<tr>
<td>Zambia Bureau of Standards</td>
<td>Honey and beeswax standards</td>
</tr>
<tr>
<td><strong>Government institutions</strong></td>
<td></td>
</tr>
<tr>
<td>Forestry Department</td>
<td>Extension and training, forest protection and management</td>
</tr>
<tr>
<td>Ministry of Agriculture and Livestock</td>
<td>Export licenses, accreditation of organic and fair trade certifiers</td>
</tr>
<tr>
<td>Ministry of Commerce, Trade and industry</td>
<td>Trade conventions, WTO regulations etc</td>
</tr>
<tr>
<td>Local Councils</td>
<td>Health inspections, trading licenses and honey licenses</td>
</tr>
<tr>
<td>Forestry Research and Training Institutions</td>
<td></td>
</tr>
<tr>
<td>Zambia Environmental Management Agency</td>
<td>Environmental standards</td>
</tr>
<tr>
<td><strong>Other organisations</strong></td>
<td></td>
</tr>
<tr>
<td>Zambia Honey Council</td>
<td>Representation, lobby and advocacy</td>
</tr>
<tr>
<td>Keeper Zambia Foundation</td>
<td>Group mobilization and strengthening.</td>
</tr>
<tr>
<td>Evangelical Church of Zambia</td>
<td></td>
</tr>
<tr>
<td>SNV Netherlands Development Organisation</td>
<td>Capacity development</td>
</tr>
</tbody>
</table>
### Stakeholder and Role Table

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Bee-KeePers Association</td>
<td>Lobbying and advocacy</td>
</tr>
<tr>
<td>Financial Institutions (Finance Bank, Stanbic etc)</td>
<td>Financial services</td>
</tr>
<tr>
<td>OPPAZ</td>
<td>Organic promotion/certification</td>
</tr>
<tr>
<td>Caritas</td>
<td>Group mobilization</td>
</tr>
<tr>
<td>FLO</td>
<td>Fair trade registration</td>
</tr>
<tr>
<td>Environment development of Zambia</td>
<td>Group mobilization</td>
</tr>
<tr>
<td>Agri-Business Forum</td>
<td>Provision of Business Development Services and sector coordination through Zambia Honey Partnership</td>
</tr>
</tbody>
</table>

### 37. RELEVANT MINISTRIES AND DEPARTMENTS

The key ministries in the bee keeping sector are:

- **The Ministry of Lands, Natural Resources and Environmental Protection**: The Ministry by virtue of its overall responsibility for forest resources and beekeeping development is the principal ministry to provide coordination to the sector. The roles of the ministry include but are not limited to: the promotion and establishment of plantations and forest nurseries, management of indigenous forests, regulation of economic utilisation of forest resources.

- **The Ministry of Finance**: The role of the Ministry of Finance in the implementation of the National Beekeeping Policy is to provide an enabling environment for the participation of all stakeholders in the beekeeping sector; spearhead resource mobilisation through the basket funding mechanism to ensure implementation of programmes, projects and activities arising from the Policy, clear beekeeping project proposals for funding in order to minimise duplication of roles, investment and enhance coordination in the beekeeping sector; and provide guidance on the use of allocated and released funds.

- **The Ministry of Agriculture and Livestock**: The Ministry of Agriculture and Livestock offer phytosanitary services and certificates for exporters of bee products which are to be decentralised to district and provincial level in order to increase access and minimise bureaucracies associated with exports. It also facilitates accreditation of local food testing laboratories to be recognised by international accreditation companies in order to promote international trade; facilitates organic and/or fair trade certification for bee reserves and products. It also is responsible for undertaking research and surveillance programs to monitor and control highly prevalent honey bee diseases and pests for market access.

- **Ministry of Health**: The Ministry of Health regulate honey quality standards for human consumption; carry out food safety inspections, sanitary and health inspections of processing facilities.

- **Ministry of Commerce, Trade and Industry**: The Ministry is charged with the responsibility of formulating and administering policies as well as regulating activities in the trade and industrial sectors in order to enhance the sectors’ contribution to sustainable social economic growth and development for the benefit of the people of Zambia. In the case for the Apiculture sector the Ministry will facilitate market access and penetration through effective trade negotiations and eliminate any impediments to both internal and external trading of bee products.

- **Zambia Revenue Authority**: (provide the necessary information on various taxes such as VAT on beekeeping products and any other information. The Authority is responsible as a key source of information on export data relating to honey and other bee products).

- **The Zambia Development Agency (ZDA)** promotes the Honey Sector through local and foreign exhibitions, market research activities in target markets, export awareness campaigns, undertaking supply and demand surveys and provision of...
market information on the available markets for honey and its bee products, among others. ZDA also liaises with Ministry of Lands, Natural Resources and Environment Protection and other Non-Governmental Organizations such as SNV (Netherlands Development Organization) to coordinate the sector.

- **Drug and Poisons Board** (provide testing laboratory for bees and bee products; collaborate with the Zambia Bureau of Standards in developing the Zambia honey and bees wax standards).
- **National Institute for Scientific and Industrial Research** (provides food testing laboratory to test honey and other bee products for the domestic and international markets).
- **Zambia Bureau of Standards** (Develop Zambia Honey Standards for domestic consumption; liaise with relevant stakeholders to harmonise the current honey standards into the new standards to be developed; facilitate export authorisation of bee products that satisfy the stated conditions from the importing countries, and provide the industry platform with necessary data on quantities exported, value of export consignment and revenue accrued to Government from each exported consignment).
- **Zambia Environmental Management Agency (ZEMA)** (Facilitate conducting of Environmental Impact Assessments in beekeeping areas, monitor the activities of the mining companies and enforce necessary laws regarding mitigation of adverse resulting effects; and recommend necessary action to mining companies on monitoring of pollution and other emissions of gases).

### 38. FORESTRY DEPARTMENT

In Gun Kokwe’s report *Small-scale woodland-based enterprises with outstanding economic potential: The case of honey in Zambia (2005)* we are informed that after many years of seeing beekeeping as a minor product of forests, the colonial administration established a bee-keeping division under Forestry Department in 1959 and a more comprehensive extension message was developed. North-Western and Copperbelt Province were selected for intensive bee-keeping activities.

“With independence in 1964, however, the private honey and beeswax buying network operating in the whole of North-Western and parts of Western Province was closed down as part of nationalist economic policies. The loss of market compromised the impact of the extension effort. The Forestry Department entered into the marketing of honey and beeswax to compensate for the absence of a marketing network and promote trade. National honey processing factories were established at Mwekera, Kabompo and Mwinilunga with a total capacity of 500 tonnes. The Beekeeping Division (BD) started buying honey providing a market for more than 10,000 beekeepers. Between 1970 and 1996, BD bought an average of 14,000 to 18,000 kg of beeswax and 17,000 to 114,000 kg of honey annually thereafter. Purchases peaked in 1990 with 57,000 kg of beeswax and 205,000 kg honey bought from village bee-keepers. Even the National Marketing Board (NAMBoard) at one time engaged in buying of beeswax. Government involvement in the honey came to an end with the advent of economic liberalisation in 1990.”

Forestry Department has continued to have officers in all provinces and most districts of the country and most of them included beekeeping in their forestry training. Unfortunately effective participation of these officers in the sector since liberalisation of the economy has been hampered by limited Government resources.
SUPPORT TO THE SECTOR

39. SUPPORT BY GOVERNMENT AND DONORS

PSDRP II & EIF: Government’s commitment to supporting trade expansion is not only evidenced by the inclusion of a Commerce and Trade Chapter in the Sixth National Development Plan, the overarching national development document, but also by prioritizing trade in the PSDRP II. Government has committed to fund a significant proportion of the PSDRP II which runs from mid-2009 to 2014. PSDRP II includes Business Licensing and Regulatory Reforms, SME Development, Labour and Skills Development, Public Private Partnership Development and Trade Expansion. The EIF has been integrated into the Trade Expansion Component of the PSDRP II and the DTIS and its Action Matrix forms the basis for all interventions of the programme. Other donors have also committed to support the PSDRP II using basket funding and indeed bilateral project funding based on nationally identified priorities. Some of the trade-related technical assistance (TRTA) programmes, in line with the EIF process being coordinated by the Ministry of Commerce, Trade and Industry (MCTI) include the Joint UNIDO-WTO Trade Capacity Building Programme for Zambia.

Aid for Trade in particular EIF programme is an important and effective tool for building and strengthening capacity to trade and deepening continental integration, thus intra-African trade. Zambia is using the EIF Programme to accelerate poverty reduction processes through strategic interventions along the value-chains of selected priority sectors to stimulate growth and job creation. The Zambian Government is currently implementing a Tier 2 project under the EIF Programme called ‘‘Trade and Investment Project for Enhanced Competitiveness of Zambia’s Apiculture Sector’’. On the 28th January, 2013 the EIF Board approved Zambia’s first ever Tier 2 project called Trade and Investment Project for Enhanced Competitiveness of Zambia’s Apiculture Sector (TIPEC-ZAS) for period of three (3) years with a total budget of two million, eight hundred and twenty thousand, one hundred and thirty United States Dollars (USD 2,828,130.00) for the Apiculture sector. The overall objective of the Project is to enhance sustainable entrepreneurship in the Apiculture sector through increased production and productivity, improved market access and improved quality and standards. The project will adopt a market based value chain approach focusing on strengthening the production capacities of primary producers and building commercial relationships between upstream and downstream supply chain actors. This will include service providers, producer groups, processors, logistic operators and distributors.

The project is expected to improve the sector’s annual production levels from 4,000 MT to 7,000 MT in volume of bee products by year 3 of the project life cycle and also transform the public institution responsible for forestry and beekeeping management into a centre of excellence. As many as 5,000 producer including 15% youth, 35% women will have access to training and extension services through lead producers and production hubs that will be part of the production networks. There is enormous potential to increase honey exports from the current 1,200 MT to 5,000 MT by the end of project implementation. In a bid to promote the participation of women in the Apiculture sector, the TIPEC-ZAS project has prioritised the selection of female beneficiaries. The project will deliberately pay special attention to youth/women led and youth/women owned enterprises as part of the strategy to ensure gender for empowerment. Of the targeted 5,000 beekeepers for support, 35% of these will be women and 15% will be youth.
CORDAID, a Dutch Development Organization, is active in the Honey sector with particular attention on the Small and Medium Scale Enterprises (SMEs) and Beekeepers by providing those grants and loans on flexible terms and conditions. In addition, SNV is currently providing technical assistance and capacity building to the Honey sector in order to enhance its competitiveness.

In 2006/7 Zambia commissioned a Study to assess the competitiveness of the Honey sector and this ultimately led into the development of the Honey Sector Roadmap. The roadmap for the honey and bee products sector was developed as an intervention tool that provides a rational approach to donors, public institutions and the private sector, to the promoting of sustained and sustainable growth of Zambia in general, and the bee products sector in particular. In response to this some donors including the Swedish Cooperative Centre (SCC), HIVOS, and the Finnish Embassy provided support to the Zambia Honey Council (ZHC) with a view to enhancing the organisations operations. Further, the United Nations Development Programme (UNDP) identified an area of niche intervention ("gender focus") by providing support to women currently engaged in beekeeping activity. Many of these programs have concluded their efforts.

40. SUPPORT TO NATIONAL TRADE AND PRIVATE SECTOR DEVELOPMENT AGENDA

Zambia became a beneficiary of the Integrated Framework (IF) in 2004 and had its Diagnostic Trade Integrated Study (DTIS) conducted. The DTIS was validated in 2005. Alongside the IF process in 2004, the Zambian Government working in collaboration with the private sector, civil society and cooperating partners developed the Private Sector Development Reform Programme (PSDRP) with a view to enhancing the role of the private sector in Zambia’s economic development process. The EIF programme in Zambia is considered as an aspect of Private Sector Development (PSD) programme.

PSD is a special purpose vehicle that the Government of Zambia embraced in 1991 to transform the economy from state-run to market led. Consequently, in 2004, the Zambian Government working in collaboration with the private sector, civil society and cooperating partners developed the Private Sector Development Reform Programme (PSDRP) with the view to enhancing the role of the private sector in Zambia’s economic transformation. The PSDRP is an expansive programme encompassing reforms across various sectors of the economy aimed at creating the right environment for a vibrant private sector. The Programme is expected to lay the foundation for faster sustained private sector led growth by improving the investment climate. The PSDRP I document was developed in 2006 and its implementation was completed in 2009 and Zambia has since embarked on implementing the second phase of PSDRP II (2009-2014).

The PSDRP identified several areas of intervention and activities required to ensure the private sector takes its rightful place as the engine of growth for the Zambian economy. To champion the implementation of activities identified under the various reform areas, several working groups were established. The Trade Expansion Working Group (TEWG) was established to spearhead the implementation of all activities aimed at expanding Zambia’s capacity to trade and become internationally competitive. Successful implementation of the PSDRP is expected to among other things, result in improved trade facilitation and less cumbersome business procedures, increased productive capacities, better National Quality System, improved regulatory and policy environment to foster investment and trade, and increased market access and penetration.

As part of the trade mainstreaming process, the DTIS Priority Matrix was integrated into the PSDRP as the part of the trade priorities to be addressed under trade expansion. The Enhanced Integrated Framework (EIF) Programme has therefore, been regarded as part of the trade component of the PSDRP. Further, the Commerce and Trade Chapter was first incorporated in the Fifth National Development Plan (FNDP) and subsequently in the Sixth National Development Plan (SNDP) recognized the facilitation
of the implementation of the Enhanced Integrated Framework Programme as one such road map that can be employed to increase the volume of exports in the regional and international markets.

Notably, in 2005 an EIF Framework Programme based on the DTIS Action Matrix priorities, was formulated and integrated into the PSDRP I to guide implementation of the EIF and Trade Expansion activities. The EIF Programme also has profound links with trade facilitation and Aid for Trade Initiatives that are being implemented at regional level such as the COMESA Aid for Trade\textsuperscript{14}, the DFID-funded Regional Trade Facilitation Programme (RTFP)\textsuperscript{15} within the SADC, and the COMESA-EAC-SADC Tripartite North-South Corridor\textsuperscript{16} Pilot Aid for Trade Programme. The EIF framework programme recognizes the need to take a comprehensive and holistic approach to addressing competitiveness, ensuring export trade contributes to wealth creation and successful export trade diversification.

41. KEY PARTICIPANTS IN CHAIN DEVELOPMENT IMPLEMENTATION

The internal 2008 SNV document CAPACITY DEVELOPMENT SERVICES FOR APICULTURE IN ZAMBIA “Enhancing the Competitiveness of the Zambia Apiculture Industry Honey Value Chain” lists the following key participants in value chain development of the industry:

“Key participants in the process of road map implementation are the honey sector exporters and producers, the Ministry of Trade, Commerce and Industry, the Department of Forestry of the Ministry of Tourism, the Veterinary Department of the Ministry of Agriculture and Cooperatives, the Export Promotion and International Competitiveness of the Zambia Development Agency(ZDA), the Zambia Bureau of Standards, auditing companies and testing laboratories in Zambia, University of Zambia Food Science and Technology Department, national and international NGOs, such as SNV, SHEMP, MATEP, Keepers Zambia Foundation, the Zambia Honey Council and North Western Beekeepers’ Association, private sector banks, insurance companies, and international organizations such as the International Trade Centre, UNDP or FAO.”

42. STAKEHOLDERS AT 2014 ZAMBIA HONEY PLATFORM ANNUAL MEETING

There were 25 participants at the May 2014 Zambia Honey Platform meeting including UN bodies like FAO; international development agencies like JICA, SNV; Government – Forestry Department, Zambia Forestry College; national NGO’s OPPAZ, ZHC, ABF, Environment Africa, Imiti Ikulala Empanga; Buyers and processors included MBE, Ubuchi Capital, Forest Fruits, MESH. Service providers

Apart from the Government agencies and departments (particularly Forestry Department), beekeepers and purchasers of honey, NGO’s who are playing a major role in the honey sector include SNV (a Netherlands development agency) who have been playing an active and leading role in the honey sector for more than 10 years and who promote

\textsuperscript{14}. COMESA has recently set up a Unit to coordinate Aid for Trade assistance within the Eastern and Southern African Region. The Unit is expected to develop and implement a regional aid for trade strategy.

\textsuperscript{15}. The RFTP is a DFID supported programme that aims at enhancing trade facilitation in the SADC region

\textsuperscript{16}. The North-South Corridor is a pilot regional Aid for Trade programme among COMESA, SADC and EAC with the broad objective of improving trade support infrastructure and addressing matters relating to trade facilitation.
a value chain development forum/framework to act as a basis for coordination in the sector, Zambia Honey Council (ZHC) set up in 2006 to be the apex organisation for the sector but who have tended to focus more on the needs of beekeepers. Agri-Business Forum (ABF) who have taken the secretariat role of the more recently set up Zambia Honey Partnership platform which broadly represents stakeholders in the whole sector, including Government.

43. ZAMBIA HONEY COUNCIL (ZHC)

Zambia Honey Council (ZHC) was formed in 2003 to provide a forum for honey producers, processors and buyers to discuss issues pertinent to the honey sector. Initially named the Zambia National Bee Keepers Association, the organisation changed its name to ZHC to incorporate all the stakeholders in the honey sector. Since 2005 ZHC has been having dialogue meetings with its key stakeholders, mainly primary producers of honey, the traders and processors to look at ways of improving the operations of the Council as well as to identify challenges faced by each of the stakeholder groups. Its operations are currently confined to three main districts in Zambia i.e. Kaoma, Kapiri Mposhi and Kabompo Districts. Currently ZHC works with 4,000 individual honey producers that are formed into groups and plans to reach 10,000 producers by the end of 2011.

44. HIVOS

Hivos has supported the ZHC since 2005. HIVOS’s interest in ZHC is based on the fact that it seeks to ensure that honey producers have access to markets and thus earn good income to sustain their livelihoods. In 2005 Hivos gave ZHC micro funds to allow it to host a series of meetings with the stakeholders to identify the challenges faced by the honey production sector and to explore ways of assisting the producers, buyers and processors. Hivos has reported that it intends to continue supporting ZHC to improve the production and marketing of honey by small scale honey producers. Funding will be directed to the accreditation of honey processors and the training of both producers and processors to reach the ZHC quality mark. Support will also be given to enable ZHC establish 14 bulking centres to enable producers to bulk up their honey to meet buyer requirements. This will make the marketing of honey easier. Links will be maintained with the Zambia National Farmers Union which runs district information centres. Through these and use of mobile phones, honey producers can access information on the price of honey in the country and use this to negotiate fair prices with buyers. This project will reach out to 4,000 honey producers mainly in Western and North Western provinces of Zambia, 30% of them women.

45. AGRI-BUSINESS FORUM (ABF)

The mission of ABF is to facilitate the development and application of innovative approaches to contract farming schemes for profitable smallholder’s farm production and agribusiness development. The ABF focus is the development of a viable outgrower sub sector in Zambia that could enable smallholders farmers participate in the production of cash crops to which value could be added for local and export market at a profit. Part of the ABF’s road map is to work through strategic partnerships to deliver services to its members and the broader agriculture community.

The ABF has experience in managing and implementing partnerships with both local and international organisations. Previously it implemented a project that was aimed at
strengthening the capacity of producer associations engaged in specific value chains. The intervention was anchored around the private sector companies that contracted these associations as their suppliers. Currently the ABF is the Coordinating Partner for a regional staff exchange program called the Fredskorpset (FK) Program funded by the Norwegian Government. As coordinating partner we are tasked with supervision of other partner organisations on the partnership called the Agribusiness Development network whose members are drawn from 4 countries in the region. The NEPAD Business Foundation (NBF) and ABF recently entered into an agreement where the latter is hosting the country office for the former.

ABF uses the value chain as a holistic approach to challenges and opportunities that affect the entire chain. This has led us to move to a higher level of engaging all stakeholders involved including government and private sector. An example of such work is the involvement in the Zambia Honey Partnership.

ABF has been working closely with SNV-Netherlands Development Organization to address various issues in the Honey sector. In June 2012, the ABF entered into an MOU with SNV to provide services in two value chains i.e. Honey and Rice. In the Honey value chain, ABF was to facilitate the review of the Beekeeping draft Policy through a consultative process. In addition, the ABF was to facilitate market access and trade within the region/sub region by addressing critical issues that limit Bee products trade within the regional countries particularly RSA. In 2013 ABF was contracted to carry out producer group mobilisation, organisation and sensitization in North western and Luapula Provinces of Zambia under the Trade and Investment Project for Enhanced competiveness of Zambia Apiculture Sector – TIPEC-ZAS Project.

One of the salient features of the TIPEC-ZAS project will be the organization of commercially oriented small scale beekeepers.

46. THE ORGANIC PROCESSORS AND PRODUCERS ASSOCIATION OF ZAMBIA (OPPAZ)

The Organic Producers and Processors Association of Zambia (OPPAZ), is an apex member-based business support organisation which unites, leads and coordinates producers, processors, traders, trainers and other stakeholders towards the development of organic agriculture in Zambia. The mission of OPPAZ is to promote equitable and sustainable use of the environment and its natural resources. OPPAZ aims to promote, facilitate and coordinate production, processing, marketing and trade of quality organic products for employment generation, wealth creation and improvement of quality of life in a gender-balanced and drug-free environment. The main goal of the organisation is to sustainably increase income earnings and improve the quality of life of men and women operating in the organic agribusiness value-chains in a drug-free environment. OPPAZ provides a number of services and support to the Zambian honey sector, particularly in production and marketing of organic honey, organic certification, informal scientific research and policy advocacy.

47. THE ZAMBIA HONEY PARTNERSHIP PLATFORM

The Zambia Honey Partnership platform has been developed as a coordination framework that is providing a rational approach, by both the public institutions and the private sector actors involved in promoting sustainable social and economic growth of the honey sector in particular. The Agri-Business Forum was selected to be the Secretariat of the ZHP in order that it can coordinate all the activities in the honey sector that need to be run by the ZHP. Annually the ZHP through its Secretariat, the Agri-Business Forum
(ABF), organises an annual general meeting to review the previous year honey season. The main purpose of the annual meeting is to provide a platform to clarify roles of the various actors in the honey sector, review the performance of the previous year, identify priority opportunities and issues that need to be addressed and develop national and provincial actions plans.

48. EXTENSION SERVICES FOR COMPLIANCE REQUIREMENTS

Extension training is done by a number of organisations in Zambia. Some are buyer/processors like Forest Fruits, Rivendell Enterprises, Mpongwe Beekeeping Enterprises and COMACO. (Mpongwe and Rivendell also make beehives and equipment). Also doing a lot of training is ZHC who were set up to be an Apex organisation for the honey sector in 2006 but they are not felt to focus sufficiently on the needs of buyer/processors. ZHC have produced a Study Circle Beekeeping Guide but it does not include organic requirements.

Forestry Department has offices in all Provinces and most districts. Beekeeping is studied as a module under Forestry qualifications. They used to train beekeepers, buy and process honey and wax and sell into a revolving fund but this was stopped when the economy was liberalised in 1990s.

As described in the background to the final draft of the National Beekeeping Policy: The Public Reform Service Programme of 1997 saw the dissolution of the Beekeeping Division in the new Forestry Department. This was hastened by the liberalization of the economy in the third republic (1990s) which led to the withdrawal of the Forestry Department from purchase of bee products. This meant that Government retained the extension role and left the private sector to enter the market to trade.

Institutionally, the mandate to manage the beekeeping sector is the responsibility of the Forestry Department under the Ministry of Lands, Natural Resources and Environmental Protection but it is assumed in this regard that several other functions relating to beekeeping are performed by other departments and agencies. The Forestry Department has continued to manage the sector in the absence of any comprehensive regulations and laws. This has resulted in the regulation of various aspects of beekeeping under different pieces of legislation. For example, bees as animals regulated under veterinary; honey as food regulated under the Food and Drug Act; beeswax as a manufacturing product; honey and beeswax as export products, and beekeeping as a commercial activity. This scenario means that the sector is segmented. This is exacerbated by the lack of appropriate coordination mechanisms.

As mentioned earlier in this report, the policy suggests that Forestry should again play a coordination role.
Like all agricultural production in developing countries, credit is always an issue in the procurement and processing of Zambian honey. The cost of hives and buckets utilized by the beekeepers creates a barrier for entry at both the producer and processor level. Some processors reduce their costs by not supporting the producer with hives or buckets, however, this circumvents the support that others provide and is a short-term and opportunistic action by profit takers looking for quick short-term profits.

Many processors supply beekeepers with hives and buckets. These resources are one of the limiting factors for expansion of honey exports (and production) in Zambia.

49. FINANCIAL SERVICES & DEVELOPMENT OF CREDIT FACILITIES

Challenges on the access of the financial services in the rural areas have also been and continue to be addressed. Government and other stakeholders are aiming at building sustainable systems at the grass root level. The key driver being support of the informal financial institutions (IFIs), popularly known as “savings groups”. A known and popularly applied IFI is Savings and Credit Cooperative Organizations (SACCOS). Since many beekeepers do not qualify for credit from commercial banks by some reasons including lack of bank recognized security, they may find lending opportunities via their SACCOS.

Forest Fruit’s experience has found that borrowing money for top bar hives and paying out of proceeds of beekeeping is not viable for beekeepers and that a subsidy or start up grant is required. However, this is felt not to be true in all cases. Most microfinance companies currently charge about 4.6% interest per month (Bank of Zambia sets limit at 5%) such as CETzam who with Zambia Honey Council were assisted by Hivos to support beekeepers. These loans have been taken up by beekeepers for hives, buckets and even for roof sheeting and vegetable production needs. ZHC say repayment rate has been good although Cetzam is slow to process loans. However this interest is too high for buyers/processors to borrow for trade finance. SNV are currently talking with Fefisol who they met at Biofach 2014 in the latter regard. Micro Bankers Trust is working with small scale farmers in Chongwe district to improve dairy production, for instance, with interest of 35% p.a. These and other international micro-finance companies with local offices (e.g. Vision Fund and FINCA) state that they do not discriminate against women, in fact women are their best clients in terms of repayment. If small scale farmers have no security a system of guarantee groups at village level is apparently a successful model. FINCA aims to help successful businesses to grow. They also support saving. They do not support trade finance in isolation but say there are finance companies which do.

The Zambia Development Agency provides short term loans to honey exporters through the EU financed Zambia Export Development Fund (ZEDEF) for pre and post shipment finance for up to six months, and medium term loans for production and/or seasonal inputs for up to twelve months and London Interbank Borrowing Rate (LIBOR) +2%. Other organizations & their projects.
50. MAJOR INITIATIVES PROMOTING THE ZAMBIAN HONEY SECTOR

Local nongovernment organisations which secure support to supply training, equipment and hives, to beekeepers and link the beekeepers to markets or purchase the honey themselves and supply the markets like Environment Africa, Green Living Movement, Organic Producers & Processors Association of Zambia (OPPAZ). For a full picture of some of the major initiatives to promote beekeeping industry particularly in northwestern province summarized, please see the table below:

Table 12: Major initiatives to promote beekeeping industry in Zambia 1970s – 2007s

<table>
<thead>
<tr>
<th>Organization – Project</th>
<th>Initiative to support beekeeping industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>OXFAM</td>
<td>Oxfam supported the construction of Kabompo Beekeeping Training Centre in Kabompo District. The training centre is under Forestry Department.</td>
</tr>
<tr>
<td>Area Development Project – Funded by IFAD</td>
<td>The area development project funded by IFAD supported beekeeping extension in three districts of the NWP namely, Solwezi, Kasempa and Mwinilunga.</td>
</tr>
<tr>
<td>Community Based Natural Resources Management Project – Kasempa District</td>
<td>The project supported beekeeping extension in Kasempa District.</td>
</tr>
<tr>
<td>Community Environmental Management Project – Mufumbwe District</td>
<td>The project supported beekeeping extension in Mufumbwe District.</td>
</tr>
<tr>
<td>GRZ-Beekeeping Division, Forestry Department</td>
<td>Provision of Equipment, Beekeeping training, extension and buying</td>
</tr>
<tr>
<td>GTZ</td>
<td>Importation of beekeeping equipment and introduction of frame hives</td>
</tr>
<tr>
<td>Zambia environmental development</td>
<td>Marketing &amp; Environment</td>
</tr>
<tr>
<td>Caritas</td>
<td>Purchasing of Honey</td>
</tr>
<tr>
<td>KZF</td>
<td>Training &amp; capacity building</td>
</tr>
<tr>
<td>Africare</td>
<td>Training</td>
</tr>
<tr>
<td>ZDA</td>
<td>Export promotion</td>
</tr>
<tr>
<td>ZATAC Ltd</td>
<td>Finance</td>
</tr>
<tr>
<td>SNV</td>
<td>Capacity development</td>
</tr>
<tr>
<td>MATTEP</td>
<td>Export finance</td>
</tr>
<tr>
<td>USAID/PROFIT</td>
<td>Finance/Training</td>
</tr>
<tr>
<td>Agri-Business Forum</td>
<td>Linking finance and advocacy to honey processors, facilitate access to markets and lobby for conducive business environment.</td>
</tr>
</tbody>
</table>

Funding and technical support to the Honey Sector in Zambia since 2006 includes the following:

(Information from SNV 2008 internal road map document and MTIC EIF TIPEC-ZAS 2013-15 document)
Table 13: Funding and Technical Support to the honey sector since 2006

<table>
<thead>
<tr>
<th>Agency</th>
<th>Type of intervention 2006-2015</th>
<th>Approximate Year/period</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRZ MCTI</td>
<td>Development of the Apiculture (Bee products) Sector Road map</td>
<td>2006/7</td>
</tr>
<tr>
<td>NGOS &amp; Donors (EU, UNDP, Royal Norwegian Embassy, SNV, HIVOS, Cordaid, COMESA)</td>
<td>Capacity development of beekeepers and SMEs, mainly in North western for North Western Beekeepers Association, Mpongwe Beekeeping Enterprises, on the copperbelt, Mesh Enterprises, Kapiri Mposhi Beekeeping Association, Zambia Honey Council</td>
<td>From 2006</td>
</tr>
<tr>
<td>Hivos, SNV, Cordaid</td>
<td>Supported the sector and activities of Zambia Honey Council</td>
<td>Since 2007-2013</td>
</tr>
<tr>
<td>GRZ MCTI/ZDA</td>
<td>– Government to government negotiations for the removal of trade barriers including bee products within the sub region. – Facilitating market linkages within the Apiculture value chain by sponsoring players to various forums and trade fair shows both within and outside the region in order to promote export trade.</td>
<td>On going</td>
</tr>
<tr>
<td>Hivos, the Finnish Embassy, Pro rinvest, and the EU.</td>
<td>Capacity development services support to Zambia Honey Council</td>
<td>Some on going</td>
</tr>
<tr>
<td>SNV and Cordaid</td>
<td>Various capacity development programmes in North-Western, Western, Northern, Central and Copperbelt provinces</td>
<td>Up to 2013</td>
</tr>
<tr>
<td>SNV and GRZ</td>
<td>Collaborating to establish an Apiculture policy framework.</td>
<td>Ongoing</td>
</tr>
<tr>
<td>SNV and Zambia Forestry College (ZFC)</td>
<td>Working together to facilitate training of beekeepers for improved quality production.</td>
<td>On going</td>
</tr>
<tr>
<td>Swedish Co-operative Centre</td>
<td>Supporting ZHC in promoting quality and standards in bee products production</td>
<td>Up to 2013</td>
</tr>
<tr>
<td>UNIDO-WTO/MCTI (NORAD funded)</td>
<td>Includes upgrading the facilities of the Zambia Bureau of Standards (ZABS) and Food and Drug Control Laboratory (FDA) with special emphasis on the food sector’s ability to prove conformity</td>
<td>Ongoing</td>
</tr>
<tr>
<td>MTCI/UNOPS/SNV</td>
<td>EIF TIPEC-ZAS capacity building project</td>
<td>2013-2015</td>
</tr>
</tbody>
</table>

The Ministry of Trade, Commerce and Industry EIF TIPEC-ZAS project 2013-15 is funded by UNOPS and is being implemented by SNV.

Under the SNV managed EIF project 2013-2015, a baseline study was conducted in 2013 by service providers/input suppliers/producers AgriBusiness Forum (ABF), Mpongwe Beekeeping Enterprises (MBE), North Western Beekeepers Association (NWBKA) and Zambia Honey Council (ZHC).

Zambia Honey Council reported in interview that Finland Fund for Local Cooperation 100,000 Euro-assisted 4 x women’s groups in Mumbwa and Kaoma and 2 in Kabompo of about 30-40 members each with 40 top bar hives per group. They also had own bark hives. Since 2010 ZHC have worked to develop group formation, capacity of beekeepers and bulking centres. The figures below do not include bark hives and should be reduced by 50% when calculating production because of absconding rate. ZHC has been using the study circle method of training which has increased membership. They inform having currently 7000 paid up beekeeper members, most of which are in North Western Province. Processing using manual presses has been set up at 50% of bulking centres.
CHAPTER 2. STAKEHOLDERS, SUPPORT & SERVICE PROVIDERS FOR THE ZAMBIAN HONEY SECTOR

51. HONEY VALUE CHAIN DEVELOPMENT: COLLABORATIVE DEVELOPMENT SUPPORT UNDER AGRI-PROFOCUS

SNV and Cordaid signed a collaborative MOU in 2010, aimed at harmonising interventions in the honey industry. SNV provides capacity development support, whilst Cordaid supports the sector with value chain financing. Although both parties had been supporting the honey sector for various years already, the Agri-ProFocus partnership stimulated a more formalised collaboration, boosted by the Multi Stakeholder Meeting in 2009. HIVOS, also active in honey, is also tuning off its support activities to another player in the honey chain (Zambia Honey Council).

The honey value chain was selected due to its economic potential (local, regional and global markets) to pull thousands of poor people of in Zambia out of the poverty situation through increased incomes and production (MDG1). In 2007, SNV started working together with Cordaid to address some constraints at market level and producer level. One processor, Mesh Enterprises, accessed a loan and grant from Cordaid while SNV supported the proposal development process. In the same year (2007), interventions and another funding (Euros 159,000) was brokered from Cordaid for operational support to NWBKA. In February 2008, the honey apiculture programme was developed aimed at enhancing competitiveness in the honey sector as a way of increasing incomes for producers and sector growth. In May 2008, the sector experienced significant increases in honey production with Forest fruits (key exporter) recording 350 tonnes, Mpongwe beekeeping recorded 20 tonnes from previous 10 tonnes (from 153 farmers) while the production for Mesh increased by over 200%. Market awareness and linkages simulated production.

At the producer level the current status (2010) as a result of multi-actor interventions, of which both SNV and Cordaid have been part of, includes:

- Production is currently around 4,000MT from the lowest levels of 150MT in 2005/6 (30% export)
- The number of active producers has increased to nearly 10,000 from 6,504 in 2006.
- Beekeepers earn 60% of their incomes from bee products.
- Bulking centres have been established in a number of areas to provide market at production point.
- Producers linked to more than 20 SMEs and contracts with two major buyers.
- The association, for the first time, is able to bulk honey for re-sale to the market.
- Both Cordaid & SNV continue to add a lot of value to the sector in terms of skills and knowledge in sub-sector and value chain analysis and value chain development, Networking and linkages and knowledge in market linkages and Multi-stakeholder processes approach.

In this meeting there was agreement to form a Multi-Stakeholder Platform (MSP), the Zambia Honey Partnership (ZHP) was mooted. At its 2009 Annual Meeting, the honey sector agreed to formally adopt the ZHP as its framework for organizing and coordinating the sector.

In 2009, another funding was provided to the honey sector through Mpongwe beekeeping enterprises and the situation for 2009/2010 in the case of Mpongwe beekeeping was as follows:

- Increased production from 5 tons in 2006 to 250 tons in 2010.
- Company growth from US$60,000 in 2006 to US$500,000 in 2010 annual turnover
- Improved processing capacity from 22 tons to 1,000 tons per annum
- Reduced transaction costs by 35% as a result of linkages with NWBKA through bulking strategies
- Increased market share in the region.
- Achieving good governance structure
- Increase in per capita income for primary stakeholders such as producers (K150,000 in 2007 – K262,500 in 2009 per season), employees (150,000 in 2006 – 350,000; minimum wage)
- Employment creation; from 14 in 2006 to over 22 during peak season this year
- Increased no of organized producer groups; from 2 in 2006 to 6 in 2009
- Enhanced sales turnover (300 m in 2006 – 800 m in 2009)

Since the formation of the Zambia Partnership Forum, Cordaid has been actively supporting the organisation through Agri Business Forum by way of sponsoring the honey programme officer, among others. One of the key lessons in the process has been the need to recognize different levels of economic and political power, differing interests and conflict and the varied capacities of different stakeholders. Bringing people together does not resolve all conflicts and differences in an industry but a shared analysis of issues, using a unifying analytical framework, gives a greater chance of finding common ground and making the process a real vehicle for change. Similarly, both SNV and Cordaid provided financial and logistical support to the successful hosting of the Api-Expo which was held in Zambia, Lusaka aimed at promoting the African honey on the international scene and facilitating relevant linkages.


51.1. WHAT WAS ACCOMPLISHED UNDER THE EIF PROJECT DURING 2013

According to the SNV 2013 EIF Technical Report, “50 Certified Beekeeping Trainers drawn from 13 groups in sixteen (16) districts across the country have been trained at the Zambia Forestry College. Their first task was to provide training in improved production techniques to the clients, and thereafter have been involved in providing extension services in apiary management, pre-post-harvest techniques, queen breeding and basic entrepreneurship to the other group members. Of the targeted 5,000, a total number of 3,417 producers were trained during the year under review. A plan has been developed which would enable the establishment of a Knowledge and Research Centre at the College.”

51.2. EXPORT- LED POVERTY REDUCTION PROGRAMME:

The honey sector was selected as one of the most promising sectors identified under the International Trade Centre’s Export-Led Poverty Reduction Programme on trade development aimed at encouraging and supporting pro-poor economic growth in developing countries by means of empowering the economically disadvantaged producers thereby reducing the proportion of people living in extreme poverty so that they participate in the export value chain. This is given the fact that its organic nature gives it ready preferential market access in Europe and other developed region.

51.3. RELATED POVERTY REDUCTION PROGRAMMES:

Government of the Republic of Zambia in 2002 started implementing the poverty reduction programmes (PRP). One of the key areas looked at was regional development that focused on infrastructure development, land resettlement and small-scale industrial development. Small-scale industrial development programmes included activities such as the promotion of beekeeping and honey processing. The expected output of this project was the procurement of raw and semi-processed honey and beeswax, processing machinery, and mobilization, sensitization and training of beekeeper groups.
CHAPTER 3.

ISSUES & OPPORTUNITIES ALONG THE VALUE CHAIN
52. SWOT ANALYSIS OF THE ZAMBIAN HONEY SECTOR

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Zambia is fortunate to be endowed with vast forested areas and a big strong in terms of honey production levels is that in North Western Province there are thought to be more than 10000 traditional beekeepers that have been producing honey in bark hives for hundreds of years. Many of these beekeepers have more than 300 hives each and collectively the Province is able to produce a large quantity of honey. Up to 1400 ton per year is suggested.</td>
<td>Production issues&lt;br&gt;1. There are weaknesses in the strength of Zambia's traditional beekeeping. This includes that the best trees cut for hive making are among the best nectar producing trees. Introduction of top bar hives in North Western province has not so far been significantly successful. There tends to be a belief that bees do not like the hives. Also hives that are placed on stands are susceptible to attack by pests like honey badgers, biting ants, black ants and as well as a high absconding rate. Bark or log hives tend to produce a lower quality and quantity of honey compared to modern top bar hives. Inefficiencies resulting from the use of traditional hives and the limitations those beekeepers have in securing new hives and technologies; this issue is partly addressed through the private sector participation in hive procurement, training and processing.</td>
</tr>
<tr>
<td>2. Although the absconding and aggressive nature of Zambian bees might be seen as a weakness, this factor is thought to account for the health of the bees. No bee disease has yet been reported despite checks by the Zambia Agriculture Research Institute (ZARI). According to the professional beekeeper Horst Wendorf, Manager of Bee Sweet, a few parasites that have been found are managed by the bees themselves and have not required treatment. The lack of use of medicines or pesticides in beekeeping gives Zambian honey a market edge in international markets.</td>
<td>2. In terms of women participation in beekeeping, women are not culturally able to climb high trees and therefore are excluded from management of bark hive beekeeping unless they employ men to place and harvest the hives which reduces their income from the honey. However women in the family do play a role in the processing of harvested honey and beer brewing.</td>
</tr>
<tr>
<td>3. In many areas of Zambia there are two major honey flows which apart from increasing productivity of the bees, also gives an opportunity to market distinctive flora specific honey in high end markets.</td>
<td>3. The high cost of developing and maintaining relationships with beekeepers, the cost of logistics for remote conditions. Much work in mobilising and training beekeepers has been done over the years. This knowledge needs to be consolidated and effective ways found to minimise costs. Quality honey and wax products are valuable and good business plans need to be developed and followed.</td>
</tr>
<tr>
<td>4. Top bar hive honey production is increasing in other provinces of the country like Copperbelt, Central and Eastern where companies like MBE, Rivendell, ZHC and COMACO have been introducing hives, training beekeepers and purchasing honey. Women are also involved in the beekeeping as the baseline figures on groups show. However, the total production quantity so far appears to be less than 150 ton from these two provinces. Figures are not however possible to come by for informal markets and roadside sales which are particularly visible on the main Lusaka to Copperbelt road. Nor for honey used in local brewing of beer.</td>
<td>4. High cost of beekeeper mobilisation, training, internal inspections and documented traceability requirements of organic certification. Certification must be market driven and has to be combined with high quality product. Ways need to be found to help companies through the conversion stage.</td>
</tr>
<tr>
<td>5. There is one innovative company on the Copperbelt which has designed a top bar which can be securely hoisted up and down 4-5 metres with a simple pulley taking 3 minutes. It appears that this hive has the advantages of the traditional hive with the better management possibilities of the top bar hive. Although 2014 is only the second year of harvest of these hybrid hives there appears to be less absconding of bees from these hives compared to other top bar hives. The hives are made of scrap pine wood grown in timber plantations on the Copperbelt. It is resistant to borer beetle and can last many years. This company plans that each beekeeper will eventually have 25 hives and enjoy an income of at least $100/month from beekeeping. Currently they are working with about 2000 beekeepers.</td>
<td>5. Insufficient well equipped processing facilities.</td>
</tr>
<tr>
<td>6. Buyers like Forest Fruits who have developed a consistent relationship with the beekeepers including training, distribution of buckets, and payment on purchase have helped to grow the production of honey in their areas. Such reliable relationships stimulate beekeepers to acquire more hives and more people get involved in beekeeping.</td>
<td>Quality issues&lt;br&gt;6. A weakness is that the ZHC mark is not being seen as useful and is not adopted by all players. The Zambian Bureau of Standards does not play a controlling role regarding its use.</td>
</tr>
<tr>
<td>7. Honey quality is one of the biggest issues. The better the quality, the higher the export price. This could be tackled by coordinated training curriculum for beekeepers, effective training of trainers, sharing of appropriate knowledge on processing methods and equipment, Low interest loans for acquisition of appropriate equipment. Testing of honey before export. Accreditation of ZABS lab facilities.</td>
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</tr>
<tr>
<td>8. A weakness is that not enough attention has been paid to developing a quality wax product as in some markets it fetches a higher prices than honey.</td>
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</tr>
<tr>
<td>9. High cost of organic honey and beeswax certification: the producers will receive a premium for product that is certified organic and certified Fairtrade, therefore there is an economic incentive across the supply chain to receive this certification.</td>
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</tr>
<tr>
<td>STRENGTHS</td>
<td>WEAKNESSES</td>
</tr>
<tr>
<td>-----------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>Training issues</strong></td>
<td>10. Service providers like ZHC have been focusing on beekeeper group formation, training and processing at bulking centres. However the market linkage does not appear to be transparent as far as the processing and exporting companies are concerned. Traders may be linking with these markets and honey has been linked into a sms system coordinated by the Zambia National Farmers Union. This study has not gathered enough information on the effectiveness of this system for beekeepers.</td>
</tr>
<tr>
<td>11. There has been a lot of training of beekeepers, however it is pointed out in some reports and the draft Beekeeping policy that the quality of training is inconsistent and beekeepers are sometimes given contradictory messages by trainers representing different organisations. Beekeeping needs to become a professional qualification. More than just a module as at the present tertiary training level and the curriculum should be standardised.</td>
<td></td>
</tr>
<tr>
<td>12. There are felt to be insufficient professional beekeeper trainers in Zambia. This should start from understanding how to achieve the quality desired by the market at the level of beekeeper hive management, harvesting and at processing level. Beekeeper Qualifications are needed at tertiary level</td>
<td></td>
</tr>
<tr>
<td><strong>Other issues</strong></td>
<td>13. A weakness is that transport is high cost in land-locked Zambia. Logistics of remote areas, bad roads, cost of fuel (highest in region).</td>
</tr>
<tr>
<td>14. Non availability of adequate packaging is a big issue for retail suppliers. They have to import moulds at high cost or use inferior jars available locally but which often leak honey.</td>
<td></td>
</tr>
<tr>
<td>15. Processing technology and equipment for quality product is felt to be lacking by a number of SME’s in the sector.</td>
<td></td>
</tr>
<tr>
<td>16. Invisibility of marketed Zambian bee products in the global picture/market; Buyers who are involved with the expansion of the Zambian apiculture industry will work to promote Zambian honey so that they can maximize their returns, and hence the value chain returns at every level.</td>
<td></td>
</tr>
<tr>
<td>17. Lack of finance for beekeepers to purchase transportation means for getting the honey to the extractor or processor, bicycles, packaging materials, protective clothing and equipment; Support from the private sector is outlined in this report which will address the supply of these resources. While not covering all the needs in the market the example and success of the outlined private sector will drive efficiency into the market and create opportunities at all levels of the value chain.</td>
<td></td>
</tr>
</tbody>
</table>
## STRENGTHS

### OPPORTUNITIES

1. Unlike some countries in our region, Zambia still has very large forested areas. Unlike logging, charcoal and mining, beekeeping is a renewable enterprise benefitting livelihoods at beekeeper level and along the value chains in the short, medium and long term which enhances the health of the forest resource base.

2. Zambia’s Forestry Department played an effective role in the honey sector in the past, albeit in a climate of total suppression of private enterprise, and are keen to engage again. If within an effective Beekeeping Policy they could play an enabling coordination role to assist both the beekeepers and private enterprise, this could create an all win situation. Effective regulation of Forest zones is needed which includes support by local leadership.

3. There are one or two professional beekeepers in Zambia (such as Horst Wendorf) who could possibly help to spearhead creation of a professional qualification and curriculum. This should include processing technologies which lead to a quality product acceptable to high end international markets.

4. Zambians need to become more aware of the opportunities in the market place for quality honey and wax as well as awareness of technologies and processes which will meet the highest quality requirements.

5. There are opportunities to brand the honey by flora species – even beyond the two major species which represent the two major honey flows in Zambia – for access to specialised markets.

6. Through advocacy by all stakeholders in the honey sector, Zambia could lead the way in mitigating the threats to bees which have blighted the honey sector in other parts of the world.

### THREATS

1. There are continuous threats to the integrity of woodlands in Zambia by clearing of trees for agriculture, logging, charcoal burning and mining. Periodic invasions of caterpillars can affect the amount of nectar available to the bees. The most productive beekeeping areas are also well endowed with mineral resources and high rainfall useful to agriculture which is strongly being promoted by Government and development organisations for poverty alleviation.

2. There are now world moves to ban certain pesticides like neonicotinoids which new Harvard research shows are definitely major contributors to Bee Colony Collapse disorder which is devastating bee populations elsewhere in the world. These systematic pesticides which permeate all parts of the plant are also used in Zambia to coat hybrid seeds. Bees like to take moisture from maize tassels said to be a major source of poisoning of bees.

3. Another major threat is the push in the region for adoption of GMO crops. Zambia, who has made a strong stand against GMOs since 2002, has now received the first request to its Biosafety Authority to grow GM cotton. Our neighbours Malawi have just received a request for release of Bt cotton after 2 years of trial. Cotton is usually regarded as the “Trojan horse” opening the way to further GM crops. GM contamination of honey may affect international markets as well as pollinators like bees.

4. Weak private sector participation at national and international levels to bring together all provinces and create partnerships with international organizations.

5. Lack of a commodity exchange for honey at rural markets; with the immediate involvement of the global buyers, this exchange will be less important than it was in the past as producers will know their product has a market at a globally acceptable price before the product is harvested.

6. Lack of market access in regional markets and centralized export procedures and issuance of quality certificates.

## WEAKENESSES
WORLD HONEY PRODUCTION

53. KEY FACTS

From 2005-2010, global production of honey increased by 10% from 1.4 million metric tons (MTs) to 1.54 million MTs. Starting in October 2006, large-scale unexplained losses of honey bees began to occur in the US and EU negatively affecting global supply. The phenomenon, termed Colony Collapse Disorder (CCD), was in part responsible for a 2% decline in world honey production from 2006-2007. As of 2013, CCD remained an ongoing problem for the honey industry with the US being the hardest hit. In the EU, CCD is expected to contribute to a decline in honey production, particularly in the South European countries (Portugal, Spain, Italy, and Greece) and in Poland. These losses are having a large impact on the global honey trade as the US and EU move towards foreign supplies to make up for lost domestic production. During the 2010-2011 winter periods, US honey bee losses (not limited to CCD) were 30% and in the winter of 2012/2013 the loss was 31.5%, which was in the same range as losses recorded in 2007 and 2009. One difference noted for the winter of 2012/2013 in the US were that more colonies dwindled away rather than suffering from the onset of CCD, where colonies are lost suddenly. (source – http://www.ars.usda.gov/is/br/beelosses/)

Most beekeepers indicated that this level of loss was economically unsustainable for beekeeping operations. Large-scale commercial beekeepers indicated that losses were due to several contributing factors, including poor queens, Varroa mite, pesticides, and CCD. According to a 2011 report, preliminary results of the EU bee surveillance system show that a 10% colony loss is normal and that CCD has caused losses of up to 30% in certain EU countries and years.

In 2012, China was the most significant global producer, producing 398,000 MTs, or 26% of the global share by volume. The next largest producers were Turkey at 81,115 MTs (or 5.3%), US at 79,800 MTs (or 5.2%), and Ukraine at 70,800 MTs (or 4.6%). Argentina is also a major honey producer, but extreme climatic conditions such as drought and floods caused production to drop from 110,000 MTs to 59,000 MTs (or by 46%) from 2005-2010.

The US production of honey is in steep decline due to the reduction in the number of bee colonies, and increased costs, leading to rising honey prices. The decline of bee colonies is primarily caused by colony collapse disorder, which resulted in over 60-80% loss of bees in many hives. Moreover, calamities such as drought and wildfire also affected the bee production and costs in the recent past. Various macroeconomic factors such as U.S. dollar depreciation and weak economic conditions also led to the price rise in honey. Further data is available at http://faostat.fao.org/site/339/default.aspx.

17.– USDA, CCD Progress Report, June 2011
18.– CBI, Trends and Segments for Honey, August 2011
The EU is also an important producer of honey, accounting for around 13% of the global honey production. However, European beekeeping is severely threatened by virus and the Colony Collapse Disorder and problems related to pesticide use. Both ‘diseases’ lead to decreases in the number of bee colonies, drops in honey production and affect the profitability of beekeeping. The EU and Africa produced 203,600 MTs (13%) and 179,400 (12%) of global honey supply, respectively. Registered production of beeswax amounted to around 4 thousand tonnes in 2005. Production of royal jelly, pollen and propolis is negligible.
Within Africa, Ethiopia is the largest producer of honey. From 2005-2010, Ethiopian honey production increased 26% from 36,000 MTs to 45,300 MTs. Ethiopia produces dozens of honey varieties based on pollen source, season, and agro-ecological region of production\(^{20}\). Tanzania is the second largest honey producer in Africa and biggest African supplier to the EU.

54. DIFFICULTIES IN WORLD PRODUCTION

The global bee products industry is deeply concerned about the decline in bee health and honey productivity. In the US alone, honey production has declined by 40% in the last 10 years. Recent international research studies indicate that bee losses around the globe may be due to “the 3 Ps”: Parasites, Pesticides and Poor feeding. Recent international reports have linked global climate change with potentially devastating effects on global agricultural production. Asia is the only world region reporting significant increases in honey production since the year 2001. There are new forms of cooperation and collaborative efforts among scientists, beekeeper and farmers to protect bee populations. In the new edition of *The Hive and the Honeybee* (2013) indicated important influences that effect changes in production, the emergence of new producing areas and the correlative loss of traditional areas. These are:

- Changes in the world consumption and perception of honey.
- Impact of global climate change on honey production.
- The need for harmonized and integrated testing levels for honey residue testing, as for other foods.
- Honey marketed as healthy natural foods. More scientific understanding of the chemistry of honey, its appeal, and its health attributes and advantages relative to competitive sweeteners.
- New products; development of value added markets for pure honey.
- Qualities and food safety issues. Some restricted substances include naturally occurring components.
- Non-tariff trade barriers; the World Trade Organization’s mandate to reduce such barriers, changes in the antidumping regime.
- Food Safety and Modernization Act for US food facilities and foreign food facilities. This act will increase the responsibility of companies acting as importers of food products. Traceability of honey and quality control from the producer to the processor now need to be monitored and verified by auditors.
- Legal issues, international trade law, creation and maintenance of a level and fair playing field. New penalties for circumvention, avoidance of antidumping duties, etc. Legal scrutiny of the honey marketplace will increase to prevent unfair competitive advantage.
- Honey labelling is becoming a critical issue, particularly aimed at reducing fraud in respect to honey’s country of origin.
- Non-GMO labelling is becoming necessary in Europe and in US markets.
- Marketing of Honey is widening considerably (incorporating honey into beverages and new food products).
- National campaigns are important in increasing consumer’s perception of honey’s value, quality and health benefits.
From 2006-2011, global imports of honey (excluding intra-EU trade) increased by 7% from 352,581 MTs to 378,994 MTs. Over the same period, global import values increased dramatically from $583.9 million to $1.17 billion or by 102%. The sharp increase in value is attributed to the poor honey harvests in the US, EU, and Argentina, which created critical supply shortages on the global market.

Table 15: World Imports of Natural Honey (All Types in Metric Tons)

<table>
<thead>
<tr>
<th>Importers</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU*</td>
<td>135,325</td>
<td>$222,942</td>
<td>127,033</td>
<td>$239,514</td>
<td>142,306</td>
<td>$354,552</td>
</tr>
<tr>
<td>USA</td>
<td>125,940</td>
<td>$172,777</td>
<td>104,986</td>
<td>$221,046</td>
<td>95,495</td>
<td>$220,300</td>
</tr>
<tr>
<td>Japan</td>
<td>40,072</td>
<td>$62,113</td>
<td>41,682</td>
<td>$85,182</td>
<td>36,919</td>
<td>$87,234</td>
</tr>
<tr>
<td>Saudi Arabia**</td>
<td>13,362</td>
<td>$34,003</td>
<td>7,918</td>
<td>$27,344</td>
<td>8,220</td>
<td>$29,482</td>
</tr>
<tr>
<td>Switzerland</td>
<td>6,415</td>
<td>$18,511</td>
<td>7,045</td>
<td>$21,755</td>
<td>7,244</td>
<td>$27,201</td>
</tr>
<tr>
<td>Others</td>
<td>31,466</td>
<td>$73,595</td>
<td>39,309</td>
<td>$99,535</td>
<td>47,049</td>
<td>$135,428</td>
</tr>
<tr>
<td>Total</td>
<td>352,581</td>
<td>$583,940</td>
<td>326,089</td>
<td>$617,791</td>
<td>351,185</td>
<td>$850,752</td>
</tr>
</tbody>
</table>

Table 15: World Imports of Natural Honey 2013 (All types in metric tonnes)

<table>
<thead>
<tr>
<th>Importers</th>
<th>Quantity</th>
<th>Value (USD 000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>283810</td>
<td>$946,409</td>
</tr>
<tr>
<td>USA</td>
<td>152845</td>
<td>$497,866</td>
</tr>
<tr>
<td>Japan</td>
<td>39030</td>
<td>$116,268</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>13315</td>
<td>$57,236</td>
</tr>
<tr>
<td>Switzerland</td>
<td>8169</td>
<td>$36,867</td>
</tr>
<tr>
<td>China</td>
<td>4860</td>
<td>$42,870</td>
</tr>
<tr>
<td>Others</td>
<td>73155</td>
<td>$301,919</td>
</tr>
<tr>
<td>Total</td>
<td>575184</td>
<td>$199,9455</td>
</tr>
</tbody>
</table>

Source: UN Comtrade, USDA-GATS, Eurostat, HS Code 0409.00.00
*Excludes Intra-EU trade, **2011 data estimates based on World exports to Saudi Arabia

Source: ITC, based on UN COMTRADE statistics
MAIN INTERNATIONAL HONEY SUPPLIERS

55. CHINA

China, the world’s biggest honey producer, accounted for 39% of all world honey imports (excluding intra-EU trade) in 2011. In 2013 it accounted for 12.2% share in world exports (ITC) with an export value of $246,550 USD thousand. The quantity exported was 124,901 tonnes and its annual growth of export between 2009-2013 is 13% (ITC). China is the largest supplier to the EU market, specifically Belgium, Spain, United Kingdom, and Poland, while exports to Germany and the Netherlands are on the rise. It was the largest supplier to the United Kingdom in 2013 with a 29.1% share in the United Kingdom’s imports (ITC) the trade relationship has not always been a harmonious one. From 2002-2004, the EU banned Chinese honey imports due to products tainted with antibiotics including chloramphenicol, streptomycin, and tetracycline. The EU lifted the ban in 2004 after China agreed to reduce the level of contaminants in its honey. Due to its lower price and relatively recent restoration of trade, Chinese honey has seen above average growth in the EU market, mostly to the low-end market. In the late 1990s, Chinese exporters lost significant global market share due to poor production brought on by a bacterial outbreak among its bee colonies. Once Chinese producers contained the outbreak with antibiotics (sparking the EU ban), they sought to gain back their former US market share by “dumping” their honey at 150% below market price. This triggered an anti-dumping duty which was later modified to $2.63 per kilogram in 2009. From August 2012, the duty remained in effect. The EU ban and US anti-dumping duty of the early 2000s gave rise to the illegal traffic of adulterated Chinese honey through third-party countries. The US has not banned Indian honey, but there is strong suspicion that a considerable portion of imports from India are of Chinese origin. From 2001-2011, US imports of Indian honey increased from 20 MTs to 26,837 MTs. Similar export increases to the US were also recorded from Vietnam, Malaysia, Taiwan, Indonesia, and Thailand, over the same period. A US industry representative questioned on the subject confirmed that the “entire community” (i.e. honey industry) is aware that low quality Chinese honey is being dumped on the US market via India, Vietnam, and other East Asian countries. According to a 2011 US report, approx. one-third of all honey consumed in the US may be smuggled in from China. There has been a recent example of this happening – in an article produced by the American Honey Producers there was more Chinese honey believed to be going to the US via illegal shipment through India. It was believed to be a deliberate effort to push down U.S. wholesale honey prices.

56. ARGENTINA

Argentina was the second largest producer in the world in 2007, but has since slid to fifth place in 2010 due to poor climatic conditions and diminishing forage space for bees. Drought conditions have hit certain honey producing regions, while floods have destroyed low-lying bee colonies in other areas. Argentina is also struggling with reduced forage area (i.e. nectar sources) for bees since more land is being converted to farmland for growing corn and soybeans. From 2005-2011, Argentine production declined from 110,000 MTs to 59,000 MTs. Production recovered in 2011 to 65,000 MTs, but Argentine honey crop reduced in 2012 due to drought conditions, also in Chile and Uruguay and parts of Brazil. In 2013 it was back up to being the second largest exporter of honey with an export quantity of 124,901 at a value of $212,637 USD thousand with a 10.5% share in world exports. It is the 11th largest supplier of honey to the United Kingdom.

There is some concern over the continuing supply from Argentina regarding currency, economic and banking stability. The sharp inflation rate of 25% per year which looks set to continue and political changes i the central government have an exerted a counter-intuitive effect making beekeepers reluctant sellers due to the weakening peso (Source International Honey Market Report, The American Honey Producers Association January 2014).

57. MEXICO

From 2006-2011, Mexico was the third largest supplier to the EU, with exports rising from 12,424 MTs to 15,717 MTs or by 27%. The majority of Mexican honey (~12,000 MTs per year) was purchased by Germany, with the UK being the secondary EU buyer. A June 2012 article stated that Germany has been aggressively buying Mexican Yucatan honey. It should be noted that 95% of honey production in the Yucatan Peninsula is exported to the international market, and specifically to the EU. The Yucatan crop typically ends in July, but finished in late May in 2012 due to climatic conditions. In 2013 Mexico was the 5th largest exporter in the world with an export value of $112,352 and a 5.5% share in world exports. In 2013 it was the 3rd largest market supplier of honey to the UK.

58. REGIONAL COMPETITORS

Ethiopia only exports a small amount to the international market, with the majority of exports being shipped to neighboring Sudan (531 MTs in 2011). Tanzanian exports to the EU declined from 385 MTs to 327 MTs, with Belgium and Germany being the primary buyers. It should be noted that in 2010, Zambia was the largest African supplier to the EU, exporting 518 MTs (mostly to Belgium). However, in 2011, Zambian supplies to the EU dropped to 67 MTs in 2011. Zambia was the 55th largest exporter of honey in the world in 2013 with a value exported of $1484 USD thousand and a 0.1% share in the world exports. (ITC) Africa does not export any significant amounts of honey to the US market.
CHAPTER 4. INTERNATIONAL MARKETS.

MAIN INTERNATIONAL HONEY IMPORTERS

The report titled “Honey: A Global Strategic Business Report” by Global Industry Analysts, Inc., proposes that the global market for honey is projected to exceed 1.9 million tons by the year 2015. This is primarily driven by increasing awareness levels and health consciousness among the consumers, leading to increasing demand for healthy and natural food products. In line with the trend, several honey producers are launching new products and varieties at regular intervals. The increasing trend of organic and healthy spreads is expected to continue giving rise to new variants and flavors in the global honey market.

Increasing preference among consumers for honey-based products, is leading to a boost in the variety and assortment of honey based food products, baby products, yogurts and drinks. Moreover, honey contains antioxidants, minerals, vitamins and proteins, making itself an appealing ingredient as compared to artificial sweeteners. The increasing awareness of Manuka honey and its large amounts of health benefits have also boosted markets.


59. THE EU MARKET

The EU has the highest per capita honey consumption in the world and produced enough honey to fulfill approximately 60% of its demand in 2010. From 2006-2011, EU imports (excluding intra-EU trade) increased by 8% from 135,325 MTs to 146,742 MTs and equivalent values rose by 91% from $222.9 million to $425.2 million. In general, EU consumers prefer light honey (i.e. white, extra light amber, light amber) as opposed to dark honey (i.e. amber). The EU market has had a two tier price market – one based on cheap lower quality Chinese honey and the other based on European and Argentine honey. Interestingly EU consumers responded by reducing their purchased of the lower priced honey and increased their purchases of higher quality, though more expensive, honey.

From 2006-2011, Germany was the largest import market within the EU, but import volumes decreased from 88,440 MTs to 77,360 MTs or by 13%. Germany is the second largest EU producer of honey (after Spain) and produced 23,137 MTs in 2010. The German trading centers for honey are primarily located in Bremen and Hamburg. In 2013 Germany was still the largest importer of honey with a 16.1% share in world imports. The United Kingdom was the second largest EU market and imports increase by 21% during 2006-2011 (from 29,512 MTs to 35,633 MTs). The UK was still the third largest importer of honey in 2013 with the largest imports coming from China. The UK primarily trades honey24. The third largest market for honey in the EU is France, which increased imports by 21%, from 2006-2011. Belgium is the fourth largest EU import market and

24– www.ethiopia-ciafs.org | ciafs@fintrac.com | www.fintrac.com | Market Survey #01 | September 2012
the second largest in terms of import growth. From 2006-2011, Belgian imports rose by 122% from 9,473 MTs to 21,055 MTs. Belgium growth in honey imports is due to its emerging role as a re-exporter of Chinese imports to other EU member states. The port of Antwerp is a major point of entry, but not all imports are handled by Belgian companies. German, French and Dutch companies are known to import at Antwerp and transport the honey directly via their own trucks. Although only the seventh largest EU import market in 2011, Poland experienced the sharpest import growth in the region at 140%. From 2006-2011, Similar to Ethiopia, Poland has a large domestic alcoholic honey mead market (2011 CBI report25).

Due to the maturity of the market, it is not expected to show enormous growth in the next 5 years. Increased interest in a healthy life style maintains consumer interest in honey stable, but does not lead to a significant growth in sales. The economic crisis has, furthermore, little effect on honey sales. Consumers in the EU continue to purchase honey, as they regard honey as a basic food product. In general, the honey market is a very stable market. Nevertheless, the market is still evolving. Market shares of monofloral/single-origin honeys are increasing and increased concerns about the effects of intensive farming on the countryside, as well as on the environment in general, have also intensified interest in organic honey. There is also an increase (especially in Europe) for locally bought honey.

60. JAPAN

Japan is the third largest market and nearly entirely reliant on imports. In 2010, the country produced enough honey to fulfill only 5% of its demand. From 2006-2011, Japanese imports were flat and hovered around 40,000 MTs per year. Japan sourced the majority of their honey from neighboring China, with much smaller amounts originating in Argentina and Canada. In 2013 Japan imported 39,030 tonnes of honey at a value of $116,268 (USD thousand). It had 5.8% share of the world’s imports. (ITC) As elsewhere, Japanese consumers prefer lighter grades of honey.

61. THE MIDDLE EAST

Saudi Arabia, the fourth largest market, produces a marginal amount of honey and relies on imports to meet domestic market demand. From 2006-2011, imports declined an estimated 22% from 13,362 MTs to 10,474 MTs, while values rose 30% from $34 million to $44.1 million. The quantities imported increased in 2013 to 13,315 with a value of $57,236 USD thousand (ITC). The country mainly sources from Mexico and Pakistan, with smaller amounts from Argentina and India. Overall, the Middle East is a major consumer and import market for honey. The Koran refers to honey’s healing/medicinal properties and honey consumption across the Middle East rises during religious and festive occasions, particularly during the month of Ramadan (July-early August 2013). Notable importers include United Arab Emirates (2,000-3,000 MTs per year), Oman (1,100 MTs per year), Kuwait (750 MTs per year), Jordan (700 MTs per year), Yemen (600 MTs), and Qatar (~450 MTs per year). Yemen is traditionally the largest honey manufacturer in the Arabian Peninsula and produces the highest quality (and consequently the most expensive) honey from the ancient Sidr tree (Ziziphus spina-christi).

25.– CBI or Centre for the Promotion of Imports for Developing Countries: http://www.cbi.eu/
62. THE US MARKET

The US is the second largest honey market in the world and is heavily reliant on imports to meet domestic demand. In 2010, the US produced enough honey to meet 42% of its demand. In 2011, this figure dropped to 35% due to a sizeable decline in domestic honey production. From 2006-2011, US imports of honey increased by only 4%, from 125,940 MTs to 130,494 MT, while equivalent values rose by 124% from $172.7 million to $387.2 million. The US is becoming increasingly reliant on foreign imports to satisfy demand due to domestic production problems. Honey production in 2011 from US producers with five or more colonies totalled 148 million pounds, down 16 percent from 2010. (USDA, March 2012)\(^ {26}\). In 2013 the US imported a value of $497,885 USD thousand which was 152,845 tonnes. This was 24.9% of the world’s imports. (ITC)

US imports of honey by market share of different product types: Light Amber 43% ; White 27% ; Extra Light Amber 24% ; Honey for Retail (incl. Comb) 3% ; Amber 3%

The total value of honey imported to the US over 2012 was $438 million and in 2013 $497 million.

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(million)</td>
<td>(thousand metric tons)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$308</td>
<td>$406</td>
<td>$438</td>
</tr>
<tr>
<td></td>
<td>113,929</td>
<td>130,760</td>
<td>141,817</td>
</tr>
</tbody>
</table>

**Source:** National Honey Report

American beekeepers in the first months of 2013 have expressed growing alarm at the severe loss of bee colonies. Some beekeepers have reported losses of over 50% of their bee population. Producers are finding great difficulty in getting an adequate number of bees to pollinate the almond groves in the California Central Valley. Despite the extremely high pollination fees, the decline of bee populations has not been reversed. Many beekeepers and apiary scientists attribute the bee decline to the reduction of pasturelands, open fields, and the encroachment by corn, soybean and canola crops on which powerful pesticides are being used\(^ {27}\).

---

**Table 17: Top supplier/exporters of honey to the USA**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>90056</td>
<td>65700</td>
<td>91907</td>
<td>90906</td>
<td>80994</td>
<td>1,05,677</td>
<td>1,25,939</td>
<td>1,05,676</td>
<td>1,04,984</td>
<td>95475</td>
<td>1,13,929</td>
<td>1,30,766</td>
</tr>
<tr>
<td>Argentina</td>
<td>45010</td>
<td>20472</td>
<td>8692</td>
<td>4425</td>
<td>3620</td>
<td>22776</td>
<td>28878</td>
<td>20379</td>
<td>10043</td>
<td>10899</td>
<td>17414</td>
<td>33502</td>
</tr>
<tr>
<td>Vietnam</td>
<td>1902</td>
<td>5751</td>
<td>14356</td>
<td>7979</td>
<td>9792</td>
<td>13582</td>
<td>13263</td>
<td>15707</td>
<td>19378</td>
<td>17430</td>
<td>20738</td>
<td>27826</td>
</tr>
<tr>
<td>India</td>
<td>0</td>
<td>20</td>
<td>2465</td>
<td>4645</td>
<td>6948</td>
<td>7632</td>
<td>11090</td>
<td>7671</td>
<td>13658</td>
<td>13137</td>
<td>18462</td>
<td>26912</td>
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<tr>
<td>Brazil</td>
<td>154</td>
<td>145</td>
<td>5363</td>
<td>7297</td>
<td>3690</td>
<td>3783</td>
<td>10806</td>
<td>12103</td>
<td>13598</td>
<td>17709</td>
<td>10036</td>
<td>14981</td>
</tr>
<tr>
<td>Canada</td>
<td>12960</td>
<td>10564</td>
<td>19617</td>
<td>11607</td>
<td>10172</td>
<td>10252</td>
<td>11576</td>
<td>13961</td>
<td>17305</td>
<td>8302</td>
<td>11053</td>
<td>7148</td>
</tr>
<tr>
<td>Uruguay</td>
<td>60</td>
<td>2478</td>
<td>5968</td>
<td>5308</td>
<td>3137</td>
<td>4010</td>
<td>1525</td>
<td>1893</td>
<td>227</td>
<td>19</td>
<td>852</td>
<td>7083</td>
</tr>
<tr>
<td>Mexico</td>
<td>2076</td>
<td>4241</td>
<td>11544</td>
<td>7350</td>
<td>3254</td>
<td>1452</td>
<td>2580</td>
<td>3192</td>
<td>1411</td>
<td>1625</td>
<td>3225</td>
<td>2846</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0</td>
<td>0</td>
<td>1039</td>
<td>3534</td>
<td>442</td>
<td>220</td>
<td>141</td>
<td>1891</td>
<td>4150</td>
<td>9068</td>
<td>15396</td>
<td>2326</td>
</tr>
<tr>
<td>Thailand</td>
<td>161</td>
<td>1302</td>
<td>4445</td>
<td>799</td>
<td>769</td>
<td>518</td>
<td>1795</td>
<td>790</td>
<td>956</td>
<td>1847</td>
<td>1699</td>
<td>1637</td>
</tr>
<tr>
<td>China</td>
<td>26819</td>
<td>17713</td>
<td>7583</td>
<td>22827</td>
<td>26827</td>
<td>29366</td>
<td>32149</td>
<td>17755</td>
<td>11252</td>
<td>67</td>
<td>1547</td>
<td>1531</td>
</tr>
<tr>
<td>New Zealand</td>
<td>73</td>
<td>89</td>
<td>42</td>
<td>195</td>
<td>114</td>
<td>247</td>
<td>195</td>
<td>355</td>
<td>650</td>
<td>1022</td>
<td>1047</td>
<td>968</td>
</tr>
<tr>
<td>Taiwan</td>
<td>27</td>
<td>27</td>
<td>44</td>
<td>81</td>
<td>759</td>
<td>2408</td>
<td>311</td>
<td>753</td>
<td>3983</td>
<td>5576</td>
<td>1755</td>
<td>903</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>131</td>
<td>174</td>
<td>99</td>
<td>245</td>
<td>164</td>
<td>206</td>
<td>109</td>
<td>140</td>
<td>196</td>
<td>175</td>
<td>206</td>
<td>661</td>
</tr>
<tr>
<td>Ukraine</td>
<td>26</td>
<td>0</td>
<td>573</td>
<td>2226</td>
<td>1596</td>
<td>337</td>
<td>1134</td>
<td>502</td>
<td>84</td>
<td>635</td>
<td>440</td>
<td>453</td>
</tr>
<tr>
<td>All Others</td>
<td>661</td>
<td>2724</td>
<td>10077</td>
<td>12387</td>
<td>9621</td>
<td>8887</td>
<td>10388</td>
<td>8587</td>
<td>8103</td>
<td>7963</td>
<td>9960</td>
<td>1990</td>
</tr>
</tbody>
</table>

Source: US Census Bureau
MAINT INTERNATIONAL CUSTOMERS FOR ZAMBIAN HONEY

Table 18: Importing markets of honey produced and exported by Zambia 2009–2013 (Source ITC)

<table>
<thead>
<tr>
<th>Importers</th>
<th>Exported value in 2009</th>
<th>Exported value in 2010</th>
<th>Exported value in 2011</th>
<th>Exported value in 2012</th>
<th>Exported value in 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>586</td>
<td>1384</td>
<td>684</td>
<td>1317</td>
<td>1484</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>64</td>
<td>98</td>
<td>205</td>
<td>364</td>
<td>485</td>
</tr>
<tr>
<td>Belgium</td>
<td>358</td>
<td>779</td>
<td>80</td>
<td>352</td>
<td>371</td>
</tr>
<tr>
<td>Norway</td>
<td>97</td>
<td>94</td>
<td>195</td>
<td>0</td>
<td>327</td>
</tr>
<tr>
<td>South Africa</td>
<td>56</td>
<td>149</td>
<td>59</td>
<td>164</td>
<td>131</td>
</tr>
<tr>
<td>Canada?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>77</td>
</tr>
<tr>
<td>Botswana</td>
<td>7</td>
<td>23</td>
<td>29</td>
<td>97</td>
<td>71</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>2</td>
<td>20</td>
<td>42</td>
<td>62</td>
<td>20</td>
</tr>
<tr>
<td>?</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Mauritius</td>
<td>0</td>
<td>210</td>
<td>74</td>
<td>0</td>
<td>0</td>
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</table>

Table 19: Importing market values for honey exported from Zambia, 2013 plus export growth by country for 2009-2013 and tariff that may be faced (Source ITC).

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>1484</td>
<td>1467</td>
<td>100</td>
<td>388</td>
<td>Tons</td>
<td>20</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>485</td>
<td>485</td>
<td>23.7</td>
<td>130</td>
<td>Tons</td>
<td>71</td>
<td>59</td>
<td>33</td>
</tr>
<tr>
<td>Belgium</td>
<td>371</td>
<td>371</td>
<td>25</td>
<td>108</td>
<td>Tons</td>
<td>-3</td>
<td>-8</td>
<td>-33</td>
</tr>
<tr>
<td>Norway</td>
<td>327</td>
<td>327</td>
<td>22</td>
<td>86</td>
<td>Tons</td>
<td>-19</td>
<td>26</td>
<td>0</td>
</tr>
<tr>
<td>South Africa</td>
<td>131</td>
<td>116</td>
<td>8.8</td>
<td>33</td>
<td>Tons</td>
<td>20</td>
<td>3</td>
<td>-20</td>
</tr>
<tr>
<td>Canada</td>
<td>77</td>
<td>77</td>
<td>5.2</td>
<td>14</td>
<td>Tons</td>
<td>-4</td>
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<td>0</td>
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<tr>
<td>Botswana</td>
<td>71</td>
<td>71</td>
<td>4.8</td>
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<td>Tons</td>
<td>83</td>
<td>81</td>
<td>-27</td>
</tr>
<tr>
<td>Zimbabwe</td>
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<td>20</td>
<td>1.3</td>
<td>4</td>
<td>Tons</td>
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<td>81</td>
<td>-27</td>
</tr>
<tr>
<td>?</td>
<td>1</td>
<td>1</td>
<td>0.1</td>
<td>0</td>
<td>Tons</td>
<td>2</td>
<td>0</td>
<td>30</td>
</tr>
</tbody>
</table>

Approximately eight countries import honey from Zambia including the United Kingdom, Belgium and South Africa. The United Kingdom has the highest of these imports and import amount to the UK has steadily increased from 2009 to 2013. The increase has been by 59% /annum in quantity and 33% /annum in value (ITC).
IMPORTERS SUPPLY-CHAIN STRUCTURE

63. FOR HONEY

The main global market channels for honey: The import market is dominated by several large companies, which import, refine, and pack for industry purposes. Some of the honey importers (smaller importers) are also packers of retail honey. Most often, specialized companies, which have a brand name in honey, do the retail packing. Some honey packers prefer to import part of their demand themselves, but specialized honey importers still have a strong position. Honey packers may supply their honey directly to the large multiple retailers, while for the smaller health-food and specialty shops, the honey is sold through a wholesaler. Packers blend most of the poly-floral honey to make acceptable table honeys. Most of the low-priced honeys end up as private label products on supermarket shelves. The higher-quality mono-floral and single-origin honeys are sold as packer’s brands in both supermarkets and specialty shops.

63.1. SPECIALTY HONEYS

Specialty honeys such as Manuka honeys from New Zealand are very expensive but are not traded in bulk. Light-coloured honeys fetch a higher price than dark honeys. In European and international trading, prices of honey are often quoted in US dollars.

63.2. ORGANIC HONEY

Organic honey is valued more highly than conventional honey of the same quality. The price premium and market development of organic honey is heavily influenced by the amount of supply. Organic certification on top of competitive price and high quality will assure the Zambia supplier of a very competitive position in the apex market. There is currently a large under-supply of organic honey from European countries. The main reasons are the presence of colony collapse, the lack of unpolluted areas, and cold winters. The varroa mite is most effectively treated with veterinary medicines, which are not allowed in organic production. In Africa, feed crops are amply available, and the bees can produce year round. Organic certification rules require that only certain types of chemicals may be used for the treatment of bee diseases and beehives. The varroa mite is not yet widespread across Africa, a big advantage for organic honey production in Africa.

63.3. FAIRTRADE HONEY

The Fairtrade Labeling Organisations International (FLO) has developed general fair-trade standards as well as product specific standards, including a standard for fair-trade honey. According to the general fair-trade standards, producers and traders must meet certain requirements in terms of transparency and democracy, as well as continuously improve social and environmental conditions. The standard for fairtrade honey specifies minimum prices that small farmers’ organizations must receive for

their honey. Fair-trade honey is classified in two quality categories, A and B. As for the conventional honey market, these grades are defined according to content of water and hydroxymethylfulfural (HMF), using a point scale (best honeys, those with lowest content of water and HMF, are classified grade A, others grade B). The price is paid to the producers based on the grade. When a fair-trade certified trader forms a licensee agreement with a national fair-trade organization the honey may be marketed with the respective national fair-trade label in that country.

64. FOR OTHER BEE PRODUCTS

There are multiple market outlets and buyers for bee products, being versatile and highly establish ingredients/commodities in the international market. Due to their varying properties they also have differing end uses and application. There is an upward trend in demand for bee products within the manufacturing, health and beauty industries as new discoveries about bees and their product are made and consumer interest increase (new research findings on the many healing properties, media coverage about the threat to world bee populations and their value to the health of the world eco-systems, etc.). The flowchart shown in Annex Document provides an overview of the inter-relationships with the supply chain and market flows.

64.1. BEESWAX

Compared to the market for honey, the market for beeswax in the European Union is small. Spain has the largest market for beeswax, but it produces 90 per cent itself. Germany, on the other hand, produces little beeswax and has to import 76 per cent of its needed volume. Germany, therefore, is the leading import country for beeswax in the European Union. There are two categories of beeswax: crude and refined beeswax. The industry uses refined beeswax for its applications. Around 60% of the imported beeswax is crude and needs to be refined first. 71% of the beeswax imported by the EU countries comes from countries outside the European Union. China is by far the largest supplier to the European Union accounting for 71% of all beeswax imports from outside the European Union. A small part of the beeswax market consists of organic beeswax, which is used mainly in natural cosmetics. The market for natural cosmetics is growing worldwide. Euromonitor reported an annual growth of 9 per cent from 2003 to 2009, while the total cosmetics market is expected to continue to grow by at least 1 per cent annually. The increased popularity of natural cosmetics is due to the interest of consumers in a healthier lifestyle. Because of the limited number of applications of organic beeswax, the total volume of the organic beeswax market is small. Some refiners believe that the number of applications will increase in the future, for instance in food products, and they expect the market for organic beeswax to grow.

The cosmetics and pharmaceutical industries have no complete substitute for beeswax. At least small quantities will always be needed to maintain specific quality and characteristics and ingredient claims ‘contains beeswax’. Beeswax is mainly used in body care health care and cosmetics. Small amounts of beeswax have food and flavouring applications and are edible in the sense of having similar toxicity to indigestible plant waxes. However, these wax mono esters are poorly hydrolysed in the guts of humans and mammals so there is no significant food value in beeswax29 (European Food Safety Authority 2007).

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Cosmetic grade Beeswax is often refined and pelleted for uniformity and ease by the manufacturer. Two grades are often used:

- **Yellow**: The natural colour of well extracted beeswax that has been filtered when molten to remove any unwanted and foreign objects (dust, pollen, insect parts).
- **White**: A near white grade that has undertaken extra processing to remove the natural pigments and to finish with a product that will not discolour cosmetic products.

A German study found that beeswax was superior to similar barrier creams (normally bases such as petroleum jelly) when used (Frosch, Peiler, Gruery Grunenberg 2003)

Peter J. Frosch, Detlef Peiler, Veit Grunert, Beate Grunenberg (July 2003) 30. Beeswax is traditionally used as a coating for cheese, by sealing out the air and protecting from spoilage. It is also used in small amounts in polishing of furniture in its pure form or made into ‘French’ Polishes or simply Terpentine/Linseed bases.

There are international market reports of surging demand in wax in candles, textiles cosmetics and even confectionery. According to Glow Light Limited, candle consumption has grown steadily in Africa, especially sales to the Roman Catholic Church which forms the primary customer, Glow Light Limited currently produce 10,000 candle sticks per day against demand. Beeswax can be used in its pure form as a candle wax, often made from sheets that are rolled with a central wick. Beeswax cannot normally compete on price with paraffin wax but can be blended into paraffin wax candles to add a natural appeal, aroma and also increase the melt point of candles which is particularly useful in hotter climates. Beeswax has a higher melting point than paraffin waxes and is less likely to drip than candles made from other waxes. Waxes with a melting point above 88% do not perform well during burning. The Roman Catholic Church requires that its ceremonial candles are made with at least 51% pure beeswax. In Kenya, Vitapix Textile Limited in Eldoret (a textile company) and Glow light Limited in Nakuru, invested in modern bee hives for communities in order to increase beeswax production for their products. On average, beeswax is purchased from farmers at approx. Euros 2.50/ kg. Other companies like Bata the shoe company and Kiwi Shoe Polish Company are also buying the beeswax from farmers.

International purchasers have also expressed interest in buying beeswax from African supplier, but say there is not enough supply to meet their large demand. Zambian beekeepers have experienced sales growth to buyers in the US (Strahl & Pitsch), a “leading refiner of beeswax in the United States” and Kahl & Co. of Germany, which bills itself as the “only wax refinery that is organically certified to refine organic wax in Europe.” (Business Daily Africa, Tues June 10 2014) 31. Buyers include pharmaceutical suppliers for bulk such as Aspen or from smaller companies such as the Body Shop who use beeswax in some of their products. 32. Lush use beeswax in various products. 33. Lush deals with many products from Africa and would be very open to being approached by the co-operative or representative for supply. Another company is BalmBalm who also use beeswax in a lot of their products. 34. There are many other companies such as Burts Bees 35 and Badger Balm 36 whom are happy to be approached by African suppliers. Some bees wax wholesalers: Beeswax, South Africa 37, Simply Bee 38 and Bulk Natural Oils 39.
Importers of beeswax can be divided into refiners and honey importers. Refiners are companies specializing in refining natural waxes. Some produce synthetic waxes. Some of the large honey importers are also importers of beeswax. The refining of the beeswax is done by the specialist refiners by order of the importer. The German company Kahl & Co. Vertriebsgesellschaft mbH is one of the largest refiners of beeswax in Europe, also Koster Keunen B.V. in the Netherlands. Kahl & Co is the only wax refinery that is organic-certified to refine organic wax in Europe. They currently import crude organic beeswax from New Zealand, Australia, and Mexico. The supply-chain structure for beeswax is generally as follows: Beeswax producer sells to beeswax exporter; beeswax exporter sells to beeswax to importer/refiners and to agents. The agents sell to the refiners. Both the beeswax importers and refiners sell to the Industry with a portion going again through agents.

64.2. PROPOLIS

Propolis has important use throughout the pharmaceutical and cosmetics industries. Many medicinal properties including anti-microbial and anti-inflammatory and there are claims about its use for treating several forms of cancer. Propolis is subject to intensive testing to verify its many claimed properties.

The following uses of propolis and its extracts have been found in literature, but without substantiating evidence or reference to scientific studies: anti-asthmatic treatment in mouth sprays, support of pulmonary system, anti-rheumatic, inhibition of melanoma and carcinoma tumour cells, tissue regeneration, strengthening of capillaries, anti-diabetic activity, phytoinhibitor. Propolis can be mixed into creams, balms or emulsified with honey. It is also made into tablets, capsules and tinctures. Most herbal supplement providers have a propolis supplements and will buy from a wholesaler. One that operates globally including in Africa is Wholesale.uk.com. Amazon is also a market place that is global due to its online capabilities. Propolis can be seen on there in all its forms (there is even propolis toothpaste on there). As stated before the excellence of this is that it can be accessed from anywhere in the world.

According to an article on the online magazine Farm Biz Africa, dated Thursday 12th June 2014 and titled ‘Farmers quench Pharmaceuticals demand for hive by product’ 40, the rise of propolis as a wonder ingredient for the global pharmaceutical and cosmetic industries is driving new sales for farmers across Africa. The article reports that the demand for the product is growing faster than supply. Propolis has become an active ingredient in skin moisturizers (often found in products mixed with Aloe Vera such as facial cremes and hand crèmes), food technologies and medicines. For example, Kenyan companies Tego Foods, Dotino Pharmaceuticals and Lightshade Cosmetics are now sourcing propolis from local farmers. Canadian cosmetics company Herrera Cosmetics INC has been scouting in Kenya for propolis. US pharmaceutical company Almaco Ltd is in talks with youth group Molo for supplying propolis. The idea is to have these raw products exported to us from the nearest source. Already we are thinking of opening a branch in Zambia, since they are one of the largest exporters of honey and other bee products in the region, but even their supply cannot sustain us, which is why we are looking to other producers like Kenya,” said Matthew Keane of Almaco Pharmaceutical.

The international corporation Colgate–Palmolive moved to strengthen its market share in April 2012 by launching a new Protex soap variant in Kenya. The growing consumer preference for anti-bacterial products with natural remedies in the Personal Care Category has driven Colgate-Palmolive to add the new Protex-Propolis bar soap variant to its range41. One diverse use that could be looked at is the use of propolis in aquaculture. It is used in place of the traditional chemical antifungals to prevent fungal

41.– http://allafrica.com/stories/201204170298.html
pathogens in fish and fish breeding stocks. It is entirely safe to use\(^{42}\). Some propolis wholesalers: Well Bee-ing\(^{43}\), UK, the Propolis People, South Africa\(^{44}\) buys propolis from African manufacturers and conducts the extractions and production processes.

64.3. BEE VENOM

Bee venom is used in the cosmetic industry as it has been found to have many benefits such as it can promote the production of collagen in the skin which aids in smoothing out lines and wrinkles. It is already found in products manufactured by cosmetic companies, one example being the brand Skin Chemists who make a product used by the British Royal family. It is tipped to be a top trend globally and much work is being done on it. As well as this it has many medical benefits including even being researched for HIV treatment. This product would be of interest to all the cosmetic and pharmaceutical companies nationally and globally. It would also be of interest to universities for research purposes. The venom of the African bee is stronger and more effective than the European bee and hence more effective in its applications.

64.4. ROYAL JELLY

Royal Jelly is used as a dietary supplement and as a component to skin care products again making it of interest to the pharmaceuticals and cosmetic industries as well as the health food industries.

Internationally, China is the world’s largest producer and exporter of royal jelly. Its estimated annual production is in the order of 400 to 500 tons, nearly all exported to Japan, Europe and the USA. China accounts for approximately 60% of world production. Other countries in the Far East (Korea, Taiwan and Japan) are also important producers and/or exporters. In the rest of the world, royal jelly is produced mainly in Eastern Europe. Wholesalers include: Bee Pollen Buzz\(^{45}\) and the Aloe Co\(^{46}\).

Bee Pollen: Bee Pollen is sued as a health supplement making it of interest to supplement retailers and wholefood shops. One interesting facts about bee pollen is that it cannot be synthesized in a laboratory. When researchers take away a bee’s pollen-filled comb and feed her manmade pollen, the bee dies even though all the known nutrients are present in the lab-produced synthesized food. Many thousands of chemical analyses of bee pollen have been made with the very latest diagnostic equipment, but there are still some elements present in bee pollen that science cannot identify. The bees add some mysterious “extra” of their own. These unidentified elements may very well be the reason bee pollen works so spectacularly against so many diverse conditions of ill health. This makes it valuable to buyers for health food supplements as it cannot be copied. It is being used on an ever larger scale for human nourishment and health. With CCD wiping out many Bee colonies in the West and also their contamination with agrichemical cocktails then this African sourced material may be guaranteed more of a market share.

Importers supply-chain structure for propolis, pollen and royal jelly: Pollen, propolis and royal jelly are collected and then bought from the producers in an un-refined form by processors. These products are sold to manufacturers who refine and often fractionate extracts from the pollen and propolis for used in formulations, or use the refined products in supplements or capsule and liquid form. The supply chain for bee venom is highly specialised. The markets for royal jelly, pollen and propolis are very small. Due to the small size of the market and fragmentation of the retail sector, importers and traders do not widely trade in these products. Please see the section on bee venom.

\(^{42}\) – http://www.scienceinafrica.com/old/2008/october/propolis.htm
\(^{43}\) – http://www.royaljellyinhoney.co.uk/bee-products-wholesale.html
\(^{44}\) – http://www.thepropolispeople.co.za/
\(^{46}\) – http://thealoe.co/royal-jelly/#axzz34LPN3HPB
Global honey prices are not expected to fall in the near future due to heavy demand. Developments in Argentine, Chinese, and Mexican production tend to have a strong influence on honey prices paid by EU importers. Next to general quality determinations, color is the single most important factor determining import and wholesale prices. From January 2010 to August 2012, EU prices (CIF) for three grades (white, extra light amber, and lighter amber) of Chinese honey decreased from an average of $2,212 to $2,110 per MT.

Beginning in April 2010, prices began to rise due to poor EU production and the ban on Indian honey, forcing importers to look for other suppliers. From January 2010 to August 2012, average EU prices for four grades (white, extra light amber, light amber, and amber) decreased from $3,171 to $3,030 per MT. Argentine prices also rose in April 2010 and plateaued at $3,494 per MT before declining in September 2011. Due to its limited availability and high quality, EU prices (CIF) of Mexican honey is the highest of the three largest suppliers. From January 2010 to August 2012, Mexican Orange Blossom honey averaged $3,752 per MT, while the darker grade Yucatan honey averaged $3,489 per MT. EU prices from all three suppliers are expected to remain firm due to poor European production and strong demand from US and Japan.

Ethiopian supply to the EU is erratic and limited to only a handful of European countries. EU Prices (CIF) for Ethiopian honey is on average $100 to $300 higher than Mexican honey. From February 2010 to May 2012, EU prices for Ethiopian honey rose from $3,520 to $4,033. Ethiopian exports to the EU are going to expand with the establishment of Parodi Ethiopia and associated Fairtrade and Certified honey being produced in 2013.

From January 2010 to April 2012, US prices (CIF) for Argentine honey was stable and averaged $3,183 per MT, while Mexican honey averaged $2,982 per MT. From March 2010 to December 2011, US prices for Chinese honey rose from $2,668 to $4,586 per MT, due in part to the countervailing duty. As of August 2012, the US had very little carryover honey from last years’ poor crop; US raw honey prices are rising as a result.

Honey can be stored for long periods of time under appropriate conditions. However, since honey harvests are limited to certain periods of the year according to the region of production EU imports of honey generally have three peak periods: February to March, May to June, and August to October. In general, imports stay above 10,000 MTs per month. US imports typically have one major peak, from February to April. Imports generally never fall below 5,000 MTs per month.

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47.– CIF or Cost Insurance Freight, is the price of a good delivered at the border of the importing country, including any insurance and freight charges.

EU imports of honey have a general 17.30% duty rate for third-party countries. Zambia qualifies for a 0% tariff rate whereas Mexico qualifies for a rate of 8.6%.

US imports of honey have a general duty of 1.9%, and a duty of 6.6% for Cuba and North Korea. Zambia qualifies for a 0% tariff rate due to the African Growth and Opportunity Act (AGOA).

Japan has an import honey duty rate of 25.50% (MFN rate) and 30% general rate. Zambia is a member of the Least Developed Countries (LDC) group, which qualifies it for a 0% tariff rate.

Saudi Arabia and the United Arab Emirates have a general 5% duty rate (Ad valorem duty) for honey imports (which includes Zambia).

49.– [Source](http://ec.europa.eu/trade/wider-agenda/development/generalised-system-of-preferences/everything-but-arms)

50.– [Source](http://www.agoa.gov/AGOAEligibility/index.asp)
CHAPTER 5.

ZAMBIA COMPARATIVE ADVANTAGE
ZAMBIA EXPORT PROFILE

Zambia began exporting honey products in the early 1990s, and in 2000 the country was able to export honey for about US$120,000 and subsequently in 2008 managed to export roughly US$670,000. The figures depict an increase in export earnings of approximately 82 per cent over a period of eight (8) years. In order of importance, United Kingdom was the largest importer of Zambian honey (50%), Belgium (15%), Germany (9.17%), South Africa (6.4%), United States of America (6.4%), Norway (75%) and others (7.28%) between 2004 and 2008.

Zambia is now the largest exporter of certified organic honey from Southern and Eastern Africa. In 2010, Zambia exported slightly above 637 MT representing a trade value of US$1,384,247. Of the total exports in 2010, 384 MT (over 50%) was to the EU market (UN Comtrade Database, 2012. The presence of vast areas of miombo forest contributes significantly to the high production potential of bee products in the country. Zambian honey is known for its natural state (compared to honey from industrial countries). Due to an increasing concern from consumers for no or little chemicals in food products, it is in high demand. It is expected that the demand for pure (preferably organically produced) honey will continue to grow in the future. High production of honey and high population of bee colonies, together with the international appreciation of the natural purity of Zambian honey provides a great market advantage for beekeepers, packers, trader and exporters.

Over recent years Zambia has also gained entry to the European Union countries for the exportation of honey, having fulfilled the EU criteria, that includes the establishment and up-keep of the national reside monitoring plan. Zambia is one of only six African countries that have met the conditions for accessing the EU market, which is the largest international market for bee products. This provides Zambia with competitive advantage in the export market over many countries in Africa that have not been able to achieve this statutory EU entry compliance for honey.

During 2005, the honey sector export earnings of honey and beeswax declined by 34% from US$825,422 in 2004 to US$544,501 in 2005. The decrease in the exports in 2005 was due to the appreciation of the local currency, Kwacha by 30%, which reduced the profitability of the honey net exporters such as North Western Bee Products and Forest Fruits Zambia whose costs are predominantly in Kwacha and therefore not affect a corresponding dollar price increase on their products. The honey sector reached its peak as a result of increased production due to favourable climatic factors and favourable prices during 2004.

Table 20: Indications of the export earnings in the honey sector for the 2000-2005.

<table>
<thead>
<tr>
<th>SECTOR</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
</table>

The main markets for bee products in the past five years continue to be United Kingdom (55%), Germany (35%) and South Africa (5%) with re exports to France, Holland, Norway and Belgium. Honey and beeswax products have great market potential in Canada, Middle East, Japan and the United States of America where honey promoters must be encouraged and motivated to continue exploring both export and value addition opportunities. Efforts are under way to encourage local packaging companies to invest in glass bottling and plastic moulds that would allow promoters moving into table honey exports.

51. – According to findings in a case study conducted by the kommerskollegium, National Board of Trade (2009)
Regional markets and cross border trading: Despite the limited availability of information, there is a dynamic informal trade in honey across Africa. Regional markets such as South Africa, Botswana, Zimbabwe, Tanzania, Namibia and Mauritius represented a combined total of over 250 MT of Zambia's exports in 2010. The regional trade is spurred by the fact that the market requirements in these countries are far less stringent than the export markets like the E.U. with the exception of South Africa. The use of porous border points has supported the movements of large amounts of honey across borders. Much of it is transported in small volumes by middlemen. It is therefore almost impossible to accurately estimate how much honey is traded regionally. Given the general orientation of regional trade, porous borders, under declaration, any published information is likely to be inaccurate. It is of particular concerns that the export volume is as low as they are, considering the potential for Zambian bee products in the international market. In general, it is felt that the industry is held back due to various factors related to inadequate investment in production, quality management, and extension services, as well as market linkages (GoZ, 2013). Potential markets for honey include the Far East, Canada, and the Arabic countries which have remained unexplored and offer great opportunities for Zambia (GoZ, 2013).
ZAMBIA HONEY EXPORTS IN VALUE AND VOLUME OVER THE YEARS

While it is impossible to confirm an accurate number for Zambian honey production and exporters there are reasonable sources of data available. Below you will find much of this data as available through certifiable sources.


Figure 8: Zambia honey production

Zambia has had inconsistent quantities of export quality honey; however, recent records indicate that 2010 was the best year with just over 600 MT of export quantity with a value of $1.384 million USD. This number differs from numbers calculated when adding up what produces reported to surveyors during this study, however reflect actual exports as recorded by export and import documentation.

Table 21: Zambia export quantities

Source: FAOSTAT
It is significant to note that while production grows annually the exports are inconsistent. This may be an indication that the changes in exports are a result of demand rather than supply as you can see from comparing the charts of exports (above) with production (below). According to FAO estimates, the volume of honey produced in Zambia continue to grow while their exports are inconsistent, thus reflecting a demand and possibly quality issue rather than quantity of supply available. This could also be impacted by domestic demand, which we are not in a position to estimate, however, the volumes would indicate otherwise. The decrease between 2010 and 2011 could also be a factor of over purchasing by major buyers in 2010 with inventories carrying over into 2011. This over inventory could be a factor of over forecasting consumer acceptance or a change in consumer acceptance.

<table>
<thead>
<tr>
<th>Table 22: Zambia Exports 2000-2011</th>
</tr>
</thead>
</table>

### Export Value (1000 $)

<table>
<thead>
<tr>
<th>year</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zambia</td>
<td>Honey, natural</td>
<td>929</td>
<td>626</td>
<td>618</td>
<td>386</td>
<td>414</td>
<td>586</td>
<td>1384</td>
</tr>
</tbody>
</table>

[ ] = Official data

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### Export Quantity (tonnes)

<table>
<thead>
<tr>
<th>year</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zambia</td>
<td>Honey, natural</td>
<td>565</td>
<td>390</td>
<td>324</td>
<td>182</td>
<td>157</td>
<td>211</td>
<td>637</td>
</tr>
</tbody>
</table>

* = Unofficial figure | [ ] = Official data

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CountrySTAT – Zambia

http://countrystat.org/home.aspx?c=ZMB&ta=251CTR040&tr=37
A review of production and international trade numbers it can be confidently hypothesized that this is a demand issue resulting from inconsistent retail demand, therefore, it would be vital to address demand, while improving quality, efficiency and quantity through a demand driven effort to find new, less volatile and more viable markets.

One proven way to get consistent sales is to decrease the dependence on retail sales and increase the dependence on use of honey as an ingredient. Once a food processor has started working with a supply source they are reluctant to change as it may impact the specifications of their finished product. While industrial sales will require some time to develop they are more consistent than retail once established.

In 2013 the leading international market for Zambian honey was the UK with the majority of this honey being sold by NWBP and Forest Fruit through Socially Conscience (SC) markets including Oxfam, the Body Shop and others. The UK market was followed closely by Belgium and Norway, also in the SC markets.

Figure 9: Top 5 Zambian honey markets by destination (value)
The following chart reflects exports of Zambian honey between 2001 and 2013. A review of this chart again clearly identifies the sporadic nature of Zambia honey exports are a factor of demand not supply when compared with the relatively consistent growth in supply in this same time frame growing from 500 MT in 2004 to 680 MT in 2011 while exports in 2011 were a significant drop from 2010 as a result of a significant decrease in Belgium imports of Zambian honey.

Regional markets and cross border trading: Despite the limited availability of information, there is a dynamic informal trade in honey across Africa. The regional trade is spurred by the fact that the market requirements in these countries are far less stringent than the export markets like the EU and the USA.

Regional markets such as South Africa, Botswana, Zimbabwe, Tanzania, Namibia and Mauritius represented a combined total of over 250 MT of Zambia’s exports in 2010.
The inconsistent export for Zambian honey is a factor of many elements, but it does not appear to be a factor of available supply. The fact that the UK has steady growth while Belgium, Norway and South Africa are up and down during the same time and not during the same years—when one is down the other is up—therefore all indications are that it is a demand consistency issue not quality or quantity.

**Figure 12: Evolution of exports by country and market share from 2010 to 2013**

Only the UK shows consistent growth over time while Belgium, Norway and South Africa have had large growth followed by non-substantial volumes. The exports to Canada appear to be a "one-off" opportunity in 2013, or it could be the start of a new relationship which will be tested with exports in 2014 to determine if this is a trend or rare occurrence.

There remains growth potential for Zambia honey exports to markets where they have a history of sales. The chart below shows the percentage of Zambian exports to these markets with the gap between the blue lines and the yellow lines reflecting the potential for growth.

**Figure 13: 2013 Exports by country and market share**

List of importing markets for a product exported by Zambia in 2013 | Product: 0409 Natural honey

http://www.trademap.org/Country_SelProductCountry_Graph.aspx
The table below reflects the 2012 exports of Zambian honey in value, volume and unit price. It is interesting to note that the average price per kg to the markets accounting for 82% of the volume is just under $3.00 USD per kg documents that the international average price in March of 2014 is $3.76 CIF, while the $3.00 is FOB this does give you an idea as the $3.76 is not certified Organic or Fairtrade. (For more information on price please review Annex Document).

Table 23: 2012 Zambian Exports Value, Volume and price per ton

<table>
<thead>
<tr>
<th>Importers</th>
<th>Exported value 2012 (USD thousand)</th>
<th>Trade balance 2012 (USD thousand)</th>
<th>Share in Zambia’s exports (%)</th>
<th>Exported quantity 2013</th>
<th>Quantity unit</th>
<th>Unit value (USD/unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>1,317</td>
<td>1,302</td>
<td>100</td>
<td>441</td>
<td>Tons</td>
<td>2,986</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>552</td>
<td>552</td>
<td>41.9</td>
<td>173</td>
<td>Tons</td>
<td>3,191</td>
</tr>
<tr>
<td>South Africa</td>
<td>164</td>
<td>150</td>
<td>12.5</td>
<td>58</td>
<td>Tons</td>
<td>2,828</td>
</tr>
<tr>
<td>Botswana</td>
<td>97</td>
<td>97</td>
<td>7.4</td>
<td>44</td>
<td>Tons</td>
<td>2,205</td>
</tr>
<tr>
<td>Nauru</td>
<td>78</td>
<td>78</td>
<td>5.9</td>
<td>22</td>
<td>Tons</td>
<td>3,545</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>62</td>
<td>62</td>
<td>4.7</td>
<td>13</td>
<td>Tons</td>
<td>4,769</td>
</tr>
</tbody>
</table>

The chart below reflects the annual import growth of honey imports for countries where Zambia is exporting currently. These countries have an 11% annual growth in honey imports with Zambia falling below this growth level in their two biggest markets – the UK and Belgium. In reviewing this chart one has to take into consideration the fact that the Zambian honey exports are inconsistent so “growth” numbers do not necessarily reflect trends due to the inconsistency of the exports. It does however once again emphasize the fact that export demand exists to be met by Zambian honey exporters.

Figure 14: Growth potential of targeted markets

Trade Map - Growth in demand for the selected export product from Zambia in 2013 | Product: 0409 Natural honey

Figure 15: Growth potential by country

The countries listed on the left of the above chart are countries where there are zero Zambian exports in 2013 yet there is significant growth potential. These countries include the USA, Japan, Italy, France, Spain, Saudi Arabia and the Netherlands among others. All of these countries have annual growth in honey imports with some as high as 25% annually.
There are numerous external factors which can impact the apiculture industry in Zambia. The economics of Zambia and the exchange rate, which is greatly impacted by copper prices and sales, can cause a major adjustment to the competitive position of the Zambian apiculture industry. The currency of the global honey trade is the US Dollar (USD) therefore the exchange rate between the USD (the currency of global honey trade) and the Zambian Kwacha will be an important factor. The chart below reflects the exchange rate over time of the Kwacha per USD.

It is interesting to note that the drop in exports that occurred between 2010 and 2011 does not appear to be an exchange rate impacted issue.

Below is a more current exchange rate between the dollar and the ZMW.
The chart below reflects the Zambian honey exports in relationship to the exchange rate between the USD and the Zambian Kwacha. With the exception of the period of 2007 to 2008, the value of exports generally shadows the exchange rate between the USD and the Kwacha. While one does not expect this relationship between the exchange rate and exports to change, one could suggest that all parties involved with the execution of this program keep an eye on the exchange rate; along with honey exports, this program includes the purchase of a number of resources from domestic and international markets and therefore consideration should be made to exchange rate risks.
ZAMBIA COMPARATIVE ADVANTAGE IN EXPORT MARKETS

There is currently a large under supply of pure honey in the international market. The main reasons are the presence of the varroa mite, the lack of unpolluted areas, and cold winters. Zambian bee colonies are in general far more robust than in Western and Northern countries where pollutants in bee forage are widespread. As Zambia has vast unpolluted areas, it has a strong marketing position for high quality bee-products, together with portraying the sustainable trade aspect.

Due to the vast open plains of miombo and multiflora woodland in Zambia, the different habitats and botanical variations, there is much opportunity to develop a range of specialty multiflora and single flora honey. Unifloral (single flora) honeys, such as acacia, are increasingly in demand, despite their higher prices. Multifloral honey varieties from certain geographic regions are also increasingly popular and appreciated by local consumers or tourists. Specialized honeys are those, for example, from certain forest types or those produced in regions which are guaranteed to be uncontaminated. Occasionally other products may find a market niche among exports, but processed products for sophisticated markets face extremely high quality demands and competition. Unifloral honeys represent a sizeable and well-paid portion of the international honey market.

Organic honey is in strong international demand, as part of the overall trend towards natural products in the West. Major European supermarket chains now stock a wide range of organic products. In 2002, the Iceland group announced it would supply 100% organic products in every food category under their own brand. Waitrose, Tesco, Co-op and Sainsbury’s are leading UK supermarkets and all publicised that 20% of their range will be certified organic by the end of 2006. Europe is particularly under supplied in organic honey, due to similar reasons as signed above (natural landscape is comparatively very limited, higher widespread levels of pollution, disease and pest pressures etc.). The development of the Internal Control System (ICS) is also a strong supply chain system which can greatly enhance the availability and quality standards of the bee products, as well as increasing the traceability and risk handling capacity of the producer associations. In Zambia, some government and NGO extension staff has been trained to provide producer groups the ICS training. This is important for the operator when achieving and managing the necessary recording systems. There are a number of certified organic bee product operations in Zambia with active ICS and are exporting organic honey to the EU, Canada and US. The current export levels could be

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52 Miombo is the Swahili word for *Brachystegia*, a genus of tree comprising a large number of species. Miombo woodland is classified in the tropical and subtropical grasslands, savannas, and shrublands biome (in the World Wildlife Fund scheme). The biome includes four woodland savanna ecoregions characterized by the predominant presence of Miombo species, with a range of climates from humid to semi-arid, and tropical to subtropical or even temperate.
expanded significantly if more tangible support was given at a national level to enable this (such as modification to current taxation regimes).

An example can be found in Tropical Forest Products in the UK, the honey is sold in jars in supermarkets and other shops throughout the UK and the EU.

Figure 19: Organic Forest Honey sold in UK

Tropical Forest Products supplies cosmetic manufacturers in the UK, EU and USA. NWBP supplies more than half of the African honey exported to the EU at prices 50% above the average price paid for other imported honey.

This fact documents the export of honey through these channels, however, the higher prices paid create issues with expectations of honey producers who are looking to achieve higher than market returns which are supported by the Socially Conscience (SC) aspects of Tropical Forest Products imports and sales under the Fairtrade and organic certified labels. These higher prices create unrealistic market expectations for greater unsustainable export growth. This could be part of the reason why Zambian exports have been inconsistent over time. In order to achieve sustainable exports it is critical that prices and price expectations reflect actual market demand rather than NGO or government subsidized demand which will not continue perpetually after the NGO leaves or the governmental policy and support change. While a product can sell through the SC market, the volumes will be limited as discussed below in the section on SC marketing.

66. POTENTIAL TYPE OF BUYERS FOR ZAMBIAN TABLE HONEY

Although a substantial amount of honey is consumed locally in Zambia, only a relatively small percentage is sold through local supermarkets and shops. However, there is a fast growing middle class and expatriate community in Zambia and many new supermarkets are opening in urban centres. Among medium and large enterprises supplying to local supermarkets and shops gives potential for organised processors to enter these chains.

There are different categories of buyers in Zambia:

- Those that with international development agency input developed as the management, processing and marketing arm of the organic and fair trade certified Northwestern Beekeepers Association. A cooperative model that currently is not optimally functioning.
- The private sector organic certified buyer who has developed an internal control system of thousands of registered beekeepers through a process of cohesive group formation, training, collection centres, and continues to systematically improve
processing equipment, procedures and capacity in order to deliver a bulk quality product to the overseas market and more recently packaging for retail outlets locally and regionally.

- Buyers who also make beehives, bee equipment, and protective clothing and train beekeepers in top bar hive management, process and bulk sell honey and wax to the regional market and package for the local market. Some such buyers have started the process to reach the organic export market.
- Buyers who have limited processing capacity who mainly sell to the regional and local market and may buy directly from beekeepers or from traders.
- Buyers who are traders and who mostly buy liquid honey from beekeepers.
- Local non-government organisations which secure support to supply training, equipment and hives to beekeepers and link the beekeepers to markets or purchase the honey themselves and supply the markets.

Please see Annex Document for a list of companies with contact website addresses.

67. POTENTIAL TYPES OF BUYERS FOR HONEY BY PRODUCTS

67.1. PHARMACEUTICAL USE

There are increasing interests from Pharmaceutical companies in the use of bee products in their new product development. Pharmaceutical companies operating in Eastern and Southern Africa are increasing in number. There large and often multi-national companies only deal with bulk quantities. For example; international pharmaceutical companies, such as Aspen\(^53\) or cosmetic companies such as the Body Shop or Lush, use beeswax and propolis in some of their products\(^54\) and Almaco Pharmaceutical Ltd\(^55\).

As these companies require bulk supply, and on a regular and consistent basis they generally work through wholesalers and exporters. However, occasionally some buyers work direct with small groups or their representatives in order to convey an ethical trade message or harness a fairtrade marketing image and premium. Please see 2.5 for contact details of pharmaceutical companies based in this region.

There is an annual Africa Pharmaceutical summit where the advisory board, comprising experts whose combined experience spans the spectrum of the pharmaceutical industry, investment and the public sector are available. One of the key themes of 2014 is partnering and licensing especially for those looking to enter the African Market Place to increase sales and distribution\(^56\).

67.2. COSMETIC USE

Global trends have showed a shift from the East towards the South with 56% of new consumption in Africa by 2050. The growing middle class in many countries in Africa are

53.– www.aspenpharma.com/home.aspx
54.– www.thebodyshop.com/values/ingredient_beeswax.aspx. The large international pharmaceutical group is Aspen Holdings operate in and supply to Europe, Germany, Latin America, Mauritius, Australia, Malaysia, the Philippines and the Netherlands. Aspen has manufacturing sites in Dar es Salaam in Tanzania and Nairobi in Kenya to supply to countries in East Africa and designated export territories. The key territories supplied to include Ethiopia, Ghana, Ivory Coast, Kenya, Nigeria, Senegal, Tanzania and Uganda. Collectively these two sites manufacture nearly 2 billion tablets, 2000 kilolitres of liquids and 10 tonnes of semi-solid products annually. Aspen operates a Shelys in East and Central Africa and as Beta healthcare in Kenya, which is a subsidiary of Shelys. Aspen has a large base in South Africa.
55.– Almaco Pharmaceutical Ltd is a Canadian company possibly owned by Johnson and Johnson with interest and bases in Africa.
56.– http://africapharmasummit.com/
prompting plans from cosmetic companies to look into African investment. Unilever and L’Oreal are both investing in the cosmetic market in Africa. In an article in Business Day Live\(^{57}\), Unilever global was reported to have unidentified Africa as its next growth market. Subsidiary Unilever SA is one of the largest fast-moving consumer goods companies in South Africa. Its product range includes foods, beverages, cleaning agents and personal care products. Among the company’s brands are Vaseline, Sunlight, Rama, Orno, Handy Andy, Shield, Dawn, Dove and Lux. Unilever SA has more than 3,000 staff members across two offices and five manufacturing locations in the country.

L’Oreal’s press release in March 2014 is titled “L’Oreal pursues its growth road map in sub-Saharan Africa building on its expertise in geo-cosmetics”. The products will be mainly hair based and the company is keen to incorporate natural ingredients (such as bee products) throughout its ranges. L’Oreal has three commercial hubs in Africa – in South Africa, Kenya and Nigeria which cover neighbouring markets. With 650 employees and two plants in South Africa and Kenya, L’Oreal sold almost 120 million units in Sub-Saharan Africa in 2013 (+52% on 2012). L’Oreal now has regional hubs in South Africa, Kenya and Ghana.

An article in Reuters\(^{58}\) states that Estee Lauder plans to expand its presence in sub-Saharan Africa by rolling out its $1 billion dollar brands Clinique and MAC to tap into the strong demand from the regions middle class. Clinique was introduced to Nigeria last year and there are plans to introduce into Mozambique. MAC makeup has been launched in Nigeria. It will also be adding to new partner stores in Botswana and Zambia sometime in 2014. Estee Lauder is focusing on cities with the biggest growth potential, said Fox, and has identified key locations such as Lagos, Abuja and Port Harcourt in Nigeria, as well as the capitals of Ghana, Kenya, Zambia, Mozambique and Angola.

Hererra Cosmetics Inc. A Canadian Firm looking to export propolis for use in their products. Bee product operators in Zambia could consider supplying raw or semi-process bee products at cosmetic grade to these companies in the future. Zambia companies have significante opportunities to develop cosmetic and bodycare ranges for their home market if the pricing and level of quality and packaging can be achieved in a competitive way. Alternatively, bodycare ranges can be produced for local markets at lower prices (according to the market segment).

68. BRANDING AND MARKETING

For retail packed product (honey and wax products) development, the price will be more determined by the quality of the honey and wax, and the level of value addition, packaging, branding and market segment. To further increase competitive advantage, an interesting and provocative profile of the production, beneficiaries and incomes generation story should be developed as a central theme to the promotion and marketing approach, and attractively presented in the publicity and marketing materials. This could include aspects of community trade/fairtrade (Fairtrade certification), sustainable harvest, (and organic certification) the positive characteristics of production and processing methodologies that enable the involvement of women and the less advantaged members of rural communities, etc. A website marketing facility will provide a significant global facility for promoting the ‘feel good factor’ of the nature of this business approach.

\(^{57}\) – www.bdlive.co.za/africa/africannews/2013/06/20/unilever-calls-africa-next-growth-market
\(^{58}\) – www.reuters.com/article/2013/07/31/us-esteelauder-africa-idUSBRE96U13V20130731
68.1. MARKET SEGMENT

Table 24: Market Segmentation

<table>
<thead>
<tr>
<th>Segment</th>
<th>Dynamics</th>
<th>Road map</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Large</td>
<td>Growth</td>
</tr>
<tr>
<td>Rural – Low income bracket</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural – medium income bracket</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tourist lodges</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban – medium income bracket</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban – high income bracket</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tourist retail outlets and hotels</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

68.2. MARKET RESEARCH

The effort of producing a detailed marketing plan as part of a business plan is well rewarded in their positive effect on good business decisions and investment plans. This is a practical and invaluable exercise which needs to be carried out as soon as all the necessary information has been gained from the pilot phase. As a tool to management, business plans will allow for the viability of the operation to be assessed and re-assessed as it moves through its development phases, updating the marketing and the business plan should be encouraged as a fundamental management practice.

Major brokers and traders publish regular market reports to advise their customers about supply, demand and price developments on websites. Regular information on prices and market trends.

- The Public Ledger Weekly publication on – www.public-ledger.com
- CBI, Netherlands www.cbi.nl
Also from:

- Organic Trade Services www.organcists.com Organic market forum with buyer and seller information, news and statistics. Related sites: www.planetaorganico.com (Brazil)
- Food Ingredients www.foodingredientsonline.com Market information.
- International Food Ingredients www.ifi-online.com

68.3. RELEVANT INTERNATIONAL TRADE FAIRS

Excellent opportunity to gain an in-depth understanding of market trends, meet potential buyers, evaluate new product designs, pricing development etc... The web sites for suitable congresses and fairs are listed below:

- BIOFACH Germany www.biofach.de
- BIOFACH US www.nuernbergglobalfairs.com
- BIOFACH Japan www.nuernbergglobalfairs.com
- Natural products Expo(for US, Asia and European countries) www.naturalproducts.com

Nationals market surveys and consumer feedback questionnaires can be conducted by university students.

- APIMONDIA global fairs www.apimondia.org
CURRENT & POTENTIAL MARKET OPPORTUNITIES FOR ZAMBIA HONEY

69. MARKET SEGMENTATION

The international market for Zambian honey is segmented into the following sectors:

69.1. SOCIALLY CONSCIENCE BUYERS

Historically, Zambian honey exports have been strong to the socially conscience (SC) consumers in Europe, primarily the UK and Belgium through North Western Bee Products and Forest Fruits Limited. Recent research developed for this effort has indicated that the NWBA is not currently operating at an optimally functional level and is no longer organic or fair trade certified.

Three operators are currently engaged in organic certification, two of these are new to certification and in conversion year. One operator has dropped but could be revived or absorbed. Forest Fruits has been organic certified since 2001 and has over 6000 registered organic beekeepers. MBE and Rivendell (Bee Sweet) are in compulsory 1 year conversion to organic. MBE has 400 registered in conversion beekeepers and Rivendell has 1750. NWBKA and NWBKP have not been Organic or Fair Trade certified for some years. Ubuchi have expressed desire to be organic certified.

For the statistics reviewed, it appears that nearly 100% of this volume is destined for specialised markets targeting consumers who buy the product because it is origin identified and in many cases organic. These buyers appear to have been buying the product because their customer base supports their causes and are willing to pay the premium for Fairtrade and organic product.

This market is characterized by the consumer that is willing to pay a premium for products that are produced with moral and environmental values that are in harmony with their own social and environmental ethics and expectations (the production and consumption of this product is good for the producers, the environment and society) and a comparatively positive balance of these elements when compared with more mainstream products. These products often have elements of the following characteristics:

a. Frequently produced on a smaller scale with less mechanization (more labor thus increasing employment) and a smaller environmentally negative footprint than their more mass produced competition.

b. Produced by small producers with a more intimate relationship to all levels of the value chain than mainstream products. Often times these producers are known to invest their “heart and soul” into the production of these products and are intimately familiar with their product line. They are often not mass produced but produced by hand on a small scale.

c. Characteristics that set their products apart from mainstream products are certified by a third party certifying agency. Examples of these certifications include organic, Fairtrade, Rainforest Alliance (RFA), World Wildlife Federation (WWF), TÜV SÜD,
British Retail Consortium (BRC), Bird Friendly, Japanese Agricultural Standards (JAS) and others.

d. Product is often traceable back to an individual producer, location and production process.

e. Higher distribution costs associated with shipping and distribution of smaller lots which is an element of both smaller production and demand.

f. Higher per unit production costs due to lack of economies of scale.

The Zambian honey sold in the past through North Western Bee Products and Forest Fruits Limited has benefitted from having an image and certification of being both socially and environmentally “friendly”. Therefore the customers of North Western Bee Products and Forest Fruits Limited are willing to pay the premium associated with securing the organic and Fairtrade certification and the economics of scale on the distribution of the products. From what one can tell from market review is that these products have not entered the mainstream market but continue to be sold based upon these certifications and characteristics.

The SC market has significant benefits to the value chain which realize higher returns than product sold through the mainstream channels. Their per unit return to all levels of the supply chain are higher than if the product were sold through other less niche channels. Their labor is often higher per unit as producing, tracking and maintaining identity integrity throughout the value chain is a time consuming, costly and detail requiring element of SC products.

While the benefits of higher unit costs of selling exclusively through the SC market would seem to demonstrate that a producer should strive to only sell through this market it has the following elements to consider:

a. Higher per unit cost for production as elements associated with its production require more intensive labor and attention to the production.

b. Smaller yields – while this is not always the case it is often a fact that production under these unique methods yield smaller quantities of marketable product.

c. Smaller demand than mainstream products due to higher costs associated with production and distribution and the number of consumers willing to pay the premium for the characteristics that these products possess. The smaller the price gap between SC product and mainstream product the more consumers willing to pay the premium for the SC product, therefore efforts along the value chain should focus on bringing down the cost of getting product into the SC market.

Zambia possesses comparative and competitive advantages in the production of SC honey over many other honey producers. These advantages include their extensive forest resources, low labor costs, relatively easily organic certifiable land and the fact that they do not suffer from Colony Collapse Disorder (CCD).

These advantages are offset by a number of factors including high freight costs resulting from a range of factors including proximity to port facilities, poor roads from production to market and the fact that Zambia is not known as a producer of premium quality honey.

SC product may be sold from Zambia in retail ready (consumer goods packaging) or bulk. See below for further definition for each of these formats.

For convenience sake in this report we include diaspora markets in the SC market classification. We do this because buyers who buy a product based upon personal ties to a market are in most cases not buying the product based upon product packaging, price and quality considerations. Diaspora buyers will purchase a product based upon its origin and often overlook standard purchase decision triggers. These markets are concentrated, as are the diaspora themselves, and limited by the diaspora population, their preference and memories for the product and their purchasing power demand.
69.2. CONSUMER PACKAGED GOODS

Packaging that can go directly to the consumer via the retail shelf or other direct to consumer channel (internet sales) is referred as Consumer Packaged Goods (CPG). There are both retail and food service sized packaging that falls into CPG classification.

Retail packaging is what one would find on the retail shelf at your local shop or the destination “box” stores like Costco and Walmart. In honey this would be in sizes as small as 50 grams to 1 kilo jars—the 1 kg jars would be sold through the box type stores while the smaller sizes would be sold to the convenience or standard retail store. In this segment of CPG the package design and image is often more important than the quality of the product. It is the package which helps move the product from the shelf. The consumer in most cases does not know the quality of the product until they consume the product. After product package design price is the second factor that motivates the consumer to purchase the product.

Retail packed honey is typically in glass or plastic with visibility of the product to the consumer. While plastic is cheaper than glass in both container cost and freight it provides a lower quality image to the product than glass. Glass provides a high end image and the more unique the bottle the higher price the retailer can charge for the product as consumers will purchase the product because of the unique characteristic of the glass. Plastic is popular in honey due to the ability to squeeze the container to force the product out of the container.
Popular honey sizes are:

- 2 oz. (50 grams) – single service
- 5 oz. (150 grams)
- 8 oz. (250 grams)
- 12 oz. Bear (375 gram) – squeeze
- 1 lb. (500 gram) jar
- 2 lb. jar (1000 gram)

Another form of packaging is the retail pouch as produced as marketed under the Zambezi brand under an NGO managed by Gonzaga University with funding from the Murdock Charitable Trust. This package style allows for efficient shipping due to the weight of the package. This product is targeting the SC market.

The other sector of CPG is for the institutional market. This market is often described as anyplace where food is consumed besides the home. For honey this ranges from single serve portion controlled packages (as one would find at a fast food restaurant – KFC for example) or at a high-end restaurant (like a Four Seasons hotel or room service to institutional packaging – like one would find in a hospital.

The most common sizes are the food service can refer to as the #10 can – pictured below with 5 lbs. of honey. Other food service packages include the 3 and 5 pound plastic pale.

In institutional packaged products, the design of the package takes third position behind price per unit and quality. The institutional buyer is looking at the cost per unit and knows that the consumer will never see the package therefore does not want to see the packers funds spent on expensive label design and printing but rather on quality of the product and strength of the package.
Additionally institutional packaged product is most frequently in a can where the product is not visible to the consumer or rigid plastic. This aids in transportation of the product as cans are more stable in shipments and less weight than glass and is less likely to be damaged in transport.

To supply CPG from Zambia to the global market requires product to be packed at origin in packaging that will be purchased by the end consumer with a strong influence based upon packing design and appeal. While supplying CPG to the market does provide Zambia with increased income through doing the value add of CPG packaging inside of Zambia, it is a complex and long-term effort for suppliers to move from production of bulk product or packaging that is acceptable in the domestic or regional market to internationally acceptable CPG.

In producing CPG Zambia has a competitive advantage compared to many of the top global markets doing the processing inside of their country due to their low cost of labor and capital costs associated with land and building construction. However, these advantages must be compared and offset by a number of factors including the cost and availability of quality packing material and technologies, skilled labor and availability of logistics. Development support programs can help overcome some of these issues – providing packaging technology and training and improving labor skills but they can often do little with logistical disadvantages due to the high cost of improving infrastructure and geographic limitations.

Even if these issues can be overcome there remains a significant challenge of getting importers, distributors and retailers to carry the CPG product. As profit driven entities, these organizations are reluctant to carry product that is not easily sold – producing quick turns from the investment of their retail space. This reflects back to the fact that getting consumers to try a new brand or brand and origin of a product is expensive and time consuming.

69.3. BULK PRODUCT

Bulk product is product that is sold in a format that is either further processed or used as an ingredient in another product. In the case of honey this would include product that is sold to food manufacturers of products including honey coated cereals, energy bars, honey coated chicken or meat products or thousands of other products that use honey as an ingredient.

Figure 21: IBC – Intermediate Bulk Containers
In the global honey trade there is some overlap where industrial users will utilize #10 cans in their production but typically in bulk manufacturing this honey is in a 55 gallon drum. However, it can also be packaged in a 330 gallon Intermediate Bulk Containers (IBCs) or a 5 gallon plastic pale. Most global trade in bulk honey is done in 55 gallon drums due to the efficiencies of this container. The IBC provides better quality control however the logistics cost increases due to the need to position and return the container, whereas the drums are universally traded. Africa does have a shortage of new 55 gallon steel drums however plans are under development in Ethiopia to produce these drums in Ethiopia which will be available across Africa at a competitive price compared to currently available imported drums.

While bulk product requires high quality standards (often higher than retail), a differentiating factor between bulk and retail is the fact that the buyer knows the quality before they purchase the product.

Bulk packing is typically “easier” than retail packaging and shipping in bulk reduces the cost of freight per kilo as the package weight is not a major factor in the shipment and quality drums are easier to obtain than retail packaging in countries like Zambia. The tare weight of glass or plastic jars is greater than that of a 55 gallon drum and therefore adds weight to the shipment on a product that is going to “weigh out” (reach legal ocean and road limits) before it “cubes out” (fills the cubic space) in a 20’ container.

It is easier to get one industrial buyer to purchase a container (18,000 kilos) of bulk honey based upon quality and price than it is to get thousands of retail consumers to buy the same volume based upon label, image, advertising, price and quality. Per unit of measure, bulk sales are “easier” to achieve than retail sales as a container load of bulk product requires the decision of one buyer rather than tens of thousands.

**70. INTERNATIONAL OPPORTUNITIES FOR ZAMBIAN HONEY**

**70.1. OPPORTUNITIES IN THE EU MARKET**

The EU market is most restrictive on the quality of the honey and compliance to traceability and food hygiene standards. Table grade honey average C&F is Euros 1.30-1.40/ kg and Euros 1.90-2.50/ kg for organic certified up to 3.20/ kg for single flora organic fairtrade, (Minimum FLO price Euros 1.30/ kg). The current UK price from smaller scale importers for single flora is C&F bulk price Euros 2.10 to 2.40/ kg and multiflora at Euros 1.80-2.30/ kg. Top prices are gained for organic and fairtrade certified single flora table honey. This is currently around Euros 2.80-3.40/ kg. Prices are affected by quality, flora (uniflora/multiflora) and volume.
Example export price of conventional honey in the EU market sourced from Africa (CIF):

- Bulk table grade honey (approx) – over 1,000 kg – Euros 1.40 to 2.20/kg
- Bulk table grade organic honey (approx) over 1,000 kg – Euros 2.40 to 2.80/kg
- Bulk industrial grade honey (approx) – over 1,000 kg – Euros 0.90 to 1.10/kg
- Example price of conventional retail packed honey in the EU market sourced from Africa 2013
  - Retail packed table grade honey (approx) – 50 to 1,000 kg – Euros 6 to 8/kg. 1,000 kg ± Euros 4 to 7/kg.

The table below shows example of comparative retail prices in Euros of honey for year in 2013. Prices are affected by the demographic – national economical environments.

**Table 25: Comparative retail prices of honey for in 2013 (for 50-1000 kg consignments)**

<table>
<thead>
<tr>
<th>Type of honey</th>
<th>Slovenia (for 900g)</th>
<th>Serbia (for 900g)</th>
<th>Switzerland (for 1 kg)</th>
<th>Austria (for 1 kg)</th>
<th>Germany (for 1 kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>flower honey</td>
<td>6-7.5</td>
<td>5,5-12</td>
<td>–</td>
<td>7.5-8</td>
<td>7-10</td>
</tr>
<tr>
<td>acacia honey</td>
<td>6-8.5</td>
<td>5-6</td>
<td>–</td>
<td>7.5-8</td>
<td>7-10</td>
</tr>
<tr>
<td>forest honey</td>
<td>7.5-9</td>
<td>–</td>
<td>12-14</td>
<td>7.5-14</td>
<td>9-12</td>
</tr>
</tbody>
</table>

Zambia has maintained its compliance to the EU regulation for the importation of honey from non-EU sources. This means that there should be an active residue monitoring plan in place and other honey traceability measures.

**UK leading importers**

The UK market represents 11% of the total EU market with an annual increase in excess of 5% between 2004 and 2008. The UK is the 2nd largest importer of honey accounting for 13% of the EU total import volume. The primary supplier to the UK is China with a 41% market share followed by Mexico (9.2%), Argentina (7.5%), Brazil (6.8%), India (2.7%) and Guatemala (1.1%).

The UK is a significant market for Fairtrade certified honey importing 20% of the global sales of volume in 2009 with increases between 2005 and 2007 of 23% annually.

In the UK the average retail sales price of Fairtrade honey was £12.75/kg.

The UK also accounts for nearly 20% of the EU market for organic honey

- www.Rowsehoney.co.uk – importer, packer and wholesaler.
- www.fdl.co.uk – leading importer supplies packers and industrial users – Fairtrade certified.
- www.kmmpton.co.uk – importer
- www.etco.co.uk – sales agent


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Belgium market

Belgium accounted for only 2.5% of the total EU honey market in 20089, however, in 2012 accounted for nearly 42% of Zambian exports.

In 2010 Zambia represented 2% of Belgium’s imports; China had a 68% share, while Mexico (6.2%), Argentina (5.6%), Chile (2.3%), India and Brazil (1.6%).

Belgium is also a major re-exporter of honey with 19,000 MT in 2009 going primarily to France, Spain and Poland.

There are two importers of Fairtrade honey in Belgium – Oxfam and Maya. Maya imports exclusively from Latin America.

Meli brand claims to have a 70% market share under their brands Meli, Melapi, and Meliflor. They also pack private label honey for large retailers including Carrefour and Match.

Bijenhof is the other significant packer in Belgium with a 5% market share. Foreign packers account for the balance of the retail volume in Belgium.


German market

Germany accounts for 25% of the apparent consumption of honey in the EU and is the leader in Fairtrade certified honey accounting for 24% of the global total.

The domestic production in Germany decreased between 2006 and 2010 due to CCD and cold springs. However it increased again in 2011 and beyond.

Germany imported 73% of its honey from DC countries with Mexico accounting for 14%, Chile 8.2%, Brazil and Uruguay 5.4%.

Germany is a re-exporter of honey with an estimated 21,000 MT of processed honey re-exported to other EU countries including the Netherlands, France, the UK and Austria.

Germany is the #1 market in Europe for organic honey accounting for nearly 30% of the EU market. In 2006 the brand Allos had an 80% market share. http://www.allos.de

Germany has Black Forest honey which opens the doors for tropical honeys from Zambia with their dark colors.

German importers of honey are:

- www.tuchel-sohn.de – Fairtrade certified
- www.breitsamer.de – Fairtrade certified
- www.Fauesten-reform.de – Fairtrade certified
- www.gepa.de – leading importer of Fairtrade certified
- www.honigimprot.de – Fairtrade certified, targets industrial
- www.stut-nahrungsmittelwerke.de – Private label and industrial

70.2. OPPORTUNITIES IN THE US MARKET

The US market is easier to penetrate than the EU market concerning quality standards. Unblended table grade honey (multi to single flora) average C&F:

- Bulk table grade honey (approx.) over 1,000 kg – Euros 1.20 to 2.20/ kg
- Bulk table grade organic honey (approx.) over 1,000 kg – Euros 2.10 to 2.70/ kg.

In Africa the average price for honey (crushed) received by producers is Euros 0.90 to 2.10/ kg depending on the season and geographic location. Traders sell honey to the processors at a price range between Euros 1.20 to 1.80/ kg. Processors retail honey at over Euros 3.20/ kg equivalent.

70.3. OPPORTUNITIES IN THE MIDDLE EAST MARKET

Saudi Arabia: The Saudi Arabian market is promising for Zambian suppliers. It imports over 5,000 tonnes/year. Import prices for table grade honey range from Euros 1.90-2.80/ kg C&F. Retail-packed honey are charged a 12-per cent import duty. Honey destined for industrial use is normally exempt from any duty, but the importer must obtain a waiver from Customs. Labelling must indicate the product name, origin, weight, production and expiry dates and the importer and exporter, hygienic regulations and definitions of honey

Kuweit: Similar, market size 1,200 t/year (recorded)

The Gulf States: The Middle East imports over 90% of its food (US$9 billion). Honey and wax is imported mainly from Yemen (highly prized), Argentina and the US. Import prices range from Euros 1.70 to 3.10/ kg. African honey may already unofficially enter via Yemen).

71. FUTURE & POTENTIAL MARKET OPPORTUNITIES FOR ZAMBIAN HONEY BY-PRODUCTS

71.1. FOR BEESWAX

The export of Zambian beeswax is limited as the harvest of beeswax is also limited. To increase exports of beeswax the production needs to increase and this is difficult with traditional hives. As the vast majority of honey is produced from traditional log hives, and honey is predominantly marketed as crushed honey (crushed comb) the most beeswax is lost in the process, discarded or destroyed. Additionally, due to widespread improper harvesting techniques, much of the beeswax produced is of poor quality, for example harvested from immature honey or a mixture with that from mature honey. Therefore, beeswax is mostly wasted due to poor honey harvesting and extraction techniques and lack of adequate training on part of the beekeepers, but also due to poor understanding of its market value.

However, similar to honey, the international price for refined beeswax is lower than the domestic price. There is strong international demand and great potential for the export of beeswax from Zambia. In the global market, beeswax price ranges from Euros 2.50 to 6/ kg for light-coloured wax, occasionally reaching Euros10 to15/ kg. However, bulk wax from China is currently entering the market at less than Euros1.50/ kg. This beeswax will be designed for industrial markets due to the high market perception of Chinese bee products and contamination.

60. – Saudi Arabian Standards Organization Director General Standards Dept. Tel.: (966-1) 452-0000, ext. 1125
Data on prices of organic beeswax are not readily available. The EU imports approximately 50 percent of its supply from developing countries. The main importing countries are Germany, France and the UK. These nations all have significant pharmaceutical and medical industries requiring beeswax. Because of the relatively small size of the international market, due to limited supply, there are few importers. Refiners mention that there is an attractive price premium for organic beeswax (30-40% premiums and over).

Tropical countries dominate world beeswax production and export, with industrialized countries needing to import beeswax. This is because of the different styles - beekeeping that uses movable-frame hives (for example, Langstroth hives) results in the harvesting of relatively little beeswax. Using these sorts of hives, the ratio of honey to beeswax production is approximately 75:1. Beekeeping using local style, fixed-comb hives, or movable-comb (top-bar) hives results in greater yields of beeswax. The ratio of honey and beeswax production using fixed comb or movable-comb hives is about 10:1. For this reason, in Zambia where fixed-comb beekeeping is the most common production method, significant amounts of beeswax can be achieved which provide a valuable export crop and can be the most valued product of beekeeping.

New honeycomb is nearly white. The colouration of beeswax (shades of yellow, orange and red through to brown) is due to the presence of various substances, especially pollen. This colour is not significance to the quality of the wax but light coloured wax is more valued than dark wax in the international market. A dark colour is often associated with poor quality (over-heated causes wax to darken). The finest beeswax is considered to be from wax cappings and is much lighter in colour. Bleaching using agents such as sulphuric acid or hydrogen peroxide is now generally considered as unnecessary and damaging to the natural wax.

The main quality issues concern authenticity of origin, and contamination from residues of drugs used to control honeybee diseases, mainly the acaricides used to control mite predators, paradichlorbenzene, used to control wax moth. The use of these chemicals in beekeeping in industrialized countries makes beeswax harvested from the predominantly disease-free colonies of Zambia more attractive.

Pure beeswax has a good aroma, and when a wax block is broken, it shows a grainy surface. That is not the case if it has been adulterated with paraffin, fat or other oil. If pure beeswax is chewed it does not stick to the teeth, and when rolled between fingers it softens but not sticky. When paraffin wax is mixed with beeswax it becomes more transparent and greasy. Beeswax is solid at room temperature (it is brittle once the temperature drops below 18 °C and quickly becomes soft and pliable at around 35 to 40 °C), with a melting point of 64.5 °C. Beeswax has hundreds of uses. As well as those indicated in the section below, around 20 percent of the world trade in beeswax is used for, models and casting in industry and art, for decoration or sculptures and jewelry before they are placed in a mould for casting in silver, gold or bronze, to make polish for cars, furniture, shoes and for treatment of other leather products, grafting waxes, in lubricants for industrial use, etc..

### 71.1.1. Cosmetic and pharmaceutical grade honey and wax

Natural products remain central to new product exploration and development in the international medicinal, nutraceuticals and bodycare industries. Bee products are already highly recognized for their therapeutic benefits throughout the world, including their value in body and beauty care. There is a small and rapidly growing market for high quality bee products for natural cosmetics, worldwide. Euromonitor reported annual growth of 9 per cent since 2003.

In order to access more attractive cosmetic and pharmaceutical markets, processors should invest into the necessary equipment and accreditation required for achieving refined bee product – such as purified honey and wax, to the import standards of the identified country, and establishes a sound reputation for reliable supply. Most importing companies prefer to buy in larger quantities (5+ tons). For smaller quantities, there is
more opportunity to develop national and regional markets for value added cosmetic, nutraceuticals and health supplements from Zambian bee-product in order to maximize returns to the producers.

The cosmetics and pharmaceutical industries have no complete substitute for beeswax. At least small quantities will always be needed to maintain quality and specific characteristics. Industrial use of beeswax might increase if availability would increase and become more reliable or if prices could drop significantly. The balance between cheap substitutes and quality considerations has kept prices stable. Most industrial users prefer to buy crudely rendered and filtered wax directly from local sources because their own processing guarantees better quality control. Around 40 percent of the world trade in beeswax is used for the cosmetics industry, which requires first class beeswax that has not been overheated, is pure and free from propolis. The world price is usually around US$4-10 per kilogram. At a local level, making skin ointment from beeswax can be one of the most profitable beekeeping activities. Around 30 percent of world trade in beeswax is used by the pharmaceutical industry that, like the cosmetic industry, requires good quality wax.

In Western markets the prices for finished (retail ready) products made from beeswax vary widely from country to country. In African markets, the retail price setting will be determined more by the attractiveness of the product packaging and presentation, price and formulation. It will be necessary to market trial any apitherapy or cosmetic product during a pilot phase before further investment is made. Generally, the best margin between raw material value and end product price may be obtained in bodycare, natural healthcare and cosmetic preparations. Pharmaceutical markets will be extremely difficult to penetrate due to the significant legal requirements for market entry (accredited case studies, product trials double blind trials, and the high registration and legal fees etc.), plus sophisticated and high cost equipment for the processing requirements. This excludes dermatological and traditional medicinal products.

71.2. FOR PROPOLIS

Propolis (also known as bee glue) is a sticky substance collected by bees from leaves, buds and sap of certain trees. Bees use this stuff to fill cracks in their hive, to seal the entrance hole when it is too large, and to keep the hive clean and free from diseases and parasites. Propolis possesses several properties that make it very suitable as an antibiotic and antifungal agent in the pharmaceutical industry. It is also used in natural medicine to treat various conditions, including inflammations, viral diseases, ulcers, skin burns and scalds. As propolis is not difficult to extract and is used in the nutraceuticals and cosmetic industries both in the African and the international market, there is a realistic opportunity for bee products enterprises to develop local and national markets.

There is a sound international market for already for purified propolis, pharmaceutical and natural products market. These are increasing annually in size. Much higher price are achieved where the propolis is produced and semi-processed through market approved channels and processed through accredited, well equipped laboratories. Once quality standards of the large consumer nations are reached, exports may become feasible. It is advisable for Zambian bee products companies to gain market experience now while competition is still relatively low, will provide an advantage in the future when competition and quality control become more stringent. International prices for raw propolis are currently between Euros 18-25/ kg.

71.3. FOR POLLEN

Pollen is basically food for bees. It is a powder-like material found on flowering plants that is collected, eaten and stored by bees in honey comb cells. In many developed countries, pollen is used in some expensive dietary supplements, since it is believed to have valuable medicinal properties.
As for propolis, the processing techniques for propolis can be adapted for bee products
to Zambia. The bulk pollen consumer market seems to be growing in industrialized
countries, but pollen tablets are still a common feature of health food stores
and command an excessively high price. Encapsulation and extraction of pollen lend
themselves easily to small scale manufacturing and result in safer consumer products.
The best profit margin for selling pollen appears to be in selling it pill form. This enormous
price margin cannot be achieved everywhere, but reflects a consumer attitude that exists
in some countries. Dried pollen in the USA ranges from Euros 9 to 15/ kg wholesale and
Euros 12 to 25/ kg retail.

71.4. FOR ROYAL JELLY

Royal jelly (or bee’s milk) is a special substance produced by worker bees and fed to the
queen bee. Studies show royal jelly to be a good source of Vitamin B. Like pollen, it is
thought to have medicinal value and is used in certain expensive dietary preparations. It
is consumed more in Asia than any other part of the world. Consumption of royal jelly in
China alone is more than 75 tonnes annually. In fact, China makes royal jelly chocolate
candy and wine, as well as lotions and tonics for natural healing.

Royal jelly can be extracted through careful training and guidance, and the back-up
assistance of the research institutions (e.g. International Centre for Insect Physiology
and Ecology, Kenya). The process is more exacting and has more negative impact if
not carefully conducted and consistently managed. It is therefore a less attractive bee
product enterprise than other bee products for most Zambian companies.

The international wholesale price of royal jelly, based on that of China the largest sup-
plier, is Euros 50-80 per kg. Local prices in different countries can still vary considerably
and be much higher, Euros 100 and 180/ kg. Even without international competition,
the decline in price was already obvious by the late 1950’s in countries where the use of
royal jelly started. The greater availability worldwide (particularly due to increasing Asian
production) and the fact that the properties of royal jelly have not yet been determined
conclusively, are probably the two main reasons for this drop in price. In its processed
form as tablets, capsules or vials, the equivalent of 1 kg of royal jelly may cost the
consumer of some products from Euros 35 to as much as Euros 2,800. The price margin
is similar to that of dried and processed pollen.

71.5. FOR BEE VENOM

Honey bee venom (scientifically known as Apitoxin) is used by the bees as a defensive
weapon to protect the colony from intruders and attackers. This substance is responsible
for the bee’s painful sting and is produced in the abdomen of worker bees that defend the
bee colony. Bee venom is used in medicine as treatment for rheumatism and other joint
diseases due to its anti-inflammatory action. It is also used to desensitize people who
are allergic to bee stings and insect bites. Current operators marketing bee venom have
experienced strong demand for the cosmetic/beauty care industry. The market has been
considerably boosted by recent media reports film and music stars and members of the
British Royal family using bee venom products to improve their skin tone and reduce the
effects of aging (wrinkles). In Western and Northern markets, the volume of skin care and
beauty products that incorporate bee venom in minute quantities has expanded consider-
ably over the last 3 yrs. However, bee venom is a highly specialized product with only very
few international buyers. The extraction operation is time consuming and also exacting,
and requires careful management on a commercial scale. There could be an opening for
Zambian producers and processors to master the techniques for national and regional
markets, if NGO and research and training institutes will support the development of
this particularly niche industry. The international market volume is relatively small too,
although there are no comprehensive surveys. Prepared for injections or sold in smaller
quantities, prices can be much higher. However, the beekeeper often does not get this
price. The prevailing prices in European and Asian markets are generally slightly lower.
TOP CHALLENGES AND RECOMMENDATIONS

Below are the main top five challenges affecting the Zambian honey sector and a set of recommendations to address these challenges.

72. MARKETING & TRADE CHALLENGE

Recommendations & way forward:
*Increase sales of bee products by improving quality of honey, packaging, offering additional bee products, and providing finance mechanisms to meet international standards and utilize best practices.*

Many of the concerns of the Zambian Honey Sector are rooted in the sales and production of quality honey products. These two go hand in hand to deliver livelihoods to all sectors of the honey economy. Without improvement in some areas of the marketing and trade, an increase in sales and production may not be achieved.

The use of modern hives could significantly help the quality of Zambian honey. Honey that is produced in traditional hives is deemed to be inferior to modern hives in the following characteristics: colour, smoky taste, and excess foreign material.

Use of modern extraction and processing equipment will also improve the quality of the product. A comparison of modern hives versus traditional hives can be found in the Annex document.

Quality standards and accreditation

- Certification in Good Manufacturing Practices (GMP) like HACCP is universal among buyers and should be implemented at all necessary steps across the value chain.
- There are other standards which the market may require including British Retail Consortium (BRC), Fairtrade, organic, and ISO. These should be considered depending upon the market they are targeting their sales. The specific requirements will be defined by the buyers.

It will also be advantageous for Zambia to have internationally recognized quality testing laboratories which can test the product for quality, residual chemicals, and foreign matter.

Packaging remains an important issue. Proper packaging is what sells a product the first time. Most of the bulk processors and packers need to improve the quality of material that the labels are printed on. Attractive designs should be made in order to make the product more presentable and especially if the processors are targeting the international markets. Working with the buyers will help ensure that the package size, design and label meet their market expectations and import requirements.

On the domestic market there has been a marked improvement in both the quality and availability of local honey on the formal retail market. Much of the honey being offered on the local market is of good quality and packaged in plastic jars and bottles. Concerted efforts however are still required to further improve on the quality and packaging of the
product to enable more retail packed Zambian honey to access European markets where quality and labelling standards and customer options are more stringent.

Additional bee products offered locally and internationally will increase sales for the apiculture industry.

There are branding opportunities based on flora species for specialized markets. There needs to be awareness creation regarding value of beeswax. Some see it as a waste product. There are processes which can increase export price of quality wax, such as pelleting which could be utilised if modern hives are implemented.

The challenge for processors of finding reliable distributors for their products locally and regionally needs to be tackled. The local honey label requires 3rd party legitimacy or a participatory guarantee system.

The impediments to the growth of the industry at producer (supplier) and processor (buyer) levels include but are not limited to the scarcity of affordable trade finance, poor quality of the products, high transportation costs, poor product packaging, inconsistency of supply and poor relationship between the producers and processors (ZHP, 2011). Other challenges that have contributed to the slow growth of the industry are limited access to bulking facilities, substandard handling and cropping practices and market linkages at all levels of the value chain.

Zambia has preferential trade agreements under the COMESA treaty and SADC Trade Protocols that provide immense potential for future cost effective trade in bee products. However, lack of market information on available buyers and suppliers and a sustainable supply of bee products pose challenges to capitalizing on these preferential trade agreements. Furthermore, beekeepers are scattered and poor infrastructure hampers buyers to reach remote producers. The challenge for processors of finding reliable distributors for their products locally and regionally needs to be tackled. The local honey label requires 3rd party legitimacy or a participatory guarantee system.

73. TRAINING & CAPACITY BUILDING CHALLENGE

**Recommendations & way forward:**

*To promote the development and strengthening of extension service, training and education in bee keeping.*

The need has been mentioned for development of higher education qualifications for beekeeping and a harmonized curriculum for beekeepers which should also incorporate organic requirements.

Beekeeping training, education and extension play a paramount role in developing and enhancing the performance of the apiculture sector. Bee keepers, processors and retailers of bee products need education, training and extension services in order to improve their businesses and strengthen the sector.

The Forestry Department, Ministry of Agriculture and Cooperatives, Bee Keepers Associations, honey processing companies and NGOs have provided various forms of training and extension services in the past. The degree of success of these programs has varied. However, the contribution of education, training and extension services to the sector has not translated into increased honey production, efficiencies or profits.

It has been observed that the lack of effective coordination among stakeholders in education, training and extension has greatly reduced the effectiveness and impact of these education efforts. Lack of coordination has caused not only duplication but confusion with cases of different organizations training the same farmers in beekeeping giving
conflicting messages has been reported. The training provided to the various players in
the sector is not accredited and standards have been a regular area of concern. Zambia
lacks formal education providers at tertiary level for individuals seeking formal education
in apiculture. Currently, there is no educational institution in Zambia offering tertiary
level qualifications in apiculture. Viable linkages among training providers, research
institutions and key players in the sector have been inadequate in coordination of efforts.
In addition, the scarcity of resources in the capacity building institutions has hampered
the provision of quality training and extension services.

There is need to raise awareness about and advocate against bee killing pesticides
and GMOs which will weaken and eventually kill Zambian bees, as well as having a
detrimental effect on export markets.

Training – Production:

Food safety measures need to be brought into at all stages of the production and
processing of honey.

Innovation and Technology:

The new innovation developed by Rivendell at Luanshya for top bar hives to be easily
placed and brought down from 4-5m high in trees with simple pulley system needs to
be studied and if agreed to be successful, adopted widely.

74. SECTOR ORGANIZATION, PARTICIPATION,
& COOPERATIVE PLANNING CHALLENGES

Recommendations & way forward:
To ensure broader participation of stakeholders at all levels of the value chain.

In order to ensure the robust growth of the apiculture sector there is need for the partici-
pation of a cross section of actors including private sector, women, and youth. Barring
the full inclusion of youth that represent more than half of the population, women that are
the backbone of rural households and the private sector which is the engine of growth;
the development of the sector will remain stunted.

The main private sector processing companies have played a key investment role in
facilitating the mobilisation of beekeepers into groups, provision of beekeeping equip-
ment leases to producers, training and extension. However, feedback from the industry
provides documentation that the capacity of the majority of private sector companies
remains limited with many facing resource constraints in procuring honey stocks as well
as technical and human resource constraints in processing, packaging and marketing of
quality bee products. Due to the limited capacity of said companies, private investments
in production and processing technologies have remained less than optimal to facilitate
rapid growth of the sector.

Furthermore, traditional norms and practices continue to perpetuate gender imbal-
cances in the sector. The predominant production methods that involve the suspension
of bark hives in trees hinder women, who are culturally restricted from climbing trees and
youth who are not physically strong enough to climb the trees. Consequently, female
beekeepers that lack access to modern beehives are compelled to hire men to site
their bark hives and harvest honey on their behalf. This raises the cost of production for
female beekeepers. Thus, in order to fully realize the potential of women to participate in
beekeeping, deliberate efforts are required to ensure that women have affordable access
to modern beekeeping technologies. In addition, the formation of women’s beekeeping
groups should be supported and targeted assistance provided to women processors.
Over 60% of Zambia’s 13.5 million population is made up of youth below the age of 35 years while the youth unemployment rate stands at 48%. Despite beekeeping providing a viable income generating activity for youth, the practice of beekeeping has by and large remained the preserve of the older members of society. The youth have generally been disinclined to engage in beekeeping owing to the perceived lack of economic returns. The status quo thus poses the danger of losing indigenous knowledge of beekeeping with the passing on of older generations of beekeepers. The beekeeping policy must deliberately provide incentives to make beekeeping attractive to the youth.

At the inception of organized beekeeping in Zambia, the sector was primarily administered by government and (albeit to a limited extent) the private sector through organized beekeeper groups, associations and cooperatives which were located in specific routing systems in each district. Government internalized the regulation of the beekeeping sector by setting up the Beekeeping Division, an institution under the Forestry Department, responsible for promoting beekeeping activities. However, following the Public Sector Reforms of the early 1990’s the Beekeeping Division was dissolved. Unfortunately the lack of a coordination body to take over the roles previously performed by the Beekeeping Division adversely affected the growth of the sector resulting in segmentation of various aspects among government agencies and departments.

In order to address the deficiency created by lack of a coordination body for the sector the Zambia Honey Partnership, a multi-stakeholder platform, was developed as a coordination framework to provide a rational approach, by both the public institutions and private sector actors involved in promoting sustainable social and economic growth of the honey sector in particular. The platform emerged through a series of stakeholder meetings and consultations. These stakeholders have included Government agencies, business and trade associations, beekeepers, exporters/packers, researchers and international development agencies.

However, the ZHP as an industry dialogue platforms’ role is limited to advocacy, lobbying & complimenting government functions. In order to realise the policy objectives however, there is need for the government to provide an institutional framework to coordinate the beekeeping sector. The coordinating institution, board or agency to be established by government through an Act of Parliament shall address the prevailing deficiencies by conducting and facilitating research and development, and regulating training, extension, production and marketing of bee products. The structure and capacity of the apex organisation needs to be developed so that it can inclusively facilitate improvements for the sector.

Group formation and bulking centres should continue to be developed in conjunction with buyers.

75. RESEARCH AND DEVELOPMENT CHALLENGE

Recommendations & way forward:
To promote research and development in beekeeping to enhance performance of the sector and its contribution to economic development.

Research plays an important role in providing technological innovations and practices that would contribute to the development of the beekeeping sector. Results of research must be appropriately packaged and timely disseminated in order to bring about the desired outcome. Key impediments to the development of research in beekeeping are linked to the institutional arrangements as well as a lack of capacity and funding for research. The Forestry Department in its current establishment has a research unit which includes beekeeping and apiaries but little capacity to conduct field research. As a result, development of local improved technologies for production and processing are lacking. Furthermore, this adds to the dearth of robust research into bee diseases
CHAPTER 6. RECOMMENDATIONS, IMPLEMENTATION PLAN & CONCLUSION

and health, improved marketing, value addition and product diversification; climatic influences on bee behaviour and health. Even when information is available, the dissemination of research findings to beekeepers/stakeholders has been inadequate.

Research also plays an important role in the control and surveillance of bee pests and diseases. In view of the serious disease situation in the region (i.e. Foul Brood, Cape Bee, Varroa mite) disease control should be high on the agenda in Zambia and the role of research in informing disease control and prevention cannot be overemphasized. Existing measures to control pest and disease include in the residue control plan designed and implemented by the Department of Veterinary Services to monitor and control honey exports to the European market. The Zambia Agricultural Research Institute is also mandated to implement disease surveillance systems across the country. Annual honey and bee disease surveillance surveys conducted by ZARI between 2009 and 2012 across the main production areas of North Western, Copperbelt, Central and Eastern provinces revealed that there was no evidence of the Paenibacillus larvae that causes American Foul Brood and this was subsequently notified under the WTO regulations.

Currently, the regulations impacting or associated with beekeeping diseases would be enshrined in the Livestock Policy and Legislation of Zambia under the Stock Diseases Act Cap 252 which is in line with the OIE for international regulation monitoring, reporting and addressing bee diseases. These regulations incorporate the transporting of unoccupied or occupied swarm boxes. It is therefore important that these measures are incorporated in the Beekeeping Policy in order to compliment and strengthen the management of bee colonies and harmonize related policies in this area so that import and export controls are also coordinated. Furthermore, laws must be implemented and enforced to compel every beekeeper who finds any pest or disease in his or her bees or whose beekeeping equipment is infected, to immediately report the presence of the pest or the existence of the disease to the relevant authorities.

ZABS accreditation for its labs should be followed up and communication established as to the testing needs of the honey sector.

In addition to ZABS and ZARI, the Zambia Forestry College can also be included as it has already being empowered by the TIPEC-ZAS project in many areas of research.

76. ENVIRONMENT CHALLENGE

Recommendations & way forward:
Establishment of a provision of state protected beekeeping reserves in the key honey production areas to ensure that beekeepers do not lose out to other competing land uses such as mining and agriculture including registration of beekeepers, licensing, and establishment of forest reserves.

Forestry needs to create a balance between enabling and control of resources. Allowing value to be created in the honey sector will help to protect this valuable resource.

Beekeeping is mainly practiced by farmers on customary and state land. However, the proximity to other land-use types has caused conflicts between beekeepers and other actors.

The agricultural or farming sector is estimated to provide about 75% of employment to rural Zambians. Most beekeepers are crop and livestock farmers who practice beekeeping as an alternative or supplemental income source. In some cases the agricultural crops may provide a source of nectar while bees also pollinate some crops. The relationship is not always symbiotic however as some farmers spray chemicals to protect their agricultural crops, some of which may be poisonous to bees and can cause substantial
losses in honey production. In addition the use of agro-chemicals in beekeeping areas negates the potential for organic certification of honey produced from those areas.

The land tenure system on customary land encourages communal use of land and natural resources. This arrangement leaves the beekeepers vulnerable to losses when title deeds for areas which beekeepers have occupied for establishment of their apiaries are allocated to alternative parties. It is also easy for beekeepers to lose their self-allocated beekeeping areas to other national development projects like mining and road construction without compensation. The other competing land uses that conflict with beekeeping include the felling of trees for timber, charcoal and caterpillar harvesting which results in the destruction of floral sources for bees which in turn affects honey production. Late burning and shifting cultivation destroys floral sources and drives away bees due to the smoke pollution caused by burning of the trees.

Beekeeping in Zambia has mainly been practiced in non-mining areas. Where it is done near mining districts like Kalulushi, Kitwe, Mufulira and Lufwanyama; there has never been any regulation to protect the beekeeper from losses as a result of pollution from the mines. In recent times, the heart of beekeeping production in Zambia i.e. North Western province has also been opened up for mining activities in Solwezi, Lumwana and Mwinilunga. Large tracts of forest land have been cleared to pave way for these national projects including road construction to the mines. These activities result in the loss of nectar sources in the short-term and, the anticipated long-term pollution also have effects on the flowering of trees, the potential to organically certify honey produced in these areas and the entire ecosystem. While a few people will be employed in the established mines, many will remain in the surrounding villages and continue to depend on ventures like beekeeping for a livelihood which are under threat from the mining.

Due to lack of regulations for the beekeeping sector people have taken advantage of any open area to practice beekeeping. Public places have not been spared. These arrangements tend to inconvenience other users of such facilities. There is no policy in place that deliberately provides for the allocation of state protected beekeeping reserves as is the case for Game Management and Wildlife Conservation Areas. Furthermore, the lack of a regulatory mechanism to register and issue licenses to beekeepers entails that it is not known which beekeepers are operating in the forests. The establishment of a provision of state protected beekeeping reserves in the key honey production areas will ensure that beekeepers do not lose out to other competing land uses such as Mining and Agriculture. Also, the registration of beekeepers and issuance of beekeeping licenses to farmers to establish apiaries in designated beekeeping and forest reserves will provide valuable data that will help ensure the sustainable management of the forest resource.
IMPLEMENTATION PLAN

77. STRUCTURE

Please find below the implementation plan based on the national export strategy plan derived from the 2007 JITAP strategy, updated with the contributions of the Zambia honey stakeholders during the honey value chain roundtable that took place in July 2014 in Lusaka.

The main findings and recommendations have been integrated under the four key strategic objectives below.

The implementation plan is divided in four key strategic areas relevant for the strengthening of the Zambia honey sector.

1. Increase quantity and quality of bee products complying with international standards
2. Create access to relevant markets, disseminate market information and make the Zambia honey visible at international markets
3. Improve and strengthen honey sector organization and inter-professional communication
4. Provide adapted financial services to support producers and exporters capacities
Strategic objective number 1: Increase quantity and quality of bee products complying with international standards

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<th>Activities</th>
<th>Activity No.</th>
<th>Type of activity</th>
<th>Direct Recipients</th>
<th>Potential implementing partners</th>
<th>Progress measures (indicators)</th>
<th>External support required</th>
<th>Priority</th>
<th>Proposed activities to be carried out by the sector &amp; current status</th>
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</table>
| 1. Quality management:  
   a. Improve the harvesting and post-harvest handling (smoking techniques, use of protective equipment, use of containers, honey grading and pressing, storage)  
   b. Set up a quality certificate for every step of the value chain with a report analysing all activities  
   c. Improve quality awareness of producers through training. NGOs and government extension services align the value chain  | 1.01 | Quality/Production | Producers, Processors, Exporters | Forestry Dept., In MACO, EPIC, private sector companies, NGOs (e.g. SNV, Keepers Zambia Foundation), Zambia Honey Council, ITC | Number of trained beekeepers, beekeepers groups, increase volume of quality exports, inspections, number of samples and buckets rejected benchmarked to current situation, regular meetings of stakeholders on quality management, movement to higher quality | Long-term experts, intermediate trainers, quality experts and trainers, financing through banks | Very high | 1. Hold regular meetings of stakeholders of Zambia honey products to improve communication and information sharing  
2. Increase number of companies in the industry  
3. Increase the number of beekeepers  
4. Prioritize the beekeeping sector by the government as a mean to reduce poverty  
5. Increase awareness and education among the public |
| 2. Quality standards and accreditation:  
   a. Bring Zambian quality testing laboratories up to international standards through the provision of training and equipment  
   b. International export accreditation of private laboratories and the Zambia Bureau of Standards or recognition of existing Zambian standards in target countries after period of adjustment  
   c. Introduce HACCP safety standards and good manufacturing practices (GMP)  | 1.02 | Quality standards | Producers, processors, packers, testing laboratories, Zambia Bureau of Standards (for food: food and drug testing labs, National Institute for Scientific and Industrial Research in University of Zambia of Food Science and Technology; for phytosanitary: Mount Makulu Agriculture Research Station) | Forestry Dept. under MACO, ZABS under MOC, testing laboratories and external auditors, Zambia Bureau of Standards, global inspection bodies (e.g. SGS, Bureau of Veritas) | Recognitions of quality certificates and accreditation of testing approved by foreign laboratories, certifications and accreditations of laboratories, quality standards and traceability mechanisms are in place, number of certified samples/processors/trainers, number of honey samples analysed, ISO norms are adopted, quality partnerships established | Financ- ing through World Bank or donors, technical capacity building IFAD/FAO | Very high | 1. Assist and upgrade if necessary ZABS honey testing lab for accreditation to international standards  
2. Introduce GMP/HACCP on a greater scale among producers and processors  
3. Train sector’s actors to GMP and HACCP certifications to allow greater access to international markets such as the EU market |
| 3. Storage and Logistics:  
   a. Identify central storage points in existing production areas and develop or improve storage centres  
   b. Train storage technician on storage, logistics and management  | 1.03 | Storage, Logistics and transport | Beekeepers, processors | Forestry Department EPIC, Beekeepers Associations | Storage points renovated or newly established, trained storage managers, reduction of transport costs | Financing of new/reno- vated storage points | High | SNV has supported bulk centres (5 completed)  
ZHC is also building bulking centres  
1. Assist and support improvements in security and hygiene measures at bulking centres  
2. Create new bulking centres for remote areas  
3. Train bulking center personnel on storage, logistics, and management |
<table>
<thead>
<tr>
<th>Activities</th>
<th>Activity No</th>
<th>Type of activity</th>
<th>Direct Recipients</th>
<th>Potential implementing partners</th>
<th>Progress measures (indicators)</th>
<th>External support required</th>
<th>Priority</th>
<th>Proposed activities to be carried out by the sector &amp; current status</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Export procedures</td>
<td>1.04</td>
<td>Export procedures and policies</td>
<td>Producers, processors and Exporters</td>
<td>Forestry Dept, Honey Council, EPIC, ITC</td>
<td>New simplified procedures, decrease average delay in getting export documentation (SPS)</td>
<td></td>
<td>Low</td>
<td>The process is easy and does not need to be addressed.</td>
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<tr>
<td>5. Locally available inputs</td>
<td>1.05</td>
<td>Procurement</td>
<td>Producers, craftsmen and exporters</td>
<td>Technical colleges, Forestry Department, NGOs (e.g. SNV) ITC and World Bank</td>
<td>Prices and local availability of modern hives, protective clothing, centrifuges, number of craftsmen supplying the honey sector, domestic sales/import ratios in procurement</td>
<td></td>
<td>Very high</td>
<td>Companies and individuals are already manufacturing and milling the hives, protective clothing etc. Supplies still expensive and not embraced by companies 1. Train locals to improve capacity to make the necessary beekeeping equipment at cheaper prices than imported goods</td>
</tr>
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<tr>
<td>6. Packaging:</td>
<td>1.06</td>
<td>Packaging</td>
<td>Producers, Processors, Exporters/processors</td>
<td>MCTI, ITC, national packaging industry, National Agriculture Information Services at MACO</td>
<td>Plastic or glass jars of retail size available, attractive retail package design, number of retail sales overseas</td>
<td></td>
<td>High</td>
<td>Some companies are currently doing it with plastic mouldings and bottles 1. Identify packaging requirements of final customers in target export markets 2. Improve quality of plastic bottles &amp; adapt the packaging and labelling to target market requirements 3. Find new/additional sources of packaging nationally and regionally</td>
</tr>
</tbody>
</table>
### Strategic objective number 2: Create access to relevant markets, disseminate market information and make the Zambia honey visible at international markets

<table>
<thead>
<tr>
<th>Activities</th>
<th>Activity No</th>
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<th>Direct Recipients</th>
<th>Potential implementing partners</th>
<th>Progress measures (indicators)</th>
<th>External support required</th>
<th>Priority</th>
<th>Proposed activities to be carried out by the sector &amp; current status</th>
</tr>
</thead>
</table>
| 1. Market and Product diversification:  
a. Determine target markets and tailor production and marketing behaviour to the particular needs (labelling, packaging, taste, safety)  
b. Ensure compliance to international quality standards, especially organic food standards  
c. Introduce new products, e.g. bees wax  | 2.01 | Market and product diversification | Exporters, Traders, Processors | ZDA, EPIC, MCTI, MACO, ITC, Embassies, EU Commis, MTENR, Individual companies |Exports to new markets, bee products' portfolio development, share of organic exports | ITC expertise, Bi-national trade promotion institutions, financing of international donors | Very high | Target markets have been identified  
Growing capacity of processors to meet targeted markets still needs assistance  
International quality standards not achieved |
| | | | | | | | | No value addition commercially capacities  
| | | | | | | Very high | a. Conduct market research on target market for Zambian honey and honey by-products (including wax)  
b. Identify buyers and buyer’s requirements of the identified target market for honey and honey by-products (quality, labelling, certification, packaging etc.)  
c. Organise technical tour/business generation tour to target markets |
| Market information:  
a. Create a unified system for collection and dissemination of market information based at EPIC and in collaboration with the Zambia Honey Council  
b. Develop suitable ways to spread the market, prices and availability information to the provinces, e.g. through provincial information centres, mobile information services  
c. Create a database of producers and buyers within the Zambian honey sector  | 2.02 | Market information | Exporters, Processors, Traders, Producers, Trade and Promotion Agencies in Lusaka and other provinces | MCTI, MACO, Shemp Agro Business Component, IT companies, ZNFU, Zambia Honey Council, EPIC, Zambia Honey Partnership SNV | Numbers of information centres, numbers of information requests/subscribers to services, coverage of information system, share of registered producers and buyers | IT expertise/specialists, funding for infrastructure | Very high | Not achieved  
Zambia Honey Partnership should be heading honey sector  
Database required in areas where processors are located  
Create unified system of collection and dissemination of market information through  
a. Organise geomapping activities to identify and locate Zambian beekeepers by sector  
b. Train and assist ZHC to run and update the database of members  
c. Train & assist ZHC to offer additional services to its members once fully identified and registered  
Use ICT technology (mobile applications) to disseminate technical and market information to ZHC members and other beekeepers |
| 3. Trade promotion:  
a. Promote Zambia products in target markets by active participation of Zambian exporters in trade fairs (BioFach, Anuga, Birmingham), study tours, regional shows, etc.  
b. Strengthen the Honey Council to become the leading representative of Zambian bee products.  | 2.03 | Promotion | Exporters, Processors, Traders, Zambia Honey Council | ZDA, SNV, EPIC, MCTI, MACO, ITC, Zambia Honey Council | Number of participants in fair and exchange visits; new orders generated, sales volume to new markets, recognition of Zambia Honey Council | ITC, Chambers of Commerce, Shemp Agro Business Component | High | Not achieved, still an ongoing process  
Train and support Zambian honey stakeholders to international trade fairs  
Processors are not members of Zambia Honey Council  
Assist and train the ZHC to include processors  
Assist and train ZHC to develop its service portfolio to suit needs of new/additional members (processors, etc.). |
<table>
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<tr>
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<th>Proposed activities to be carried out by the sector &amp; current status</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Marketing:</td>
<td>2.04</td>
<td>Communication and promotion</td>
<td>Exporters, Processors, Producers, International consumers, Supermarkets</td>
<td>EPIC, MCTI, Zambia Honey Council, SHEMP, ITC, MACO, leading honey importers, Zambia Honey Partnership</td>
<td>Logo established, registered users of logo, communication road map ready, higher international awareness of Zambian bee products.</td>
<td>Expert to create communication road map and logo design, quality requirements of leading importers, World Bank, European Commission</td>
<td>High</td>
<td>Not achieved: Logo made available but not effectively utilized. Companies need assistance in getting proper certifications. Independent companies are capable to build brands to market demand. a. Create communication road map for Zambian honey sector (differentiation, new target niche). b. Identify/review possibility of developing new brand/logo or use existing ZHC logo and strengthen it. c. Support sector’s actors (processors, exporters) in their branding and positioning efforts.</td>
</tr>
<tr>
<td>5. New distribution channels:</td>
<td>2.06</td>
<td>Distribution</td>
<td>Exporters, Processors, Traders, Producers, Importers</td>
<td>EPIC, Chambers of Commerce and Industry, ITC, MACO, MCTI, Training Centres SNV</td>
<td>Numbers of new partnerships or alliances, number of matchmaking events organized, new business generated, number of rural commodity exchanges.</td>
<td>Market analysis services, financing for networking events, commodity exchanges</td>
<td>High</td>
<td>Achieved – information is available. Facilitation of information on targeted markets to be addressed with different trade entry barriers. Need to access and develop new supply markets. a. Identify potential new supply source, matching the needs of the Zambian honey actors’ customers (i.e. in terms of quantity, quality, and certification required...) b. Identify feasibility of establishing a special commodity exchanges for honey at rural markets in Zambia.</td>
</tr>
<tr>
<td>6. Export procedures:</td>
<td>2.05</td>
<td>Procedures and policies</td>
<td>Exporters/producers, Traders</td>
<td>EPIC, MCTI, Training organizations, MACO, National Laboratories, SNV</td>
<td>Average delay of obtaining export licenses, number of licenses issued, training on export legislation, number of steps in obtaining licenses reduced</td>
<td>Capacity building</td>
<td>Medium</td>
<td>Not achieved: a. Organise training for export/customs officers related to export licenses issuance. Achieved information is available.</td>
</tr>
</tbody>
</table>
### Strategic objective number 3: Improve and strengthen honey sector organization and inter-professional communication

<table>
<thead>
<tr>
<th>Activities</th>
<th>Activity No.</th>
<th>Type of activity</th>
<th>Direct Recipients</th>
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<th>Progress measures (indicators)</th>
<th>External support required</th>
<th>Priority</th>
<th>Proposed activities to be carried out by the sector &amp; current status</th>
</tr>
</thead>
</table>
| 1. Make the Zambian Honey Council an effective apex body: Organize a unifying meeting of the ZHC with all stakeholders of the sector to discuss the future organization of the sector; • strengthen the organization; • have a regular newsletter on sectorial issues; • translate information in local languages | 3.01 | Sector Organization | All stakeholders of the honey sector | Zambia Honey Council, Beekeepers Associations, EPIC, Shemp Agro Business Component, Zambia National Farmers Union, NGOs, ZDA | Establishment of an appropriate apex body covering the majority (75%) of Zambia’s honey sector, newsletter published regularly | Advise on possible organizational and administrative structures needed, financing newsletter and translation | Very High | a. Establish Zambia Honey website  
b. Conduct organization assessment  
c. Establish ZHC presence in honey production districts  
d. Develop production and marketing manuals in local languages |
| 2. Strengthening the local beekeepers associations • through capacity building on delivering key services, • resource inputs, • organizing regional meetings | 3.02 | Sector Organization | Producers, Processors, Exporters, Support service providers | MCTI, EPIC, ITC, Trade support service providers, SNV, ZDA | Increasing outreach of local beekeeping associations, more services delivered to beekeepers, regional meetings organized regularly | Expertise on meso-level organizational strengthening; financial resources to support beekeepers associations | Very High | a. Conduct organization assessment  
b. Establish buyers linkage  
c. Establish flexible membership recruitment and development  
d. Establish storage building centres |
| 3. Improve communication and coordination for beekeeping issues between ministries • through Zambia Honey Council with support from the ZDA • Improve information flow from Lusaka to other provinces through Information Centres | 3.03 | Coordination | Ministries, Honey Council and producers | All ministries dealing with beekeeping; EPIC, Zambia Honey Council, Provincial Centres | Regular meetings organized with representatives of different ministries to exchange information on honey sector; Provincial Information Centres ready to disseminate information | None (?) | Very High | a. Finalize honey policy  
b. Expand SME policy include Zamtel and MFPR  
c. Strengthen IC at batching centres |
| 4. Further develop Public and Private Partnership for the honey sector in Zambia | 3.04 | Coordination | Exporters, Processors, Traders, Producers, ZDA | ZDA, MCTI, MACO, ITC, MTENR, ZDA | PPP body established, regular meetings are planned and held involving all the value chain stakeholders | None (?) | Very High | Demand driven private sector involvement is critical |
| 5. Develop an regional and international network and partnerships • with established honey sector associations in main target markets; • to promote information on changes in market preferences | 3.05 | Inter-professional Coordination and Communication | Zambia Honey Council; Traders, Exporters | ZDA, ITC, Zambia Honey Council, Chambers of Commerce, TPOs | Membership agreement; exchange visits organized; new contacts established | Membership fees, cost of travel and exchange visits | Medium | a. Facilitate the establishment of regional honey body  
b. Facilitate international exhibits and expos attending for trade access |
<table>
<thead>
<tr>
<th>Activities</th>
<th>Activity No.</th>
<th>Type of activity</th>
<th>Direct Recipients</th>
<th>Potential Implementing Partners</th>
<th>Progress Measures (indicators)</th>
<th>External Support Required</th>
<th>Priority</th>
<th>Proposed activities to be carried out by the sector &amp; current status</th>
</tr>
</thead>
</table>
| 1. Micro-credit and savings schemes:                                     | 4.01         | Microfinance     | Producers         | Beekeepers’ Associations, Banks, MTENR, ML-NAEP MACO, MCTI | Savings and credit schemes created; number of beekeepers having access to microcredit schemes, Amount of loans given, Amount of money saved | ADB, World Bank, ITC consultancy | Very High| FDCFF – some companies benefited from this, now it has been moved to the CEEC.  
1. Action – need to update the 2007 sector road map  
2. Action – strengthen Association, improve capacity of the group  
3. Action – improve capacity to supply. |
| • Back up Forest Credit Facility Fund to offer microcredit to beekeepers |              |                  |                   |                                 |                                |                          |          |                                                               |
| • Simultaneously develop group lending and saving schemes based with beekeepers associations |              |                  |                   |                                 |                                |                          |          |                                                               |
| • Develop innovative small loan schemes for beekeepers in rural areas in order to purchase drums, bicycles and cropping equipment |              |                  |                   |                                 |                                |                          |          |                                                               |
| 2. Improved access to formal credit:                                      | 4.02         | Banking and credit | Exporters/processors, local craftsmen | Zambia Honey Council, Banks, ZNFU, ITC | Number of beneficiaries approaching banks successfully, amount of formal credit given | ITC consultancy | Medium | ZHC has MOU with Getzam to finalize with ministry of finance to help traders access credit – ongoing |
| • Zambia Honey Council to help beekeepers/processors/exporters on how to approach banks for formal credits |              |                  |                   |                                 |                                |                          |          |                                                               |
78. ANTICIPATED OUTPUTS OF IMPLEMENTING THE ROAD MAP FOR THE ZAMBIA HONEY SECTOR

It is anticipated that the implementation of the honey sector road map would result in:

- Increase incomes to the Zambia apiculture sector across the value chain.
- Increase the skills of all actors in the Zambia apiculture sector
- Increase the number of modern hives in the sector
- Increase the number of regional extraction and processing centres
- Increase the involvement of women in the Zambian apiculture industry through the use of modern hives and processing jobs.
- Improve the safety of the apiculture sector for the works through the use of modern hives, and protective clothing
- Increased overall employment opportunities in the honey sector;
- Increased efforts in training and education for beekeepers countrywide;
- Certification of more organic and Fairtrade
- Production of the forests for natural forage through creating value in the forests and minimizing harm caused by traditional hives.

79. ANALYSIS OF BENEFICIARIES AND STAKEHOLDERS

The implementation of the road map would benefit all the sector stakeholders. However, the primary beneficiaries of the road map will be:

- Beekeepers in Zambia
- Industry support services including logistic companies, finance companies, and other service providers.
- Skilled workers who will be the leaders of the training, businesses and industry.
- Local craftsmen and providers of inputs for the honey sector
- Traders, processors and exporting companies
- Certification and auditing companies

Implementation of this road map would contribute to sustainable growth in the country, increased incomes at the bottom of the pyramid, a professional apiculture, increased exports and diversification of export revenue and a positively influence environmentally friendly forest management.
80. KEY SECTOR PROGRESS INDICATORS

The effective monitoring of the road map requires the use of a set of progress indicators to trace the most important developments in the sector and its environment. Indicators should include:

- Volume and market value of honey and bee product exports and domestic sales
- Volume of exports to new markets and/or of new bee products (bees wax, propolis)
- Number of certified producer groups and accredited auditors (for organic, fair trade or quality standards)
- Number of beekeepers trained in modern beekeeping techniques
- Number of new hives established
- Number of primary extraction facilities
- Completion of secondary processing facilities
- Production capacity and actual employment figures related to the honey sector
- Production share of quality honey bee products in compliance with HACCP/ISO 22000 standards
- Number of formal distribution partnerships to established markets (with experienced importers)
- Availability of essential inputs such as drums, bee hives, protective clothing and glass/plastic jars at reasonable prices and quality
- Number of functional storage and market information centres in provinces
- Zambia Honey Council and provincial beekeepers’ associations are well established and delivering useful services to the honey sector
CONCLUSION

81. OVERVIEW

A complete overview of the Zambian supply potential is difficult to obtain. There are still many forested areas in Zambia, despite the incessant encroachment of charcoal, logging and crop production. New mines are impacting the most productive beekeeping area - North Western Province. Not only potential chemical contamination of water sources which bees may use but also increased charcoal burning to service the new or expanded mining towns. The honey sector in this major honey producing province has been the target of much grant intervention in the past and much of this has not left sustainable improvement. Only Zambezi district appears to need more attention to link producers to market. Logistics of distance and poor roads may be the major hindrance.

There is no doubt that much potential for expansion of honey production exists in Zambia, but as the bigger buyer/processors have found, if the buyer builds up a relationship of trust and reliability with the producer, more is produced and more producers get involved. This is not an overnight process. Trade finance is required as beekeepers cannot wait for payment. Cell phone payment is a useful innovation to avoid carrying large sums of money in remote areas.

By all accounts the market for Zambian quality honey is unlimited but this is built on a reputation of it being good quality pure forest honey. Forests need to be protected. Charcoal burning is currently uncontrolled. Current agriculture could potentially bring chemical contamination to honey and death to bees unless ecologically sound production methods can be promoted.

The Government Forestry department has provincial and district offices all over Zambia and needs to play an enabling role. Solving of bottlenecks. Helping to conserve forested areas. The private sector is wary of Forestry involvement in buying, processing and selling honey as it may contribute to skewing the market as they feel the donor funded SME’s and STI’s do. However, this concern of the private sector needs to be countered with means to ensure that beekeepers get a fair price and the opportunity to develop their enterprise. It is possible that more successful SME’s in the sector will keep prices competitive and fair.

82. FUTURE OUTLOOK

The Zambian government vision for the honey industry is:

“A vibrant and well-coordinated bee keeping sector significantly and sustainably contributing to the socio-economic development of Zambia”

Sales of honey from Zambia are limited only by factors primarily within the control of the Zambian industry. With an increase in production capacity and efficiency stimulated by modern hives and improved production and processing techniques, Zambian honey should be able to fall within the global market acceptable price and producers should be able to profit – current globally acceptable price is $3.50 USD per kg ex-works for certified organic and Fairtrade. This is a premium versus the numbers documented in statistics of sales in 2012 which was just under $3.00 USD per kg.
The fact is that getting Zambian honey certified organic and Fairtrade (OFT) is going to be comparatively easier than several competing origins due to the fact that most of the land where the bees would forage has not been extensively farmed, and if farmed in most cases has not been farmed utilizing fertilizers, herbicides or pesticides. It is evident that global demand for honey that is certified OFT continues to grow and Zambia is in a good position to profit from this effort. Zambia has a good presence in the UK which is the #2 organic markets while it has no statistically documented direct business into the #1 organic market of Germany. It is also interesting to note that Germany has a market for the darker forest honey which is predominantly produced in Zambia, while the UK and Belgium prefer lighter coloured honey produced in less volume in Zambia during the cold season when the Julbernardia trees flower. This means there is an untapped opportunity with Germany.

Furthermore, global production of honey is at risk due to Colony Collapse Disorder CCD and Zambia does not suffer from this phenomena. CCD has affected large commercial beekeepers with hundreds and thousands of hives. It is not documented to impact the small producer and therefore most Zambian beekeepers should not experience this issue.

The natural elements of Zambian honey once documented and accepted by the global community, will provide for some significant opportunities in the pharmaceutical and cosmetic industry as well as the food industry. These non-food markets provide yet another niche for Zambian honey to achieve significant demand and returns and if properly positioned in the market will allow for higher per kg returns than honey sold in other markets and for internal Zambian consumption.
ANNEX DOCUMENT OF THE ZAMBIAN HONEY ROADMAP
**COMMON BEE TREES OF THE ZAMBIA MIOMBO WOODLANDS**

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**Table 2. Common bee trees of the Zambian miombo woodland**

<table>
<thead>
<tr>
<th>Common miombo species</th>
<th>Local name</th>
<th>English name</th>
<th>Competing uses</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Brachystegia</em> spp. (16), e.g. <em>B. longifolia</em>, <em>B. spiciformis</em>, <em>B. boehmii</em>, <em>B. floribunda</em></td>
<td>Muombo (B), Musamba (Luv, Lun)</td>
<td>n.a.</td>
<td>Fibre, construction timber, charcoal, bark hives, dye</td>
</tr>
<tr>
<td><em>Combretum</em> spp. (&gt;24), e.g. <em>C. zeyheri</em></td>
<td>Mukenge (Lo, Luv)</td>
<td>n.a.</td>
<td>Roots for basketry, dye</td>
</tr>
<tr>
<td><em>Cryptosepalum</em> spp. (2), e.g. <em>C. exfoliatum</em> ssp. <em>pseudotaxus</em></td>
<td>Mukuve (Luv), Mukungu (Luv, Lunda), Musambangalati (B)</td>
<td>n.a.</td>
<td>Medicine, bark hive construction</td>
</tr>
<tr>
<td><em>Isoberlinia</em> spp. (2), e.g. <em>I. angolensis</em></td>
<td>Mutobo (B, K, Lun, Luv)</td>
<td>n.a.</td>
<td>Caterpillars, mining timber, firewood, carpentry, fibre, medicine</td>
</tr>
<tr>
<td><em>Julbernardia</em> spp. (2), i.e. <em>J. paniculata</em>, <em>J. globiflora</em></td>
<td>Mutondo (B), Lunyumbe (Luv), Mwanda (Lun)</td>
<td>n.a.</td>
<td>Caterpillars, mining timber, dye, bark hives, rope, dye, c/coal</td>
</tr>
<tr>
<td><em>Marquesia</em> spp. (2), i.e. <em>M. macroura</em>, <em>M. acuminata</em></td>
<td>Museshi (B), Muvuka (Luv), Mulunga (Lun)</td>
<td>n.a.</td>
<td>Construction timber, charcoal, end plate in hive construction</td>
</tr>
<tr>
<td><em>Parinari</em> spp. (&gt;3), e.g. <em>P. curatellifolia</em></td>
<td>Mpundu (B), Mubula (Lo), Mucha (Luv, Lun)</td>
<td>Mobola plum</td>
<td>Poles for construction; charcoal, fruits</td>
</tr>
<tr>
<td><em>Syzygium</em> spp. (&gt;3), e.g. <em>S. cordatum</em>, <em>S. guineense</em></td>
<td>Mufinsa (B), Musombo (Luv, Lun)</td>
<td>Water berry</td>
<td>Carpentry, dye, medicinal use, fruits, canoes, poles</td>
</tr>
<tr>
<td><em>Uapaca</em> spp. (7), e.g. <em>U. kirkiana</em>, <em>U. nitida</em></td>
<td>Masuku (B), Mupopolo (Luv)</td>
<td>Wild loquat</td>
<td>Termite resistant wood, fruit, construction timber, medicine</td>
</tr>
</tbody>
</table>

B = Bemba, Luv = Luvalé, Lun = Lunda, K = Kaonde, Lo = Lozi

---

**1. Small-scale woodland-based enterprises with outstanding economic potential**
Table 3. Common tree species used for bark hives in North-Western Province in 1987 (Source: Clauss 1992)

<table>
<thead>
<tr>
<th>Tree species</th>
<th>Source of nectar</th>
<th>Durability of hive</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Burkea africana</em></td>
<td>No</td>
<td>2-5 years, av. 2.5 years</td>
</tr>
<tr>
<td><em>Brachystegia boehmii</em></td>
<td>Yes</td>
<td>4-9 years, av. 4.3 years</td>
</tr>
<tr>
<td><em>B. longifolia</em></td>
<td>Yes</td>
<td>2-10 years, av. 4.4 years</td>
</tr>
<tr>
<td><em>B. spiciformis</em></td>
<td>Yes</td>
<td>2-10 years, av. 4.5 years</td>
</tr>
<tr>
<td><em>Cryptosepalum exfoliatum ssp pseudotaxus</em></td>
<td>Yes</td>
<td>2-30 years, av. 9.1 years</td>
</tr>
<tr>
<td><em>Julbernardia paniculata</em></td>
<td>Yes</td>
<td>2-20 years, av. 5.5 years</td>
</tr>
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</table>

Comparison between modern and traditional hives

<table>
<thead>
<tr>
<th>Description</th>
<th>Frame [modern] hive</th>
<th>Bark [traditional] hive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origin</td>
<td>Kenyan top bar hive</td>
<td>Traditional in Zambia [bark of tree]</td>
</tr>
<tr>
<td>Capacity</td>
<td>25kg liquid honey per hive per season</td>
<td>10kg liquid honey per hive per season</td>
</tr>
<tr>
<td>Cost [ZK]</td>
<td>120,000.00</td>
<td>10,000.00</td>
</tr>
<tr>
<td>Advantages</td>
<td>Yield more honey</td>
<td>Easy and very cheap to make, i.e. readily available materials</td>
</tr>
<tr>
<td></td>
<td>Each comb is movable and can be shifted or taken out for inspection</td>
<td>No need for high capital</td>
</tr>
<tr>
<td></td>
<td>Beekeeper crop ripe honey comb only without breaking the unripe combs</td>
<td>Limited skill is required</td>
</tr>
<tr>
<td></td>
<td>When moving combs bees are gently handled and less alarmed</td>
<td>Not expensive to manage and maintain</td>
</tr>
<tr>
<td></td>
<td>Only few guard bees are required at the entrance holes; therefore colony feel safe even passing at a close distance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No need of tall trees, i.e. even women can be beekeepers</td>
<td></td>
</tr>
<tr>
<td>Disadvantages</td>
<td>Expensive when made of wood</td>
<td>Quality of honey is degraded by bark debris and other foreign particles, e.g. grass</td>
</tr>
<tr>
<td></td>
<td>Beekeepers need modern skills and spend more time</td>
<td>Yield per annum is lower than in frame hives</td>
</tr>
<tr>
<td></td>
<td>Close management of colonies for profitability</td>
<td>It is very difficult to inspect the colonies inside the hive</td>
</tr>
<tr>
<td></td>
<td>Control is difficult if not suspended in wires</td>
<td>It is not easy to detect bee diseases or pests in the colonies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>It is cumbersome and dangerous to climb trees during hanging and cropping, and especially difficult for women</td>
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### Table 4. Impact of bark hive making on forest resource in North-Western Province (Source: Clauss 1992, IFAD 1999 and the author)

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<tr>
<td>Accessible woodland and forest containing trees suitable for debarking (70% of total area)</td>
<td>88,800 km²</td>
<td>Accessible woodland and forest containing trees suitable for debarking – 1996 data (ZFAP 1998, p. 30)</td>
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<tr>
<td>Total population</td>
<td>408,025</td>
<td>Total population 2000 census 583,350 + annual growth of 2.9 per cent</td>
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<tr>
<td>Estimated total number of beekeepers (3.7% of population)</td>
<td>15,000</td>
<td>Estimated total number at 2.9% growth from 1997 provincial figure of 14,400 beekeepers</td>
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<tr>
<td>No. of bark hives per beekeeper</td>
<td>73</td>
<td>Number of bark hives per beekeeper</td>
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<tr>
<td>Average number of new hives per beekeeper/year</td>
<td>29</td>
<td>Conservative increase by 15% (see text)</td>
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<td>Average number of bark hives from a tree</td>
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<td>As in Clauss’ report</td>
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<td>Estimated total number of new hives prepared per year</td>
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<td>Estimated total number of new hives prepared per year</td>
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<tr>
<td>Total number of trees destroyed by bark hive making each year</td>
<td>272,900</td>
<td>Total number of trees destroyed by bark hive making each year</td>
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<td>Average number of trees destroyed per square km</td>
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<tr>
<td>Number of tree specimens normally used for hive making and with bark structure suitable for debarking</td>
<td>224 /km²</td>
<td>Number of tree specimens normally used for hive making and with bark structure suitable for debarking</td>
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<tr>
<td>Turnover rate (as calculated by IFAD 1999)</td>
<td>72 years</td>
<td>Turnover rate (calculated using same formula as IFAD 1999)</td>
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### INTERNATIONAL BULK HONEY PRICES

*Table 26: International Bulk Prices*

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http://www.honey.com/honey-industry/honey-industry-statistics/international-bulk-prices/
### Table 27: US Average Retail Prices

Unit Honey Prices by Month - Retail | National Honey Board

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http://www.honey.com/honey-industry/honey-industry-statistics/unit-honey-prices-by-month-retail

### Table 28: US Average Wholesale prices

Unit Honey Prices by Month - Wholesale | National Honey Board

<table>
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LIST OF DOCUMENTS AND REPORTS CONSIDERED RELEVANT TO THE INTERNATIONAL HONEY MARKET

- Kommerskollegium – National Board of Trade - A Case Study of Zambian Honey Exports – 2008
- Joint UNIDO/WTO Trade Capacity Building Program Framework for Zambia – notes on Chiawa Field Trip
- Enhanced Integrated Framework – Zambia
- NORAD – Zambia gears up for Trade – driven by a new national quality policy
- Fairtrade Standards for Honey for Small Producers 2011
- COMESA Harmonized Standard – Standard for Honey
- “Enhancing the Competitiveness of the Zambia Apiculture Industry; honey value chain – January 2010 – SNV
- SNV – Sweet Treasures from the forest: The Case of Lua Lua beekeeping cooperative and Mungwi Beekeepers
- CBI Product Factsheet – Honey in France 2011
- The African Honey Magazine Dec 2013 and March 2014
- National Honey Board (USA) Foodservice Operators Honey IQ 2010
- CBI Product Factsheet – Honey in Germany 2011
- CBI Product Factsheet – Honey in the EU 2011
- CBI Product Factsheet – Honey in the United Kingdom 2011
- CBI EU General System of Preferences
- CBI EU Legislation Honey intended for Human Use
- Honey and Beeswax Value Chain, SNV Zambia, North Western Portfolio, January 2006
- The European Development Fund Private Sector Capacity Building Project Document, 2003
- Diagnostic Trade Integration Study, World Bank, 2005
- Forestry Policy, Ministry of Tourism, Environment and Natural Resources
The relative importance of each factor is expressed numerically on the scale of 100. The maximum number of points that may be given each factor is:

Factors .................................. Points

Flavor and aroma ...................... 50
Absence of defects .................... 40
Clarity ................................. 10
Total Score ............................ 100

http://www.cbi.eu/marketintel_platform/honey-and-sugars/195547
CHAPTER 6. ANNEX DOCUMENT OF THE ZAMBIAN HONEY ROADMAP

HONEY CERTIFICATION

Producer Purity Certification

Under the proposal accepted by the European Union, handlers must obtain a certification of honey purity from each producer whose honey will be shipped to the European Union. Certification may be accomplished on a per-crop year or per-contract basis. Samples of an acceptable form for each of these types of certifications appear on the following two pages:

RECORDKEEPING REQUIREMENTS ON CERTIFIED PRODUCERS

A file for each Certified Producer will be maintained and made available for review and must include the following documents:

- Completed Producer Certification (updated at minimum each crop year or for each contract). Download these forms below or obtain hard copies from the National Honey Board.
- Dated weigh ticket for each lot/load delivered
- Crop year and floral variety description for each lot/drum/pail noted on each weigh ticket
- Test results as required by the specified sampling protocol under this program

CONTAINER MARKING REQUIREMENTS

Each drum/pail of raw honey from a Certified Producer will be clearly marked with the following as received:

- Producer Name
- Crop Year
- Floral Variety/Receipt Date

Producer files are to be retained for 3 years beyond the crop year or contract year to which they apply.

With the exception of container labels, records may be stored electronically provided that they duplicate, in all material respects, the information required above.

PRODUCER PURITY CERTIFICATION FORM – PER CONTRACT

Producer Purity Certification Form for certification per contract.

Handlers must obtain a certification of honey purity from each producer whose honey will be shipped to the European Union.

Organic Labeling Requirements

A growing number of consumers look for the word “organic” on a label. “Organic” is not just an adjective, nor is it synonymous with “natural.” The USDA has implemented a set of national standards that foods labeled “organic” must meet, whether produced in the United States or imported from other countries. Before a product can be labeled “organic,” a USDA-approved certifier inspects the farm where the food is grown to make sure the farmer is following all the rules necessary to meet USDA organic standards. The USDA accredits state, private, and foreign organizations or persons to become these “certifying agents.” If you wish to produce or handle agricultural products that can be sold, labeled, or represented as “100 percent organic,” “organic” or “made with organic ingredients,” you must be certified by an accredited certifying agent. More information on how to become certified can be found on the National Organic Program Web site at www.ams.usda.gov/AMSv1.0/nop.

Organic food is produced by farmers who emphasize the use of renewable resources and the conservation of soil and water to enhance environmental quality for future generations. Organic food is produced without using most conventional pesticides, fertilizers made with synthetic ingredients or sewage sludge; bioengineering; or ionizing radiation. The USDA Organic seal on a product (shown below) indicates that a product is at least 95 percent organic. Organic labeling standards can be found at http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=StELDeV3004446&acc=nogenerfo.
# INTERNATIONAL HONEY BUYERS

<table>
<thead>
<tr>
<th>HONEY BUYERS</th>
<th>Contact</th>
<th>Origin</th>
<th>Markets served</th>
<th>Product type requested</th>
<th>Other specs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRIORITIZED CONTACTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Confectionary and Tahina Factory Co. Ltd. (Tema)</td>
<td>Ahmed Ossama Zaiz</td>
<td>Saudi Arabia</td>
<td>Middle East</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>4 Corners Trading</td>
<td>Mike Walden, Com</td>
<td>Dubai</td>
<td>UAE and across</td>
<td>Retail, niche preferred</td>
<td>Work with suppliers to develop specifications such as packaging, delivery options, etc. Mostly small bottles/little packages.</td>
</tr>
<tr>
<td>Aramtec Consumer Products - Importers and Distributors</td>
<td>Abdu Ahraf, Sales &amp; Dubai</td>
<td>Dubai</td>
<td>UAE and Oman</td>
<td>Bulk / yellow/clearer processed honey demanded</td>
<td>Pricing important</td>
</tr>
<tr>
<td>Agro Jerneh Sdn Bhd</td>
<td>Muhammad Yahaya</td>
<td>Malaysia</td>
<td>na</td>
<td>Bulk raw honey as an ingredient for the energy bars they produce - purchase 1000 Kilos per month from China and Taiwan.</td>
<td>Price utmost</td>
</tr>
<tr>
<td>Breitsamer und Ulrich</td>
<td>David Körner, Assi</td>
<td>Germany</td>
<td>na</td>
<td>Retail, pack: local organic, specialty</td>
<td></td>
</tr>
<tr>
<td>Reina Apicola Levantina S.I.</td>
<td>Carmen Solivaures Corts, Director of Sales, Pol. Industri</td>
<td>Alzira, Espana</td>
<td>na</td>
<td>Bulk processed and semi processed honey of specific floral varieties such as Eucalyptus, Acacia, and Polyflora variety honey</td>
<td></td>
</tr>
<tr>
<td><strong>SECONDARY CONTACTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Altiparmak</td>
<td>Mehmet Bese, Foreign Trade Manager</td>
<td>Istanbul</td>
<td>Europe, US</td>
<td>NA</td>
<td><a href="http://www.chefmiddleeast.com">www.chefmiddleeast.com</a></td>
</tr>
<tr>
<td>Chef Middle East LLC</td>
<td>Bruce Woolner, Operations Manager</td>
<td>Dubai</td>
<td>Gulf, Europe</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Fursten-Reform Div. Langnese H</td>
<td>Contact name? ph: 49 (0)4332/40901</td>
<td>na</td>
<td>na</td>
<td>Niche market opportunities</td>
<td>Currently importing honey from Austria and Australia</td>
</tr>
<tr>
<td>Nizwa Food Industries, LLC</td>
<td>Ibrahim Salim Al H</td>
<td>Oman</td>
<td>na</td>
<td>na</td>
<td></td>
</tr>
<tr>
<td>Trofina Food (ME) FZC.LLC</td>
<td>Saurabh Rustagi, Purchasing Manager, PO Box 42239,</td>
<td>na</td>
<td>na</td>
<td>Bulk processed and semi processed honey for repacking</td>
<td></td>
</tr>
</tbody>
</table>

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**INTERNATIONAL HONEY BUYERS**

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**INTERNATIONAL HONEY BUYERS**
188


Buyer Name
Address
City
State/Region
Country
1751 S W 8th St Pompano Beach FlPompano
33069 UsBeach
Tel 954 781 0003
Florida
Fax 954 783 4889
United States
Sol Group Marketing / Freshex Ltd.
Guangdong Province, China
Shenzhen
Guangdong
China
Shenzhen Trading Co., Kellogg honey
Pompano
Beach
Beach
Fl 33064 Florida
2220 Usa
United States
Central American Produce Inc. 2200 Park Central Blvd N Ste 600 Pompano
2801 Airport Dr Ste 101 Madera Ca 93637
Madera
8739 Usa
California
United States
Classic Fruit Co.
Bornstrasse 16 17 Bremen Hb 28195Bremen
Germany
Bremen
Germany
J.G. Schutte Honig GmbH
730 S Powerline Rd Ste G Deerfield Beach
Deerfield
Fl Beach
33442 Tel Ctc Gabriela
Florida Chacon
United States
Ayco Farms Inc.
499 Nw 70th Av Suite 107 PlantationPlantation
Fl 33317 U
House
SA
Florida
United States
Fresh Quest Inc.
6281 Regio Avenue, Buena Park, California,
Buena Park
United States, 90620
California
United States
Walong Marketing Inc.
P.O. Box 2744, Eugene, Oregon, United
Eugene
States, 97402
Oregon
United States
Glorybee Foods Inc.
10464 Bryan Hwy Onsted Michigan 49265
OnstedUs
Michigan
United States
Groeb Farms Inc.
2268 E Beachcomber Dr Gilbert Az 85234
GilbertUs
Arizona
United States
Ecotrade International
483 Grande Cote Rd Rosemere Quebec
Rosemère
J7a 1m1 Ca
Quebec
Canada
Odem International Inc.
28517 Valley Ctr Rd El Centro Ca 92244
Valley
Usa
Center
California
United States
Melons Of Central America
Helgolander Ufer 7 Berlin Be 10557 Germany
Berlin
Berlin
Germany
Apimiel GmbH
106 Allen Rd Basking Ridge Nj 07920 Usa 1 973 5647808
United States
C.M. Goettsche & Co. Inc.
1601 E Olympic Blvd Bldg 100 Los Angeles
Los Angeles
Ca 900021
California
United States
Borg Produce Sales Inc.
275 Centennial Way Suite 200 P O Box 206 Tustin Ca 92780 Us
The Imp. & Exp. Group Inc.
1300 Viele Av Bronx Ny 10474 Usa Bronx
New York
United States
Bel Canto Food Llc
200 4th St Oakland Ca 94607
Oakland
California
United States
Cost Plus Management Services Inc.
133 Nanterre St Danville Ca 94506 Us
Danville
California
United States
Ergogenic Nutrition
104 Crandon Blv 409 Key Biscayne Fl
Key
33149
Biscayne
Usa Key Biscayne
Florida
Fl 33149 Fl 33149 Us United States
Crown International Usa Llc
14358 N Frank Lloyd Wright Blvd Suite
Scottsdale
5 Scottsdale Az 85260
Arizona
480 477 6680 Phone 480 United
477 6681
States
Fax
Dollar Only Wholesale, Llc
Merced 90502 Us
California
United States
Heritage International (Usa) Inc. 20280 S Vermont Av Suite 250 To California
193 A Turcotte St Rosemere Qc J7a 3a7 Ca
Canada
Odem International Inc.
1250 Techny Road, Northbrook, IL, United
Northbrook
States, 60062
Il
United States
Euromarket Designs Inc.
969 Revere Drive Hillside Nj 07205 2947
Hillside
Usa
New Jersey
United States
Sarah Imp. & Exp. Llc
3500 E Barnard Av Cudahy Wi 53110Cudahy
Usa
Wisconsin
United States
Smithfield Global Products
9130 S Dadeland Blvd Suite 1600 MiMiami
Miami Fl 33156 United States
Florida
United States
Bees Brothers Llc
Terminal Market From Rd 153 To 157New
Bronx
York
N Y 10474 Us New York
United States
Katzman Produce
Irving
United States, 75063Texas
United States
Michaels Stores Procurement Co.8000,
Inc. Bent Branch Drive, Irving, Texas,
95 Route 17 South Paramus Nj UniteParamus
D States
New Jersey
United States
Euro American Brands Llc
325 Andrews Rd Trevosa Pa 19047 United
Feasterville
StatesTrevose
Pennsylvania
United States
Associated Production Services Inc.
1021 Echo Lake Rd Watertown Ct 06795
Watertown
Usa
Connecticut
United States
Koster Keunen Inc.
16111 Woodinville Redmond Rd Ne Woodinville
Woodinville Washington 98072
Washington
United States
United States
Winsome Trading Inc.
5750, McDermott Drive, Berkeley, Illinois,
Berkeley
United States, 60163
Illinois
United States
Honey Can Do International, L.L.C.
730 S Powerline Rd Ste G Deerfield Beach
Deerfield
Fl Beach
33442 Us
Florida
United States
Ayco Farms Inc.
9911 Inglewood Av Suite 200 Inglewood
Inglewood
Ca 903013600 Atencion
California
Raymond Keffer
United States
J&K Fresh
2818a Anthony Lane South Minneapolis
Minneapolis
Mn 55418 U S A TelMinnesota
1 612 789 3456 Ext 101 United States
Interlog Usa Inc.
1000, Air Way , Glendale, California,Glendale
United States, 91201 California
United States
Indo European Foods Inc.
K Toronto Ontario Canada
Ontario
M4p 2v8
Canada
Canadian Tire Corporation Ltd. 2180 Yonge St P O Box 770 StationToronto
21500 Gordon Way Richmond B C Canada
Richmond
V6w 1j8
British Columbia
Canada
T&T Supermarket Inc.
United States
Ritrovo Italian Regional Foods 309 S Cloverdale Suits D 11 12 Seattle Wa 98108 Wa 98108 Us
9341 Courtland Drive Ne Rockford MiRockford
49351 Contact Christy Danielson
Michigan Tel 616 866 5633 United
Fax 616
States
866 0675
Wolverine World Wide Inc.
3333, Beverly Road, Hoffman Estates,
Hoffman
Illinois,Estates
United States,Illinois
60179
United States
Kmart Corporation
4630 Olin Rd Dallas Tx 75244
Dallas
Texas
United States
Kidkraft Lp
United States
Del Monte Fresh Produce Na Inc. Dock 1 Berth 3 Port Hueneme Ca 93041 Us
18710 S Wilmington Av Suite 100 Rancho Dominguez Ca 90220 Tel 310 631 4087 Fax 310
United
631 States
4299 United States
Carotrans International Inc.
36 36 33rd St Ste 307 Long Island City
Long
NyIsland
11106City
Usa
New York
United States
Forever Cheese Inc.
301 Lewis Blvd Sioux City Ia 51101 Usa
Sioux City
Iowa
United States
Sioux Honey Association
230 Great East Neck Rd West Babylon
West
NyBabylon
11704 6315879000108
New York
Strahl & Pitsch Inc.
1300 Viele Av Maspeth New York NyBronx
10474 Us
New York
United States
Bel Canto Fancy Foods
3225 Westech Drive Norcross Ga 30344
Norcross
Us
Georgia
United States
Plaid Enterprises
70 Outwater Lane Garfield Nj 07026 Usa C O Cargo Partner Network Inc 2 48 29 Brookville
United
Blvd States
Rosedale Ny
Fast Pak Trading Inc.
195 Schelter Rd P O Box 800 Lincolnshire
Lincolnshire
Il 60069 Phone NoIllinois
847 383 2300 Fax Lincolnshire
United
Il States
Xl Screw Corp.
One
Cvs
Drive
Woonsocket
Ri
02895
U
S
A
Tel
401
770
4263
Fax
401
765
8142
Steve
Genereux
United
States
Cvs Pharmacy Inc.
500 North Third St Suite 105 FairfieldFairfield
Ia 52556 Usa
Iowa
United States
Heavenly Organics Llc
12220a Rojas Drive El Paso Tx 79936
ElUs
Paso
Texas
United States
Honeywell Security
11, Sunrise Plaza, Suite No. 305, Valley
Valley
Stream,
StreamNew York, New
United
York
States, 11580
United States
Motherlines Inc.
2230 Sw 2nd St Pompano Beach Fl Pompano
33069 3121
Beach
Usa
Florida
United States
Sun America Imp. Llc
100 Menlo Park Drive Suite 302c Ed Edison
Nj 08837 Tel 732 623 9059
New9046
Jersey
Fax 732 626 6277 1
United
7324041404
States Telex 1 7326266277
Freightcan Global Inc.
5032 W Colter St Glandale Arizona 85301
Glendale
Tel 623 298 3782 Contacto
Arizona Barry Zwillinger United States
Legend Produce
422 Detroit St Ann Arbor Mi 48104 Us
Ann Arbor
Michigan
United States
Zingerman's Delicatessen
La Ca 90045
Los Angeles
Ext 803
California
United States
Sst. International, 10415, S. La Cienaga
Bd Ctc Jeff Stewart Tel 3103427700
Portland
Usa
Oregon
United States
Provvista Speciality Foods Inc. 2389 Nw Wilson St Portland Or 97210
11 Enterprise Av North Secaucus Nj Secaucus
07094 Us
New Jersey
United States
White Toque Inc.
2040 2042 East Maple Av El Segundo
El Ca
Segundo
90245 5008 Usa Us
California
United States
Lambs&Ivy Inc.
3306 Powell St Emeryville Ca 94608 Emeryville
United States
California
United States
Royal Coffee Inc.
Lacey
Tel 360 866 0080 Fax Washington
360 252 8999 1 3608660080United
Tel ExStates
1 360252 89
Agbanga Karite SARL (Distributor)8925 Orion Dr Neste Alacey Wa98516
2700 N Military Trail Suite 410 Boca Boca
RatonRaton
Us
Florida
United States
Rosemont Farm Corporation
Bensalem
19007 United States
Pennsylvania
United States
National Honey Almond Inc. (Nha)2014 Ford Rd Unit 9 1 Bristol Pennsylvania
Division E 341 W 31st St Los Angeles Ca90007 Usa
United States
Milk & Honey Apparel Inc.
444 Castro St Suite 140 Mountain View
Mountain
Ca 94041
View
California
United States
Redoctane
4465 Corporate Ctr Drive Los Alamitos
LosCaAlamitos
90720 Us
California
United States
Frieda's Inc.
16601 Central Green Blvd Suite 200 Houston Tx 77032 Usa Tel
Texas
1 2814433001 Fax 1 281443193
United States
1 2814433001 Telex 1 2814431938
Deugro (Usa) Inc.
30068 Eigenbrodt Way Union City CaUnion
94587
City
Usa
California
United States
Khong Guan Corporation
208 Main Av Defiance Ia 51527 Usa 888
Defiance
469 4669
Iowa
United States
Smitty Bee Honey Co.
805 E Badger Rd 5 Lynden Wa98264Lynden
Us
Washington
United States
Flora Inc.
2001 Kawai Rd Lincolnton Nc 28092 Lincolnton
Us
North Carolina
United States
F M S Enterprises Usa Inc.
290 Nye Av Irvington Nj 07111 0554 Usa
Irvington
New Jersey
United States
Jagro Inc.
10 14 Hewett St London London Gtl Nw1
HeckGtl United KingdomScotland
United Kingdom
Kimpton Brothers Ltd.
United States, 55403 Mn
United States
Target Stores, Division Of Target 1
C000 Nicollet Mall, Minneapolis, MN,Minneapolis
205 Shaw Rd So San Francisco Ca 94080
South Usa
San Francisco California
United States
Italfoods Inc.
8200 Nw 33rd St Suite 105 Mia 33122 Ctc Sonia Oonnell 33122 Ctc Sonia O Fl33122 UsUnited States
Utc Overseas Inc.
7549 Graber Rd Middleton Wi 53562Middleton
United States
Wisconsin
United States
Springs Window Fashions Llc.
2611 Westgrove Suite 109 CarrolltonCarrollton
Tx 75006 United StatesTexas
United States
Base4 Group Inc.
100 South Milwaukee Av Vernon HillsVernon
Il 60061
Hills
USA
Illinois
United States
American Hotel Register Co.
7465 Candlewood Rd Suites S Y Hanover
Hannover
Md 21076 Usa Tel Maryland
001 410 536 0007 Fax 001 410
United
536States
5657
Zust Bachmeier Of Switzerland Inc.
3333 Sargent Rd Jackson Mi United Jackson,
States 7894415
Mount
Michigan
United States
Dawn Food Products Inc.
30 Vesey St 10th Floor New York Ny 10007 Phone 2123939100 Fax 2123939004 Mr Simioni
United States
Is America Llc
120 Park Lane Brisbane Ca 94005 Us
Brisbane
California
United States
Lettieri & Co., Ltd.
Illinois
United States
Berlin Global Packaging Group 525 W Monroe Chicago Il 60661 UsaChicago
39 Franklin Mckay Rd Attelboro Ma 02703
Attleboro
Us 5082260660 Massachusetts
United States
Chex Finer Foods
515 Cannon Industrial Blvd Cannon Falls
Cannon
Mn Falls
55009 Us
Minnesota
United States
Mel O Honey Inc.
Hayward, Mount
California
United States
Prince Of Peace Enterprises Inc. 3536 Arden Rd Hayward Ca 94545 Usa
United States
Chiquita Fresh North America Llc250 East Fifth St Cincinnati Oh 45202 Ph 513 784 8048 Fx 513 564 2551 Ctc Dave November
Bargteheide
Bargteheide Sh 22941
LandGermany
Schleswig-Holstein
Germany
Langnese Honig GmbH & Co. Kg Kommanditgesellschaft Hammoorer Weg
Pompano Beach Fl 33064 Nw 44st 2001
Pompano
Pompano
Beach
Beach Usa
Florida
Fl Fl 33064 Us 012017730730
United States
Antico Stone Llc
6025 Genoa Red Bluff Pasadena Tx 77507 Us
United States
Techemet Llp
1100 S Powerline Rd Ste 215 Deerfield
Deerfield
BeachBeach
Fl 33442 Usa Florida
United States
Agritrade Farms Llc
11711 Interstate 10 East Baytown Texas
Baytown
77523 Tel 281 576 1700
Texas
United States
Honey Holding I Ltd.


POTENTIAL PPP WITH PARODI FOUNDATION

82.5.1. The plan

No industry develops without demand. Companies that have the demand are in the best position to support the production of product that meets their demand. It is in the best interest of these companies to support the production of quality product to meet their needs. Therefore the first objective of this effort is to get the buyers involved in the program to support the development of the Zambian apiculture industry. This support can take many forms and levels of commitment from supply of modern hives and processing technology to training and capacity building, but all efforts should include a contract for the production at a fair market price.

82.5.2. Meet face to face with targeted partners

It is recommended to either visit the markets or better yet have the buyers visit Zambia, perhaps during the stakeholders meeting to be schedule as a result of this report. These buyers could also be encouraged to visit Zambia following events such as the 1st Apimondia Symposium on African Bees and Beekeeping 2014 – Tanzania in which many of the key honey buyers will be attending. In these meetings, provide a copy of this report and other information to support their decision making process to determine how they can best support the Zambian honey industry.

Should the opportunity to meet face to face with targeted buyers not be possible due to budget or timing efforts, contact can be done via other means including email, Skype and phone calls.

Additionally buyers can be targeted at trade events like Sial in Paris in October of 2014 or the Fancy Food show in NYC in July. Results can be achieved at a tradeshows without participation in these events with a booth, attending a show and meeting with “sellers” of retail brands and talking with them about their honey needs and how Zambian honey can help them meet their quotas.

20/20 Development Company, the author of this report, has identified a private sector partner for the development of the Zambian apiary industry.

Parodi International, operating globally as both Parodi International and Matrunita (the processing arm for Parodi Group) is a leading global trader of honey and bee products. As a private company their annual sales are confidential, however, are independently estimated to be around $50 million USD globally. They have honey processing operations in Argentina, Brazil, Chile, Ethiopia, Germany, Italy, Romania, Spain, Ukraine, Uruguay, and USA. As a processor and trader of honey it is estimated that they rank globally in the top three companies in volume and capacity.

Parodi International has established a Foundation for the support of the bee industry globally. 20/20DC has worked with them in Ethiopia to establish a similar operation to that outlined in this report and it is their objective to work with 20/20DC and the development industry to duplicate this program across Africa.
While Parodi and 20/20DC will work to secure development industry buy-in and look to capitalize upon synergies of the efforts of their foundation and the development industry, Parodi is ready to move forward with the following plan, subject to honey industry and development industry cooperation, and the formation of a Public Private Partnership.

The key elements of this program are the following:

- Training in modern apiculture practices
- Equipment necessary to produce globally accepted quality honey
- Equipment to extract, process and package (bulk) globally acceptable quality honey
- Equipment necessary to transport the honey from the producers to the primary and final processors.
- A contract for all honey produced – at the globally accepted ex-works honey price.
- Results of program:
  - 200 trained producers
  - 10 trained extension agents
  - 5 primary processing facilities
  - 1 secondary processing facilities
  - 6000 modern bee hives
  - Wax exports
  - Approximately 180 MT of honey produced and sold – nine 20’ containers
  - Approximately $600,000 USD worth of honey from these producers plus processing capacity to handle more product for export.
  - Direct employment of approximately 20 local staff and a market for 200 producing families.

82.5.3. Plan details

**Industrial packaged goods strategy**

**Step #1: obtain the balance of the funding and establish a local corporation**

Parodi Foundation will provide seed money, training and resources to support the following program. In cooperation with the ITC and other appropriate stakeholders and donors, PF will work to find other sources of funding and supplies to support the program.

PF will work with the appropriate Zambian stakeholders to establish a legal entity for the processing and export of honey. The structure of this organization will be determined through dialogue with between PF and appropriate stakeholders.

**Step #2: Hiring and Train the trainers**

Through a recruitment and interview process, the Parodi operation will hire 10 individuals to perform the role of mentor and extension agent for the bee keepers to be identified in the third step of this process. Local NGOs and the Zambian Honey Council will assist the Parodi Foundation (PF) in recruiting students.

Through a teaming agreement with the Sociedad Argentina de Apicultores (SADA) and 20/20 Institute of Entrepreneurship and Trade, Parodi will provide training to 15 potential extension agents. This training will include both technical apiculture, leadership and business training. It will cover all issues of production of bee products to ensure that global standards can be achieved with the product that these producers produce.

All 15 students will receive a certificate of completion of the course which will provide documentation of their skills. This documents will increase their appeal to the honey industry as accomplished students. From these 15 students PF will select the top 10
students, these students will be offered a job with a three year contract to provide services to the PF and their efforts in Zambia.

**Step #3: Certified Trainers train beekeepers**

The first task of the newly trained trainers will be to train a wider audience of Zambian beekeepers. The program will train 400 bee keepers in globally approved techniques of beekeeping. At the end of the course a test will be conducted to identify the “best” students with the greatest potential for success. The Parodi Foundation will select the top 200 students from the class to continue in the Parodi program.

These students will be divided into 10 groups of 20 producers. One of the trainers will be assigned as the mentor/extension agent to coordinate and facilitate this group’s honey production.

**Step #4: Supply of materials and facilities**

The Parodi Foundation, with support of the development community, will provided each of these 200 producers with the following materials:

- 30 modern hives each produced in Romania or Argentina at the discretion of PF.
- Bee colonies sufficient to populate 6000 hives
- 20 Bee suits
- Transportation vehicle – 1 per group of 20
  - Extraction facilities – 1 per group of 20
  - Processing and packing facilities – 1 per group of 40

The operation will require the following building facilities:

- 5 Extraction facilities of approximately 10 x 20 meters, new or approved existing facilities are acceptable. Appropriate technology for these facilities as determined by PF and its team of engineers and experienced honey processors.
- 1 Processing plant centrally located for final processing, export packaging and exporting. This facilities should be approximately 500 square meters, new or approved existing facilities are acceptable.

**Step #5: Certification and Production**

The Parodi Foundation and the extension agents will work with the development industry to secure organic and Fairtrade certification for the beekeepers under the program.

The producers will produce the honey, the extension agents will work with them on logistics to get the honey to one of five extraction facilities built by the company.

**Step #6: Processing and export**

Extraction will be done at one of 5 extraction facilities. Transportation of supers will be done on a project supplied truck.

Processing and packing will be done at one processing facility provided by the project and managed by the corporation established by PF or a Parodi affiliate.

**Step #7: Sustainability**

Sustainable exports, jobs and expansion of the industry.
# Zambian Honey Test Analysis Results

**Analysis Report No. 1412170822**  
**Date: 17.12.2014**  
**Page 1/2**

**Client:** Matrunita Mediterranea SRL  
Via Trenite 25  
17047 Vado Ligure  
Italy

**Our reference no.:** PI1412110064  
**Sample description / Batch:** Zambian Honey - Batch: HEALING ZAMBIA  
**Sample temp. when received / stored:** RT  
**Packing / Quantity:** Glass, twist off / ca. 150g  
**Sampling:** Client  

**Analysis Requested:** Pollen - botanical and geographical origin (110120d1)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yeast content - estimated</td>
<td>slightly increased (&lt;600,000/10g)</td>
<td>PM DE01_040(a)</td>
<td>(a)</td>
</tr>
<tr>
<td>Starch content acc. to pollen content</td>
<td>n.d. (&lt;1%)</td>
<td>PM DE01_087(a)</td>
<td>(a)</td>
</tr>
<tr>
<td>Consistency</td>
<td>light, cloudy</td>
<td>PM DE01_108(a)</td>
<td>(a)</td>
</tr>
<tr>
<td>Odour</td>
<td>typical for honey</td>
<td>PM DE01_108(a)</td>
<td>(a)</td>
</tr>
<tr>
<td>Taste</td>
<td>sweet, fruity, spicy</td>
<td>PM DE01_108(a)</td>
<td>(a)</td>
</tr>
<tr>
<td>Honeydew elements</td>
<td>crystalline matter, spores</td>
<td>PM DE01_108(a)</td>
<td>(a)</td>
</tr>
<tr>
<td>Other sediment</td>
<td>beehive, vegetable flours</td>
<td>PM DE01_108(a)</td>
<td>(a)</td>
</tr>
<tr>
<td>Pollen conductivity</td>
<td>0.34 mS/cm</td>
<td>PM DE01_042(a)</td>
<td>(a)</td>
</tr>
<tr>
<td>Main Pollen (&lt;45%)</td>
<td>Julisemaria, Caesalpiniosae</td>
<td>55%</td>
<td>DIN 10700(a)</td>
</tr>
<tr>
<td>Aecomp. Pollen (&gt;15%)</td>
<td>Compositae, Daisy Family</td>
<td>22%</td>
<td>DIN 10700(a)</td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Lamina T. Anacardiaceae</td>
<td>DIN 10700(a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Brophytis, Caesalpiniaceae</td>
<td>DIN 10700(a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Combrebia, Combrebiaceae</td>
<td>DIN 10700(a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Vernonia, Compositae, Ironwood</td>
<td>DIN 10700(a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Gramineae, Grasses</td>
<td>DIN 10700(a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Labiatae, Labiatae, Labiates</td>
<td>DIN 10700(a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Anicia, Mimosoaceae, Acacia</td>
<td>DIN 10700(a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Myrtaceae, Myrtle Family</td>
<td>DIN 10700(a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Tymphemella, Tiliaceae</td>
<td>DIN 10700(a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Pollen – unknown</td>
<td>DIN 10700(a)</td>
<td></td>
</tr>
</tbody>
</table>

### Interpretation:

According to the pollen-analysis the above mentioned sample may be called "Blossom Honey". In addition the product name may be supplemented with information concerning the regional origin "Africa (Zambia possible)."

---

(continued on the next page...)
(Council Directive 2001/110/EC dated 2012/2001 in combination with literature). The pollen content of this sample is very high. We recommend investigating the apicultural practice.

[Signature]

Unsophen Joachim
Responsibility Scientist, Biologist
ANALYSIS REPORT No. 1412120480

Client: Matrunita Mediterranea SRL
Via Trieste 25
17047 Vado Ligure
Italy

Our reference no.: FI1412110064
Product: Honey
Sample description / Batch: Zambia Honey - Batch: HEALING.ZAMBIA
Sample received on / transports by: 11.12.2014 via Orto.
Seal: none
Sample temp. when received / stored: RT
Sampling: client
Packaging / Quantity: Glass, 100 g

ANALYSIS REQUESTED: Fructose/Glucose-Ratio by HPLC-RI (11012020)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
<th>Limit</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fructose (%)</td>
<td>38.8</td>
<td>g/100 g</td>
<td>FM DET 0.20 (a)</td>
</tr>
<tr>
<td>Glucose (%)</td>
<td>21.9</td>
<td>g/100 g</td>
<td>FM DET 0.20 (a)</td>
</tr>
<tr>
<td>Fructose/Glucose Ratio</td>
<td>1.75</td>
<td></td>
<td>FM DET 0.20 (a)</td>
</tr>
</tbody>
</table>

n.c. - not detected < 0.5 g/100 g (Fru. Glu. Suc): < 1.0 g/100 g (Max. Tur).
(a): calculated according to limits of DIN EN 13116/EC (2007) (max.) and added method (1 AUSJ § 84 LI 1.410.0G)

Interpretation:
Regarding the analyzed parameters and the mentioned limits of detection the sugar content of the sample corresponds to the legal regulations (Honey directive 2001/113/EC from Dec. 20th, 2001. Article 1 in connection with Annex II.
The Fructose/Glucose-Ratio is within the naturally occurring range (according to relevant literature: Persano Odo, Apidologie 35 (2004), 36-01 and Swiss food compendium (2004)).

Dr. Martin Schubert
Responsible Scientist, Certified Food Chemist
Zambian Honey Test Analysis Results

ANALYSIS REPORT No. 1412170611
DATE: 17.12.2014
PAGE 1/2

Client:
Matrunito Mediterranea SRL
Via Trieste 25
17847 Vado Ligure
Italy

Our reference no.: P1112110686
Product: Honey
Sample description / Batch: Zambia Honey - Batch: MIOMBO/ZAMBLIA
Sample received on / transported by: 11.12.2014 via Shipment
Sample temp. when received / stored: RT
Packaging / Quantity: Glass, bottle of ca. 150g

ANALYSIS REQUESTED: Pollen - botanical and geographical origin (11012841)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test content - estimated</td>
<td>medium (1/100,000/10g)</td>
<td>PM D201_045 (a)</td>
<td></td>
</tr>
<tr>
<td>Starch content - estimated</td>
<td>n.d. (&lt;1%)</td>
<td>PM D201_057 (a)</td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>Light</td>
<td>PM D201_108 (a)</td>
<td></td>
</tr>
<tr>
<td>Consistency</td>
<td>partly crystalline</td>
<td>PM D201_109 (a)</td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>typical for honey</td>
<td>PM D201_103 (a)</td>
<td></td>
</tr>
<tr>
<td>Taste</td>
<td>sweet, fruity, spicy</td>
<td>PM D201_108 (a)</td>
<td></td>
</tr>
<tr>
<td>Honeydew elements</td>
<td>crystalline matter, spores</td>
<td>PM D201_108 (a)</td>
<td></td>
</tr>
<tr>
<td>Other sediment</td>
<td>bee hair, vegetable fibres</td>
<td>PM D201_103 (a)</td>
<td></td>
</tr>
<tr>
<td>Electric conductivity</td>
<td>0.33 mS/cm</td>
<td>PM D201_042 (a)</td>
<td></td>
</tr>
<tr>
<td>Accum. Pollen (&gt;15%)</td>
<td>Compositae, Daisy Family</td>
<td>34 %</td>
<td>DIN 10730 (a)</td>
</tr>
<tr>
<td>Significant isolated pollen (&gt;1%)</td>
<td>Jubaernia, Caesalpiniaceae</td>
<td>4 %</td>
<td>DIN 10720 (a)</td>
</tr>
<tr>
<td>Significant isolated pollen (&gt;2%)</td>
<td>Vermonia, Compositae, Ironwood</td>
<td>0 %</td>
<td>DIN 10720 (a)</td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Acanthaceae, Acanthaceae</td>
<td>DNI 10730 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Euphorbiaceae, Euphorbiaceae</td>
<td>DNI 10700 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Graminaceae, Graminaceae</td>
<td>DNI 10700 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Myrtaceae, Myrtaceae</td>
<td>DNI 10700 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Sesamum, Pedaliaceae, Sesame</td>
<td>DNI 10700 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Rhus, Rubiaceae</td>
<td>DNI 10700 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Ulmaceae, Ulmaceae</td>
<td>DNI 10700 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Polet T, unknown</td>
<td>DNI 10700 (a)</td>
<td></td>
</tr>
</tbody>
</table>

T/Type: n.d. not detected, n.s (Starch)<1%, n.a not analysed

(a): accredited under terms of DIN EN ISO 17025 (es): not accredited method (1): inhouse procedure
(2): method procedure (3): inhouse procedure
This document may only be reproduced in full. The results given herein apply to the submitted sample only.

Interpretation:
According to the pollen analysis the above-mentioned sample may be called “Blossom Honey”. In addition the product name may be supplemented with information concerning the regional origin “Africa (Zambia possibly)”

continued on the next page...
(Council Directive 2001/110/EC dated 2012/2001 in combination with literature). The pollen content of this sample is very high. We recommend investigating the apicultural practice.

Christoph Joachim
Responsible Scientist, Biologist
# Intertek

**ANALYSIS REPORT No. 1412120483**  
**DATE: 12.12.2014**  
**PAGE 1/1**

---

**Client**  
Matrunita Mediterranea SRL  
Via Trieste 25  
17647 Vado Ligure  
Italy

---

**Our reference no.:** P1412110066  
**Product:** Honey  
**Sample description / Batch:** Zambia Honey - Batch: MIOMBO/ZAMBIA  
**Sample received on / transported by:** 11.12.2014 via DHL  
**Seal:** n/a  
**Sample temp. when received / stored:** RT  
**Sampling:** Client  
**Packaging / Quantity:** Glass, twist-off / ca. 150g  
**Date / End of analysis:** 11.12.2014 / 12.12.2014

---

**ANALYSIS REQUESTED: Fructose/Glucose-Ratio by HPLC-RI (11012020)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
<th>Unit</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fructose (F)</td>
<td>39.0 g/100 g</td>
<td>PM DE01_C20 (a)</td>
<td></td>
</tr>
<tr>
<td>Glucose (G)</td>
<td>32.5 g/100 g</td>
<td>PM DE01_C20 (a)</td>
<td></td>
</tr>
<tr>
<td>F/G ratio*</td>
<td>1.20</td>
<td></td>
<td>PM DE01_C20 (a)</td>
</tr>
</tbody>
</table>

- n.d. - not detected < 0.6 g/100 g (Fru, Glu, Suc); < 1.0 g/100 g (Mai, Tur); *calculated
- (a): accredited under terms of DIN EN ISO/IEC 17025 (ie.), not accredited method.
- 1. ASU § 04 LFÖB L 40.00-7

---

**Interpretation:**  
Regarding the analyzed parameters and the mentioned limits of detection the sugar content of the sample corresponds to the legal regulations (honey directive 2001/110/EC from Dec. 30th, 2001; Article 1 in connection with Annex II).  
The F/G ratio is within the naturally occurring range (according to relevant literature: Persano Oddo, Apidologie 35 (2004), 38-81 and Swiss food compendium (2004)).

---

Dr. Martin Schubert  
*Responsible Scientist, Certified Food Chemist*
ANALYSIS REPORT No. 1412120485

DATE: 12.12.2014

Client:
Matrunita Mediterranea SRL
Via Trieste 25
17047 Vado Ligure
Italy

Our reference no.: PH1412110088
Product: honey
Sample description / Batch: Tanzania Honey - Batch: SANJARA/TANZANIA
Sample received / transported: 11.12.2014 via DHL
Sample temp. when received / stored: RT
Sampling: Client
Packaging / Quantity: Glass, sealed off / ca. 150g

ANALYSIS REQUESTED: Fructose/Glucose-Ratio by HPLC-RI (11012020)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
<th>Unit</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fructose (%)</td>
<td>30.9</td>
<td>g/100g</td>
<td>PM CEB1.020 (a)</td>
</tr>
<tr>
<td>Glucose (%)</td>
<td>27.3</td>
<td>g/100g</td>
<td>PM CEB1.020 (a)</td>
</tr>
<tr>
<td>F/G ratio*</td>
<td>1.14</td>
<td></td>
<td>PM CEB1.020 (a)</td>
</tr>
</tbody>
</table>

n.d. - not detected < 0.5 g/100 g (Fru, Glu, Suc); < 1.0 g/100 g (Mal, Tur); *calculated
(a) accredited under terms of DIN EN ISO/IEC 17025 (n.a., not accredited method, 1) ASU § 64 LPO G LR 40.00-7
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Interpretation:
Regarding the analyzed parameters and the mentioned limits of detection the sugar content of the sample corresponds to the legal regulations (Honey directive 2001/110/EC from Dec. 20th, 2001: Article 1 in connection with Annex II).
The F/G ratio is within the naturally occurring range (according to relevant literature: Persano Oddo, Apidologie 35 (2004), 36-81 and Swiss food compendium (2004)).

Dr. Martin Schubert
Responsible Scientist, Certified Food Chemist
ANALYSIS REPORT No. 1412170449
DATE: 17.12.2014

Client:
Matrunita Mediterranea SRL
Via Trieste 25
17947 Vado Ligure
Italy

Our reference no.: PI1412180087
Product: Honey
Sample description / Batch: Zambia Honey - Batch: LUANO/ZAMBIA
Sample received on / transported by: 11.12.2014 via DHL
Sample temp. when received / stored: RT
Sampling: Client
Packaging / Quantity: Glass, bottles of 100 g

ANALYSIS REQUESTED: Pollen - botanical and geographical origin (11012841)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yeast content - estimated</td>
<td>slightly increased (&lt;500,000 - 10 g)</td>
<td>PM DE01_046 (a)</td>
<td></td>
</tr>
<tr>
<td>Starch content - acc. to pollen content</td>
<td>n.d (&lt;1%)</td>
<td>PM DE01_337 (a)</td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>light</td>
<td>PM DE01_106 (a)</td>
<td></td>
</tr>
<tr>
<td>Consistency</td>
<td>creamy</td>
<td>PM DE01_106 (a)</td>
<td></td>
</tr>
<tr>
<td>Odour</td>
<td>typical for honey</td>
<td>PM DE01_106 (a)</td>
<td></td>
</tr>
<tr>
<td>Taste</td>
<td>sweet, earthy, fresh, fruity</td>
<td>PM DE01_108 (a)</td>
<td></td>
</tr>
<tr>
<td>Honeydew elements</td>
<td>crystalline matter, spore</td>
<td>PM DE01_108 (a)</td>
<td></td>
</tr>
<tr>
<td>Other sediment</td>
<td>vegetable fibres</td>
<td>PM DE01_108 (a)</td>
<td></td>
</tr>
<tr>
<td>Electro conductivity</td>
<td>0.40 mS/cm</td>
<td>PM DE01_042 (a)</td>
<td></td>
</tr>
<tr>
<td>Main Pollen (&gt;45%)</td>
<td>pollen type unknown</td>
<td>65 %</td>
<td>DIN 10780 (a)</td>
</tr>
<tr>
<td>Significant isolated pollen (&gt;5%)</td>
<td>Compositae, Daisy Family</td>
<td>13 %</td>
<td>DIN 10780 (a)</td>
</tr>
<tr>
<td>Significant isolated pollen (&gt;3%)</td>
<td>Vemonia, Compositae, Ironweed</td>
<td>9 %</td>
<td>DIN 10780 (a)</td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Lamiaceae-T. Acanthoeae</td>
<td>DIN 10780 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Sphagnum-T. Atricostae</td>
<td>DIN 10780 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Juliafrax, Cassiafrax</td>
<td>DIN 10780 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Cyperaceae, Cyperaceae, Sedge Family</td>
<td>DIN 10780 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Cinnamomaceae, Cinnamominae</td>
<td>DIN 10780 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Gramineae, Gramineae</td>
<td>DIN 10780 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Nymphaea caeruleae-T., Nymphaea. Blue</td>
<td>DIN 10780 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Myrtacea, Myrtaceae</td>
<td>DIN 10780 (a)</td>
<td></td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Pollen-T Unknown</td>
<td>DIN 10780 (a)</td>
<td></td>
</tr>
</tbody>
</table>

T-Type: n.d* not detected, n.d. (Starch) <1%, n.a. not analysed

(a): accredited under terms of DIN EN ISO/IEC 17025, (a): not accredited method. (1) Inhouse procedure (2) Inhouse procedure (3) Inhouse procedure
This document may only be reproduced in full. The results given herein apply to the submitted sample only.

Interpretation:
According to the pollen analysis the above mentioned sample may be called “Blossom Honey”. In addition the product name may be supplemented with information concerning the regional origin “Africa (possibly Zambia)”

continued on the next page...
(Council Directive 2001/110/EC dated 20/12/2001 in combination with literature). The pollen content of this sample is very high. We recommend investigating the apiicultural practice.

[Signature]

Unnatope Joachim
Responsible Scientist, Biologist
### ANALYSIS REPORT No. 1412120484

**DATE:** 12.12.2014

---

**Client:** Matrunito Mediterranea SRL  
Via Trieste 25  
17947 Vado Ligure  
Italy

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Our reference no.</strong></td>
<td>P1412110967</td>
</tr>
<tr>
<td><strong>Product</strong></td>
<td>Honey</td>
</tr>
<tr>
<td><strong>Sample description / Batch</strong></td>
<td>Zambia Honey - Batch: LUANO/ZAMBIA</td>
</tr>
<tr>
<td><strong>Sample received on / transported by</strong></td>
<td>11.12.2014 via CHL</td>
</tr>
<tr>
<td><strong>Sample temp. when received / stored</strong></td>
<td>RT Sampling</td>
</tr>
<tr>
<td><strong>Packaging / Quantity</strong></td>
<td>Glass, 150g</td>
</tr>
</tbody>
</table>

---

**ANALYSIS REQUESTED:** Fructose/Glucose-Ratio by HPLC-RI (11012020)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
<th>Unit</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fructose</td>
<td>38.0 g</td>
<td>g/100 g</td>
<td>PM DE01_020 (a)</td>
</tr>
<tr>
<td>Glucose</td>
<td>35.2 g</td>
<td>g/100 g</td>
<td>PM DE01_020 (a)</td>
</tr>
<tr>
<td>F/G-ratio</td>
<td>1.07</td>
<td></td>
<td>PM DE01_020 (a)</td>
</tr>
</tbody>
</table>

n.d. - not detected < 0.6 g/100 g (Fru, Glu, Sue); < 1.0 g/100 g (Mai, Tur); *calculated
(a): accredited under terms of DIN EN ISO/IEC 17025. (ne): not accredited method. (1) ASU § 04 LPGB L 40.00-7
This document may only be reproduced in full. The results given herein apply to the submitted sample only.

---

**Interpretation:**
Regarding the analyzed parameters and the mentioned limits of detection, the sugar content of the sample corresponds to the legal regulations (Honey directive 2001/110/EC from Dec. 30th, 2001; Article 1 in connection with Annex II).
The F/G ratio is within the naturally occurring range (according to relevant literature: Persano Oddo, Apidologie 35 (2004), 38-81 and Swiss food compendium (2004)).

---

Dr. Martin Schubert  
Responsible Scientist, Certified Food Chemist

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27199 Bremen, Germany  
Tel.: +49 421 65 727 1  
Fax: +49 421 65 727 222  
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Ditz Ermann  
Registrierstelle Bremen, HRB 26346  
USt-ID: DE 180120973  
Geschäftsführer  
Dir. Jörg Peter Rehme  
Johannes Müller-Gehrt  
International Project Manager.
**ANALYSIS REPORT No. 1412170616**

**DATE: 17.12.2014**

**Client:** Matrurita Mediterranea SRL

**Via Trieste 26**

**17049 Vado Ligure**

**Italy**

**Our reference no.**

<table>
<thead>
<tr>
<th>Reference no.</th>
<th>F11412110005</th>
</tr>
</thead>
</table>

**Product:** Honey

**Sample description / Batch:** Zambia Honey - Batch: MUNATUZAMBA

**Sample received / transported by:** Intertek Mediolanum S.p.A.

**Sample on receipt**

<table>
<thead>
<tr>
<th>Sample on receipt</th>
<th>11.12.2014 via DHL</th>
</tr>
</thead>
</table>

**Sample temp. when received / stored:** RT

**Sampling:** Client

**Packaging / Quantity:** Glass, test tube, ca. 150g


**ANALYSIS REQUESTED:** Pollen - botanical and geographical origin (1161241)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yeast content - estimated</td>
<td>slightly increased (&lt;500.000/10g)</td>
<td>FM DE01-046 (a)</td>
</tr>
<tr>
<td>Starch content, acc. to pollen content</td>
<td>n.d. (&lt;1%)</td>
<td>FM DE01_037 (a)</td>
</tr>
<tr>
<td>Colour</td>
<td>light</td>
<td>FM DE01_106 (a)*</td>
</tr>
<tr>
<td>Consistency</td>
<td>liquid</td>
<td>FM DE01_106 (a)</td>
</tr>
<tr>
<td>Odour</td>
<td>typical for honey</td>
<td>FM DE01_106 (a)</td>
</tr>
<tr>
<td>Taste</td>
<td>sweet, bloomy, fruity</td>
<td>FM DE01_106 (a)</td>
</tr>
<tr>
<td>Honeydew elements</td>
<td>crystalline matter</td>
<td>FM DE01_106 (a)</td>
</tr>
<tr>
<td>Other sediment</td>
<td>vegetable honey</td>
<td>FM DE01_106 (a)</td>
</tr>
<tr>
<td>Electricity conductivity</td>
<td>0.45 mohm</td>
<td>FM DE01_082 (a)</td>
</tr>
<tr>
<td>Main Pollen (&gt;46%)</td>
<td>Compositae, Daisy Family</td>
<td>77%</td>
</tr>
<tr>
<td>Accompany Pollen (&gt;15%)</td>
<td>Vernonia, Compositae, Ironweed</td>
<td>17%</td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Acantiaceae, Arabiaceae</td>
<td>DIN 10760 (a)</td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Xanthium, Compositae, Convolvaceae</td>
<td>DIN 10760 (a)</td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Gramineae, Gramineae</td>
<td>DIN 10760 (a)</td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Ocimum, Labiatae</td>
<td>DIN 10760 (a)</td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Acacia, Mimosaceae, Acacia</td>
<td>DIN 10760 (a)</td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Sesamum, Pedaliaceae, Sesame</td>
<td>DIN 10760 (a)</td>
</tr>
<tr>
<td>Isolated pollen</td>
<td>Pollen, unknown</td>
<td>DIN 10760 (a)</td>
</tr>
</tbody>
</table>

**Interpretation:**

According to the pollen analysis the above-mentioned sample may be called "Blossom Honey." In addition, the product name may be supplemented with information concerning the regional origin "Africa [Zambia possible]."

---

(on the next page...)

*Intertek Food Services GmbH*

*Inter-Flag-Office 8*

*26734 Bremen, Germany*

*Tel.: +49 421 60 137 1*

*Fax: +49 421 60 227 222*

*info@intermek.com*

*Dr. Kurt-Peter Röper*

*Intertek Müller GmbH*

*Researcher*

*Postfach 3916*

*13318 Stralsund, Germany*
ZAMBIAN HONEY TEST ANALYSIS RESULTS.

(Council Directive 2001/110/EC dated 20/12/2001 in combination with literature). The pollen content of this sample is very high. We recommend investigating the agricultural practice.

Christoph Joachim
Responsible Scientist, Biologist
**ANALYSIS REPORT No. 1412120481**

**DATE: 12.12.2014**

**PAGE 1/1**

**Client:** Matruna Mediterranea SRL
**Via Trieste 25**
**17047 Vado Ligure**
**Italy**

- **Our reference no.:** P14121210045
- **Product:** Honey
- **Sample description / Batch:** Zambia Honey - Batch: MUNATIZAMBA
- **Sample received / transported by:** 11.12.2014 via CHL
- **Sample temp. when received / stored:** RT
- **Packaging / Quantity:** Glass, bottle off / ca. 150g
- **Seal:** none
- **Sampling:** Client
- **Date / End of analysis:** 11.12.2014 / 12.12.2014

**ANALYSIS REQUESTED: Fructose/Glucose-Ratio by HPLC-Rl (11012020)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
<th>Unit</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fructose (F)</td>
<td>37.9</td>
<td>g/100g</td>
<td>PM DE01_020 (a)</td>
</tr>
<tr>
<td>Glucose (G)</td>
<td>34.2</td>
<td>g/100g</td>
<td>PM DE01_020 (a)</td>
</tr>
<tr>
<td>F/G-ratio</td>
<td>1.1</td>
<td></td>
<td>PM DE01_020 (a)</td>
</tr>
</tbody>
</table>

- n.d. - not detected < 0.5 g/100 g (Fr., Glu. Sucr.); < 1.0 g/100 g (Mel, Tur) *calculated
- (a) - not accredited method
- (1) - ASU 04 LF08 L 40.00-7

**Interpretation:**
Regarding the analyzed parameters and the mentioned limits of detection the sugar content of the sample corresponds to the legal regulations (Honey directive 2001/110/EC from Dec. 20th, 2001; Article 1 in connection with Annex II). The F/G ratio is within the naturally occurring range (according to relevant literature: Persano Oddo, Apologia 36 (2004), 38-81 and Swiss food compendium (2004)).

 Signed: 

 Dr. Martin Schubert
 Responsible Scientist, Certified Food Chemist

---

**Intertek Food Services GmbH**
**Oeltje-Palm-Straße 8**
**28739 Bremen, Germany**
**Tel.: +49 421 65 770 1**
**Fax: +49 421 65 770 27**
**food@intertek.com**
ANALYSIS REPORT No. 1412170614
DATE: 17.12.2014

Client:
Marturita Mediterranea SRL
Via Trieste 25
17947 Vado Ligure
Italy

Reference no.:
P1412110063

Sample description / Batch:
Zambia Honey - Batch: MANYANGA/ZAMBIA

Sample received / transported by:
11.12.2014 via CHL

Sample temp. when received / stored:
RT

Packaging / Quantity:
Stainless steel / ca. 100g

Start / End of analysis:

ANALYSIS REQUESTED: Pollen - botanical and geographical origin (11012941)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Result</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test content</td>
<td>estimated slightly increased (&lt;50.000-10g)</td>
<td>PM DE01_040 (a)</td>
<td></td>
</tr>
<tr>
<td>Starch content acc. to pollen content</td>
<td>n.d (c1%)</td>
<td>PM DE01_037 (a)</td>
<td></td>
</tr>
<tr>
<td>Colour</td>
<td>light</td>
<td>PM DE01_105 (a)</td>
<td></td>
</tr>
<tr>
<td>Consistency</td>
<td>liquid</td>
<td>PM DE01_105 (a)</td>
<td></td>
</tr>
<tr>
<td>Odour</td>
<td>typical for honey</td>
<td>PM DE01_100 (a)</td>
<td></td>
</tr>
<tr>
<td>Taste</td>
<td>sweet, bloom, fruity, caramel like</td>
<td>PM DE01_108 (a)</td>
<td></td>
</tr>
<tr>
<td>Honeydew elements</td>
<td>crystalline, milar, spore like</td>
<td>PM DE01_108 (a)</td>
<td></td>
</tr>
<tr>
<td>Other sediments</td>
<td>vegetable fibres</td>
<td>PM DE01_105 (a)</td>
<td></td>
</tr>
<tr>
<td>Electr. conductivity</td>
<td>0.50 mS/cm</td>
<td>PM DE01_042 (a)</td>
<td></td>
</tr>
</tbody>
</table>

Main pollen (>45%):
- Myrtaceae, Myrtle Family: 33 % (a)
- Juniperaria, Cestropoaceae: 4 % (a)

Significant isolated pollen (>2%):
- Schefferia, Asteraceae: DIN 10780 (a)
- Brachysygos, Cestropoaceae: DIN 10780 (a)
- Crambe, Crambeaceae: DIN 10780 (a)
- Canaluma, Compositae, Incarnet: DIN 10780 (a)
- Commelinae, Commelinaceae: DIN 10780 (a)
- Cynoglossum, Caryophyllaceae: DIN 10780 (a)
- Seferia, Sphagnaceae: DIN 10780 (a)
- Pollen T: Unknown: DIN 10780 (a)

Interpretation:
According to the pollen-analysis the above mentioned sample may be called “Blossom Honey”. In addition the product name may be supplemented with information concerning the regional origin “Africa (Zambia possible)”.

continued on the next page...
(Council Directive 2001/110/EC dated 20/12/2001 in combination with literature). The pollen content of this sample is very high. We recommend investigating the apicultural practices.

 Unsigned

Unseregn Joachim
Responsible Scientist, Biologist
ANALYSIS REPORT No. 1412120479

DATE: 12.12.2014

Client
Matrunita Mediterranea SRL
Via Trieste 25
17047 Vado Ligure
Italy

Our reference no.: PH1412110363
Product: Honey
Sample description / Batch: Zambian Honey - Batch: MANGAIAZAMBA
Sample received on / Transported by: 11.12.2014 via DHL
Sample temp. when received / stored: RT
Packaging / Quantity: Glass, twist off / 1.150 g

ANALYSIS REQUESTED: Fructose/Glucose Ratio by HP LC-RI (1102020)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
<th>Unit</th>
<th>Method</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fructose (g)</td>
<td>40.4</td>
<td>g/100</td>
<td>PM DE01 C00 (a)</td>
<td>PM DE01 C00 (a)</td>
</tr>
<tr>
<td>Glucose (g)</td>
<td>31.1</td>
<td>g/100</td>
<td>PM DE01 C00 (a)</td>
<td>PM DE01 C00 (a)</td>
</tr>
<tr>
<td>F/G ratio</td>
<td>1.30</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n.d. - not detected < 0.5 g/100 g (Fru. Olu. Suc) < 1.0 g/100 g (Mal. Tur) ; calculated
(a) - accredited under terms of DIN EN ISO/IEC 17025, (na) - not accredited method. (1) ASU 9 641140 1 40 10 7
This document may only be reproduced in full. The results given herein apply to the submitted sample only.

Interpretation:
Regarding the analyzed parameters and the mentioned limits of detection the sugar content of the sample corresponds to the legal regulations (Honey directive 2001/110/EC from Dec. 20th, 2001, Article 1 in connection with Annex II).
The F/G ratio is within the naturally occurring range (according to relevant literature. Perzano Oddo, Apidologie 35 (2004), 39-61 and Swiss food compendium (2004)).

Sincerely,

Dr. Martin Schubert
Responsible Scientist, Certified Food Chemist
Chapter 6. Annex Document of the Zambian Honey Roadmap

---

**Analysis Report No. 1412120484**

**Date:** 12.12.2014  
**Page 1/1**

**Client:** Matriun Mediterra SRL  
Via Trieste 25  
17047 Vedo Ligure  
Italy

**Our reference no.:** PI1412110067  
**Product:** Honey  
**Sample description / Batch:** Zambezi Honey - Batch: LUNA/ZAMBIA  
**Sample received / transported by:** 11.12.2014 via DHL  
**Sample lamp, air received / stored:** RT  
**Packaging / Quantity:** Glass, filled of ca. 160g  

**Analysis Requested:** Fructose/Glucose Ratio by HPLC-RI (11012020)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Result</th>
<th>Unit</th>
<th>Method</th>
<th>Interpreted Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fructose (F)</td>
<td>36.8</td>
<td>g/100g</td>
<td>FM DE01 020 (a)</td>
<td>not detected &lt; 0.5 g/100 g (Fr., Glu, Suc) &lt; 1.0 g/100 g (Val, Tur)</td>
</tr>
<tr>
<td>Glucose (G)</td>
<td>36.2</td>
<td>g/100g</td>
<td>FM DE01 020 (a)</td>
<td>not detected &lt; 0.5 g/100 g (Fr., Glu, Suc) &lt; 1.0 g/100 g (Val, Tur)</td>
</tr>
<tr>
<td>F/G ratio</td>
<td>1.07</td>
<td></td>
<td>FM DE01 020 (a)</td>
<td>calculated</td>
</tr>
</tbody>
</table>

**Interpretation:**
Regarding the analyzed parameters and the mentioned limits of detection the sugar content of the sample corresponds to the legal regulations (Honey directive 2001/110/EC from Dec. 20th, 2001, Article 1 in connection with Annex II). The F/G ratio is within the naturally occurring range (according to relevant literature: Persano Oddo, Apidologie 35 (2004), 39-81 and Swiss food compendium (2004)).

_J. Schubert_

Dr. Martin Schubert  
Responsible Scientist, Certified Food Chemist
### Additional test results on Zambian honey samples

<table>
<thead>
<tr>
<th>Lotto</th>
<th>origine</th>
<th>Produttore</th>
<th>color</th>
<th>condutt</th>
<th>HMF</th>
<th>Umidità</th>
<th>F/G</th>
<th>Pollen</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANYNGA/ZAMBIA</td>
<td>Zambia</td>
<td>Meshearles</td>
<td>109</td>
<td>0.59</td>
<td>6</td>
<td>17</td>
<td>1.30</td>
<td>Blossom (pollen very high)</td>
</tr>
<tr>
<td>HEALING/ZAMBIA</td>
<td>Zambia</td>
<td>Queen's Bee</td>
<td>104</td>
<td>0.34</td>
<td>42.2</td>
<td>18.6</td>
<td>1.15</td>
<td>Blossom (pollen very high)</td>
</tr>
<tr>
<td>MUNATI/ZAMBIA</td>
<td>Zambia</td>
<td>Munati</td>
<td>75</td>
<td>0.46</td>
<td>11.2</td>
<td>18.5</td>
<td>1.11</td>
<td>Blossom (pollen very high)</td>
</tr>
<tr>
<td>MIOMBO/ZAMBIA</td>
<td>Zambia</td>
<td>Mpongwe</td>
<td>79</td>
<td>0.31</td>
<td>55.4</td>
<td>18</td>
<td>1.20</td>
<td>Blossom (pollen very high)</td>
</tr>
<tr>
<td>SANJARA/TANZANIA</td>
<td>Tanzania</td>
<td>Sanjara Food</td>
<td>139</td>
<td>0.22</td>
<td>74</td>
<td>19.3</td>
<td>1.34</td>
<td></td>
</tr>
<tr>
<td>LUANO/ZAMBIA</td>
<td>Zambia</td>
<td>Kapenda Mabula</td>
<td>127</td>
<td>0.39</td>
<td>2.8</td>
<td>16.9</td>
<td>1.07</td>
<td>Blossom (pollen very high)</td>
</tr>
</tbody>
</table>
ORGANIC HONEY GUIDELINES

The commonly used organic honey production guidelines have been given below (please note that the guidelines and the numbers given below are indicative and may differ by country).

Location of Organic Apiary: An organic apiary should be placed on a piece of land that is maintained organically. The nectar, honeydew, or pollen used by the honey bees should come from organic sources. Normally, a honey bee can travel up to 3 km for gathering honey. Hence, any chemical farms in the vicinity should be located outside a distance of about 3 km.

Organic Bee Hives: The bee hives used for organic apiculture should be made of natural timber or metal. Treated timber cannot be used for making the hives. Furthermore, lead-based paints should not be used and if plastics are used, then they should be covered with bee wax.

Transition Period: Like organic milk production, there is a transition period involved when a farmer shifts from conventional honey production to organic honey production. This transition period is about 12 months. Non-organic wax should be replaced with organic wax during this transition period.

Origin of Honey Bees: The replaced or introduced honey bees can come from organic as well as non-organic apiaries. The apiary where new honey bees have been introduced can be included in organic honey production only after a period of about 60 days, after ensuring the replacement of bees and the management of the apiary has been carried out through organic means.

Feed for Organic Honey Bees: In organic apiculture, the honey bee hives should not be placed in or near farms where chemical farming is being practiced. Also, artificial feeding can be carried out; however, this should only be done when it is difficult to provide access to organic foraging to the bees. When non-organic feed is used, the apiary should be removed from organic honey production, depending on the duration of artificial feeding.

Queen Honey Bees: The queen honey bees can be replaced whenever required. A healthy queen should be selected for replacement to ensure preventative disease management. Sometimes, artificial insemination is also permitted. Cutting of the wings of the queen honey bee is not permitted.

ETHIOPIA HONEY SECTOR EXAMPLE

There are approximately 1.5 million beekeepers in Ethiopia and 8 to 10 million bee colony hives. Ethiopia is an important source for specialty organic honey with its unique characteristics including its white, gold, and red coloration. Despite the great potential for export of specialty and traditional honey Ethiopia remains a small scale exporter due to the fact that currently, 80% of Ethiopian honey is used for Tej (honey wine), 5% rural household consumption and 15% marketed as table honey (both domestic and export). In Ethiopia the demand for honey for Tej keeps the price artificially high against the global market due to the fact that producers will most often utilize the honey in Tej rather than sell it below a floor price that they set based upon their own needs and expectations. Zambia could have a similar scenario due to the demand for honey in their “honey beer”.

Ethiopian honey exports are expected to increase significantly due to the recent Joint Venture between Parodi Foundation and Zenbaba Cooperative which was established with the support of 20/20DC under contract with USAID. The equipment for this processing has arrived in Ethiopia and will begin production with the new crop of honey in September-November 2014.

The graphic below reflects the current listing on the Fairtrade Africa website with Zenbaba achieving Fairtrade and organic status in April 2014 as a result of the support program in place for Zenbaba through the market support of Parodi and co-investment support by USAID.
Figure 24: Zenbaba Fairtrade and Organic certification
Producer Profile – Fairtrade Africa

http://www.fairtradeafrica.net/producers-products/producer-profile/?prod=716
Honey legislation


<table>
<thead>
<tr>
<th>Compositional criteria</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar content</td>
<td></td>
</tr>
<tr>
<td>Fructose and glucose content (sum of both)</td>
<td></td>
</tr>
<tr>
<td>blossom honey</td>
<td>not less than 60 g/100 g</td>
</tr>
<tr>
<td>honeydew honey, blends of honeydew and blossom honey</td>
<td>not less than 45 g/100 g</td>
</tr>
<tr>
<td>Sucrose</td>
<td></td>
</tr>
<tr>
<td>in general</td>
<td></td>
</tr>
<tr>
<td>False acacia (Robinia pseudoacacia), alfalfa (Medicago sativa), Banksia (Banksia menziesi), French honeysuckle (Hedysarum), red gum (Eucalyptus camaldulensis), leatherwood (Eucryphia lucida, Eucryphia milligani), Citrus spp.</td>
<td>not more than 5 g/100 g</td>
</tr>
<tr>
<td>in general</td>
<td></td>
</tr>
<tr>
<td>lavender (Lavandula spp.), borage (Borago officinalis)</td>
<td></td>
</tr>
<tr>
<td>Moisture content</td>
<td></td>
</tr>
<tr>
<td>in general</td>
<td></td>
</tr>
<tr>
<td>heather (Calluna), EU, CA; bakers’ honey, EU</td>
<td>not more than 20 %</td>
</tr>
<tr>
<td>bakers’ honey from heather (Calluna), EU</td>
<td>not more than 22 %</td>
</tr>
<tr>
<td>not more than 25 %</td>
<td></td>
</tr>
<tr>
<td>Electrical conductivity</td>
<td></td>
</tr>
<tr>
<td>honey not listed below, and blends of these honeys</td>
<td></td>
</tr>
<tr>
<td>honeydew honey and chestnut honey and blends of these except those listed below</td>
<td>not more than 0.8 mS/cm</td>
</tr>
<tr>
<td>Exceptions: strawberry tree (Arbutus unedo), bell heather (Erica), eucalyptus, lime (Tilia spp.), heather (Calluna), manuka or jelly bush (Leptospermum), tea tree (Melaleuca spp.)</td>
<td>not less than 0.8 mS/cm</td>
</tr>
<tr>
<td>Free acid</td>
<td></td>
</tr>
<tr>
<td>in general</td>
<td></td>
</tr>
<tr>
<td>bakers’ honey (only EU Directive)</td>
<td>not more than 50 meq/kg</td>
</tr>
<tr>
<td>not more than 80 meq/kg</td>
<td></td>
</tr>
<tr>
<td>Diastase activity* (Schade units)</td>
<td></td>
</tr>
<tr>
<td>In general; except bakers’ honey (EU)</td>
<td>not less than 8</td>
</tr>
<tr>
<td>Honey with low natural enzyme content (e.g. citrus honey) and an HMF content of not more than 15 mg/kg</td>
<td>not less than 3</td>
</tr>
<tr>
<td>HMF** (mg/kg)</td>
<td></td>
</tr>
<tr>
<td>In general; except bakers’ honey (EU Directive)</td>
<td>40</td>
</tr>
<tr>
<td>Honey of declared origin from regions with tropical climates and blends of these honeys</td>
<td>80</td>
</tr>
</tbody>
</table>

* Honey buyers often require a maximum of 20 mg/kg.
** Determined after processing and blending.
LINKS TO USEFUL INFORMATION SOURCES

82.5.4. Markets

- Mintel Market Intelligence www.mintel.com Trade statistics and market information. Subscription only service. Studies on organic food markets for most EU countries.
- Organic Trade Services www.organics.com Organic market forum with buyer and seller information, news and statistics. Related sites: www.planetaorganico.com (Brazil)
- Food Ingredients www.foodingredientsonline.com Market information.
- International Food Ingredients www.ifi-online.com
- Public Ledger www.public-ledger.com Market information on most Commodities (non organic). Subscription service.

82.5.5. General interest

- http://video.pbs.org/video/995224587 - “Honey” VALUE-ADDED PRODUCTS FROM BEEKEEPING...FAO
http://orangeblossomhoney.org – “About”, Yucatan Honey Bee, Mexico
http://www.yucatanhoneybee.com/about.html Colony Collapse Disorder Progress Report, USDA, June 2011
IBRA – International Bee Research Association http://www.ibra.org.uk/
University of Sussex Laboratory of Apiculture and Social Insects (LASI) http://www.sussex.ac.uk/lasi/
The Centre for Honeybee Research, Ashville USA http://www.chbr.org/
Bee Base https://secure.fera.defra.gov.uk/beebase/index.cfm
The Practical Beekeeper – Bee Keeping Naturally http://www.bushfarms.com/bees.htm

82.5.6. Quality control


1.– An excellent organisation that promotes the value of bees by providing information on bee science and beekeeping worldwide. The International Bee Research Association (IBRA) was established in 1949 for the advancement of beekeeping science, as a not for profit organisation. It is unique and has one of the largest databases of scientific information on bees and bee related interests in the world. IBRA is internationally recognised as the world’s single source and foremost provider of information on bees. Its database and information services, including journals, teaching aides and publications, embrace not only familiar domesticated bee species managed by man for their beneficial products but also c
It is £36.00 a year to join and that gives you access too journals and articles and seminars etc.
2.– The Laboratory of Apiculture and Social Insects (LASI) at the University of Sussex is the largest research group in the UK studying honey bees and other social insects. The applied research is aimed at helping the honey bee and beekeepers, whilst the basic research studies how insect societies function).
3.– The Centre has four long-term goals:
To promote conferences, schools, events to educate beekeepers and the general public on the importance of honeybees in our environment.
To engage in research to further our knowledge of honeybees as well as find answers to challenges to their continued existence.
To serve as a world communications centre for the exchange of information and contacts relating to bees and beekeeping.
To establish a comprehensive laboratory for the analyses of everything affecting the health of bees and their environment.
4.– Designed for beekeepers as a base of a wide range of free information for both new and experienced bee keepers. It is also home to the National Bee Unit that delivers Bee Health Programmes on behalf of the Department for Environment, Food and Rural Affairs (DEFRA) and the Welsh Government (WG) in England and Wales. It has been involved in the management and control of bee pests and diseases, along with training and dissemination of information to beekeepers for over 60 years.
82.5.7. Finance

- www.triodos.co.uk Triodos Bank, UK. Loan and equity finance for organic businesses (sustainable banking).
- www.shared-interest.com Shared Interest. Trade finance for fair trade importers from developing countries.

82.5.8. Organic and Fair Trade

- Foodfirst www.foodfirst.co.uk Database of UK organic companies.
- bioequitable@hotmail.com Bio Equitable
- www.fairtrade.net Fair Trade Labelling Organisation International
- www.ifat.org International Fair Trade Association
- www.traidcraft.co.uk Traidcraft
- www.transfair.org TransFair International

82.5.9. Trade Fairs & Congresses

- BioFach – Nürnberg, Germany (annually). www.biofach.de
- Biofach – Washington, DC, USA BioFach América Latina
- Biofach – Brazil
- International Organic Trade Fair and Conference, Rio de Janeiro, Brazil BioFach Japan
- International Organic Trade Fair, Tokyo, Japan
- Organic Products Europe. Olympia, London www.naturalproducts.co.uk
- ANUGA. Cologne, Germany (biennial) www.koelnmesse.de/anuga alternating with SIAL.
- Food Ingredients Europe (biennial) alternating with Health Ingredients Europe www.fi-events.com
- Horecava. Amsterdam, The Netherlands www.rai.nl
- IBA. Düsseldorf, Germany www.messe-duesseldorf.de
- International Food Exhibition. London, United Kingdom www.ife.co.uk
- Interherba. Pozna’n, Poland www.interherba.pl
- Natural Products Expos www.naturalproductsexpo.com
- Natural Products East, Washington DC www.expoeast.com
- Natural Products West, Anaheim, California www.expowest.com/
- Natural Products Europe, Amsterdam, The Netherlands www.expoeurope.com/
- Natural Products Asia, Hong Kong SAR, China www.naturalproductsasia.com
- Natural Trade Show www.naturaltradeshow.com organic/natural products in Harrogate and Brighton, UK.
- World Food Moscow www.ite-exhibitions.com
- SIAL, Paris (biennial) www.sial.fr alternating with ANUGA.
- Natural and Organic Products Europe Show – London, UK. Annually http://www.naturalproducts.co.uk/
- Natural Products Expo West, Anaheim, California, USA – Annually http://www.expowest.com/ew14/public/enter.aspx
- Natural and Organic Products Asia, Hong Kong, China http://www.chinaexhibition.com/trade_events/3786-Natural_and_Organic_Products_Asia_2014.html
- EPIF -Eco products International Fair Taipei
- Neurological Rehabilitation Therapy and Technology Exposition, London UK. Annually http://10times.com/neurological-rehabilitation-therapy#
- The Allergy and Free From Show, London UK Annually
- Medicare Taiwan, Taiwan, Annually http://www.medicaretaiwan.com/
- Cphi China Pharmaceutical Show, Shanghai China http://www.cphi.com/china/home/
- Consumer Goods Fair, Krasnoyarsk, Russia http://10times.com/consumer-goods-fair
- Enviofood Meeting Point, Madrid Spain http://10times.com/enviofood
BEE PRODUCTS IN THE US – LINKS TO RELEVANT ARTICLES

82.5.10. Marketing

- American Association of Professional Apiculturists
- American Beekeeping Federation – Membership organization for American beekeepers.
- American Honey Producers Association
- Apiary Inspectors of America
- Apimondia, International Federation of Beekeepers Associations – International organization creating links among beekeepers around the world.
- Apiservices Beekeeping Development – Promotion of beekeeping with advice columns, feasibility studies, market studies, equipment tests and software.
- Bee-economics and the Leap in Pollination Fees, Agricultural Issues Center, University of California, 2006 – Paper describing honeybee supply and demand issues and the operation of the pollination market. Recently, honeybee pests and other problems have reduced available supplies, while expansion of almond acreage has increased peak-season demand. The resulting leap in pollination fees follows from these market fundamentals.
- Bees, Department of Primary Industries and Fisheries, Queensland, Australia.
- Canada’s Honey Industry, Agriculture and Agri-Food Canada, Ottawa, Ontario – The United States remained the primary destination for Canadian honey exports in 2007, taking 86% of total exports.
- Congress and Agencies Should Take Additional Steps to Reduce Substantial Shortfalls in Duty Collection, Government Accountability Office, 2008 – Over $600 million in duties remain uncollected, from 2001. A majority of the uncollected duties comes from four products from China: crawfish tail meat ($354 million), garlic ($75 million), honey ($43 million) and mushrooms ($41 million).
- Global Agricultural Trade System (GATS), Foreign Ag Service (FAS), USDA.
- Honey, National Ag Statistical Service (NASS), USDA – This publication contains the annual report of the number of colonies producing honey and U.S. honey production, average price and total value.
- Honey Research and Promotion Programs, Fruit and Vegetable Programs, Agricultural Marketing Service (AMS), USDA.
- The International Bee Research Association – Nonprofit organization promoting the study and conservation of bees through research.
- National Honey Board – Promoting the research, awareness and use of honey and honey products.
- National Honey Report, AMS, USDA – The annual report of the number of colonies producing honey, honey production, average price, and so on. BeeHoo – World’s beekeeping directory.
- National Honey Packers & Dealers Association
82.5.11. Production

- **Beekeeping**, Agricultural Alternatives, Penn State University, 2001 – Includes an enterprise budget.
- **Beekeeping**, National Agricultural Library, USDA.
- **Bees and Pollination**, Ohio State University.
- **Bee Health**, eXtension – This comprehensive resource for science-based information on bee health management strategies provides help for new and inexperienced producers, as well as those with experience but who need an answer to a specific question. The site also includes in-depth, peer-reviewed articles covering bee biology and production.
- **Carl Hayden Bee Research Center**, Agricultural Research Service (ARS), USDA, Arizona.
- **Crop Pollination Exposes Honey Bees to Pesticides Which Alters Their Susceptibility to the Gut Pathogen Nosema ceranae**, PLoS ONE, July 2013 – This study, conducted by researchers with the University of Maryland, University of California and USDA, found that bees are more susceptible to a lethal parasite when they are exposed to crop pesticides. The researchers detected 35 different pesticides in sample pollen collected from seven major crops.
- **Honey Bee Colony Collapse Disorder**, Congressional Research Service, 2010 – Between the winters of 2006/2007 and 2007/2008, managed bee colony losses averaged more than 30%. However, estimates for winter 2008/2009 suggest a possible decrease in the rate of bee colony losses.
- **Honey Bee Insemination Service** – Provider of insemination training, consulting, equipment and services to insemination as well as genetic research.
- **Integrated Pest Management for Varroa Destructor in the Northeastern United States using Drone Brood Removal and Formic Acid**, Cornell University, 2005 (funded by SARE, USDA) – This focuses on management of the parasitic honey bee mite Varroa destructor in the northeastern United States.
- **Keeping Bees Busy and Buzzing**, YouTube, USDA, 2012 – USDA researchers are working to help people learn about bees while trying to figure out why some bee colonies are disappearing.
- **Michigan State University Apiculture Laboratory** – Researching the value of honey bees for both production and pollination.
- **Mid-Atlantic Apiculture Research and Extension Consortium** - This is a regional effort to address the pest management crisis facing the beekeeping industry in the Mid-Atlantic region.
- Further resources from established national societies on bee keeping and bee products
  - Bee Culture – the magazine of American Beekeeping: [http://www.beeculture.com/content/whoswho/](http://www.beeculture.com/content/whoswho/)
Apiary Inspectors of America – Links to national bee keeping associations: http://www.apiaryinspectors.org/links.html
The European Professional Beekeepers: http://www.professional-beekeepers.eu/
Beekeepers Society of South Australia: http://www.bees.org.au/
National Beekeepers Association of New Zealand: http://nba.org.nz/

82.5.12. Some interesting Bee Facts:

- The honeybee has been around for millions of years. It is scientifically also known as Apis mellifera.
- Honey bees are vital as pollinators. They are responsible for pollinating 70 of the 100 crops that provide 90% of the world’s food.
- Honey is the only food that includes all the substances necessary to sustain life, including enzymes, vitamins, minerals, and water; and it’s the only food that contains “pinocembrin”, an antioxidant associated with improved brain functioning.
- Honeybees need to visit 4,200,000 flowers to make a kg of honey.
- Each cell of a capped honeycomb contains the nectar from about 1,000 flowers.
- Honeybees sense of smell is so precise that it can differentiate hundreds of different floral varieties and tell whether a flower carried pollen or nectar from metres away.
- The average worker bee produces about 1/12th teaspoon of honey in her lifetime.
- A hive of bees will fly 90,000 miles, the equivalent of three orbits around the earth to collect 1 kg of honey.
- A colony of bees consists of 20,000-60,000 honeybees and one queen. Worker honey bees are female, live for about 6 weeks and do all the work.
- 14. The queen bee can live up to 5 years and is the only bee that lays eggs. She is the busiest in the summer months, when the hive needs to be at its maximum strength, and lays up to 2500 eggs per day.
- Only worker bees sting, and only if they feel threatened and they die once they sting. Queens have a stinger, but they don’t leave the hive to help defend it.
LIST OF HONEYBEE FLORAS

Botanical Name, Families and Flowering Periods

- Acacia brevispica Fabaceae Tree Echileqana Jan.-May
- Acacia mellifera Mimosaceae Shrub Gumarna May-Jun
- Acacia asak Mimosaceae Tree Tsalwa April-May
- Acacia seyal Mimosaceae Tree Key Girar May-Jun
- Acacia tortolis Mimosaceae Tree Abiqa May-Jun
- Achyranthus aspera. Amaranthaceae Herb Aluma September
- Adansonia digitata Bombacaceae Tree Firtata June-Aug
- Agave sisalina Agavaceae Yekacha tekel Chiret Sept-Jan
- Aloe berhana Aloeaceae Herb Ret Nov.-May
- Azadirachta indica Meliaceae Tree Nim July-Mar.
- Anthemis tigrensis Asteraceae Herb Jan.-Apr.
- Acacia senegal Mimosoideae Tree Saphansa April-May
- Aregemone mexicana -Herb Koshoshila Oct-Jan
- Adansonia digitata Bombacaceae Tree Bamba May-July
- Boscia angustifolia Capparidaceae Shrub Shisha April-May
- Balanite aegyptica Balanitaceae Tree Goza April-May
- Becium grandiflorum Lamiaceae Woody herb Mentese July-Dec
- Brassica spp. Brassicaceae Herb Gomen Zer September
- Buddlia polystachia Buddleiaceae Shrub Anfar Nov. May
- Bidens pachylopa Asteraceae Herb Adey Abeba Sep.-Oct.
- Cordia africana Boraginaceae Tree Wanza May-Jun
- Cynodon dactylon Poaceae Grass Serdo August-Oct
- Carthamus tinctorius Asteraceae Herb Yeabesha suf Nov-Dec
- Carduus nyassanus Asteraceae Herb Koshoshila Sept.-Nov.
- Carissa edulis Apocynaceae Shrub Agam Nov.-Mar.
- Callistemon citrinus Myrtaceae shrub Bottle brush Year round
- Capparis tomentosa Caprifoliaceae Shrub Gumero Dec-Feb
- Citrus aurantifolia Rutaceae Shrub Lemon Sept-Dec
- Ocimum adoensis Verbenaceae Herb Kosert May-July
- Cassia edulis Rutaceae Shrub Abokar Sept-Dec
- Conyza steudelli Asteraceae Herb Dec-May
- Coffea arabica Rubiaceae Shrub Buna Feb-April
- Cicer arietinum Fabaceae Herb Shimbera Oct.-Nov.
- Clerodendrum cordifolium Verbenaceae Shrub Atuch May-Nov.
- Coriandrum sativum Apiaceae Herb Denbilale Aug.-Sep.
- Carica papaya Caricaceae Tree Papaya Sept-Nov
- *Digitaria abyssinica* Poaceae Grass Wariat August-Oct
- *Dodonia angustifolia* Spindaceae Shrub Kitikta Sept-Jan
- *Datura stramonium* Solanaceae Herb Ase-faris Aug.-Feb.
- *Dichrostachys cinera* Mimosoideae Shrub Girmi Feb-May
- *Euphorbia tetricallii* Euphorbiaceae Shrub Kinchb Sept-Dec
- *Eluesine folicofolia* Poaceae Herb Akroma Augus-Octt
- *Eucalyptus camaldensis* Myrtaceae Tree Bahir Zaf May-July
- *Euclea shimperi* Ebenaceae Shrub Dedeho March-April
- *Euphorbia abyssinica* Euphorbiaceae Tree Kulkual Sep.-Nov.
- *Ficus vasta* Moraceae Tree Waraka
- *Grivella robutsa* Rutaceae Tree Grivella Sept-Oct
- *Grewia bicolor* Tiliaceae Shrub Saha June-Nov
- *Grewia vilosa* Tiliaceae Shrub Matta July-Nov
- *Guizotia abyssinica* Asteraceae Herb Nug Sept-Oct
- *Gossypium hirsutum* Malvaceae Herb Tete Sep.-Nov.
- *Guizotia scabra* Asteraceae Herb Mech Sep.-Nov.
- *Galinosoga parvillora* Asteraceae Herb Yeshwa-arem Sept-Oct
- *Helianthus annuus* Asteraceae Herb Yeferenj Suf Sept-Oct
- *Hyparrhenia rufa* Poaceae Grass Senbelet Aug-sept
- *Hypoestes forskalii* Acanthaceae Herb Dergu All year round
- *Laggera pterodon* Asteraceae Herb Keskese Sept-Dec
- *Mangifera indica* Anacardiaceae Tree Mango Sept-Nov
- *Nicandra physalodes* Solanaceae Herb Azangira Sept-Oct
- *Ocimum basilicum* Lamiaceae Herb Aba Timara August-sept
- *Opuntia ficus-indica* Cactaceae Herb Beles May-July
- *Osyris quadripartite* Santalaceae Shrub Querret Sept-Dec
- *Psidium guajava* Myrtaceae Shrub Zeytun Sept-Nov
- *Psidium gauvae* Myrtaceae Shrub Zeytun Sept-Nov
- *Pterolobium stellatum* Caesalpinioideae Shrub Kentafa Sept-Dec
- *Persea Americana* Lauraceae Tree Avocado October-Dec
- *Psocostigma thonningii* Caesalpinioideae Shrub Frqa Jan-May
- *Psidium gauvae* Myrtaceae Shrub Zeytun Sept-Dec
- *Prunus africana* Rosaceae Tree Tikur-inchet Sept-Nov
- *Phonix reclinata* Arecaceae Tree Zenbaba Oct-Dec
- *Plantago lanceolata* Plantaginaceae Herb Korteb All year round
- *Rumex nervosus* Polygonaceae Woody herb Enbacho Sept-Dec
- *Rumex bequarti* Polygonaceae Herb Tult Sept-Dec
- Ritchiea albersii Capparidaceae Shrub Dngay-seber Oct-Jun
- Schinus molle Anacardiaceae Tree Qundo Berberie Sept-Dec
- Sesamum indicum Pedaliaceae Herb Selit August-Oct
- Sorghum bicolor Poaceae Herb Mashila September
- Syzygium guineens Myrtaceae Tree Dokima Feb-April
- Solanum nigrum Solanaceae Herb Awut Sept-Oct
- Sonchus asper Asteraceae Herb Thistle Sept-Feb
- Terminalia brownii Combretaceae Tree Gonti May-June
- Terminalia glaucescens Combretaceae Tree Ekima April-May
- Trifolium Spp. Papilionaceae Herb Maget August-Dec
- Tapinanthus globiferus Loranthaceae Climber Tekesela Nov-Dec
- Verbena officinalis Verbenaceae Herb Tihuan Tila Aug-Dec
- Vernonia amaygdalina. Asteraceae Shrub Girawa Jan-Feb
- Vicia faba Papilionaceae Herb Bakiela Sept-Oct
- Verbascum sinaticum Scrophulariaceae Herb Ketetina Aug-Dec
- Withania sommifera Lamiaceae Herb Gizawa Nov-Feb
- Zea mays Poaceae Herb Bekolo September-Oct
- Ziziphus spinachristi Rhamnaceae Kurkura Giba August-Nov
The following list of addresses represents a selection of suppliers, manufacturers, organizations etc. active in these respective fields.

### 82.5.13. Beekeeping equipment

- **Apicoltura Vangelisti**
  - Viale Roma 82
  - 52017 Stia (AR), Italy
  - Tel: 39-575-582150
  - equipment for beekeeping and complete line of beekeeping products and value added products

- **Thomas**
  - 86 Rue Abbe Thomas
  - 45450 Fay aux Loges, France
  - Tel: 33-38595620; Fax: 33-38592828
  - equipment for beekeeping and elaboration of beekeeping products

- **Herzog**
  - Postfach 146
  - 7230 Schramberg, Germany
  - Tel: 49-7422-4240
  - equipment for beekeeping and elaboration of beekeeping products

- **E.H. Thorne Ltd.**
  - Beehive Works
  - Wragby, Lincoln LN3 5LA, UK
  - Tel: 44-1673-858555
  - honey presses as commonly used in East Africa and other beekeeping equipment

- **SONY EZ-Label Printer** from any SONY dealer or through
  - FAI, Federazione Apicoltori Italiani
  - Corso Vittono Emmanuelle 101
  - 00186 Rome, Italy
  - Tel: 39-6-6877175 or 6852276; Fax: 39-6-6548578
  - sells label printer, many other information and Italian beekeeping industry contacts

- **Cylindro Alveolador Apic. Ltva.**
  - Cristiansen Hordao
  - CX Postal 455, R. Bernardino di Maraes 1467
  - Belo Horizonte, MG, Brazil
  - Tel: 55-31-2262190
  - manufactures cheap, plastic foundation rollers (US$100) for hand operated press
82.5.14. More expensive foundation rollers and complete manufacturing lines can be obtained from all major beekeeping suppliers.

- Centre Laboratories
  - 35 Channel Dr.
  - Port Washington, NY 11051, USA
  - Fax: 1-516-767 4229
  - makes and distributes “Epipen”, emergency injection pen/syringe for treatment against allergic reactions to bee stings

- HoneyStix
  - 1443 45th Ave. N.E.
  - Salem, OR 97301, USA
  - Tel: 503-581 5805
  - Marketing and processing honey filled straws. Sale of straw filling machines

82.5.15. Directory of beekeeping suppliers, published in 1982 by IBRA.

- Dadant & Sons, Inc.
  - 51 South 2nd St
  - Hamilton, Illinois 62341, USA
  - Tel: 1-217-847 3324; Fax: 1-217-847 3660
  - equipment for beekeeping and elaboration of beekeeping products, publishers of Amer. Bee Journal and Hive and the Honey Bee, plus other books

- Journal and Hive and the Honey Bee, plus other books
  - Lega S.r.l., Costruzioni apistiche
  - Via de Crescenzi 18
  - 48018 Faenza (Ravenna), Italy
  - Tel: 39-546-26834; Fax: 39-546-28279
  - equipment for beekeeping and elaboration of beekeeping products

- Lyophilization freeze drying
  - Cole-Parmer (registered trade mark) International
  - 7425 North Oak Park Avenue
  - Niles, Illinois 60714, USA
  - Tel.:1-708-647 7600; Fax.: 1-708-647 9600
  - Telex: 28-9405; Cable: ‘COLEPARMER’; Easylink: 6293 9214
  - laboratory freeze driers, 4.5 to 18 litre models with 2 to 12 litre drying capacity per day, and many other laboratory equipments.

- Costruzioni Meccaniche Terruzzi S.r.l.
  - Via Ernesto Breda 176
  - 20126 Milano, Italy
  - Tel.: 39-2-2572391
  - industrial freeze driers

- Kohlensäurewerk Deutschland GmbH
  - 5462 Bad Hoenningen, Germany
  - industrial freeze driers

- Edwards High Vacuum Ltd
  - Manor Royal
  - Crawley W Sussex RH102LW, United Kingdom
  - Tel.: 44-1293-28844
  - industrial freeze driers
82.5.16. Food processing

- Alberto Bertuzzi S.p.a.
  - Viale Europa 11
  - 20047 Brugheno (Milano), Italy
  - Tel: 39-39-870553; Fax: 39-39-883205
  - machines or whole plants for the processing of fruits and vegetables but also
    honey, mead,

82.5.17. Jams and sweets

- For honey and pollen processing equipment see also beekeeping suppliers

82.5.18. Capsule fillers

- MACOFAR CEM S.p.a.
  - Via Nazionale 55
  - 40067 Rastignano (Bologna), Italy
  - Tel.: 39-51-743350; Fax: 39-51-744255
  - encapsulation equipment of industrial and artisanal capacity

- MG2 S.p.a.
  - Via del Savena 18,
  - 40065 Pianoro (Bologna), Italy
  - Tel.: 39-51-777043; Fax: 39-51-777521
  - encapsulation equipment of industrial and artisanal capacity

- Nuova Zanasi S.p.a.
  - Via 1 maggio 14
  - 40064 Ozzano Emilia (Bologna) Italy
  - Tel.: 39-51-799431; Fax: 39-51-799348
  - encapsulation equipment of industrial and artisanal capacity

- S.L. Sanderson & Co.
  - Star Route 104N
  - (173 Sandy Springs Lane)
  - Berry Creek, CA 95916, USA
  - makes “Cap M Quick”, very small hand operated trays for encapsulation

- Feton International
  - Chaussee de Louvain 799
  - Steenweg of Leuven
  - 1140 Bruxelles
  - Tel.: 32-2-734 5295
  - Capsule filler, small ones for 5000 to 7000 BFr.

82.5.19. Elaboration and manufacture for others

- RP Scherer S.p.A.
  - 04011 Aprilia (Latina), Italy
  - Tel: 39-6-9205431
  - Fax: 39-6-9205435
  - production of gelatinous capsules, encapsulation and other pharmaceutical forms
    (pills) for third parties.
- Pharmagel S.p.A.
  - Viale Europa 3
  - 20075 Lodi (Milano), Italy
  - Tel: 39-371-36041
  - production of gelatinous capsules, encapsulation and other pharmaceutical forms (pills) for third parties

- Ghimas S.p.A.
  - Via Fucini 2
  - 40033 Casalecchio di Reno (Bologna), Italy
  - Tel: 39-51-575353
  - freeze drying in contract for third parties

- Piana Apicoltura
  - Via G.P. Piana 1450
  - 40024 Castel San Pietro Terme (BO), Italy
  - Tel: 39-51-941205
  - Fax: 39-51-944652
  - Telex: 512447 APIS I
  - manufacture of cosmetics and complete line of beekeeping products and value-added products

- Apicoltura Marcolini & C.sas
  - Via G. Gastianelli 61
  - 00133 Roma, Italy
  - Tel: 39-6-7232131 or 2050316
  - bee cosmetics and soaps in contract for third parties
REGIONAL BEE PRODUCTS PROCESSORS, TRADERS/EXPORTERS AND SERVICES PROVIDERS

- **Ndalambwe Bee Farmers Ltd, Tanzania**
  - P.O 24 Sajaranda Itigi; Tel: +255713177372/713464623.
  - Email: sanjarahoney@gmail.com
  - Products: Honey, Bees wax.

- **Honey Care Africa (T) Ltd, Tanzania**
  - Tel: +255222862544, Fax: +255222864184.
  - E-mail: jayen@honeycare.co.tz
  - Web: www.honeycare.co.tz
  - Products: Honey, Bees wax.

- **Jampem Enterprises Ltd, Tanzania,**
  - P.O. Box 1608, Tabora-Tanzania;
  - Tel: +255713 276561;
  - Email: afrihoney@gmail.com
  - Products: Honey, Bees wax.

- **Beza Mar Agro Industries Ltd, Ethiopia**
  - P.O. Box 102, Addis Ababa - Ethiopia; Tel: 251-115-505099 / 251221 125893;
  - Email: bezamar@ethionet.et
  - Products: Honey, Bees wax

- **Rahi Honey Processing Enterprise, Ethiopia**
  - P.O. Box 371, Addis Ababa - Ethiopia;
  - Tel: +261-115-507204; Mob:+251-911-223559;
  - Email: rahihoneyplc@yahoo.com
  - Products: Honey, Bees wax

- **Comel Pvt Ltd. Co. Ethiopia**
  - Guna street, Kebelle 16 P.O. Box 0038,
  - Tel: +251 344 416061; Fax +251 344 406199,
  - Email: comel@ethionet.et
  - Products: Honey, Bees wax

- **Bee Natural Uganda Ltd, Uganda**
  - Pan Africa House, Plot 3 Kimathi Avenue Kampala;
  - Tel: 256 414234676; Mob: 256772209000 (Mob);
  - Email: martabell@beenaturalproducts.com;
  - Web: www.beenaturalproducts.com
  - Products: Honey, Bees wax, Propolis

- **Sulma Foods Ltd, Uganda**
– Bulema Lwogi, 10km, Kasana-Kikyusa road; P.O. Box 102, Luwero-Uganda;
  – Tel: +256 312 110949;
  – Email: sulma_foods@yahoo.com / info@sulmafoods.co.ug;
  – Web: www.sulmafoods.co.ug
  – Products: Honey, Bees wax, Propolis

■ Golden Bees Ltd, Uganda
  – P.O Box 7264 Kampala
  – Tel: +256 752 484225 / 256 702 484225.
  – E-mail: mubrynt@yahoo.com
  – Products: Honey, Bees wax, Propolis

■ Tharaka Honeybee Products Ltd, Kenya
  – P.O. Box 6910-00300 Nairobi-Kenya;
  – Tel: +254 202 535594; Mob: +254 722 253487; Fax: +254 20 8081301;
  – Email: info@tharakahoney.com; Web: www.tharakahoney.com
  – Products: Honey, Bees wax

■ African Beekeepers Ltd, Kenya
  – P.O. BOX 3752-00506 Nairobi-Kenya;
  – Tel: +254-20-2060685, Fax:+245-020-8014090;
  – E-mail: bees@africanbeekeepers.co.ke;
  – Web: www.africanbeekeepers.co.ke
  – Products: Honey, Bees wax.

■ Honey Care Kenya, Kenya
  – Muring Avenue, Nairobi, Kenya;
  – Tel/Fax: +254 20 3874448/50.
  – E-mail: info@honeycareafrica.com;
  – Web: www.honeycareafrica.com
  – Products: Honey, Bees wax.

■ Forest Fruits Ltd, Zambia
  – Tel: +260 966 75765123 / +260 211 290406.
  – Email: info@zambezigold.com;
  – Web: www.zambezigold.com
  – Products: Honey, Bees wax.

■ Mpongwe Beekeeping Enterprise, Zambia
  – P.O. Box 1, Mpongwe-Zambia;
  – Tel/Fax: +260211 482057; Mob:+260968 507671;
  – Email: mpongwebeekeeping@yahoo.com
  – Products: Honey, Bees wax.

■ Lualua Beekeeping, Zambia
  – P.O Box 410387, Kasama-Zambia.
  – Tel: +260977 580589;
  – Email: lualuabeekeeping@yahoo.com
  – Products: Honey, Bees wax.

■ MIG Ltd Rwanda
  – Email: mig@rwanda1.org
  – Products: Honey, Bees wax.
- Centre De Services Aux Apiculture, Rwanda
  - P.O. Box 1295 Kigali;
  - Tel & Fax 573961, 575460.
  - Email: ardi@rwanda1.com
  - Products: Honey, Bees wax.
- Bambui Organic Farmers CIG (BOFCIG), Cameroon
  - 4 Corners Bambui, P.O.Box 56, Bamenda;
  - Tel: 784 5408, 7456168;
  - Email: npmuma@yahoo.com
  - Products: Honey, Bees wax.
- APAS / Tropical Forest Honey, Cameroon
  - Email: mafred.epanda@btctcb.org, nathewane@yahoo.fr
  - Products: Honey, Bees wax.
- Apiculture and Nature Conservation Organization (ANCO), Cameroon
  - P.O.Box 5150, Banenda-Cameroon;
  - Tel: 23777 715651; Email:mzekaanco@yahoo.com
  - Products: Honey, Bees wax.
- Small Holder Coffee Farmers Trust, Malawi
  - P.O. Box 20133, Luwinga Industrial Site, Mzuzu 2-Malawi.
  - Tel : +265 01 332 899/663/789; Fax : +265 01 333 902
  - Email: mzuco-coffee@sdnp.org.mw; muzucoffee@malawi.net; Website: www.mzuzucoffee.com
  - Products: Honey, Bees wax.
- JW’s Beekeeping Equipment & Supplies, South Africa
  - Box: 236 Swellendam South Africa 6740,
  - Tel: +27 825142402. Email: jwbye@telkomsa.net, Website: www.jwbees.com
  - Products: Honey, Bees wax.
- KwaZulu Natal Bee Farmers Association, South Africa
  - Box: 524,Pietermaritzburg, South Africa 3200,
  - Tel: +27 84 7748692, Email: ctrmcampbell@gmail.com
  - Products: Honey, Bees wax.
- Western Cape Bee Industry Association, South Africa
  - Box: 27, Elenburg, South Africa, 7607
  - Tel: +27 21 884421. Email: nelsonqb@telkomsa.net
  - Products: Honey, Bees wax.
- Savanah Delights, Zimbabwe
  - Tel. +263-775-625266. Email. selinachitapi@yahoo.com
  - Products: Honey, Bees wax.
- Organo Seven, Zimbabwe.
  - Stand No. 17047, Cartron Rd,Graniteside
  - Tel: +263-04-2933457/8 Mob: +263-773-399389
  - Products: Honey, Bees wax.
- Inmate Trading, Zimbabwe
  - 7 Windermere Drive, Strathaven Harare.
  - Tel: +263-4-332753, Mob +263-772 554 851, Fax:+263-4- 332753.
  - Email: inmate2@webmail.co.za / tendashavi@yahoo.com
  - Products: Honey, Bees wax.
- Atlas Foods Ghana Limited Ghana
  - Tel: +233543 895858; E-mail: info@atlasfoodsghanalimited.com, Web: www.atlasfoodsghanalimited.com
  - Products: Honey, Bees wax.
- Kitgum Women Beekeepers Association (KITWOBEE), Uganda
  - P.O.Box 120, Kitgum-Uganda;
  - Tel: +256 772 575033; Email: kitwobee@yahoo.com
  - Products: Honey, Bees wax.
- Woodlands Honey Products Ltd, Kenya
  - P.O. Box 16029-00100, G.P.O. Nairobi; Tel: 254 020 551729/254 721 408924
  - Products: Honey, Bees wax, Propolis.
## POTENTIAL BEE-PRODUCTS IMPORTERS, PACKERS AND AGENTS OF BEE PRODUCTS FROM ZAMBIA

### Table Honey:

#### 82.5.20. United Kingdom

- **Peter Martin**, Chairman, Honey International Packers Association.
  - 32 West Avenue
  - UB3 2EY Hayes
  - UK
  - Tel: +44(0)2085613393
  - Fax: +44(0)2085692434
  - Email: Honeysci@aol.com

- **British Honey Importers and Packers Association (BHIPA).**
  - Grayling Group,
  - 1 Bedford Avenue,
  - London WC1B 3RA
  - Tel: 020 7255 1100
  - Fax: 020 7255 5454
  - E-mail: info@honeyassociation.com
  - Web: www.honeyassociation.com

- **Artts of Comber Ltd**
  - Belfast Road
  - Belfast
  - N. Ireland
  - Tel: (44 247) 872 260

- **BHC (Honey Suppliers) Ltd**
  - Unit 4, Wyeside Enterprise Park,
  - Llanwelld
  - Builth Wells,
  - Powys LD2 3UA.
  - Tel: 01874 622335
  - Fax: 01874 623141
  - Web: www.bhc Honeysuppliers.co.uk

- **Beck & Scott Ltd.**
  - Unit 1, Ravenhill Business Park,
  - Ravenhill Road,
  - Belfast Bt6 8aw
  - Tel: 02890 734444
  - Fax: 02890 7344440
  - E-mail: enquiries@beckandscott.com

- **Biocuticals Ltd**
  - Nutri House
  - 26 Ziennor Road
  - London SW12 0PS
  - Tel: (44 208) 675 5664
  - Fax: (44 208) 675 2257

- **Bioserum (UK) Ltd**
  - 5 Watford Road, Wembley
  - Middlesex Ha0 3ET
  - Tel: (44 208) 904 1735
  - Fax: (44 208) 908 3340

- **Blands Honey**
  - West End lane
  - Oldbury-on-Severn
  - Nr.Bristol BS12 1PS

- **Braybrooke-Hungarofood Co. Ltd**
  - Standard House
  - 18 CITY ROAD
  - London EC1Y 2AF
  - Tel: (44 207) 588 6163
  - Fax: (44 171) 638 7035

- **Boyne Valley Foods**
  - Platin
  - Drogheda, Co Louth
  - Eire
  - Tel: 00353 419 870300
  - Fax: 00353 419 8700339
  - E-mail: price@boynevalley.com

- **Chivers Hartley Ltd**
  - The Orchard
  - Chivers Way
  - Histon
  - Cambridge
  - CB4 9NR
  - Tel: 01223 233333
  - Fax: 01223 234008
POTENTIAL BEE-PRODUCTS IMPORTERS, PACKERS AND AGENTS OF BEE PRODUCTS FROM ZAMBIA.

- Church Farm Apiaries Ltd
  - 5 Main Street
  - Little Thetford, Ely
  - Cambs. CB6 3HA
  - Tel: (44 223) 538 922

- Cotswold Specialty Foods Ltd
  - Unit 1, Avenue 3, Station Lane
  - Witney
  - Oxon OX8 6HZ
  - Tel: (44 1993) 703 294 / (44 1491) 826 183
  - Fax: (44 1993) 774 227
  - E-mail: laurie@cotswoldhoney.co.uk
  - Web: www.cotswoldhoney.co.uk

- Dart Valley Foods
  - Unit 1, The Calvert Centre
  - Woodmancott, Near Winchester
  - Hampshire SO21 3BN
  - Tel: (44 1256) 397 979
  - Fax: (44 1256) 397 127
  - Web: www.dartvalleyfoods.com

- EBS (Exeter Bee Supplies)
  - Merrivale Road
  - Exeter Road Industrial Estate
  - Okehampton
  - Devon EX20 1UD
  - Tel: (44 1837) 54084
  - Fax: (44 1837) 54085
  - E-mail: Apis_mellifera@msn.com

- Essential Trading Co-op Ltd
  - Unit 3 Lodge Causeway Trading Estate
  - Fishponds
  - Bristol
  - Avon BS16 3JB
  - Tel: +44 (0) 117 958 3550
  - Fax: +44 (0) 117 958 3551
  - Web: www.essential-trading.coop

- Etc International Commodities Ltd
  - 2nd Floor,
  - Cooper House,
  - 316 Regents
  - Park Rd,
  - London N3 2JX,
  - Tel: 0208 371 8800,

- Fein & Co Ltd
  - 10-14 Hewett Street
  - London E/C2a 3RL
  - Tel: 020 7247 1483
  - Fax: 020 7247 1754
  - E-mail: honey@fdl.co.uk
  - Web: www.fdl.co.uk

- Heather Hills Honey Farm
  - Bridge of Cally, Blairgowrie
  - Perthshire PH10 7JG
  - Tel: (44 1250) 886 252
  - Fax: (44 1250) 886 252

- Honey Association
  - 15 Primrose Court
  - Prince Albert Road – London
  - NW8 7LD
  - Tel: 020 7722 7488
  - Fax: 020 7722 2309
  - E-mail: honeyassociation@aol.com

- Hybs Food International Ltd
  - 55 Park Street
  - Bristol BS1 5NT
  - Tel: (44 272) 2229 1406

- Jack Israel
  - JL1 House, Guildford Street
  - Chertsey, Surrey KT16 9ND
  - Tel: (44 932) 569 600
  - Fax: (44 932) 569 582

- Kimpton Brothers Limited
  - 10-14 Hewett Street
  - London
  - EC2A 33RL
  - Tel: 020 7247 2072
  - Fax: 020 7247 2784
  - E-mail: thomas.heck@kimpton.co.uk
  - Web: www.kimpton.co.uk

- Landauer Honey Limited
  - Top Barn
  - Newton
  - Cambridge
  - CB2 5PG
  - Tel: 01223 872444
  - Fax: 01223 872512
  - E-mail: Landauer_AG@compuserve.com
  - Web: www.landauerroup.co.uk

- Mr. J Leng,
  - R.B. Trading Ltd.,
  - Droveway No 2,
  - Bonfire Lane,
  - Horsted Keynes,
  - RH17 7AL,
  - Tel 01825 791 831,
  - Fax 791 553,
  - email ivanleng@supanet.com

- Marlet Natural Foods
  - Part of the Rayner Food Group
  - 10-14 Meadow Close
  - Ise Valley Industrial Estate
  - Wellingborough
  - Northants NN8 4BH
  - Tel: 01933 442022
  - Fax: 01933 440815
  - E-mail: JohnGW@rayner.co.uk
  - E-mail: melb@rayner.co.uk
CHAPTER 6. ANNEX DOCUMENT OF THE ZAMBIAN HONEY ROADMAP.

- Nelson Preserving Co. Ltd
  - Long Lane
  - Aintree
  - Liverpool L9 7BN
  - Tel: (44 51) 525 1606

- Netra Agro (UK) Ltd
  - 4th Floor,
  - Maple House
  - Potters Bar
  - Hertfordshire
  - EN6 5BS
  - Tel: 01707 820 030
  - Fax: 01707 820 029

- Osem Foods Ltd
  - Osem House
  - 102 Brantwood Road
  - London N17 Odx
  - Tel: 020 8885 2999
  - Fax: 020 8885 2959

- Petty, Wood & Co. Ltd
  - P.O. Box 66
  - Livingston Road
  - Andover
  - Hampshire SP10 5LA
  - Tel: (44 1264) 345 500
  - Fax: (44 1264) 332 025
  - E-mail: info@pettywood.co.uk
  - Web: www.pettywood.co.uk

- Premier Foods Ltd
  - The Orchard
  - Chivers Way
  - Histon
  - Cambridge
  - CB4 9NR
  - Tel: 01223 233333
  - Fax: 01223 234008

- QP Services
  - 32 West Avenue
  - Hayes
  - UB3 2EY
  - Tel: 020 8561 3393
  - Fax: 020 8569 2434
  - E-mail: honeysci@aol.com

- Mr. R. Ratcliffe,
  - Mann Speciality Foods,
    - Kere Valley,
    - Cordeman St. Marks,
    - Ballasalla,
    - Isle of Man IM9 3AJ,
    - Tel: 01624 851 971,
    - Fax: 852 418,
    - email raratcliffe.honey@manx.net

- Regina Health Club Ltd
  - 2a Alexandra Grove, Finchley
  - London N12 8NJ
  - Tel: (44 181) 446 6644
  - Fax: (44 181) 445 4551

- Rowse Honey Ltd
  - Moreton Avenue
  - Wallingford
  - Oxon
  - OX10 9DE
  - Tel: 01491 827400
  - Fax: 01491 827434
  - E-mail: rowse.honey@rowsehoney.co.uk
  - Web: www.rowsehoney.co.uk

- SALAMA PHARMACEUTICALS LTD.
  - LOWER CARR MILL HOPES CARR
  - STOCKPORT City, SK1 1YS
  - Tel: (44) 20-7431 4483
  - Fax: (44) 20-7916 762

- Summerbee Products
  - PO Box 213
  - Windsor House
  - Lime Avenue, Torquay
  - Devon TQ1 2ZG
  - Tel: (44 1803) 212 965
  - Fax: (44 1803) 212 965
  - E-mail: info@summerbee.co.uk
  - Web: www.summerbee.co.uk

- Traidcraft Plc.
  - Kingsway,
  - Team Valley Trading Estate
  - Gateshead NE11 0NE
  - Tel: 0191 491 0591
  - Fax: 0191 482 2690
  - E-mail: enquiries@traidcraft.co.uk
  - Web: www.traidcraft.co.uk

- TRANSASIA HOLDINGS
  - BOURNE ENTERPRISE CENTRE
  - BOROUGH GREEN City, KENT
  - Tel: (44) 1923-824 053
  - Fax: (44) 1923-821 92
  - E-mail: transasia@easynet.co.uk

- West Country Honey Farms Ltd
  - Braeside
  - West Horrington
  - Wells
  - Somerset BA5 3ED
  - Tel: (44 749) 72440
235

82.5.21. Germany

- Adolf Determan
  - 1 Auf dem Sande
  - Freihafen
  - D-20457 Hamburg 11
  - Tel: +49 (40) 36 50 41 / 42
  - Fax: +49 (40) 37 39 77

- Albert Claussen Honigversand
  - Hof Ratzebek 1
  - 23858 Ratzebek
  - Deutschland
  - Tel: 04533/8031
  - Fax: 04533/3501

- Albert Johann Meyer GmbH & Co.KG
  - 56 Slevogtstrasse
  - Postfach 103247
  - D-28209 Bremen 1
  - Tel: (49 421) 342 911

- Alfred L. Wolff GmbH
  - Grosse Bäckerstrasse 13
  - D-20095 Hamburg
  - Tel: (49 40) 3767 6100
  - Fax: (49 40) 3767 6100
  - E-mail: info@alwolff.de
  - Web: www.alwolff.de

- Allwex Food Trading GmbH
  - Auf dem Sande 1
  - D-20457 Hamburg
  - Tel: (49 40) 362 712
  - Fax: (49 40) 372 272
  - E-mail: info@allwex.de
  - Web: www.allwex.de

- Bahnsen & Prigge
  - Molkenstäh 5
  - D-21279 Hollenstedt
  - Tel: (49 4165) 81 021
  - Fax: (49 4165) 80 993
  - E-Mail: bahnsen.prigge@t-online.de
  - Web: www.bahnsen-prigge.de

- Bärenfänger Ditmar Schneider
  - Blaubeerstr. 19
  - D-89077 Ulm
  - Tel: (0731) 35520

- Bernard Holtrup GmbH & Co. KG
  - 16 Merkureck
  - Postfach 3611
  - D-48165 Münster
  - Tel: (49 2501) 6660

- Bodo Meraner
  - Saseler Chaussee 56
  - D-22391 Hamburg 65
  - Tel: (040)-6401041
  - Fax: (040)-6407171

- Breitsamer & Ulrich GmbH & Co. KG
  - Berger-Kreuz-Strasse 28
  - D-81735 München
  - Tel: +49 (0) 89 / 45 05 62-0
  - Fax: +49 (0) 89 / 45 05 62-20
  - E-mail: info@breitsamer.de
  - Web: www.breitsamer-ulrich.de

- BURMESTER PHARMATRADE GMBH
  - MAIMOORWEG 52
  - D-22179 HAMBURG
  - Tel: (49) 40-641 40 77
  - Fax: (49) 40-642 75 8

- CETIPIER
  - NORDSTRASSE 17
  - D-58135 HAGEN
  - Tel: (49)(2331) 407 735
  - Fax: (49)(2331) 406 9

- D0473TEN REFORM
  - AM SALGENHOLZ 2
  - D-22769 BRAUNSCHWEING
  - Tel: (49) 5307-920 00
  - Fax: (49) 5307-920 04

- Dreyer Beinenhonig
  - Rheinhoid Dreyer
  - 6 Auf der Mausch
  - D-3110 Uelzen
  - Tel: (49 581) 90 800
  - Fax: (49 581) 18 017

- E.A. Springer GmbH & Co.
  - Steindamm 87
  - D-20099 Hamburg 1
  - Tel: +49 (40) 241 366
  - Fax: +49 (40) 249 430

- Eden-Waren GmbH
  - Wasastraasse 10
  - D-29229 Celle
  - Tel: (49 5141) 06 51 41 / 96474
  - Fax: (49 5141) 964 874

- F. Gobber & Co.
  - 40 Bahnhofstr(a)e
  - D-27324 Eystrup
  - Tel: (49 4254) 841 113

- Fauser Vitaquellwerk KG
  - 60 Pinnerberg Chaussee
  - D-22523 Hamburg
  - Tel: 49 40 57202 0
  - Fax: 49 40 57202 200
  - E-mail: info@vitaquell.de
  - Web: www.vitaquell.de
CHAPTER 6. ANNEX DOCUMENT OF THE ZAMBIAN HONEY ROADMAP.

- Feinschmeckerei Fritz Gareis
  - Unterheising 17 A
  - D-93092 Barbing
  - Tel: + 49 (0) 9401 / 911902
  - Fax: + 49 (0) 9401 / 911906
  - Web: www.gareis.de
  - E-mail: CanSalmGareis@t-online.de

- Fine Food Feinkost GmbH & Co. KG
  - Geschäftsführer Tamme Storteboom
  - Hollefeldstraße 14
  - D-48282 Emsdetten
  - Tel: +49 (0) 2572 / 96049-6
  - Fax: +49 (0) 2572 / 96049-89
  - E-mail: info@fine-food-feinkost.de
  - Web: www.fine-food-feinkost.de

- Fine Food Feinkost Mühlenberg
  - GmbH & Co. KG
  - Südring 3
  - D-19243 Wittenburg
  - Tel: +49 (0) 388 52 / 5 2376
  - Fax: +49 (0) 388 52 / 5 3008
  - E-mail: fine-food-wittenburg@t-online.de

- Fürsten-Reform
  - Dr. med. Hans Plümer Nacht. Gm & Co.KG
  - 2 Am Salgenholz
  - D-38110 Braunschweig-Wenden
  - Tel: +49 (0)5307 / 9200 - 0
  - Fax: +49 (0)5307 / 9200 - 42
  - Web: www.biophar.de
  - Hanseatische Nahrungsmittel-Fabrik
  - Hammerer Weg 23
  - D 22941 Bargteheide
  - Tel: +49 4532-4090-2
  - Fax: +49 4532-4092-1

- Hans Sommer GmbH & CO. KG
  - Kohlhökererstrasse 4
  - D-28203 Bremen
  - Tel: (0421)-792590
  - Fax: (0421)-7925939

- Helmut N. Möller
  - Kurt-Fischer-Str. 47
  - D-22926 Ahrensburg
  - Tel: (04102)-45031
  - Fax: (04102)-45034

- HG Sanders
  - 22 Birkstrasse
  - D-22041 Hamburg-Wandsbek
  - Tel: (49 4322) 2622

- HONIG-MEHLER
  - Hauptstrasse 4a
  - D-54552 Neichen
  - Phone: + 49-2692-9205-0
  - Fax: + 49-2692-9205-50
  - e-mail: info@honig-mehler.de

- Honig-Müngersdorff GmbH
  - An St.Agatha 37
  - D-50667 Köln
  - Tel: 0221-925905-0
  - Fax: 0221-925905-20
  - E-mail: honig-muengersdorff@t-online.de
  - Web: www.honig-muengersdorff.de

- Horst Bode und Co. Import-Export
  - Havighorster Weg 6
  - D-21031 Hamburg
  - Tel: (040)-7393320
  - Fax: (040)-7397035

- Horst E. Hansen GmbH & Co.
  - Rathausstrasse 12
  - D-20095 Hamburg
  - Tel: (49 40) 324 142
  - Fax: (49 40) 335 046
  - E-mail: info@bodenaturkost.de
  - Web: www.bodenaturkost.de

- Inter-Planing GmbH
  - Kirchsteigstrasse 10
  - D-86476 Neuburg-Langensalza
  - Tel: + 49 8283 9 98 80
  - Fax: + 49 8283 99 88 25

- Jbeesn & Jessen GmbH & Co. KG
  - Hanseatic Trade Center
  - Kehrwieder 11
  - 20457 Hamburg
  - Tel: (49) 40-30 14 01
  - Fax: (49) 40-32 70 91
  - E-mail: jj@jbeesn-jessen.de
  - Web: www.Jbeesn-Jessen.de

- Joh. Gottfr. Schütte & Co Honig GmbH
  - 16-17 Bornstrasse
  - Postfach 101707
  - D-28195 Bremen
  - Tel: (49 421) 3042 260
  - Fax: (49 421) 3042 268

- Karl Dieter Soehlemann
  - Ahornstr. 6
  - D-85521 Ottobrun
  - Tel: (089)-6098936
  - Fax: (089)-6099602

- Karl Treskow
  - Joh. Hinr. Wicherstr. 14
  - D-26180 Rastede
  - Tel: (04402)-83746
  - Fax: (04402)-83746

- Lebkuchen-Schmidt GmbH & Co.
  - Zollhausstr. 30
  - D-90469 Nürnberg
  - Tel: + 49 (0) 911 - 89 66 0
  - Fax: + 49 (0) 911 - 89 66 222
  - E-mail: info@lebkuchen-schmidt.com
  - Web: www.lebkuchen-schmidt.com
POTENTIAL BEE-PRODUCTS IMPORTERS, PACKERS AND AGENTS OF BEE PRODUCTS FROM ZAMBIA.

- Mietens & Co. Realitäten-Service
  - Spaldingstrasse 130 A
  - D-20097 Hamburg
  - Tel: + 49 (0) 40 / 231245
  - Fax: + 49 (0) 40 / 231269
  - Web: www.canada-shop-mietens.de

- MONIMPEx GMBH
  - Saarbröckener Str. 20
  - 28211 Bremen
  - Tel: 04 21 / 43 03 623
  - Fax: 04 21 / 43 03 624
  - E-Mail: monimpex-bremen@gmx.de

- Onda Höfferle
  - Curschmannstrasse 5
  - D-20251 Hamburg
  - Tel: 040 - 47 33 80
  - Fax: 040 - 483056
  - E-mail: hoefferle@hoefferle.de

- Reforma Werk- Andreas Stellisch GmbH
  - Stellauer Hauptstr. 8
  - D-22885 Barsbüttel
  - Tel: + 49 (0) 40 / 675795-0
  - Fax: + 49 (0) 40 / 675795-20
  - E-Mail: Reforma@t-online.de

- Robert Krämer & Co.
  - Contrescarpe 58 - 61
  - D-28195 Bremen
  - Tel: (0421)-3398277
  - Fax: (0421)-320064

- Rothbuch KG
  - Dr. Gerhard Todenhöfer
  - 10 Düsseldorfer Strasse
  - D-Postfach 2307
  - 72072 Tübingen
  - Tel: (49 7071) 32 065

- Rüdiger Foldt
  - Lange Reihe 97
  - D-20099 Hamburg
  - Tel: (040) 280 3423
  - Fax: (040) 24 70 40

- Rudolf Klein OHG
  - Eichendorfer Str. 2
  - D-94424 Arnstorf
  - Tel: (49 8723) 1258

- Salus Haus
  - Bahnhofstr. 24
  - D-83052 Bruckmühl
  - Tel: (08062) 9010
  - Fax: (08062)-901321

- Schumacher GmbH
  - Halsersatte 1
  - D-21465 Reinbek
  - Tel: (49 40) 722 3350
  - Fax: (49 40) 722 9254

- Sigisfredo Vyhmeister
  - Im Nordfeld 30
  - D-29336 Nienhagen
  - Tel: (05144) 2077
  - Fax: (05144) 2070
  - E-mail: vyhmeister@sanova-honig.de
  - Web: www.vyhmeister.de

- S.M.P.
  - NEUSSER STR. 20
  - D-40667 MEERBUSCH
  - Tel: (49) 21-328 672
  - Fax: (49) 21-327 2579

- Sonnentau Gebr. Winkelmann KG
  - Bahnhofstrasse 15
  - D-27374 Visselhövede
  - Tel: (49 4262) 93990
  - Fax: (49 4262) 939 925

- Sonnland Nahrungsmittel GmbH & Co. KG
  - 28 Berger-Kreuz-strasse
  - D-81735 München

- Standard Ubersee Handels GmbH
  - Rothenbaumchaussee 3
  - D-20457 Hamburg
  - Tel: (49 40) 365 041 or (040)-441100
  - Fax: (49 40) 379 977 or (040)-4411035

- SUN FOOD GMBH
  - MARKTSTRASSE 10
  - D-50968 KOELN
  - Tel: (49) 221-348 13 57
  - Fax: (49) 221-385 04

- Theodor Asmus
  - Holstenhofstieg 7
  - D-22041 Hamburg
  - Tel: (040)-6562025
  - Fax: (040)-6562022

- Tuchel & Sohn GmbH Buying Department
  - Hermann-Buck-Weg 6
  - D-22309 Hamburg
  - Tel: + 49 (0) 40 / 639007-0
  - Fax: + 49 (0) 40 / 639007-77
  - E-mail: Tuchel@tuchel-com.de
  - Web: tuchel-com.de

- Werner A.Bock KG
  - Kuhredder 55-61
  - D-22397 Hamburg
  - Tel: (040)-60840-46 / 47 / 48
  - Fax: (040)-6083378

- Zwecker und Co.
  - Elisenstr. 9
  - D-22087 Hamburg
  - Tel: (040)-257383
  - Fax: (040)-2508172
82.5.22. Austria

- Adolf Darbo Ag
  - Dornau 18
  - A-6135 Stans
  - Tel: 0043 5242 695 10
  - Fax: 0043 5242 695 133
  - E-mail: robert.testor@darbo.at
  - E-mail: klaus@darbo.at
  - Web: www.darbo.at

- Bergland Honig Agsdorf 60
  - A-9560 Feldkirchen
  - Tel: 0043 4277 823 50
  - Fax: 0043 4277 823 54
  - E-mail: bergland.honig@aon.at

- Brüder Unterweger
  - Obstveredelung Ohg
  - Thal-Aue 20
  - A-9911 Thal Assling
  - Tel: 0043 4855 81 110
  - Fax: 0043 4855 81 11 13
  - E-mail: office@uwe-tfk.at

- Honigmayr Handelsgesmbh Gewerbepark 1
  - A-5451 Tenneck
  - Tel: 0043 6468 52170
  - Fax: 0043 6468 7650
  - E-mail: h.gratschmaier@honigmayr.at

- S. Spitz Gesmbh Grmundner Str. 27
  - A-4800 Attnang-Puchheim
  - Tel: 0043 732 738 107
  - E-mail: aman@spitz.at

82.5.23. Brazil

- ATAÍDES BARCELOS MAICA
  - R ANTONIO KOLLER,76
  - PORTAO
  - Tel: (051) 5621126 / 5621901

- LUA DE MEL IND. DE APITERÁPICOS NATURAIS LTDA-ME
  - AV. RACHEL WOLFRID,65
  - PORTO ALEGRE
  - Tel: (051) 3384345 / 3384345

- MARCO ANTONIO CREPSO HOFMEISTER
  - R MARCÍLIO DIAS, 1934
  - PELOTAS
  - Tel: (0532) 291340

- PRODUTOS ALIMENTÍCIOS CORSETTI S/A IND. E COM.
  - R OS 18 DO FORTE, 2124
  - CAIXAS DO SUL
  - Tel: (054) 2232377 / 2234057

- TUTI GUSTI E COM DE ALIMENTOS LTDA.
  - R GEN. DALTO FILHO, 1203.
  - CAMPINAS DO SUL
  - Tel: (054) 3661253

82.5.24. Portugal

- A. COLMEIA DO MINHO LDA.
  - QUINTA DA CUCENA-PAIO PIRES
  - 2840-093 Aldeia de Paio Pires
  - P-2840 SEIXAL
  - Tel: 21 2779020
  - Fax: 21 2279025
  - E-mail: colmeia@mail.telepac.pt

- MOITA COMERCIO INT L. LTDA.
  - APDO. 8
  - RUA DE REGA, R./C.
  - P-2080 ALMEIRIM
  - Tel: (351) 243-570 990
  - Fax: (351) 243-570 99

82.5.25. Netherlands

- Bijenstand Firma HT van dam & Zn.
  - PW Janssenweg 35-37
  - NL-8411 XR Jubbega
  - Tel: (31 516) 51839
  - Fax: (31 516) 51839

- De Traay B.V.
  - Plastinastraat 50
  - NL-8211 v
  - Tel: (31 320) 282 928
  - Fax: (31 320) 282 028

- MAXMEDAN EUROPA B.V.
  - FRANKLIN ROOSEVELTPLAATS 12/12
  - NL-2060 AMBERES
  - Tel: (32) 3-227 42 67
  - Fax: (32) 3-227 42 66

- MC Foods
  - Houtlaan 21 P.O. box 23375
  - NL-3001 KJ Rotterdam
  - Tel: (31 10) 213 0488
  - Fax: (31 10) 411 6545

- Plystra B.V.
  - Jan Tomssraat 2B
  - P.O. box 2655
  - NL-2940 AD Lekkerkerk
  - Tel: (31 1805) 1377

- Rit BV, De
  - Retzesysraat 4
  - NL-4011 JP Zoelen
  - Tel: (31 344) 681 65
  - Fax: (31 344) 681 404
UNIDEX B.V.
- POSTBUS 301
- NL-2180 AH HILLEGOM
- Tel: (31) 252-421 280
- Fax: (31) 252-421 213
- E-mail: sales@unidexholland.com
- Web: www.unidex.nl

WATERINGSEWEG 1
- NL-2611 XT DELFT
- Tel: (31) 15-279 22 80
- Fax: (31) 15-275 25 67

82.5.26. Italy

Antonio di Palo SNC
- Via Beato Franco Cristiano 4
- I-80144 Napoli
- Tel: (39 81) 736 5979

Apicolatura Iacovaneli
- Impresa individuale
- Contrada Montemarcone 40/2
- I-66041 Atessa (CH)
- Tel: (39 872) 897 793
- Fax: (39 872) 895 084

Apicoltura Piana Srl
- Via Piana 1450
- I-40024 Castel S. Pietrot (BO)
- Tel: (39 51) 941 205
- Fax: (39 51) 944 652

CROITA S.R.L.
- VIA S. DAMIANI 36
- I-65039 S. BENEDETTO DEL TRTO.
- Tel: (39) 0735-78 50 00
- Fax: (39) 0735-78 18

Dondi Lorenzo SpA
- Via Buoso de Dovara 74
- I-26100 Cremona
- Tel: (39 372) 431251

GALIA FOODS S.L.
- PLAZA CONSTITUCION 5-10.o
- C.P.L. IMPERIAL 2 S.P.A.
- VIA TIBURTINA VALERIA 475
- I-65100 PESCARA
- Tel: (39) 085-43 041
- Fax: (39) 085-50 941

Germinal Italia Srl
- Via Guido Rossa 51
- I-25060 Cellatica
- Brescia
- Tel: 030-2521666
- Fax: 030-2522417

Grosserbe Srl
- Via Viadagola 14
- I-40057 Granaro1o Dell’Emilia
- Bologna
- Tel: (39 51) 767 757
- Fax: (39 51) 767 772

LEONARDI DISTRIBUZIONE S.R.L.
- VIA MAZZINI, 96
- I-55045 PIETRASANTA-LUCCA
- Tel: (39) 0584-716 46
- Fax: (39) 0584-716 46

LUCIANO MESCHIA
- VIA A. SIST., 36
- I-20120 VARESE
- Tel: (39) 0331-957 478
- Fax: (39) 0331-957 47

LUIGI CAVALLOTTO
- STRADA ALFIANO, 14
- I-14036 MONCALVO
- Tel: (39) 0141-916 059
- Fax: (39) 0141-507 58

Natura Holding Italiana SpA
- Via Tirreno 129
- I-10134 Torino
- Tel: (39 11) 965 2384

Pernigotti Stefano e Figlio SpA
- Viale della Rimembranza
- I-15067 Novi Ligure (AL)
- Tel: (39 143) 76631
- Tlx: 211371 torron i

Pili Gianni
- Via Vittorio Emanuele 40
- I-08039 Tonara
- Tel: 0784/63445
- Fax: 0784/63191
- Web: www.torronpili.it

Plasmon Dietetici Alimentari SpA
- Via Caldolini 26
- I-20137 Milano
- Tel: 02/62061
- Fax: 02/55181935
- E-mail: info@plasmon.it
- Web: www.plasmon.it/home.htm

Porrini Miele Srl
- Via Vignetta 23
- I-21020 Brebbia (VA)
- Tel: (39 332) 770 472
- Fax: (39 332) 773 341

Secondo Vergani SpA
- Via Tacito 7
- I-26100 Cremona
- Tel: 0372/434331
- Fax: 0372/434229
CHAPTER 6. ANNEX DOCUMENT OF THE ZAMBIA HONEY ROADMAP

- Sperlari Fratelli SpA
  - Via Milano 16
  - I-26100 Cremona
  - Tel: (39 372) 410 541
- SOLIME S.R.L.
  - VIA C.ALBERTO DALLA CHIESA,10
  - I-42025 CAVRIAGO (RE)
  - Tel: (39) 0522-37 15 50/6
  - Fax: (39) 0522-57 59 96

82.5.27. Belgium

- Meli
  - Handelsstraat 13
  - B-8630 Veurne
  - Tel: (32 58) 310 310
  - Fax: (32 58) 310.311
  - E-Mail: melihoning@pi.be

82.5.28. France

- ALBERT MENES S.A.
  - 16, BLVD. JEAN JAURES
  - F-92113 CLICHY
  - Tel: +33 1 47 15 53 00
  - Fax: +33 1 47 37 21 08
- API DORSMAN S.A.R.L.
  - Route Salins
  - F-39110 LACHAPELLE SUR FURIEUSE
  - Tel: +33 3 84 73 81 62
  - Fax: +33 3 84 37 81 99
- Bernard Michaud S.A.
  - Domaine St Georges - BP 27
  - Chemin de Berdoulou
  - F-64290 Gan
  - Tel: +33 5 59 21 91 00
  - Fax: +33 5 59 21 66 60
  - Web: www.lunedemiel.fr
- BOUCHARDEAU
  - 309, RUE DE CRUSSOL - GUILHERAND
  - F-07000 GRANGES LES VALENCE
  - Tel: +33 4 75.44.67.29
  - Fax: +33 4 75.40.88.38
- COMPAGNIE des MIELS du JURA
  - R3, rue Mirode
  - F-39600 LES ARSURES
  - Tel: +33 3 84 66 02 95
  - Fax: +33 3 84 66 07 92
- COMPAGNIE APICOLE
  - RUE DE MAISON ROUGE - PB 345
  - F-45303 - PITHIVIERS EN GATINAIS
  - Tel: +33 2.38.30.03.80
  - Fax: +33 2.38.30.28.58
  - www.compagnie-apicole.com
- Coredisse
  - 11, rue Tronchet
  - F-75008 Paris
  - Tel: +33 1 47 42 77 16
- Cosmétochem France
  - BP 125
  - F-06130 Grasse Cedex
  - Tel: +33 4 93 36 63 26
  - Fax: +33 4 93 36 95 85
  - E-mail: cosmetochem.france@wanadoo.fr
- Dardennes
  - BP 3
  - F-33770 Salles
  - Tel: +33 5 56 80 40 88
- Diététique et Santé
  - BP 106
  - F-31250 Revel
  - Tel: +33 5 62 18 73 57
  - Fax: +33 5 61 83 15 25
- LABO MELVITACOSM
  - QUARTIER MARQUENOUX
  - F-07150 LAGORGE
  - Tel: +33 4.75.37.78.82
  - Fax: +33 4.75.37.78.49
- La Générale Des Miels
  - ZI La Bemillière
  - 45220 Château-Renard - France
  - Direct Line: +33 (0)2 38 28 53 13
  - GSM: +33 (0)6 84 77 11 10
  - Fax: +33 (0)2 38 28 53 21
  - Email: a.guilloton@wanadoo.fr
- La ruche Roannaise
  - Ets. Besacier
  - 6-B, rue Jean Mermoz
  - F-42300 Roanne
  - Tel: +33 4 77 67 17 33
  - Fax: +33 4 77.70.18.61
- Mellitag
  - Tour Mellita
  - 215 rue La Fontaine
  - F-94120 Fontenay-Sous-Bois
- Miel Villeneuve
  - SCDMV
  - BP 307
  - 45203 MONTARGIS cedex
  - Tel: +33 2.38.85.31.52
  - Fax: +33 2.38.85.37.88
  - E-mail: SCDMV@mielsvilleneuve.com
  - Web: www.mielsvilleneuve.fr
- NATURALIM FRANCE MIEL
  - BP 5
  - F-39330 - MOUCHARD
  - Tel: +33 3.84.37.80.20
  - Fax: +33 3.84.37.88.95
  - E-mail: naturalim-france-miel@wanadoo.fr
POTENTIAL BEE-PRODUCTS IMPORTERS, PACKERS AND AGENTS OF BEE PRODUCTS FROM ZAMBIA.

- Perronneau-Cronn Gabriel
  - Production Apicole
  - 5, rue Larrey
  - F-21004 Dijon
  - Tel: +33 3 80 41 01 86
  - Fax: +33 3 80 45 23 26

- SCRD S.C. Raoul Duval & Cie
  - 7, pl. Léon Meyer
  - B.P. 1414
  - F-76067 Le Havre
  - Tel: +33 2 35 19 66 20
  - Fax: +33 2 35 21 55 08

- Sojitz Europe plc - Paris Branch Office
  - Foodstuffs Department
  - 38 Av. Hoche
  - 75008 Paris - France
  - Phone: +33 (0)1 58 56 17 00
  - Fax: +33 (0)1 58 56 17 10
  - Nom du contact: Sébastien POU
  - Assistant: Jean-françois CHALOPIN

AUTRES ACHETEURS POTENTIELS (ALIMENTATION EN GROS):

- AU BON MARCHE
  - 5, RUE DE BABYLONE
  - 75007 PARIS
  - Tel: +33 1 44 39 80 00
  - Fax: +33 1 44 39 80 50

- AUCHAN
  - Centrale d'Achats
  - 200, rue de la Recherche
  - 59650 VILLENEUVE D'ASCQ
  - Tel.: +33 3 28 37 67 00
  - Fax: +33 3 20 67 55 20
  - Web: www.auchan.fr

- BENSOUSSAN
  - 14, RUE MARIUS CHARDON
  - 69310 PIERRE BENITE
  - Tel: +33 4 72-39-01-61
  - Fax: +33 4 72-39-01-30

- CARREFOUR FRANCE
  - 1, RUE JEAN MERMoz
  - ZAE Saint Guénault
  - 91002 EVRY CEDEX
  - Tel: +33 3 60.91.37.37
  - Fax: +33 3 60.71.86.57
  - Web: www.carrefour.fr

- CASERTA SALVI
  - AV. LAMARTINE - Z.A. DE L'AVAÇON
  - 13170 LES PENNES MIRABEAU
  - Tel: +33 4 42-02-50-55
  - Fax: +33 4 42-02-00-55

- CASINO
  - 20/24, RUE DE LA MONTAT
  - B.P. 306
  - 42006 SAINT-ETIENNE CEDEX 2
  - Tel: +33 4 77.45.31.31
  - Fax: +33 4 77.45.39.30
  - Web: www.groupe-casino.fr

- CEPASCO
  - 25, AV. DE COULIN
  - 13420 GEMENOS
  - Tel: +33 4 42-32-23-23
  - Fax: +33 4 42-32-23-87
  - E-mail: cepasco@cepasco.com spigol@spigol.com
  - Web: www.spigol.com

- HAUSSMANN
  - CNF157, BLD.
  - 75382 PARIS CEDEX 08
  - Tel: +33 1 42-99-72-72
  - Fax: +33 1 45-63-58-09

- COMPAGNIE IPC
  - 15, BLD. ROBERT SCHUMAN B.P. 88
  - 13472 MARSEILLE REPUBLIQUE CEDEX
  - Tel: +33 4 91-91-76-61
  - Fax: +33 4 91-56-13-33

- COMPTOIR FRANCE-ORIENT
  - 4, RUE DE NORMANDIE
  - 93120 LA CORNEUVE
  - Tel: +33 2 48-36-92-08
  - Fax: +33 2 48-36-17-55

- DISCO NORMANDIE
  - 3, RUE DE LA MARNE - B.P. 102
  - 76410 SAINT AUBAIN LES ELBEUF CEDEX
  - Tel: +33 2-40-34-98-20
  - Fax: +33 2-35-78-01-81

- DISTRIBUTOR
  - 217, CHEMIN DU GRAND REVOYET
  - 69561 SAINT GENIS LAVAU CEDEX
  - Tel: +33 4 72-39-97-97
  - Fax: +33 4 72-39-94-56

- FAUCHON S.A.
  - 26, PLACE DE LA MADELAINE
  - F-75008 PARIS
  - Tel: +33 1.47.42.60.11
  - Fax: +33 1.47.42.83.75

- GENERAL STOCK
  - 118, AV VICTOR HUGO
  - 93300 AUBERVILLIERS
  - Tel: +33 2-48-39-15-00
  - Fax: +33 2-48-39-30-64

- HELIX S.A.
  - 8, RUE DU SIX JUILLET
  - 21300 CHENOIDE
  - Tel: +33 3-80-52-54-23
  - Fax: +33 3-80-52-59-97
CHAPTER 6. ANNEX DOCUMENT OF THE ZAMBIAN HONEY ROADMAP

HERARCTHIAN ET FILS
- 50, BLD. DU CAPITAINE GEZE
- 13014 MARSEILLE
- Tel: +33 4-91-67-45-62
- Fax: +33 4-91-63-68-44

LECLERC
- 52, RUE CAMILLE DE MOULIN
- 92451 ISSY-LES-MOULINAUX
- Tel: +33 5.46.62.52.00
- Fax: +33 5.46.62.96.00

METRO FRANCE
- 3, RUE DES GRANDS PRES
- Z.A. DU PETIT NANTERRE
- 92024 NANTERRE CEDEX
- Tel: +33 2.47.86.63.63
- Fax: +33 2.47.84.87.14

MOUETTE S.A.
- 6, AV. LAVOISIER B.P. 34
- 13014 MARSEILLE
- Tel: +33 4-91-67-45-62
- Fax: +33 4-91-63-68-44

PROTINA
- 12, RUE DE L’ELECTRICITE
- 67800 BISSCHHEIM
- Tel: +33 3-88-62-30-56
- Fax: +33 3-88-62-64-67

SANAC
- 12, PLACE RICHARD WADDINGTON B.P. 65
- 76102 DARNETAL
- Tel: +33 2-35-08-23-08
- Fax: +33 2-35-08-05-81

SAPAC PRISONIC
- 6, RUE DE TROPIQUE
- 95438 RUNGIS CEDEX
- Tel: +33 1.45.60.36.90
- Fax: +33 1.45.60.93.66
- DIRECCION EN PARIS
- 102, RUE DE PROVENCE
- 75009 PARIS
- Tel: +33 1.42.82.50.00
- Fax: +33 1.42.82.41.88

SCA (SOCIETE CENTRAL D’ACHATS)
- 39, RUE PAUL CEZANNE
- B.P. 191-08
- 75361 PARIS CEDEX 08
- Tel: +33 1.40.75.15.15
- Fax: +33 1.40.75.11.16

SODIALIM RESTAURATION
- Z.I. SAINT APOLLINAIRE
- 20, RUE DE LA BROT BP 690
- 21018 DIJON CEDEX
- Tel: +33 3.80-72-55-72
- Fax: +33 3.80-72-55-99

VILLETTE DISTRIBUTION
- 22, AV CORENTIN-CARIOU
- 75019 PARIS
- Tel: +33 1-40-34-98-20
- Fax: +33 1-40-38-33-55

82.5.29. Greece

I. MAUROMITIS BROS. & CO.
- LIGIA
- GR-30300 NAFPACTOS
- Tel: (30) 6-34 28 316 or (30) 6-34 24910
- Fax: (30) 6-34 24 910

Elgeka S.A.
- Olympou 32
- 57009 Kalohori-Thessaloniki
- Tel: (30 31) 752 602
- Fax: (30 31) 752 335

Melissokomiki (Greek Beekeeper’s Association)
- 57 Makrigianni Street
- 14343 Athina
- Tel: (30 1) 251 4412/13
- Fax: (30 1) 252 1322

82.5.30. Denmark

Svanso Food A/S
- Stranvejen 1, 5800 Nyborg
- Tel: +45 6531 4100
- Fax: +45 6530 1041

CARDIA A/S
- Egestubben 21 - 23
- 5270 - Odense N
- Tel: +45 53 58 23 36
- Fax: +45 53 58 27 52

VIKING HONNING
- Møllegårdsvej 1 A
- 4262 - Sandved
- Tel: +45 53 75 65 05
- Fax: +45 53 75 61 50

N.A.F. INTERNATIONAL
- Vester Farimagsgade 1
- 1606 - Copenhagen V
- Tel: +45 33 15 15 33
- Fax: +45 33 15 58 61

DAGROFA A/S
- Gammelager 13
- 2605 - Brøndby
- Tel: +45 42 45 14 14
- Fax: +45 42 45 40 75

HEDEGÅRD & CHRISTENSENS Eftf. A/S
- Amalienborgvej 57 - 61
- 9400 - Nørresundby
- Tel: +45 98 17 17 55
- Fax: +45 98 19 27 75
82.5.31. Sweden

- Luce Produkter AB
  - Lilla Björn 4-B
  - 415 16 Gothenburg
  - Tel: (46 31) 465 400
  - Fax: (46 31) 465 444

- M.S. Food
  - Lina Sandels Plan 30 BV
  - 129 53 Hagersten
  - Tel: (46 8) 795 6505
  - Tel: (46 8) 795 6505

- Swedish Universal Trading AB
  - Staffansvägen 6-8
  - 191 78 Sollentuna
  - Fax: (46 8) 754 3490
  - Fax: (46 8) 754 3491

82.5.32. Ireland

- Boyne Valley Foods Ltd
  - Mell
  - Irl-Dorgheda, County Louth
  - Tel: (353 41) 37624
  - Fax: (353 41) 32217

82.5.33. Spain

- Apisol S.A.
  - Av. Blasco Ibáñez, 24
  - E-46193 Monroy (Valencia)
  - Tel: +34 96 255 5262
  - Fax: +34 96 255 6232

- DESTILERIA LA VALLESEANA S.A.
  - MENDEZ NUNEZ 14 1-1 DTO.COMER.
  - E-08003 BARCELONA
  - Tel: (34) 93-268 17 33
  - Fax: (34) 93-268 44 1

- Internacional Productos Naturales, S.A.
  - Plaza Joaquin Sanchez
  - 1 P.I. Fesa
  - E-30010 Murcia
  - Tel: 34-968-351304
  - Fax: 34-968-350266

- Hermanos Hurtado, S.A.
  - Los Quiñones, S/N
  - E-09613 Burgos
  - Tel: 34-947-384028
  - Fax: 34-947-384142

- KOBÉR-INTEXIM, S.L.
  - ESTRELLA POLAR, 14
  - E-28007 MADRID
  - Tel: (34) 91-574 88 87
  - Fax: (34) 91-504 69 4

- La Moderna Apicultura
  - Dr. Esquerdo, 47
  - E-28028 Madrid
  - Tel: +34 91 574 5240
  - Fax: +34 91 574 4181

- MATERIAS QUIMICAS S.A.
  - C./TEMPLE, 18
  - E-08038 BARCELONA
  - Tel: (34) 93-223 29 94
  - Fax: (34) 93-223 14 3

- Miel Quilmes, S.L.
  - Guerrilero Romeu, 5
  - E-46930 Quart De Poblet (Valencia)
  - Tel: 34-96-1546274
  - Fax: 34-96-154274

- HofH, S.A.
  - Pol. Ind. “El Mijares” C/Industria, 1
  - E-12550 Almazora (Castellón)
  - Tel: +34 964 50 32 30
  - Fax: +34 964 56 35 22

- MOLINA/SEGURA
  - E-30500 MURCIA
  - Tel: (34) 968-64 38 10
  - Fax: (34) 968-64 42 9
  - E-mail: juanpe.galia@nexo.es
  - Web: www.galiafoods.com

- NATURAL APICOLA, S.L.
  - AV. BLASCO IBANEZ, 55
  - MONSERRAT
  - E-46192 VALENCIA
  - Tel: (34) 96-299 94 14
  - Fax: (34) 96-299 83 2

- Nutrexpa, S.A
  - Lepanto, 410 - 414
  - E- 08025 Barcelona
  - Tel: 34-93-2900342
  - Fax: 34-93-2900342

- PRODUCTOS LA GORRA, S.A.
  - C/MATIAS MONTERO, 10
  - PLASENCIA
  - E-10600 CACERES
  - Tel: (34) 924-77 22 77
  - Fax: (34) 924-76 09 1

- SELSPAN S.C.
  - CALLE PINCARRASCO, 158-B
  - EL PINILLO
  - TORREMOLINOS (MAL.)
  - Tel: (34) 95-238 95 32
  - Fax: (34) 95-238 95 3

- TURRONES REY
  - PILAR 104
  - E-06420 CASTUENA
  - Tel: (34) 924-77 22 77
  - Fax: (34) 924-76 09 1
82.5.34. Singapore

- Health Foods & Natural Remedies
  - 3 Coleman Street, #01-12
  - Peninsula Shopping Centre
  - Singapore 179804
  - Tel: +65 337-5369
  - Fax: +65 337-068

- Duncan Baron Zenith (FE) Pte Ltd
  - 47 Jalan Pemimpin, #05-10
  - Sin Cheong Building
  - Singapore 2057
  - Tel: +65 258-1871
  - Fax: +65 259-7476

- Ad-East Enterprises Pte Ltd
  - 2 Leng Kee Road
  - Singapore 808446
  - Tel: +65 481-2588
  - Fax: +65 482-1271

- Origins Healthcare Pte Ltd
  - 2 Leng Kee Road
  - Thye Hong Centre #02-02
  - Singapore 159086
  - Tel: +65 473-8991
  - Fax: +65 473-2031

- NTUC Fairprice Co-operative Ltd
  - 680 Upper Thomson Road
  - Singapore 787103
  - Tel: +65 456-0233
  - Fax: +65 458-8915

- Nature’s Glory Pte Ltd
  - 315 Outram Road #11-03
  - Tan Boon Liat Building
  - Singapore 169074
  - Tel: +65 227-1318
  - Fax: +65 227-0868

- Glory Bee Health Products
  - 3 Cheong Chin Nam
  - Singapore 599728
  - Tel: +65 473-8991
  - Fax: +65 473-2031

- Nature’s Farm Pte Ltd
  - 21 Kaki Bukit Road 2
  - Singapore 417848
  - Tel: +65 748-9818
  - Fax: +65 744-2274

82.5.35. Canada

- Allen & Ellen Dick, Beekeepers
  - R.R. #1, Swalwell, Alta.
  - T0M 1Y0
  - Tel: 403-546-2588
  - Fax: 403-546-2588

- Babe’s Honey Farm
  - 334 Walton Place
  - Victoria, B.C.
  - V8X 3X1
  - Tel: 604-658-8319

- Beemaid Honey Ltd
  - 625 Roseberry Street
  - Winnipeg, Manitoba
  - R3H 0T4
  - Tel: (204) 786-8977
  - Fax: (204) 783-8468
  - E-mail: honey@beemaid.com
  - Web: www.beemaid.com

- Beetown Honey Products Inc.
  - R.R. #2
  - Beeton, Ontario
  - L0G 1A0
  - Tel: 705-458-4084
  - Fax: 705-458-4028

- Billy Bee Honey Products Ltd.
  - 68 Tycos Drive
  - Toronto, Ontario
  - M6B 1V9
  - Tel: (416) 789-4391
  - Fax: (416) 789-9112
  - E-mail: egrossman@billybee.com
  - Web: www.billybee.com

- Capilano-Labonté Inc.
  - 530, rang Nault
  - Victoriaville, Quebec
  - G6P 7R5
  - Tel: (819) 758-3877
  - Fax: (819) 758-9386
  - E-mail: J.michaud@capilanolabonte.com
  - Web: www.capilanolabonte.com

- Doyon and Doyon Ltée.
  - 2720 Rue Duchesne St-Laurent
  - Montréal, Quebec
  - H4R 1J4
  - Tel: 514-336-3350
  - Fax: 514-336-3351

- Gestion Hélène Binet Inc.
  - 115 A Principale
  - Saint-Benoit-Beauce, Quebec
  - G0M 1P0
  - Tel: 418-227-2077
  - Fax: 418-227-5708
POTENTIAL BEE-PRODUCTS IMPORTERS, PACKERS AND AGENTS OF BEE PRODUCTS FROM ZAMBIA.

- **Golden Acres Honey Products Ltd.**
  - Box 42
  - 1101 - 6th Ave. N.
  - Three Hills
  - T0M 2A0 Alberta
  - Tel: 403-443-7705
  - Fax: 403-443-7910
  - E-mail: info@goldenacreshoney.com

- **HONEY HOLLOW Co.**
  - 277A ST. JOHN BLVD.
  - POINTE CLAIRE, QUEBEC
  - H9R 3J1
  - Tel: 514-697-5153
  - Fax: 514-697-6054

- **KIDD BROS. PRODUCE LIMITED**
  - 5312 GRIMMER STREET
  - BURNABY, B.C.
  - V5H 2H2
  - Tel: 604-437-9757
  - Fax: 604-437-6789

- **W.J. LFAYE & SONS LIMITED**
  - 950 BOUL DE L’INDUSTRIE
  - ST-JEROME, QUEBEC
  - J7Y 4B8
  - Tel: 514-438-4131
  - Fax: 514-438-0253

- **Odem International Inc**
  - 193 A Turcotte Street
  - Rosemere
  - Québec
  - J7A 3A7
  - Tel: (450) 965-1412
  - Fax: (450) 965-1425
  - E-mail: info@honey.ca
  - Web: www.odem.ca

- **WILLMS HONEY PRODUCERS LTD.**
  - P.O. BOX 8
  - SCANDIA, ALTA.
  - T0J 220
  - Tel: 403-362-3951
  - Fax: 403-362-8990

- **WOLFE HONEY Co.**
  - P.O. BOX 92
  - FALHER, ALTA.
  - T0H 1M0
  - Tel: 403-925-2282
  - Fax: 403-925-2463

- Wynex Trading Incorporated
  - Toronto Ontario
  - M4K 2L3

**OTHER BUYERS (GENERAL FOOD):**

- **A GARDEN OF EVE**
  - 309 A JANE STREET
  - TORONTO, ONTARIO.CANADA
  - Tel: 416-763-4541
  - Fax: 416-763-4541

- **BALDWIN NATURAL FOODS**
  - 20 1/2 BALDWIN STREET
  - TORONTO, ONTARIO. CANADA
  - Tel: 416-979-1777
  - Fax: 416-979-7786

- **CANADIAN HEALTH FOOD ASSOCIATION**
  - 370 STEELECASE ROAD EAST
  - MARKHAM, ONTARIO
  - L3R 1G2. CANADA
  - Tel: 905-479-6939
  - Fax: 905-479-1516

- **DOWN UNDER HEALTH FOODS**
  - 491 CHURCH STREET
  - TORONTO, ONTARIO.
  - M4Y 2C9 CANADA
  - Tel: 416-928-0807
  - Fax: 416-928-1144

- **GOLDEN HARVEST HEALTH FOODS**
  - 240 SHEPPARD AVENUE WEST
  - WILLOWDALE, ONTARIO
  - CANADA. M2N 1N3
  - Tel: 416-225-8269
  - Fax: 416-222-6439

- **HEALTHY’S**
  - BRAMALEA CITY CENTRE
  - 25 PEEL CENTRE DRIVE
  - MISSISSAUGA, ONTARIO
  - CANADA. L6T3R5
  - Tel: 905-793-3771
  - Fax: 905-793-3217

- **NATURALLY YOURS**
  - 1 FIRST CANADIAN PLACE
  - TORONTO, ONTARIO. CANADA
  - Tel: 416-368-0100

- **ONTARIO FOOD CO-OP**
  - 22 MOWAT AVENUE
  - TORONTO, ONTARIO
  - CANADA.M6K 3J3
  - Tel: 416-533-7019
  - Fax: 416-533-0719

- **PAPATYA**
  - 211 DANFORTH AVENUE
  - TORONTO, ONTARIO
  - CANADA. M5R 1J3
  - Tel: 416-921-8609
  - Fax: 416-921-8680

- **TASTE OF NATURE HEALTH STORES**
  - 380 BLOOR STREET WEST
  - TORONTO, ONTARIO
  - CANADA. M5S 1X1
  - Tel: 416-925-8102

- **THE BIG CARROT**
  - 348 DANFORTH AVENUE
  - TORONTO, ONTARIO. CANADA.M4K 1N8
  - Tel: 416-466-2129
  - Fax: 416-466-2366
82.5.36. USA

- **American Honey Co.**
  - 124 W. Ross Rd.
  - El Centro, CA 92243
  - Tel: 760-352-8860
  - Fax: 760-352-1740
  - E-mail: honey@productsonline.com

- **BEEHIVE BOTANICALS, INC.**
  - 1629, WEST NURSERY ROAD
  - HAYWARD, WI 54843
  - Tel: (1) 715-634-4274
  - Fax: (1) 715-634-3523

- **CAL T. ALBRITTON, INC.**
  - P.O. BOX 556
  - HAVANA, FL 32333
  - Tel: (1) 850-539-5444
  - Fax: (1) 850-539-9818

- **China Products North America**
  - 100 Jerico Quad. Ste, 308
  - Jerico, NY 11753
  - Tel: 516-935-3880
  - Fax: 516-935-3959
  - E-mail: info@cpnaglobal.com
  - Web: www.cpnaglobal.com

- **D.F. INTERNATIONAL (USA), INC.**
  - 1499 HUNTINGTON DR., STE.#418
  - SOUTH PASADENA, CA 91030
  - Tel: (1) 626-799-5575
  - Fax: (1) 626-799-2036
  - E-mail: dfi9488@aol.com
  - Web: www.welcome.to/dfi

- **EVERGREEN PRODUCE, INC.**
  - 1607, 85TH AVE. NORTHEAST
  - BELLEVUE, WA 98004
  - Tel: (1) 425-688-8858
  - Fax: (1) 425-688-8181

- **Hoyts Honey Farms, Inc.**
  - (Tommy Burns)
  - Baytown Texas
  - USA

- **Lane & Son**
  - 744 Kevin CT
  - Oakland, CA 94621-4087
  - Tel: 510-569-8980
  - Fax: 510-569-0240
  - E-mail: eflane@aol.com

- **MILLERS AMERICAN HONEY, INC.**
  - P.O. BOX 500
  - 125 E. Laurel
  - COLTON, CA 92324
  - Tel: (1) 909-825-1722
  - Fax: (1) 909-825-5932
  - E-mail: mail@millershoney.com
  - Web: www.millershoney.com

- **NATIONAL SALES CO., INC.**
  - 205, MARINA DRIVE
  - FORT PIERCE, FL 34949
  - Tel: (1) 561-461-0442
  - Fax: (1) 561-461-0442

- **Neiman Brothers Co. Inc.**
  - 3322 N. Newport Ave.
  - Chicago, IL 60618
  - Tel: 773-463-3000
  - Fax: 773-463-3181
  - E-mail: lneiman@neimanbrothers.com
  - Web: www.neimanbrothers.com

- **SILVERBOW HONEY CO., INC.**
  - 1120 E. WHEELER RD.
  - MOSES LAKE, WA 98837
  - Tel: (1) 509-765-6616
  - Fax: (1) 509-765-6549

- **Sioux Honey**
  - 301 Lewis Blvd.
  - Sioux City, IA 51101
  - Tel: 712-258-0638
  - Fax: 712-258-1332
  - E-mail: mmammen@pionet.net

- **Strohmeyer & Arpe Co.**
  - 600 Morris Tpke.
  - Short Hills, NJ 07078
  - Tel: 973-379-6600
  - Fax: 973-379-6181

- **SUGARBUSH PRODUCTS, INC.**
  - 117, BRISTOL RD.
  - CHALFONT, PA 18914
  - Tel: (1) 215-822-1495
  - Fax: (1) 215-997-2519

- **Sunland International**
  - PO Box 996
  - New Cannon, CT 06840
  - Tel: 203-966-4166
  - Fax: 203-966-7227

- **THE GILWAY CO., LTD.**
  - 17, ARCADIEN AVE.
  - PARAMU, NJ 07652-1203
  - Tel: (1) 201-843-8152
  - Fax: (1) 201-843-8221

- **The Impex Group**
  - 275 Centennial Way, Ste. 200
  - Trustin, CA 92680
  - Tel: 714-544-3911
  - Fax: 714-544-8714
  - E-mail: info@impexgroup.com
  - Web: www.impexgroup.com
POTENTIAL BEE-PRODUCTS IMPORTERS, PACKERS AND AGENTS OF BEE PRODUCTS FROM ZAMBIA.

- **WESTERN COMMERCE CORP.**
  - P.O. Box 92611
  - 636, TURNBULL CANYON RD.
  - City of Industry
  - LA PUENTE, CA 91745-1186
  - Tel: (1) (626) 855-3086
  - Fax: (1) (626) 855-3087
  - Email: usbeeinc@aol.com
  - Web: www.wcommerce.com

- **WildBee Nutrition USA Group, Inc**
  - 1191 Chess Dr. Suite 202
  - Foster City, CA 94404
  - Tel: (650) 341-2732
  - Fax: (650) 312-1780
  - Email: henryhe@sbcglobal.net
  - Web: www.henryhe@wildbeegroup.com

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**82.5.37. Algeria**

- **A.I.T. 18, Avenue Cheikh AEK**
  - Medioni
  - Tel: (06) 36.39.74
  - Fax: (06) 36.39.74

- **Capa Sarl 34, rue Parmentier**
  - 16 035 Hydra
  - Tel: (02) 60.05.62 / 60.54.00
  - Fax: (02) 59.12.82

- **Cass Api El Bez, route d’Alger**
  - 19 000 Setif
  - Tel: (05) 85.07.97

- **Confiserie Krima Douar Sidi Yahia Ben Salah**
  - BP 120 09 000 Blida
  - Tel: (03) 49.69.15

- **Edgc Z.I. Rhumel BP 242**
  - (PTT 20 Août)
  - 25 000 Constantine
  - Tel: (04) 92.89.50 / 92.89.52 / 92.84.70
  - Fax: (04) 69.66.80 / 92.07.49

- **Edipal Rue Nonterra Mahieddine**
  - 29 000 Mascara
  - Tel: (06) 82.20.05

- **Etablissements Benabderrahmane**
  - 3, rue Sabri Abdelaziz
  - 25 000 Constantine
  - Tel: (04) 94.87.34

- **Onapsa Avenue de l’ALN**
  - 23 000 Annaba
  - Tel: (08) 83.42.30 / (02) 54.35.85
  - Fax: (02) 54.35.85

- **Sama Group 4, rue Cherif Mahtout**
  - 16 000 Alger
  - Tel: (02) 59.13.75
  - Fax: (02) 59.05.24

- **Sojima International 6, rue Kouidri Menaour**
  - 35 300 Bouira
  - Tel: (02) 85.19.89
  - Fax: (02) 85.19.89 / 86.78.24

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**82.5.38. Finland**

- **Kesko Oy P.O.**
  - Box 135-136
  - 00161 Helsinki
  - Tel: +358-105 311
  - Fax: +358-9-873 5544

- **Inex Partners Oy**
  - P.O. Box 154
  - 00511 Helsinki
  - Tel: +358-9-188 3800
  - Fax: +358-9-188 4233

- **Tukospar Oy**
  - P.O. Box 52
  - 00581 Helsinki
  - Tel: +358-9-6191
  - Fax: +358-9-619 6613

- **Reformikeskus Oy**
  - Ononintie 5
  - 02200 Espoo
  - Tel: +358-9-429 4064
  - Fax: +358-9-429 2724

- **Oy Stockmann Ab**
  - P.O. Box 220
  - 00101 Helsinki
  - Tel: +358-9-1211
  - Fax: +358-9-1213 153

- **Heinon Tukku Oy**
  - 01510 Vantaa
  - Tel: +358-9-700 3611
  - Fax: +358-9-7003 6160

- **Hankintatukku Oy**
  - Temppelikatu 3-5
  - 00100 Helsinki
  - Tel: +358-9-443 108
  - Fax: +358-9-443 920

- **Fennonatura**
  - Pl 81
  - 04301 Tuusula
  - Tel: +358-9-274 6010
  - Fax: +358-9-274 1513

- **Oy Hartwall Ab**
  - Pl 31
  - 00391 Helsinki
  - Tel: +358-9-54 021
  - Fax: +358-9-540 2513
CHAPTER 6. ANNEX DOCUMENT OF THE ZAMBIAN HONEY ROADMAP.

82.5.39. India

- **Ambrosia Apiaries**
  - Room 107, K-128, Ranjit Sadan,
  - Mohammadpur
  - New Delhi 110066 - India
  - Tel: +91-11-616-4494
  - Fax: +91-11-618-5142

- **Dabur India Ltd.**
  - Sahibad
  - Uttar Pradesh - India
  - Tel: +91-120-477-7925.
  - Fax: +91-120-477-7934
  - E-mail: kackerm@dabur.com
  - Web: www.dabur.com

- **Geekay Sales Corporation**
  - C-15 Hari Nagar
  - (near DDU Hospital)
  - New Delhi 110064, India
  - Tel: +91-11-540-1928
  - Fax: +91-11-540-3638
  - E-mail: gksc@nda.vsnl.net
  - Web: www.geekaysales.com

- **Himflora Fine Foods.**
  - C - 92, Madangir Village
  - New Delhi 110062, India
  - Tel: +91-11-607-5799 / 5798.
  - Fax: +91-11-608-3523.
  - E-mail: savvy_32@rediffmail.com

- **Nilgris Limited 171**
  - Brigade Road, Bangalore
  - 560001, Karnataka, India
  - Tel: +91-80-558-8401
  - Fax: +91-80-558-5348
  - E-mail: nilgris@giasbg01.vsnl.net.in

82.5.40. Middle East

- **Food & Fine Pastries Manufacturing Ltd**
  - Brand: Al Shifa (Sold in Dubai)
  - Sunbulah
  - P.O. Box 8960
  - Jeddah 21492
  - Tel: +966 2 636 8485
  - Fax: +966 2 637 0318
  - www.sunbulah.com/alshifa.htm

- **ARAMTEC**
  - Arabian American Technology Co.
  - P.O. Box 6936
  - Dubai, UAE
  - Tel:+971 4 289 5444
  - Fax : +971 4 289 4883
  - aramtec@emirates.net.ae
  - www.aramtec.com
  - (Mr. Ara Melkian, Import Export Liaison)

- **SHABA GULF General Trading Company**
  - Imports honey from Turkey (just started)
  - P.O. Box 88384
  - Dubai
  - Tel: +971 4 295 9916
  - Fax: +071 295 9917
  - basheer@alshabba.ae & info@alshabba.com
  - www.alshabba.com
  - (Mr. P.P. Basheer)

- **Reem Lean Est.**
  - (Company imports wide range of commodities. Might be interested in honey from Kenya)
  - P.O. Box 103989
  - Dubai
  - Tel: +971 4 397 5738
  - Fax: +971 4 397 5764
  - peter@reemlean.ae & hakim@reemlean.ae
  - www.reemlean.com
  - (Messrs. Peter Troesch & A. Hakim Deeb)

- **Middle East Trading Co.**
  - (Imports luxury range from Italy)
  - Saif-zone P.O. Box 8284
  - Sharjah, UAE
  - Tel/fax: +971 4 336 2469

- **Food & Life**
  - (Imports from Hungary, brand: FAL. P.t. not interested in other sources)
  - P.O. Box 327
  - Dubai
  - Fax: 285 9909

- **Agricultural Marketing Board (amb)**
  - (Also imports honey)
  - Moka
  - Republic of Mauritius
  - Tel: +230 433 2053, 433 4025
  - Fax: 433 4837
  - agbd@innet.mu
  - (Mr. Nagen M. Muneesamy, Gen. Man.)
Mohammed Ali Asghar Trading Est.
- P.O. Box 26253
- Central Market – Manama
- Bahrein
- Tel: +973 1725 6709
- Fax: +973 1723 3484
- maaasd@batelco.com.bh
- (Mr. Krn Rajan, Chief Accountant & Sales)

World of Honey & Herbs
(Had shop in shopping centre)
- Manzar Centre
- P.O. Box 15768
- Dubai
- Tel: 298 8848
- Tel: 466 6670 (Mr. Salah – did not speak to)

Dubai Municipality
Food & Environment Section
- Dubai Central Laboratory Department
- P.O. Box 67
- Tel: +971 4 301 1724
- Fax: +971 4 335 8448
- yousefss@dm.gov.ae & info@dm.gov.ae
- www.dm.gov.ae
- (Mr. Yousef Saeed Alsaadi – Food Analyst Microbiology)

Supermarkets:
- Spinneys, Box 677. Tel: 355 5250
- Al Maya Lal’s, Tel: 282 5494
- T. Choitram & Sons/Choitram Supermarkets
- Jishar, Box 6536. Tel: 272 6391

82.5.41. Norway

- Bruseth & Kobro A/S
  - Gunnar schjelderupsvei 9. PB
  - 62, Grefsen
  - NO -0409 Oslo
  - Tel: + 47 22 15 48 +
  - Fax: + 47 22 15 48 10

- Honningcentralen A/L
  - Østensjøveien 19
  - NO -0661 Oslo
  - Tel: + 47 22 65 85 +
  - Fax: + 47 22 63 + 28

- Bjørn Kahrs A/S
  - Strandgaten 207. PB 1845-
  - Nordnes
  - NO -5024 Bergen
  - Tel: + 47 55 32 12 10
  - Fax: + 47 55 22 97 79

- Bjørn R. Paasche Agentur A/S
  - Østre Nesttunvegen 10. PB 318
  - NO -5051 Nestun
  - Tel: + 47 55 13 16 19
  - Fax: + 47 55 13 24 85

82.5.42. Poland

- Api-Eko Pralkowice 115, 37-700
  - Przemysl
  - Tel/Fax: (4810) 78-6501

- Apipol Krakow 32-410 Dobczyce
  - Brzaczowice 1
  - Tel: (4812) 271-2018
  - Fax: (4812) 271-2023
  - E-mail: apipol@apipol.com.pl

- Apis Bora Komorowskiego 18
  - 23-400 Biłgoraj
  - Tel: (4884) 686-4386
  - Fax: (4884) 686-3219

- Apis Diamentowa 23, 20-950
  - Lublin
  - Tel: (4881) 744-2942
  - Fax: (4881) 744-2962

- Bartnik 43-300 Bielsko Biala,
  - Komorowicka 12
  - Tel/Fax: (4833) 816-4535

- Budrex Cicha 58, 85-650
  - Bydgoszcz
  - Tel: (4852) 346-0608
  - Fax: (4852) 341-5963

- Cd Sa Wapiennicka 42
  - Bielsko Biala
  - Tel: (4833) 818-3467
  - Fax: (4833) 818-3127
  - E-mail: bielsko1@bb.onet.pl

- Focus Matusiaka 1/58, 43-300
  - Bielsko-Biala
  - Fax: (4833) 816-9368

- Hamburska Spolka Handlowa 04-501 Warszawa
  - Plowiecka 1/3
  - Tel: (4822) 673-1133 Al 42
  - Fax: (4822) 673-1188
  - E-mail: Hsh@lkp.Atm.Com.Pl

- Golden Nectar Gliniana 6, 97-300
  - Piotrkow Trybunalski
  - Tel: (4844) 649-7036
  - Fax: (4844) 649-7036

- Onufry Krasinskiego 9, 05-820
  - Piastow
  - Tel: (4822) 723-7380
  - Fax: (4822) 723-6631
82.5.43. **Turkey**

- **Alki Dis Tic Ltd.Sti.**
  - Yukari Kizilca Koyu Sapagi
  - Orneckoy Kemalpasa
  - Izmir
  - Tel: (232) 883-1444
  - Fax: (232) 883-1347

- **Baklan Gida San.Dis Tic.Ltd.Sti.**
  - Ankara Yolu 4.Km
  - Sungurlu
  - Corum
  - Tel: (364) 311-4764
  - Fax: (364) 311-8614

- **Canatan - Adnan - Bedii**
  - Ismet Inonu Bulvari Guvenc
  - Ish.A/Blok Kat:1/2
  - Mersin
  - Tel: (324) 232-0111
  - Fax: (324) 232-2524

- **Kayseriliogullari Gida San Ve Tic Ltd Sti.**
  - Samsun Yolu 30.Km.
  - Lalahan
  - Ankara
  - Tel: (312) 865-1752
  - Fax: (312) 865-1912

- **Korhan Pazarlama Ve Dis Ticaret A.S.**
  - Barbaros Hayrettin Pasa Mah.
  - 1058 Sok.No:38
  - Kucukkoy G.O.Pasa
  - Istanbul
  - Tel: (212) 618-7080/7
  - Fax: (212) 618-7089

  - Gida Sit.H-2 Blok No:21
  - Ramii
  - Istanbul
  - Tel: (212) 581-6926
  - Fax: (212) 581-6532

- **Oz Sakalli San Urun Tic Ltd Sti.**
  - Ataturk Cad Kavasli Koprul Civari
  - Soforler Odasi Yani
  - Antakya
  - Hatay
  - Tel: (326) 221-2449
  - Fax: (326) 221-2449

- **Pinar Sut Mamulleri Sanayii A.S.**
  - Pinarbaşı Kemalpasa Asfalti
  - Bornova/Izmir
  - Tel: (232) 436-1515
  - Fax: (232) 436-2040

- **Senel Tarim Ve Gida Urunleri San.Ve Tic.Ltd.Sti.**
  - Ankara Izmir Asfalti Kaynar
  - Mevkii
  - Turgutlu
  - Manisa
  - Tel: (236) 314-3590
  - Fax: (236) 314-5319

82.5.44. **Ukraine**

- **Instituto de apicultura de Ucrania**
  - Av. Zabolotnogo, 19
  - 252022 Kyiv
  - Tel: +380 (44) 266-67-98

- **Central Business Agency**
  - Av. Shamrylo, 2b
  - 254112 Kyiv
  - Tel / Fax: +380 (44) 294-64-77 / 294-62-08

- **Industries, Inc.**
  - Av. Yaroslavlska, 22
  - 254071 Kyiv
  - Tel: +380 (44) 416-72-90 / 416-23-91 / 416-87-29

- **Orlean**
  - 290018 Lviv
  - Tel: +380 (322) 35-48-58 / 71-22-21
  - Fax: +380 (322) 76-15-85

- **Epos Closed Stock Company Trade Centre**
  - Av. Ploschad Vosstania, 2,
  - 310005 Jarkiv
  - Tel: +380 (572) 214-132 / 215-589
  - Fax: +380 (572) 211-473 / 218-764

- **Camara De Comercio E Industria De Lviv**
  - Av. Striskiy Park, 14
  - 290011 Lviv
  - Tel: +380(322) 76-46-12
  - Fax: +380 (322) 76-79-72

- **Industrial & Financial Group**
  - Joint Stock Company
  - Po. Box 644
  - 252035 Kyiv
  - Tel: +380 (44) 245-76-97 / 245-92-52
  - Tel/Fax: +380 (44) 277-30-91
82.5.45. Arabia

- Arabian Trading Corporation Atraco
  - P.O. Box 5894
  - Jeddah 21432
  - Tel: (966-2) 647-5254 / 8716
  - Fax: (966-2) 649-0956 / 648-2246

- Metro Trading & Distribution
  - P.O.Box: 1459
  - Jeddah 21431
  - Tel: (966-2) 653-3262
  - United Trading Corporation
  - P.O.Box: 64. Dhahran Airport 31932
  - Tel: (966-3) 894-0706
  - Fax: (966-3) 864-4085

- International Trading & Investment Co
  - P.O.Box: 4546. St. Nº 2 Industrial Area. Doha Qatar
  - Tel: (974) 60-2850 / 2851 y 52
  - Fax: (974) 60-2853

- Lyche Trad. Est.
  - P.O.Box: 141, Riyadh 11411
  - Tel: (966-1) 477-9932
  - Fax: (966-1) 477-9910

- Mohammed O. Al-Sulaiman
  - Trdg. Est., P.O.Box: 27319, Riyadh 11417
  - Tel.: (966-1) 478-3808 / 492-0450
  - Fax: (966-1) 478-3808

- United Food Industries Corporation
  - P.O.Box: 64, Dhahran Airport 31932
  - Tel: (966-3) 894-0706
  - Fax: (966-3) 864-4085

- Family Food Supply
  - P.O.Box: 4786
  - Riyadh 11412
  - Tel: (9661) 2412813
  - Fax: (966-1) 2414706

- Abtsal Trading and Marketing
  - P. O. Box 2242, Riyadh 11451
  - Tel: (966-1) 241-3941
  - Fax: (966-1) 478-3153

- Al Babtain Biscuits
  - Manufacturing & Foodstuff Co.
  - P.O. Box 42579, Riyadh 11551
  - Tel: (966-1) 498-0915 / 0435
  - Fax: (966-1) 498-0383

- Insha Automatic Bakery (Hala Trading Est.)
  - P. O. Box 6186, Riyadh 11442
  - Tel: (966-1) 402-9107
  - Fax: (966-1) 402-5525

- United Food Industries
  - P. O. Box 3654
  - Riyadh 11481
  - Tel: (966-1) 498-2000
  - Fax: (966-1) 498-1011
INTERNATIONAL BUYERS OF BEE-PRODUCTS BY TARGET MARKET

82.5.46. Denmark

- Dansk Voksfabrik A/S
  - Krimsvej 15
  - DK-2300 København S
  - Tel: (45) 3259 1275
  - Fax: (45) 3259 2675
  - E-mail: dansk.voksfabrik@get2net.dk
davo@get2net.dk
- NDH Nordisk Droge Handels A/S
  - Smedeland 20A
  - DK-2600 Glostrup
  - Tel: (45) 4296 6888
  - Fax: (45) 4343 3355

82.5.47. France

- Aiglon
  - Route de Boran
  - F-60460 Percy sur Oise
  - Tel: (33) 3 4427 6693
  - Fax: (33) 3 4427 6055
  - E-mail: aiglon.sa@wanadoo.fr
- Albert Vieille
  - 629 route Grasse
  - BP 217
  - F-06227 Vallauris Cedex
  - Tel: (33) 4 9364 1672
  - Fax: (33) 4 9364 8007
  - E-mail: Albert.Vieille@wanadoo.fr
- Alfred Wolff France
  - 15, rue de l’Arsenal
  - F-75004 Paris
  - Tel: (33) 1 4272 9231
  - Fax: (33) 1 4272 1199
- Alland et Robert
  - 9 rue Saintonge
  - F-75003 Paris
  - Tel: (33) 1 44592131/ 44543204
  - Fax: (33) 1 42725438
  - E-mail: info@allandetrobert.fr
  - Web: www.allandetrobert.fr
- Areca
  - 2, rue Paul Bert
  - F-13100 Aix en Provence
  - Tel: (33) 4 4296 3981
  - Fax: (33) 4 4296 3994
- Argeville
  - BP 402
  - F-06254 Mougins Cedex
  - Tel: (33) 4 9292 4343
  - Fax: (33) 4 9292 4344
  - E-mail: contact@argeville.com
  - Web: www.argeville.com
- Barlocher France
  - 19, Chemin de la Buzine
  - B.P. 72
  - F-13368 Marseille Cedex 11
  - Tel: (33) 4 9136 4078
  - Fax: (33) 4 9136 4089
  - E-mail: barlocher.france@wanadoo.fr
- Bomann Laboratoire
  - ZA La Barlière
  - F-38960 St. Etienne de Crossey
  - Tel: (33) 4 7655 3323
  - Fax: (33) 4 7655 3320
- Bompard Aromatiques
  - 208 Avenue Louison Bobet
  - BP 129
  - Parc Ind. Les Bois de Grasse
  - F-06334 Grasse Cedex - France
  - Tel: (33) 4 9309 0344
  - Fax: (33) 4 9309 1287
- Brakerli
  - 228-230, boulevard Raspail
  - F-75014 Paris
  - Tel: (33) 1 4538 95 00
  - Fax: (33) 1 4538 96 00
Comptoir Français Interchimie
- 145, rue de Paris
- F-93012 Bobigny
- Tel: (33) 1 4843 3304
- Fax: (33) 1 4844 9578

Brenntag Val de Loire
- 816, rue de Gautray
- Saint Cyr en Val
- F-45075 Orléans Cedex 2
- Tel: (33) 2 3869 7676
- Fax: (33) 2 3864 1699
- E-mail: info@brenntag.fr

Benckiser saint Marc
- 119-125, rue des Trois Fontanot
- B.P. 508
- F-92005 Nanthère Cedex
- Tel : (33) 2 4776 3049
- Fax : (33) 2 4776 3898

Gazechim
- 13/19, rue Denis Papin
- ZI de Mitry Compans
- F-77292 Mitry Mory Cedex
- Tel: (33) 1 6021 4700 / 4718
- Fax: (33) 1 6021 4721

Hassalauer
- 10, rue de l'Ancienne Mairie
- F-92771 Boulogne Billancourt Cedex
- Tel: (33) 1 4699 1400
- Fax: (33) 1 4604 8141

HB Fuller France
- Zone Industrielle Malaquin
- BP 12
- F-76580 Le Trait
- Tel: (33) 2 3505 9221
- Fax: (33) 2 3537 3678

Ingrénat
- 1, rue de Baume Sourne
- F-31390 Allaux
- Tel: (33) 4 9166 6998
- Fax: (33) 4 9161 2296

Interchemical
- 15, avenue de la Grande Armée
- F-75116 Paris
- Tel: (33) 1 4500 7486
- Fax: (33) 1 4500 0507

Interchim
- 213, Avenue Kennedy
- BP 1140
- F-03103 Montluçon Cedex
- Tel: (33) 4 7003 8855
- Fax: (33) 4 7003 8260
- E-mail: interchim@interchim.com
- Web: www.interchim.com

Jacques Vernet
- Avenue Pierre Semard
- Route de Marseille, MIN
- F-84000 Avignon
- Tel: (33) 4 9087 7833
- Fax: (33) 4 9087 7834

Jan Dekker France S.A.R.L.
- 20 Quater, rue Schnapper
- BP 5205
- F-78175 Saint Germain en Laye Cedex
- Tel: (33) 1 39 04 10 00
- Fax: (33) 1 39 04 10 20
- E-mail: france.jan.dekker@wanadoo.fr
- Web: www.jandekker.com

Lambert Rivière
- 17, rue Louison Bobet
- Val de Fontenay
- F-94132 Fontenay sous Bois
- Tel: (33) 1 4974 8080
- Fax: (33) 1 4974 8111

Laserson & Sabetay (ETS)
- Mr. Francois Laserson
- B.P. 57
- F-91151 Etampes Cedex
- Tel: (33) 1 69 16 82 00
- Fax: (33) 1 6494 9897
- E-mail: info@laserson.com

Luzzatto & Figlio
- 10, avenue Percier
- F-75008 Paris
- Tel: (33) 1 4359 5680
- Fax: (33) 1 4359 0762
- Web: www.bakerhughes.com/bakerpetro-lite/polymers/luzzatto_and_figlio/

Mane et Fils
- 620, route de Grasse
- Quartier Notre Dame
- F-06620 Bar sur Loup
- Tel: (33) 4 9309 7000
- Fax: (33) 4 9342 5425
- E-mail: webinfo@mane.com
- Web: www.vmf-mane.com

Marcel Quarré
- 10-12 rue Massue
- BP 46
- F-94302 Vincennes
- Tel: (33) 1 4174 7100
- Fax: (33) 1 4174 7159

Miellerie des Butineuses
- 189 rue source
- BP 19
- F-84450 St. Saturnin les Avignon
- Tel: (33) 4 9022 4752
- Fax: (33) 4 9022 3668
- E-mail: contact@miellerie.fr
- Web: www.miellerie.fr
CHAPTER 6. ANNEX DOCUMENT OF THE ZAMBIA HONEY ROADMAP

- Prod’Hyg
  - ZI Les Marais
  - 16, rue des Osiers
  - F-78310 Coignières
  - Tel: (33) 1 30 05 07 10
  - Fax: (33) 1 34 61 23 87
  - E-mail: prodhyg@aol.com

- Raffinerie Méridionale Ceresines Belix
  - Antilly
  - F-60620 Betz
  - Tel: (33) 3 4487 2227
  - Fax: (33) 3 4487 2611

- Robertet
  - 37 av Sidi Brahim
  - BP 52100
  - F-06131 Grasse Cedex
  - Tel: (33) 4 9340 3366
  - Fax: (33) 4 9370 6809
  - E-mail: Info@robertet.fr, fragrance@robertet.fr, Flavours@robertet.fr

- Schweizerhall France
  - 57, boulevard de Montmorency
  - F-75016 Paris
  - Tel: (33) 1 4414 6940
  - Fax: (33) 1 4414 6950

- Tisco
  - 145, rue de Paris
  - F-93012 Bobigny Cedex
  - Tel: (33) 2 4845 0054
  - Fax: (33) 2 4843 5968

- Unipex
  - 30 rue du fort
  - BP 150
  - F-92500 Rueil Malmaison Cedex
  - Tel: (33) 1 47 32 81 30
  - Fax: (33) 1 41 96 22 00
  - Web: www.unipex.com

82.5.48. Germany

- Bahnsen & Prigge
  - Molkenstäh 5
  - D-21279 Hollenstedt
  - Tel: (49 4165) 81021
  - Fax: +49 (0) 4165-80993
  - E-Mail: bahnsen.prigge@t-online.de
  - Web: www.bahnsen-prigge.de

- Ter Hell & Co. GmbH
  - Kattrepelsbrücke 1
  - Hanseatenhof
  - D-20095 Hamburg
  - Tel: (49 40) 300 5010
  - Fax: (49 40) 335 050
  - E-mail: info@terhell.com
  - Web: www.terhell.com

- Tromm GmbH
  - Feuerstraße 7-17
  - D-50735 Köln
  - Tel: (49 221) 974 5520
  - Fax: (49 221) 9745 5320
  - E-mail: info@wax-tromm.de
  - Web: www.wax-tromm.de

- Wolff & Olsen (GmbH & Co)
  - Große Bäckerstr. 13
  - Postafch 10 66 20
  - D-20044 Hamburg
  - Tel: (49 40) 376 760 / 37 67 6 - 124
  - Fax: (49 40) 3767 6100
  - Web: www.alwolff.de/alfred/flash.htm
LIST OF INTERNATIONAL BUYERS FOR MARKETS FOR TABLE AND PHARMACEUTICAL GRADE HONEY

82.5.49. Bees Wax:

Beeswax - South Africa http://beeswax.co.za/

Benecube (PTY) Ltd – Wholesalers, South Africa
http://www.benecube.co.za/

BW2 – South Africa
http://beewiseindustries.wix.com/bw2furniturepolishes#!__about-us
Furniture Polish and Care

Honeysuckle House of Honey - South Africa
Beeswax beauty products

The Body Shop – Africa
http://www.bodyshop.co.za/

Simply Bee – South Africa
Natural Beeswax products http://www.simplybeeswax.co.za/

Rubybox, South Africa
Beeswax natural beauty products http://rubybox.co.za/beauty-brands/a-h/bee-natural

Faithful to Nature – Online shop, South Africa.

Glow Light Limited, Nakuru Kenya
Candles – mostly to the catholic church. No website

Vitapix Textile Limited, Nakuru Kenya
Textiles – batiks mad using wax techniques. No website

Burts Bees, US. International market presence.
Beeswax products. Beeswax collected / sourced from farms in Easy Africa www.burtsbees.com

Inento Bee Products, East Africa, Thika, Kenya
http://inentobees.com/index.php?option=com_content&view=frontpage&Itemid=1
Mzinga Honey Products, Nzombe, Kitui County, Kenya and also Nairobi 
Wholesale Beeswax http://www.naturalhoney.kbo.co.ke/

Bee Natural Uganda 

Melt Group, Tanzania 
Wholesalers and exporters of beeswax http://www.melt.net/trading/export

Shangos Tanzania Ltd, Tanzania, 
Wholesaler and Trader of Beeswax. No website

Nyuki Mkombozi Company 
Trade in beeswax. http://www.nyukitz.blogspot.co.uk/

Rwanda Honey, Rwanda 
Beeswax Candles

Strahl and Pitch is an International Company based in the USA – one of the biggest dealers in wax products in the world. The company buys bees wax from suppliers in Africa (http://www.spwax.com)

Strahl & Pitch Inc is considered to be the leading global refiner of Beeswax, producing White and Yellow Grades of Beeswax, certified to the current USP/NF Monograph, food chemicals codex, and other compendium. We also produce our own USDA Certified Organic Beeswax. The company sources crude wax from dozens of countries throughout the world. Thei wax is sourced from beekeepers, local co-operatives, fair-trade community groups, honey industry suppliers and established and reliable international traders.

82.5.50. Propolis:

The Propolis People, South Africa: This company is the first propolis orientated company, was started in 1995 with the intention to promote awareness of the health benefits of propolis, at the time when very little was known about propolis and when supply of local propolis was genuinely scarce. 
http://www.thepropolispeople.co.za/About%20Us.html

Forever Living Products – South Africa. Online shop. Supplements 

Inento Bee Products, East Africa, Thika, Kenya. It is a rapidly expanding Kenyan enterprise specializing in import, Export, manufacturing and production of high quality bee products and equipment working for the development of bee keeping across East African region. 
http://inentobees.com/index.php?option=com_content&view=frontpage&Itemid=1


Colgate-Palmolive, International Company. Soap that contains propolis and toothpaste

Almaco Ltd – Canadian Company. Buyers of Propolis – Kenya
82.5.51. **Bee Venom:**

Nyuyminka Trading Company, South Africa. Wholesaler / online shop. Offers one branded bee venom product (http://nyuyminkatradcingcc.21food.com/)

Washington University. Used African Bee Venom for research on HIV.

Cinnabar Green, Kenya. Beauty Products – the company is exploring the incorporation of bee venom into the existing products range.

82.5.52. **Royal Jelly:**


82.5.53. **Pollen:**

Spoil yourself - South African
http://spoilyourself.co.za/shop/all-face-products/lip-balm/

South African Company
http://mitrasamenities.co.za/index.php/guest-amenities

National Apex Bodies for the Bee Products Sector.

Reseau Interprofessionnell des Apiculteurs du Cameroun (REINAC), Cameroon
Phone: +237 75335499 Email: mtchana@yahoo.fr

Ethiopian Apiculture Board (EAB), Ethiopia Phone: +251 911 879 963 Email: negashbeken@yahoo.com

Kenya Honey Council (KHC), Kenya Phone: +254 722 521 873 Email: wedakininvestco@yahoo.com

Fédération Nationale des Apiculteurs Malagasy (FENAM), Madagascar
Phone: +261 343877445. Email: fenam@mail.org

Fédération Rwandaise des Coopératives Apicoles (FRCA), Rwanda
Phone: +250 788 523 126. Email: anselmenza@yahoo.fr

South African Bee Industry Organisation (SABIO), South Africa
Phone: +27 21870 2900 Email: info@hortgro.co.za

Tanzania Honey Council (THC) Tanzania Phone: +255 754 026 652 Email: gedilinus@gmail.com

The Uganda National Apiculture, Development Organisation (TUNADO), Uganda
Phone: +256 414 258 070. Email: info@tunadobees.org

Zambia Honey Council (ZHC), Zambia
Phone: +260 212 222 607. Email: honey@zambiahoneycouncil.org.zm

Beekeepers Association of Zimbabwe (BKAZ), Zimbabwe
Phone: +263 772973213. Email: beeszimbabwe@gmail.com
82.5.54. **Pharmaceutical Companies in South Africa**

<table>
<thead>
<tr>
<th>Company</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abex Pharmaceutical Pty(Ltd)</td>
<td><a href="http://www.abexparrph.com">www.abexparrph.com</a></td>
</tr>
<tr>
<td>Activo Health (Pty)Ltd</td>
<td><a href="http://www.activo.co.za">www.activo.co.za</a></td>
</tr>
<tr>
<td>Aurobindo Pharma (Pty) Ltd</td>
<td><a href="http://www.aurobindopharma.co.za">www.aurobindopharma.co.za</a></td>
</tr>
<tr>
<td>Austell Laboratories (pty) Ltd</td>
<td><a href="http://www.austell.co.za">www.austell.co.za</a></td>
</tr>
<tr>
<td>Bliss Pharmaceuticals</td>
<td><a href="http://www.blishholdings.co.za/Pharmaceuticals/">www.blishholdings.co.za/Pharmaceuticals/</a></td>
</tr>
<tr>
<td>Cipla- Medpro (Pty) Ltd</td>
<td><a href="http://www.ciplamedpro.co.za">www.ciplamedpro.co.za</a></td>
</tr>
<tr>
<td>DI Medicine Regulatory Consultants (Pty) Ltd</td>
<td><a href="http://www.diconsultants.co.za">www.diconsultants.co.za</a></td>
</tr>
<tr>
<td>Dr Reddy’s Laboratories (Pty) Ltd</td>
<td><a href="http://www.drredleys.com/southafrica">www.drredleys.com/southafrica</a></td>
</tr>
<tr>
<td>Ferring (Pty) Ltd</td>
<td><a href="http://www.ferring.co.za">www.ferring.co.za</a></td>
</tr>
<tr>
<td>Litha Healthcare</td>
<td><a href="http://www.lithahealthcare.co.za">www.lithahealthcare.co.za</a></td>
</tr>
<tr>
<td>MRA Consultants</td>
<td><a href="http://www.mra-regulatory.com/">www.mra-regulatory.com/</a></td>
</tr>
<tr>
<td>MC Pharma(Pty) Ltd</td>
<td><a href="http://www.mcpharma.co.za">www.mcpharma.co.za</a></td>
</tr>
<tr>
<td>Medreich Ltd</td>
<td><a href="http://www.medreich.com">www.medreich.com</a></td>
</tr>
<tr>
<td>Pharma dynamics (Pty)Ltd</td>
<td><a href="http://www.pharmedynamics.co.za">www.pharmedynamics.co.za</a></td>
</tr>
<tr>
<td>Prima Pharma Consultants</td>
<td><a href="http://www.primapharma.co.za">www.primapharma.co.za</a></td>
</tr>
<tr>
<td>Ranbaxy SA (Pty)Ltd</td>
<td><a href="http://www.ranbaxy.com/south-africa">www.ranbaxy.com/south-africa</a></td>
</tr>
<tr>
<td>Teva Pharmaceuticals</td>
<td><a href="http://www.teva.com">www.teva.com</a></td>
</tr>
<tr>
<td>Watson Pharma(Pty) Ltd</td>
<td><a href="http://www.watsonpharma.co.za">www.watsonpharma.co.za</a></td>
</tr>
<tr>
<td>Zydus Group SA (Pty) Ltd</td>
<td><a href="http://www.zydustradil.com">www.zydustradil.com</a></td>
</tr>
</tbody>
</table>

82.5.55. **Members of IPASA – The innovative Pharmaceutical Association, South Africa**

- **Abbot Laboratories SA (Pty) Ltd**
  - Physical Address: Abbott Place, 219 Golf Club Terrace, Constantia Kloof, Roodepoort, 1709
  - Postal Address: PO Box 7208, Weltevreden Park, 1715
  - Tel: +27 (11) 858 2000
  - Fax:+27 (11) 858 2070
  - Website: www.abott.com

- **AbbVie (Pty) Ltd**
  - Physical Address: Roodepoort, Gauteng, South Africa
  - Abbott Place, 219 Golf Club Terrace, Constantia Kloof, 1709
  - Postal Address: PO Box 4840, Weltevreden Park
  - Tel: +27 (11) 858 2000
  - Fax:+27 (11)
  - Website: www.abbvie.com

- **Alcon Laboratories SA (Pty) Ltd**
  - Physical Address: 65 Peter Place, Bryanston Ext 13, 2021
  - Postal Address: PO Box 3198, Randburg, 2125
  - Tel: +27 (11) 840 2300
  - Fax:+27 (11) 840 2301
  - Website: www.alconlabs.com

- **Allergan Pharmaceuticals (Pty) Ltd**
  - Physical Address: 30 New Road (Entrance off Bavaria Ave), Randjespark Ext 11, Midrand, 1682
  - Postal Address: P O Box 6024, Halfway House, 1685
  - Tel: +27 (11) 545 6600
  - Fax:+27 (11) 315 6008
  - Website: www.allergan.com

- **Amgen SA (Pty) Ltd**
  - Physical Address: Building D, Ballyoaks Office Park, 35 Ballyclare Drive, Bryanston Ext 7, 2021
  - Tel: +27 (11) 510 0130
  - Fax:+27 (11) 510 0001
  - Website: www.amgen.com

- **AstraZeneca (Pty) Ltd**
  - Physical Address: 5 Leeuwkop Road, Sunninghill, 2157
  - Postal Address: Private Bag X30, Sunninghill, 2157
  - Tel: +27 (11) 797 6000
  - Fax:+27 (11) 797 6001
  - Website: www.astrazeneca.com
Baxter Healthcare South Africa (Pty) Ltd
  – Physical Address: Twickenham Building, The
    Campus, 57 Sloane & Cnr Main Road,
    Bryanston, 2021, Johannesburg, South Africa
  – Postal Address: PO Box 67302 Bryanston,
    2021
  – Tel:+27 11 575 6062
  – Fax:+27 86 719 8223
  – Website: www.baxter.com

Bayer Healthcare (Pty) Ltd
  – Physical Address: 27 Wrench Road, Isando,
    1600
  – Postal Address: PO Box 143, Isando, 1600
  – Tel: + 27 ( 11 ) 921 5911
  – Fax:+27 ( 11 ) 921 5641
  – Website: www.bayer.co.za

Boehringer Ingelheim (Pty) Ltd
  – Physical Address: 404 Main Avenue, Ferndale,
    Randburg, 2194
  – Postal Address: Private Bag X3032, Randburg,
    2125
  – Tel: + 27 (11) 348 2400
  – Fax:+27 (11) 886 3205
  – Website: www.boehringer-ingelheim.com

Bristol-Myers Squibb (Pty) Ltd
  – Physical Address: 404 Main Avenue, Ferndale,
    Randburg, 2194
  – Postal Address: Private Bag X3032, Randburg,
    2125
  – Tel: + 27 (11) 348 2400
  – Fax:+27 (11) 886 3205
  – Website: www.bms.com

Covidien (Pty) Ltd
  – Physical Address: 379 Roan Crescent, Corporate Park North,
    Randjiespark, Midrand
  – Postal Address: PO Box 8108, Halfway House, 1685
  – Tel: + 27 (11) 542 9500/25
  – Fax:+27 (11) 542 9620
  – Website: www.covidien.com

Ferring (Pty) Ltd
  – Physical Address: 6 Regency Drive, Route 21 Corporate Park,
    Irene
  – Tel: + 27 (12) 345 6358
  – Fax:+27 (12) 345 6361
  – Website: www.ferring.com

Galderma (Pty) Ltd
  – Physical Address: 17 Muswell Road South, Wedgefield Office
    Park, Phase 2, 1st Floor, Block D, Bryanston,
    2021
  – Postal Address: PO Box 71150, Bryanston,
    2021
  – Tel: + 27 (11) 706 2339
  – Fax:+27 (11) 463 4371
  – Website: www.galderma.com

GE Healthcare (Pty) Ltd
  – Physical Address: 130 Gazelle Avenue, Corporate Park South, Midrand 1685
  – PostaAddress: PO Box 787122, Sandton 2146
  – Tel: + 27 (11) 237 0000
  – Fax:+27 (86) 532 5936
  – Website: www.gehealthcare.com

Janssen Pharmaceutical (Pty) Ltd
  – Physical Address: Building No. 6, Country Club Estate,21 Woodlands Drive, Woodmead
  – Postal Address: PO Box 785939, Sandton,
    2146
  – Tel: + 27 (11) 518 7000
  – Fax:+27 (11) 518 7066
  – Website: www.janssen.co.za

Eli Lilly SA (Pty) Ltd
  – Physical Address: 1 Petunia Road , Bryanston,
    2021
  – Postal Address: Private bag X119, Bryanston,
    2021
  – Tel: + 27 (11) 510-9300
  – Fax:+27 (11) 510-9301
  – Website: www.lilly.co.za

Merck (Pty) Ltd
  – Physical Address: 1 Friesland Drive, Longmeadow Business Park,
    Modderfontein, Johannesburg, 1645
  – Postal Address: PO Box 1998, Halfway House, 1685
  – Tel: + 27 (11) 372 5000
  – Website: www.merck.co.za

MSD (Pty) Ltd South Africa
  – Physical Address: 117 16th Road, Midrand, 1685
  – Postal Address: Private bag 3, Halfway House, 1685
  – Tel: + 27 (11) 655 3000
  – Website: www.msd.co.za

Norgine (Pty) Ltd
  – Physical Address: 108 Elizabeth Avenue, Parkmore, Sandton 2146
  – Postal Address: P O Box 781247, Sandton,
    2146
  – Tel: + 27 (11) 883 5630
  – Website: www.norgine.com

Novartis (Pty) Ltd
  – Physical Address: 72/74 Steel Road , Spartan, Kempton Park
  – Postal Address: PO Box 92 , Isando, 1600
  – Tel: + 27 (11) 929-9111
  – Website: www.novartis.co.za
82.5.56. Apitherapy Books, Booklets and Magazines


Apimondia Publishing House, Bucharest, Romania (**).


Apitherapy today. On the composition and utilisation of bee products and preparations in nutrition and therapeutics with regard to their biological value.
Apimondia Publishing House, Bucharest, Romania.
1976, 107 pp. (English edition) (**);
1976, 105 pp (French edition) (**);
1980 (German edition: “Apitherapie Heute”): 103 Seiten (**);
1981 (Romanian second edition);
1989 (Romanian third edition, 103 pp. (**).

Apimondia Publishing House, Bucharest, Romania, 1979, 397 pages(**).

(1981) (France) - Apitherapie.
Revue Française d’Apiculture, 399, supplement, 104 pages.

(1987) (France) - Aujourd’hui l’Apithérapie (Supplement).
Revue Française d’Apiculture, # 465, (7-8).
(1989) - The bee products, food, health and beauty (Romanian). Apimondia Publishing House, Bucharest, Romania, 160 pages (**).

(since 1994) (USA) - Bee Informed. The official magazine of the American Apitherapy Society.


(Germany) (since 1998) - Deutsche Apitherapie Zeitung, the official magazine of the German Apitherapy Society.


Caillas, Alin (1971) (France) - Gagnez vingt ans de vie grace aux abeilles .

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Brochure.

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Apimondia Publishing House. Bucharest. 86 pp. (***).

Caillas, Alin (1978) (France) - Le pollen - sa recolte et ses usages .
Orleans. Brochure. 2-eme édition. 16 pp. (***).

Ediciones Mundi-Prensa , Madrid, España.

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Crane Eva (1975, 1979) (UK) - Honey, a comprehensive survey.
William Heinemann (London). 608 pages. 542 / 76


Croft Laurie (1987) - Honey and Health .
Thorsons Publishing Group. ISBN 0-7225-1389-5. 112 pages (***).

Ehrenwirth Verlag . München, Germany.

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Verlag Maloine , 5. Auflage.

Donadieu, Yves (1983) (France) - Honey in natural therapeutics (English).

C.Koch Verlag. Oppenau/Schwarzwald. Germany, 64 Seiten. ISBN 3-9800797-1-6 (**).


Donadieu, Yves (1991) (France) - Le pollen (Les fiches d'apitherapie).
Donadieu Editions.


Herold, Edmund (1970) (Germany) - Substances guerissantes provenantes des abeilles (German). Ehrenwirth Verlag, München, 228 pages.

Herold, Edmund (1975) (Germany) - The healing substances of the honeybees (German). Ehrenwirth Verlag, München, Germany, 226 pages.

Herold, Edmund (1985) (Germany) - The cicatrising substances of the honeybees (German). Ehrenwirth Verlag, Ed. 10. 224 pages.

Herold, Edmund (1988) (Germany) - Heilwerte aus dem Bienenvolk (Honig, Pollen, Gelee Royale, Wachs). Ehrenwirth Verlag, München, Germany.


Ioyrish, Naum Petrovich (1964) (USSR) - Pcholy, krylatyie farmatsevty. Moscow.


Ioyrish, Petrovich Naum (1975) (USSR) - Bees and people. Mir Publishers, Moscow; 213 pp. (***)


Kaal, Jacob (1986) (Holland) - Apitherapie, genezing met produkten van bijen (Apis melifera) (Dutch). Drukkerij Kaal, Amsterdam, Holand.

Kaal, Jacob (1986) (Holland) - Bijen Gezondheidsboekje (Dutch). Drukkerij Kaal, Amsterdam, Holand.


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Publisher: Rodes Printing; 3rd. edition (July 27, 2007)
ISBN-10: 1890829439

Aporie Edizione. Roma.


Paunescu Tamara, Maftei Ion, Hossu Traian, Mosteanu Tatiana (1988) (Romania) - Apiphytotherapy. Studies and research regarding a new group of original Romanian drugs (Romanian).
Apimondia Publishing House, Bucharest, Romania, 112 pages (***).

Potschinkova Pavlina (1986) (Bulgaria) - Ptschelnite produkty w medizinata (Bulgarian).
BAN Publishing House, Sofia, Bulgaria.

Potschinkova Pavlina (1986) (Bulgaria) - Bee products in Medicine.
Publishing House of the Bulgarian Academy of Sciences, Sofia.

Ehrenwirth Verlag GmbH, München, Germany, 169 pages; ISBN 3-431-03247-8 (***).

Sonntag Verlag, Stuttgart, Germany. ISBN 3-87758-097-1. (396 pages) (***)

Erboristeria Domani Libri, l'ape cosmetica, Milan, Italy, 142 pages (***-abstract in honey bibliography).

Alma-Ata, Kainar.

Heinrich Mack Nachf. Illertissen.

Stangaciu, Stefan; Hartenstein, Elfi (2000) (Romania) - Sanft heilen mit Bienenprodukten.
So nützen Sie die gesunde Kraft von Honig, Propolis, Gelee Royal & Co.
Karl F. Haug Verlag, Heidelberg, Germany. ISBN 3-8304-2031-5; 117 Seiten (***).


Ariston Verlag, Genf, Germany, 1982, 198 Seiten; ISBN 3-453-06997-8; 5 Aufl. 1985 (***).


Walji, Hasnain (1996) - Bee Health: The Revitalizing Power of Propolis, Royal Jelly and Pollen. IBRA. 78 pages (concise guidelines on using these as health supplements).
82.5.57. **Basic criteria**

- Extraction is done by a machine to process up to 1000 kg per eight-hour shift.
- Plant has three work areas classified as Intake Area (Low Hygiene Area LHA) reception of honey-comb in supers or food grade boxes and the dispatch area for honey barrels and cartons with jars/ pots. Processing Area (High Hygiene Area HHA) is the extracting area and Packing & Storage Area (Medium Hygiene Area MHA).
- The Intake Area could be build of brick and mortar and plastered with cement, to be smooth. It may be painted but this is not required
- The Processing Area must be build with concrete and/or brick and mortar. The walls are plastered smooth and tiled to working height for easy cleaning and the floor is tiled with anti-slip industrial tiles. Floors should have drainage system. Were floors and walls meet there should be rounded tiles to ensure proper cleaning. The ceilings are painted with washable paint. Follow directive “Manual de Buenas Prácticas de Manufactura para Plantas Exportadoras de Miel de Abejas”.

82.5.58. **Organic certification criteria**

- Same hygienic principles and regulation apply as for conventional food processing plants
- Organic honey to be kept completely separated from conventional honey. Barrel/carton box clearly marked.
- Processing to be done separately and all equipment and processing areas to be cleaned before starting with organic run.
- Date and time to be recorded as well as quantities and origin.
- Heating of honey to be avoided, to safeguard medicinal properties
- Pumping of honey to be avoided, to safeguard medicinal properties
- The processing plant as well as the harvesting and transporting should be set up according to the HACCP system in order to facilitate HACCP certification

82.5.59. **Basic requirements**

- Design of the factory has to take into consideration:
  - Earthquake resistant/safe building
  - Reception area
  - Extraction area
  - Barrel and bottle filling area
  - Storage of export product(s) barrels and cartons
  - Dispatch area for barrels and bottles
  - Wood working shop including hive storage
  - Wax processing room
  - Plant staff kitchen and dining room
  - Staff showers and toilets + laundry room
  - Water storage
CHAPTER 6. ANNEX DOCUMENT OF THE ZAMBIAN HONEY ROADMAP

- Electricity generator
- Offices
- Laboratory
- Specialty products processing room

82.5.60.
Design of the Plant

A. Reception (low hygiene area LHA)
- Floor to ceiling doors to allow entry of trucks but able to close to avoid bees from entering
- Off loading platform
- Weighing scales
- Administration desk
- Sampling equipment
- Opening to pass boxes with supers though to extraction area
- Alternative: goods elevator to transport boxes to highest level. Post script: during report and planning the owner informed that processing will be done at ground level. Our comment: it is still good to consider this if this honey is not competed out of a place in the organic market. Building on a lope will allow for this important and underestimated aspect of honey processing.
- Double doors to enter extraction room

B. Extraction room (high hygiene area HHA)
- Staff to wear clean white uniforms, mouth caps and hair nets
- Ventilation with filtered air, ionisers (particle precipitator). No windows
- Walls tiled, floors anti-slip tiles, floor-wall joint rounded, drainage
- Hot (85 degrees) and cold water for proper cleaning of equipment and machines
- Ceiling easily cleanable
- Double entrance doors to keep bees and other insects out
- Gravity managed: construct metal mezzanines
- All honey equipment to have covers and all made of food grade steel: SS 304

C. Barrel and bottle filling area
- Medium hygiene area, staff to wear clean white uniforms, mouth caps and hair nets
- Door covered with plastic flaps so forklift (electric) can pass (with full barrels)
- Walls tiled, floors anti-slip-tiles, floor-wall joint rounded, drainage
- Double entrance doors to extraction room

D. Storage export product
- Low Hygiene Area
- Walls smooth plastered and painted (optional)
- Barrel stacked horizontal, storage in sections separated by metal poles
- Floors acid resistant concrete, smooth
- Easy access to dispatch area by forklift
E. Dispatch of barrel/carton boxes

- Loading ramp
- Floor to ceiling doors for container truck-trailer combination access

F. Wood work shop

- Circle saw
- Plane bench
- Wood storage (use only properly dried wood for hive construction, allow drying for 2-3 years)
- Hive storage
- Hives and frames are cleaned (propolis) and repaired
- Extracted frames in super box and enter through hole in wall covered with plastic flaps

G. Wax processing room

- Extracted wax entered through hole covered with plastic flaps
- Wax melting by solar wax melters
- Foundation sheet fabrication
- Candle production for wax not considered organic
- Wax production for export (long term option)

H. Laboratory

- Two samples. One sample is retained for second opinion
- Sample for humidity with refactometer
- HMF determination
- pH determination

I. Apitherapy Products Processing room

- Processing of pollen, propolis and royal jelly, for future development. See 3.3 Apitherapy products

82.5.61. Equipment summary

Availability and prices have been compared from several suppliers. Only two European suppliers have been found to give serious and complete feed back, listed below. Seas transport, clearance duty and taxes are for both European suppliers considered the same.

Honey extraction equipment with price ex works in Europe:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Thomas (Fr)</th>
<th>Swienty (Dk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncapping machine</td>
<td>US$ 7,000.-</td>
<td>US$ 7,700</td>
</tr>
<tr>
<td>by hand uncapping tank</td>
<td>US$ 1,200.-</td>
<td>US$ 1,440</td>
</tr>
<tr>
<td>Extractor with conveyors</td>
<td>US$14,500.-</td>
<td>US$ 53,000</td>
</tr>
<tr>
<td>Filtering by centrifugal force</td>
<td>US$14,385.-</td>
<td>US$ 19,800</td>
</tr>
<tr>
<td>Settling per 1600 kg vessel</td>
<td>US$ 2,250.-</td>
<td>US$ 5,100</td>
</tr>
<tr>
<td>Storage</td>
<td>US$ 6,000.- (estimate)</td>
<td></td>
</tr>
<tr>
<td>Filling gates x2</td>
<td>US$ 350.- estimate</td>
<td>US$ 900</td>
</tr>
<tr>
<td>Pumps x5</td>
<td>US$ 6,600</td>
<td>US$</td>
</tr>
</tbody>
</table>
This option is the all in one concept and consists of an uncapping machine an extractor for 36 frames at a time, a settling tank with thermostat controlled oil-filled jacket and a spin dryer. This is not the cheapest but most likely the machine are easiest to install and to have operational within a short time. One can process about 80 supers in a 8 hour work shift. This may be the equivalent of 3200 kg honey if all frames are fully capped. Price ex works in France is US$ 30,900

**Processing Methodology Using Above Equipment**

During the planning and reporting period, already the owner of the processing plant has decided NOT to opt for the gravity fed processing flow. According to him the building of the inner processing structure to a height of 8 meters would be too costly. Below the different options are described including the gravity fed processing flow. Building site can be selected with a natural slope to facilitate gravity fed processing.

Honey is harvested from the apiaries. It must be properly packed and secured and transported to processing plant. Time between harvest and processing should be less then 24 hours.

Arriving at the plant the hive bodies or supers are off loaded on to the loading platform. Here each super is inspected and honey samples from capped cells at random taken. The supers are transported to the extraction room.

**Uncapping:** Frame by frame the comb is uncapped by hand above the uncapping tank. This is done with a thermostatically controlled electric knife can be done by two workers at same time. The frames are places in a rack with honey tray to catch the dripping honey. Next to this rack is the extractor machine. One operator loads the uncapped frames into the machine.

**Alternative 1:** the frames are placed one by one onto the uncapping machine. The machine will further transport the frames through the uncapping machine and subsequently move the frames towards the extraction machine.

**Alternative 2:** the frames are hand held in the uncapping machine. After uncapping the frame is placed in the rotary holder and once a complete batch is prepared this way, the extractor is filled.

The honey together with cappings flows by gravity to a lower positioned series of sieves, or centrifugal filtering machine (Spin-o-mel). This machine turns constantly at low speeds and honey is filtered and can flow to lower level, in heated settling tanks. This is again a continues process.

**Alternative 1+ 2.** Honey and cappings will be pumped by perpetual screw pump to the sieves or the ‘Spin-o-mel’ which filters out the cappings and filters the honey.

The filtered and cleared honey now flows in storage tanks from where it is filled into barrels or pots for export.

**Alternative 1+2:** filtered honey is pumped to storage tanks.

Filling of the barrels will be done:

- directly from the storage tanks by means of a pump
- from the storage tanks it will be transferred (pumped) to special filling tanks which are positioned high so that a barrel will easily fit under it.
82.5.62. Methods:

Option 1. gravity fed processing flow

This option causes least quality loss to the honey and its intrinsic medicinal values. The honey will have a strong position in the organic market field.

1. frames with honey comb must be transported to highest level. If constructed on a slope the reception area is to be at the highest point
2. Uncapping machine or manual uncapping (owner will decide which suits best at the initial stage)
3. Extraction machine
4. Filtering
5. Settling tank
6. Storage tank
7. Barrel filling and export

Option 2. Processing at ground level by means of pump

1. Uncapping machine or manual uncapping of comb
2. extraction machine
3. honey is pumped by perpetual screw towards filtering
4. Filtering or sieves
5. honey is pumped to high positioned settling tank
6. honey flows from settling tank to storage tanks
7. honey is pumped to barrel filling tank
8. barrel filling is done by gravity
QUALITY CONTROL

Some tools and methods that can be used for quality assurance are discussed below. Details can be found in the lists provided by the European Union and the FAO/WHO.

82.5.63. Quality indicators of honey

- Smell and taste - Olfactory, HMF Laboratory tests, Glucose-oxidase H2O2 test strips
- Freshness – diastase laboratory tests
- Moisture content - Density measuring jug + scale
- Refraction of light - refractometer
- Alcohol Foaming - Acetic acid Taste
- Fermentation - Fermentation Microscope, Enzymes Diastase Laboratory tests, HMF
- Electric conduction - Differs per honey
- Glucose / fructose - Differs per honey. Titration. Polarisation glass
- Pollen types - Differs per honey. Microscope and pollen collection or pollen atlas
- Maximum Residue - Limit Laboratory tests. Quality and regulation.

International regulations: The European Community Council Directive on Honey (EU) established the Guideline 2001/110/EG on 20 December 2001 for the European Union. This was incorporated in the individual countries’ regulations in 2003. The Food and Agriculture Organisation (FAO) and the World Health Organisation (WHO) of the United Nations set the Standard for Honey in the Codex Alimentarius, which also came into effect about the same time. Both regulations replaced earlier similar regulations, but unlike before they now both have about the same requirements. The only difference at the moment is that honey intended for the EU can only come from Apis mellifera, while the Codex allows sweet substances from other bee species, such as Apis cerana and Apis dorsata, to qualify as honey. In addition, the European Union has set requirements to limit residues of pesticides and antibiotics: residues from agricultural pesticides and some agents used to combat the Varroa mite cannot be present in honey (or they are permissible only in very small amounts). Residues of antibiotics, such as those used against foul brood disease, are not allowed.

The Codex Alimentarius defines honey as ‘a sweet substance prepared by bees using flower nectar, secretions from living plant cells or secretions from plant-sap sucking insects’. The EU and the Codex both recognise the so-called baker’s honey, which is a lower quality honey that has been heated too high or that is fermented. The labelling of the honey (figure 27) has to fulfil the following requirements. The label has to show the name of the product (honey), the volume in grams, the name and address of the producer or importer, a batch number, and a ‘best-before’ date. For good honey this is usually 18 months. The label may also include the botanical origin (e.g. citrus honey) if the honey is monofloral and this is reflected in its colour, smell and taste and its physio-chemical and microscopic characteristics. Bee products acteristics. It may also indicate the geographic area or the origin of the vegetation if the product contains only one type of honey.

Export to EU countries: Honey exported to EU countries falls under the regulation called European Community health conditions for trade and importation of honey, which includes a so-called list of third countries. To be added to this list a country first has to submit an application to the EU in Brussels, after which inspections will take place. The exporting company also has to be certified to export honey. The importer will generally first ask for and analyse samples. The importer can of course also make
its own additional demands. Other countries are free to incorporate the requirements of the EU policy in their own regulations. Most countries have a honey standard and a beeswax standard and some countries also have a standard for beehives. The Bureau of Standards certifies the quality of honey from beekeepers, traders and honey packers who sell their honey at local markets. This standard usually conforms to foreign regulations but it differs on certain points. The international quality control standards apply primarily to packaged honey that is sold in stores, whereas in many countries there is an A and a B quality. Low-quality honey may be sold locally as B quality or as honey from traditional hives. For pollen, royal jelly, propolis and bee venom there are usually no acknowledged standards. An analysis certificate is therefore provided by the Bureau of Standards to show to the customs officer if the product is to be exported.

Import by third countries: For certain animal products or for all products from and for beekeeping a quarantine regulation may be in effect to prevent the import of diseases. Some countries, such as Kenya and Trinidad and Tobago, do not allow the importation of bee products or used materials for beekeeping.

Moisture content of honey: The moisture content of good honey can vary from 14-19%. Higher moisture contents, up to 30%, are the result of premature harvesting or mixing with water or watery ingredients such as bee brood.

Moisture content: Honey can be kept for a long time as long as the moisture content is lower than 18%. If the moisture content is higher the honey will eventually ferment. If the level is very low, the honey will crystallise sooner, depending in part on the source of nectar and the glucose and fructose content, as well as the presence of crystallization kernels, but this process can be slowed down through heating and filtering.

Measuring the moisture content: The moisture content of honey can be measured with a hand-held refractometer made especially for honey (see figure 28). This can have three scales: breaking index, percentage of sugar and percentage of water. Some hand-held refractometers have only one scale, namely the percentage of water in honey. Its range of measurement is about 13-28% moisture. Refractometers are calibrated to measure at a temperature of 20 °C. To measure moisture at higher and lower temperatures a correction has to be calculated. For measurements above 20 °C: add 0.1% per °C to the read sugar percentage. For measurements below 20 °C: subtract 0.1% per °C from the read measurement. Some refractometers have automatic temperature correction (ATC). The moisture content of honey can also be measured by determining its density, that is, its weight per unit of volume. The precision of this measurement depends on the apparatus used and the amount. Honey has a density at 20 °C of 1.40 to 1.44 kg/litre, depending on the moisture content.

Sugar content of honey: Sugar content of honey is almost the opposite of its moisture content: together they form 100% of the volume. Honey that contains 18% water thus contains 82% sugars (simple sugars glucose – dextrose, and fructose - laevulose). These percentages depend on the honey’s botanical origin. All honey types eventually convert into the solid state when the glucose crystallises. The higher the glucose content, the faster the honey will crystallise, whereby fine and rough crystals develop and the honey becomes very hard. By stirring honey it becomes creamy; a paste is formed rather than a hard block.

Enzymes in honey: Honey contains the enzymes diastase, invertase and glucose-oxidase. Enzymes are denatured and damaged when heated. The norms for invertase and glucose-oxidase are seldom applied.

Diastase-index: The enzyme diastase, also called amylase, breaks starch down into maltose. The diastase index is used as a parameter for the freshness and rawness of honey. If honey is heated for 24 hours at 50 °C this enzyme will still be sufficiently intact to meet the requirements.
**HMF content:** Together with the moisture content, the HMF content is one of the most important quality criteria for honey. HMF is the abbreviation for hydroxymethylfurfural, a substance formed by one of the sugars in honey when it is heated or warmed for a long time. HMF is also found in large amounts in heated cane sugar and inverted sugar syrups. Presence of HMF can therefore also be an indication of tampering or mixing with sugars. The substance is not toxic for people, but it is for bees.

**The norm:** Both the EU and the Codex Alimentarius have determined that the HMF content in honey may not be higher than 40 mg/kg. Comb honey and freshly centrifuged honey have an HMF content of less than 5 mg/kg. If honey is stored, the HMF content increases by 1-2 mg/kg per month at a temperature of 20°C. After two years the maximum value of 40 mg/kg has usually been reached. In tropical conditions it will probably be reached even quicker. Honey from tropical areas is therefore permitted by law to have a maximum HMF content of 80 mg/kg as long as it is labelled as tropical honey.

**Indirect measuring with the peroxide test:** It is not easy to test for diastase and HMF in a small laboratory. A different method, the peroxide test, can be used instead if the necessary test strips are available. These strips cost about € 50 per pack and they have to be kept refrigerated. They are used to indirectly measure the activity of the glucose-oxidase enzyme instead of diastase. The principle is as follows: While the honey is being thickened by the bees, it is protected from fermentation by hydrogen peroxide, which is produced by enzymes in the glucose-oxidase group. The activity of this enzyme stops when the sugar content becomes higher than 80%. If the honey is diluted with water, the enzymes become active again. By measuring the hydrogen peroxide concentration one hour after diluting the honey with an equal amount of water this activity in the honey can be demonstrated on peroxide indicator sticks.

**Microscopic analysis:** Nectar in a flower contains a small amount of the flower’s own pollen. This makes it possible to identify the source of the nectar in honey. The vegetation the bees flew around in and from which they also collected pollen loads is also represented to some extent by their pollen. Each plant’s family, genus and species can thus be identified through microscopic analyses. It’s not good to have too much pollen in honey, but filtration is not allowed. Preparations on microscope slides can be made of the plants’ pollen from their stamens, from pollen loads transported on the bees’ legs, from bee bread out of the comb and from honey out of the comb or after extraction. Analysis of the pollen is used as a way to confirm the geographic and botanical origin of the honey. Monofloral honey should contain a certain percentage of the given nectar source. To carry out pollen research or analysis it is helpful to have some botanical knowledge. It is easy to see when honey has fermented, because of the foam layer that develops on top and the smell of alcohol.

**Colour, smell and taste of honey:** The colour, smell, taste and viscosity of honey is called organoleptic or sensory characteristics. The taste and smell of honey are primarily determined by the flowers and plants the honey is made from. But these characteristics can be influenced by changes that take place in the comb, especially in combs that once held brood if honey is stored in them for a long time.

**The norm:** The law only stipulates that honey can vary in colour from almost colourless to dark brown and that it must not have a strange taste or smell. Some countries have requirements for the colour of honey to be sold. Colour charts are available on the market to help identify the colours, such as light white, medium white, dark white, light amber, amber and dark amber. The colour of crystallised honey is much lighter. The value placed on certain characteristics varies between countries but also between people.
82.5.64. Quality of other bee products

**Pollen:** Pollen (in the form of pollen loads) has to be dried within one day after harvesting and stored in a dry, dark place to retain its favourable characteristics. Nutritional composition and caloric value are given in grams per 100 grams of pollen (or a percentage) after drying. The moisture content decreases during drying from about 25% (fresh) to less than 12%. Other ingredients such as wax cappings and debris from the bottom of the hive should not be present. Pollen must always be dried to prevent the growth of moulds. Aphlatoxin, which is formed by some fungi, should not be detectable in the pollen. Pollen that is collected from sprayed crops may contain pesticide residues. Other powdered ingredients, such as cassava flour, are also collected by the bees. The producer has to monitor the content of these foreign particles in the pollen.

**Propolis:** Propolis has to be dried within a few days after harvesting or stored in a freezer before processing.

**Royal jelly:** Fresh royal jelly can be kept at room temperature for only a few days. It is therefore best to freeze it. One of the active and measurable nutrients in royal jelly is 10-HDA (hydroxy-2-decenoid acid), which accounts for 2-11% of its content. The 10-HDA content is indicated on an analysis certificate. Good royal jelly contains more than 5% 10-HDA. Royal jelly should also be free of residues such as antibiotics.

**Beeswax:** Beeswax should be melted at a relatively low temperature (< 80%). If the wax is overheated it will turn brown and its quality will deteriorate. Simple extraction methods are suitable to retain the quality of the wax. An important quality indicator for beeswax is purity. Beeswax mixed with paraffin, solid fat or oil as additives can be detected by measuring the melting trajectory of the product.

**Propolis:** Propolis scraped from the woodwork in the hive normally contains pieces of beeswax, bees or bee legs, hair, wood shavings and other additives or impurities. These have to be removed if the product is to be consumed right away. After this point, it doesn’t matter very much for the quality of the propolis whether or not it is purified, for example through alcohol extraction.

**Bee venom:** Bee venom that is dried on a glass plate and then scraped off looks like a cream to grey-coloured gummy powder. The quality of the bee venom is determined by its mellitin content. Good quality dried venom contains 40 to 60% of this compound. Purified bee venom is listed in many volumes of the Pharmacopoeia as Apium venenum, but it is also used in apitherapy as an additive to foods or as a nutrient supplement. The status of this product is not clear in every country. In many countries bee venom can only be purified in certified laboratories. Bee venom is poisonous in very small amounts and some people can be allergic to it. Caution and precautionary measures are extremely important in its production and processing.
1. SCOPE
1.1 This standard applies to all honeys produced by honeybees and covers all styles of honey presentation which are offered for direct consumption.
1.2 The standard also covers honey which is packed in non-retail (bulk) containers and is intended for re-packing into retail packs.

2. DEFINITION
2.1 Definition of Honey Honey is the natural sweet substance produced by honeybees from the nectar of blossoms or from secretions of living parts of plants or excretions of plant sucking insects on the living parts of plants, which honeybees collect, transform and combine with specific substances of their own, store and leave in the honey comb to ripen and mature.
2.2 Description Honey consists essentially of different sugars predominantly glucose and fructose. The colour of honey varies from nearly colourless to dark brown. The consistency can be fluid, viscous or partly to entirely crystallized. The flavour and aroma vary, but usually derive from the plant origin.
2.3 Subsidiary Definitions and Designations
2.3.1 Origin
2.3.1.1 Blossom Honey or Nectar Honey is the honey which comes from nectaries of flowers.
2.3.1.2 Honeydew Honey is the honey which comes mainly from secretions of living parts of plants or excretions of plant sucking insects on the living parts of plants. Its colour varies from very light brown or greenish to dark brown.
2.3.2 Methods of Processing
2.3.2.1 Extracted Honey is honey only obtained by centrifuging decapped broodless combs.
2.3.2.2 Pressed Honey is honey obtained by pressing broodless combs with or without the application of moderate heat.
2.3.2.3 Drained Honey is honey obtained by draining decapped broodless combs.
2.3.3 Styles - Honey which meets all the compositional and quality criteria of Section 3 of this standard may be presented as follows:
(a) Honey which is honey in liquid or crystalline state or a mixture of the two;
(b) Comb Honey which is honey stored by bees in the cells of freshly built broodless combs and which is sold in sealed whole combs or sections of such combs
(c) Chunk Honey which is honey containing one or more pieces of comb honey;
(d) Crystallized or Granulated Honey which is honey that has undergone a natural process of solidification as a result of glucose crystallization;
(e) Creamed (or creamy or set) Honey is honey which has a fine crystalline structure and which may have undergone a physical process to give it that structure and to make it easy to spread.
3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Honey shall not have any objectionable flavour, aroma, or taint absorbed from foreign matter during its processing and storage. The honey shall not have begun to ferment or effervesce.

3.2 Honey shall not be heated to such an extent that its essential composition and quality is impaired.

3.3 Apparent reducing sugar content, calculated as invert sugar:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>Honey not listed below</td>
<td>Not less than 65%</td>
</tr>
<tr>
<td>(b)</td>
<td>Honeydew honey</td>
<td>Not less than 60%</td>
</tr>
<tr>
<td>(c)</td>
<td>Blackboy (Xanthorrhoea preissii)</td>
<td>Not less than 53%</td>
</tr>
</tbody>
</table>

3.4 Moisture Content

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>(a)</td>
<td>Honeys not listed below</td>
<td>Not more than 21%</td>
</tr>
<tr>
<td>(b)</td>
<td>Heather honey (Calluna)</td>
<td>Not more than 23%</td>
</tr>
<tr>
<td>(c)</td>
<td>Clover honey (Trifolium)</td>
<td>Not more than 23%</td>
</tr>
</tbody>
</table>

3.5 Apparent Sucrose Content

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>Honeys not listed below</td>
<td>Not more than 5%</td>
</tr>
<tr>
<td>(b)</td>
<td>Honeydew honey, blends of honeydew honey and blossom honey, Robinia, Lavender, Citrus, Alfalfa, Sweet-clover, Red Gum (Eucalyptus Camaldulensis), Acacia, leathenwood (Eucryphia Lucindia), Menzies Banksia (Banksia menziesii)</td>
<td>Not more than 10%</td>
</tr>
<tr>
<td>(c)</td>
<td>Red Bell (Calothamnus sanguineus), White stringy bark (Eucalyptus scabra), Grand Banksia (Banksia grandis), Blackboy (Xanthorrhoea preissii)</td>
<td>Not more than 15%</td>
</tr>
</tbody>
</table>

3.6 Water Insoluble Solids Contents

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(a)</td>
<td>For honeys other than pressed honey</td>
<td>Not more than 0.1%</td>
</tr>
<tr>
<td>(b)</td>
<td>Pressed honey</td>
<td>Not more than 0.5%</td>
</tr>
</tbody>
</table>

3.7 Mineral Content (ash)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>(a)</td>
<td>Honeys not listed below</td>
<td>Not more than 0.6%</td>
</tr>
<tr>
<td>(b)</td>
<td>Honeydew honey or a mixture of honeydew honey and blossom honey</td>
<td>Not more than 1.0%</td>
</tr>
</tbody>
</table>

3.8 Acidity

- Not more than 40 milliequivalents acid per 1000 grammes

3.9 Diastase Activity

- Not more than 3

3.10 Hydroxymethylfurfural Content

- Not more than 80 mg/kg

4. FOOD ADDITIVES

4.1 None permitted.
5. HYGIENE

5.1 It is recommended that the product covered by the provisions of this standard be prepared in accordance with the appropriate sections of the General Principles of Food Hygiene recommended by the Codex Alimentarius Commission (Ref. No. CACIRCP 1-1969, Rev. 2 (1985)).

5.2 Honey should be free from visible mould and, as far as practicable, be free from inorganic or organic matters foreign to its composition, such as, insects, insect debris, brood or grains of sand, when the honey appears in retail trade or is used in any product for human consumption.

5.3 Honey shall not contain toxic substances arising from microorganisms or plants in an amount which may constitute a hazard to health.

6. LABELLING In addition to Sections 2, 3, 7 and 8 of the General Standard for Labelling or Prepackaged Foods (CODEX STAN 1—1985) the following specific provisions apply:

6.1 The Name of the Food

6.1.1 Subject to the provisions of 6.1.4 products conforming to the standard shall be designated “honey”.

6.1.2 No honey may be designated by any of the designations in Section 2.3 unless it conforms to the appropriate description contained therein. The Styles in 2.3.3 (a), (c), (d) and (e) shall be declared.

6.1.3 Honey may be designated by the name of the geographical or topographical region if the honey was produced exclusively within the area referred to in the designation.

6.1.4 Honey may be designated according to floral or plant source if it comes wholly or mainly from that particular source and has the organoleptic, physicochemical and microscopic properties corresponding with that origin.

6.1.5 Honey complying with Sections 3.3(b) and (c), 3.4(b) and 3.5(b) and (c) shall have in close proximity to the word the common name or the botanical name of the floral source or sources.

6.2 Labelling of Non-Retail Containers In addition to Sections 2, 3 and 8.1.3 of the General Standard the following specific provisions apply:

6.2.1 Information on labelling as specified in this Section shall be given either on the container or in accompanying documents, except that the name of the product, lot identification, and the name and address of the manufacturer or packer shall appear on the container.

6.2.2 Lot identification, and the name and address of the manufacturer or packer may be replaced by an identification mark provided that such a mark is clearly identifiable with the accompanying documents.

6.2.3 Outer containers holding prepackaged foods in small units (see Section 6 of the General Standard) shall be fully labelled.

7. METHODS OF ANALYSIS AND SAMPLING

7.1 Determination of reducing sugar content (Type I Method)

7.1.1 Principle of method The method is a modification of the Lane and Bynon (1923) procedure involving the reduction of Soxhlet’s modification of Fehling’s solution by titration at boiling point against a solution of reducing sugars in honey using methylene blue as an internal indicator.

The maximum accuracy for this type of determination is attained by ensuring that the reduction of the Fehling’s solution during the standardization step and in the determination of the reducing sugars in the honey solution are carried out at constant volume. A preliminary titration is, therefore, essential to determine the volume of water to be added before the determinations are carried out to satisfy this requirement.

7.1.2 Reagents

7.1.2.1 Soxhlet’s Modification of Fehling’s Solution Solution A: Dissolve 69.28 g copper sulphate pentahydrate (CuSO4.5H2O; MW + 249.71) with distilled water to 1 litre. Keep one day before titration. Solution B: Dissolve 346 g sodium potassium
tartrate (C4H4K NaO6.4H2O; MW + 282.23) and 100 g sodium hydroxide (NaOH) with distilled water to 1 litre. Filter through prepared asbestos.

7.1.2.2 Standard Invert Sugar Solution (10 g/L) Weigh accurately 9.5 g pure sucrose, add 5 mL hydrochloric acid ca. 36.5 percent w/w pure HCl) and dilute with water to about 100 mL, store this acidified solution for several days at room temperature (ca. 7 days at 120 to 150°C, or 3 days at 200 to 25°C), and then dilute to 1 litre. (N.B. Acidified 1.0 percent invert sugar remains stable for several months). Neutralize a suitable volume of this solution with iM sodium hydroxide solution (40 g/L) immediately before use and dilute to the required concentration (2 g/L) for the standardization.

7.1.2.3 Methylene Blue Solution Dissolve 2 g in distilled water and dilute to 1 litre.

7.1.2.4 Alumina Cream Prepare cold saturated solution of alum (K2504A12(504)3.24H2O) in water. Add ammonium hydroxide with constant stirring until solution is alkaline to litmus, let precipitate settle and wash by decantation with water until wash-water gives only slight test for sulphate with barium chloride solution. Pour off excess water and store residual cream in stoppered bottle.

7.1.3 Sampling

7.1.3.1 Liquid or Strained Honey If sample is free from granulation, mix thoroughly by stirring or shaking; if granulated, place closed container in water-bath without submerging, and heat 30 mm. at 60°C, then if necessary heat at 65°C until liquefied. Occasional shaking is essential. Mix thoroughly and cool rapidly as soon as sample liquefies. Do not heat honey intended for hydroxymethylfurfural or diastatic determination. If foreign matter, such as wax, sticks, bees, particles of comb, etc., is present, heat sample to 40°C in water-bath and strain through cheesecloth in hot-water-funnel before sampling.

7.1.3.2 Comb Honey Cut top of comb, if sealed, and separate completely from comb by straining through a sieve the meshes of which are made by so weaving wire as to form square opening of 0.500 mm by 0.500 mm when portions of comb or wax pass through sieve, heat sample as in 7.1.3.1 and strain through cheesecloth. If honey is granulated in comb, heat until wax is liquefied; stir, cool and remove wax.

7.1.4 Procedure

7.1.4.1 Preparation of Test Sample - First Procedure (applicable to honeys which may contain sediment) (a) Transfer an accurately weighed sample of approximately 25 g (W1) from the homogenized honey to 100 mL volumetric flask, add 5 mL alumina cream (7.1.2.4) dilute to volume with water at 20°C and filter. (b) Dilute 10 mL of this solution to 500 mL with distilled water (diluted honey solution). OR

7.1.4.2 Preparation of Test Sample - Second Procedure (a) Weight accurately a representative quantity of about 2 g (W2) of the homogeneous honey sample, dissolve in distilled water and dilute to 200 mL in a calibrated flask (honey solution). (b) Dilute 50 ml of the honey solution to 100 mL using distilled water (diluted honey solution).

7.1.4.3 Standardization of the Modified Fehling’s Solution Standardize the modified Fehling’s solution A so that exactly 5 mL (pipette), when mixed with approximately 5 mL of Fehling’s solution B, will react completely with 0.050 g invert sugar added as 25 mL dilute invert sugar solution (2 g/L).

7.1.4.4 Preliminary Titration The total volume of the added reactants at the completion of the reduction titration must be 35 mL. This is made up by the addition of a suitable volume of water before the titration commences. Since the compositional criteria of the honey standard specify that there should be more than 60 percent reducing sugars (calculated as invert sugar) a preliminary titration is necessary to establish the volume of water to be added to a given sample to ensure the reduction is carried out at constant volume. This volume of water to be added is calculated by subtracting the volume of diluted honey solution consumed in the preliminary titration (c mL) from 25 mL.
Pipette 5 mL Fehling’s solution A into a 250 mL Erlenmeyer flask and add approximately 5 mL Fehling’s solution B. Add 7 mL distilled water, a little powdered pumice or other suitable antiaumping agent, followed by about 15 mL diluted honey solution from a burette. Heat the cold mixture by boiling over a wire gauze, and maintain moderate ebullition for 2 mm. Add 1 mL 0.2 percent aqueous methylene blue solution whilst still boiling and complete the titration within a total boiling time of 3 minutes, by repeated small additions of diluted honey solution until the indicator is decolorized. It is the colour of the supernatant liquid that must be observed. Note the total volume of diluted honey solution used (x mL).

7.1.4.5 Determination Calculate the amount of added water necessary to bring the total volume of the reactants at the completion of the titration to 35 mL by subtracting the preliminary titration (x mL) from 25 mL. Pipette 5 mL Fehling’s solution A into a 250 mL Erlenmeyer flask and add approximately 5 mL Fehling’s solution B. Add (25-x) mL distilled water, a little powdered pumice or other suitable antiaumping agent and, from a burette, all but 1.5 mL of the diluted honey solution volume determined in the preliminary titration. Heat the cold mixture to boiling over a wire gauze and maintain moderate ebullition for 2 mm. Add 1.0 mL 0.2 percent methylene blue solution whilst still boiling and complete the titration within a total boiling time of 3 mm. by repeated small additions of diluted honey solution until the indicator is decolorized. Note the total volume of diluted honey solution (y mL). Duplicate titrations should agree within 0.1 mL.

7.1.5 Calculation and Expression of Results

Where the First Procedure (7.1.4.1) has been used:

\[ C = \frac{x}{W1} \]

Where the Second Procedure (7.1.4.2) has been used:

\[ C = \frac{x}{W2} \]

Where
- \( C \) = g invert sugar per 100 g honey
- \( W1 \) = weight (g) of honey sample taken according to sub-section 7.1.4.1
- \( W2 \) = weight (g) of honey sample taken according to sub-section 7.1.4.2
- \( Y1 \) = volume (mL) of diluted honey solution consumed in the determination carried out according to the First Procedure (7.1.4.1)
- \( Y2 \) = volume (mL) of diluted honey solution consumed in the determination carried out according to the Second Procedure (7.1.4.2)

7.1.6 Notes on the Procedure It is essential to the accuracy and repeatability of the determination that the volume of water necessary to bring the reactant mixture to a total volume of 35 mL be determined for each individual sample; the following table gives typical volumes which may be encountered at the preliminary titration stage for the incremental contents of invert sugar shown, assuming the test sample (7.1.4.1) weighs about 25 g or test sample (7.1.4.2) weighs about 2 g.

<table>
<thead>
<tr>
<th>Invert Sugar content</th>
<th>Volume of Distilled Water to be Added</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>mL</td>
</tr>
<tr>
<td>60</td>
<td>8.3</td>
</tr>
<tr>
<td>65</td>
<td>9.6</td>
</tr>
<tr>
<td>70</td>
<td>10.7</td>
</tr>
<tr>
<td>75</td>
<td>11.8</td>
</tr>
</tbody>
</table>

7.2 Determination of Apparent Sucrose Content (Type I Method)

7.2.1 Principle of the Method Based on the Walker (1917) inversion method.

7.2.2 Reagents

7.2.2.1 Soxhlet modification of Fehling’s solution (7.2.2.1)

7.2.2.2 Standard invert sugar solution (7.2.2.2)
7.2.2.3 Hydrochloric acid (6.34 M aqueous)
7.2.2.4 Sodium hydroxide solution 2 g/litre (7.1.2.3)
7.2.2.5 Methylene blue solution 2 g/litre (7.1.2.3)

7.2.3 Sampling The honey is prepared for sampling as in 7.1.3

7.2.4 Procedure
7.2.4.1 Preparation of test sample Prepare the honey sample as in 7.1.4.1(a). Dilute 10 mL of this solution to 250 mL with distilled water. Honey solution (for sucrose determination) OR prepare the honey solution as in 7.1.4.2(a).

7.2.4.2 Hydrolysis of the test sample The honey solution (50 mL) is placed in a 100 mL graduated flask, together with 25 mL distilled water; heat the test sample to 65°C over a boiling water-flask. The flask is then removed from the water-bath and 10 mL of 6.34 M hydrochloric acid added. The solution is allowed to cool naturally for 15 minutes, and then brought to 200°C and neutralizing with 5 M sodium hydroxide, using litmus paper as indicator, cooled again, and the volume adjusted to 100 mL (diluted honey solution).

7.2.4.3 Titration As in 7.1.4.4 and 7.1.4.5.

7.2.5 Calculation and expression of results Calculate percent invert sugar (g invert sugar per 100 g honey) after inversion using the appropriate formula as percent invert sugar before inversion in 7.1.5.

| Apparent sucrose content | = | (invert sugar content after inversion minus invert sugar content before inversion) X 0.95 |

The result is expressed as g apparent sucrose per 100 g honey.

7.3 Determination of Moisture Content (Type I Method)

7.3.1 Principle of Method Based on the refractometric method of Chataway (1932), revised by Wedmore (1955).

7.3.2 Apparatus Refractometer

7.3.3 Sampling The honey is prepared for sampling as in 7.1.3.

7.3.4 Procedure

7.3.4.1 Determination of the Refractive Index Determine the refractive index of the test sample using a refractometer at a constant temperature near 200°C. Convert the reading to moisture content (percent mim) using the table given below. If the determination is made at a temperature other than 200°C, convert the reading to standard temperature of 200°C, according to the temperature corrections quoted. The method used is to be noted in the test report.
Table 29: Moisture content

<table>
<thead>
<tr>
<th>Refractive Index (20°C)</th>
<th>Moisture Content (percent)</th>
<th>Refractive Index (20°C)</th>
<th>Moisture Content (percent)</th>
<th>Refractive Index (20°C)</th>
<th>Moisture Content (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5044</td>
<td>13.0</td>
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<td>1.4835</td>
<td>21.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7.3.4.2 Temperature Corrections - Refractive Index:
- Temperatures above 20°C - Add 0.00023 per °C
- Temperatures below 20°C - Subtract 0.00023 per °C

7.4 Gravimetric Determination of Water-insoluble Solids Content (Type II Method)

7.4.1 Sampling The honey is prepared for sampling as in 7.1.3.

7.4.2 Procedure

7.4.2.1 Preparation of Test Sample Honey (20 g) is weighed to the nearest centi-gram (10 mg) and dissolved in a suitable quantity of distilled water at 80°C and mixed well.

7.4.2.2 Gravimetric Determination The test sample is filtered through a previously dried and weighed fine sintered glass crucible (pore size 15.40 μm) and washed thoroughly with hot water (80°C) until free from sugars (Mohr test). The crucible is dried for one hour at 135°C, cooled and weighed to 0.1 mg.

7.4.3 Expression of Results The result is expressed as percent water-insoluble solids (m/m).

7.5 Determination of Mineral Content ash (Type I Method)

7.5.1 Sampling Honey is prepared for sampling as in 7.1.3.

7.5.2 Procedure

7.5.2.1 Determination of the Honey Honey (5010 g) is weighed accurately into an ignited and pre-weighed platinum or silica dish and gently heated in a muffle furnace until the sample is black and dry and there is no danger of loss by foaming and overflowing. An infra-red lamp can also be used to char the sample before inserting into the furnace. If necessary, a few drops of olive oil may be added to prevent frothing. The sample is then ignited at 600°C to constant weight. The sample is cooled before weighing.

7.5.3 Expression of Results The result is expressed as percent ash (m/m).
7.6 Determination of Acidity (Type II Method)

7.6.1 Sampling The honey is prepared for sampling as in 7.1.3.

7.6.2 Reagents

7.6.2.1 Sodium hydroxide 0.1 N (carbonate-free)

7.6.2.2 Phenolphthalein indicator 1 percent (mlv) in ethanol, neutralized.

7.6.2.3 Distilled Water made carbon dioxide free by boiling and subsequent cooling.

7.6.3 Procedure

7.6.3.1 Preparation of Test Sample Honey (10.0 g) is weighed accurately and dissolved in 75 mL distilled water (7.6.2.3).

7.6.3.2 Titration The test sample is titrated against carbonate-free 0.1 M sodium hydroxide solution using 4-5 drops of neutralized phenolphthalein indicator. The end-point colour should persist for 10 seconds. For darkly coloured samples, a smaller weight should be taken. As an alternative, a pH meter may be used and the sample titrated to pH 8.3.

7.6.4 Calculation and Expression of Results The result is expressed as millival (milli-equivalents acid/kg honey and is calculated as follows: Acidity = 10v where v = the number of mL 0.1 M NaOH used in the neutralization of 10 g honey.

7.7 Determination of Diastase Activity (Type I Method)


7.7.2 Reagents

7.7.2.1 Iodine Stock Solution: Dissolve 8.8 g of iodine analytical grade, in 30-40 mL water containing 22 g potassium iodine, analytical grade, and dilute to 1 litre with water.

7.7.2.2 Iodine solution 0.0007 N: Dissolve 20 g potassium iodine, analytical grade, in 30-40 mL water in a 500-mL volumetric flask. Add 5.0 mL iodine stock solution and make up to volume. Make up a fresh solution every second day.

7.7.2.3 Acetate Buffer - pH 5.3 (1.59M): Dissolve 87 g sodium acetate.3H2O in 400 mL water, add about 10.5 mL glacial acetic acid in a little water and make up to 500 mL. Adjust the pH to 5.3 with sodium acetate or acetic acid as necessary, using a pH meter.

7.7.2.4 Sodium Chloride Solution 0.5 M: Dissolve 14.5 g sodium chloride, analytical grade, in boiled-out distilled water and make up to 500 mL. The keeping time is limited by mould growth.

7.7.2.5 Starch Solution:

(a) Preparation of soluble starch In a conical flask immersed in a water-bath and fitted with a reflux condenser, boil 20 g of potato starch for one hour in the presence of a mixture of 100 mL of 95 percent ethanol and 7 mL of 1 M hydrochloric acid. Cool, filter through a filtering crucible (pore size 90 – 150 m) and wash with water until the wash/water ceases to give any chloride reaction. Drain thoroughly and dry the starch in air at 35 °C. The soluble starch must be stored in a well stoppered flask.

(b) Determination of moisture content of soluble starch Accurately weigh a quantity of approximately 2 g of soluble starch and spread in a thin layer over the bottom of a weighing bottle (diameter 5 cm). Dry for one and a half hours at 1300°C. Allow to cool in a dessicator and re-weigh. The weight loss with respect to 100 g represents the moisture content. The moisture content of such starch should be 7-8% m/m depending on the humidity of the air in which the sample has been dried.

(c) Preparation of starch solution Use a starch with a blue value between 0.5-0.55 using a 1 cm cell, as determined by the method below. Weigh out the amount of starch which is equivalent to 2 g anhydrous starch. Mix with 90 mL of water in a 250 mL conical flask. Bring rapidly to the boil, swirling the solution as much as
possible, heating over a thick wire gauze preferably with an asbestos centre. Boil gently for 3 mm., cover and allow to cool spontaneously to room temperature. Transfer to a 100 mL volumetric flask, place in a water bath at 40°C to attain this temperature and make up to volume at 40°C.

Method for determining blue value of starch The amount of starch equivalent to 1 g anhydrous starch is dissolved by the above method, cooled and 2.5 mL acetate buffer added before making up to 100 mL in a volumetric flask. To a 100 mL volumetric flask add 75 mL water, 1 mL M hydrochloric acid and 1.5 mL of 0.02 N iodine solution. Then add 0.5 mL of the starch solution and make up to volume with water. Allow to stand for one hour in the dark and read in 1 cm cell using a spectrophotometer at 660 nm against a blank containing all the ingredients except the starch solution. Reading on the absorbance scale = Blue value.

7.7.3 Apparatus
7.7.3.1 Water-bath at 40 + 0.20°C.
7.7.3.2 Spectrophotometer to read at 660 nm.
7.7.4 Sampling The honey sample is prepared as in 7.1.3 without any heating.
7.7.5 Procedure
7.7.5.1 Preparation of test samples: Honey solution: 10.0 g honey is weighed into a 50 mL beaker and 5.0 mL acetate buffer solution is added, together with 20 mL water to dissolve the sample. The sample is completely dissolved by stirring the cold solution. 3.0 mL sodium chloride solution is added to a 50 mL volumetric flask and the dissolved honey sample is transferred to this and the volume adjusted to 50 mL. N.B.: It is essential that the honey should be buffered before coming into contact with sodium chloride.

Standardization of the starch solution The starch solution is warmed to 40°C and 5 mL pipetted into 10 mL of water at 40°C and mixed well. 1 mL of this solution is pipetted into 10 mL 0.0007 N iodine solution, diluted with 35 mL of water and mixed well. The colour is read at 660 nm against a water blank using a 1 cm cell. The absorbance should be 0.760 ± 0.020. If necessary the volume of added water is adjusted to obtain the correct absorbance.

7.7.5.2 Absorbance determination Pipette 10 mL honey solution into 50 mL graduated cylinder and place in 400 + 20°C water-bath with flask containing starch solution. After 15 minutes, pipette 5 starch solution into the honey solution, mix, and start stop-watch. At 5 minutes intervals remove 1 mL aliquots and add to 10.00 mL 0.0007 N iodine solution and add to 10.00 mL 0.0007 N iodine solution. Mix and dilute to standard volume (see 6.7.5.1). Determine absorbance at 660 nm in spectrophotometer immediately using 1 cm cell. Continue taking 1 mL aliquots at intervals until absorbance of less than 0.235 is reached.

7.7.6 Calculation and expression of results The absorbance is plotted against time (mm) on a rectilinear paper. A straight line is drawn through at least the last three points on the graph to determine the time when the reaction mixture reaches an absorbance of 0.235. Divide 300 by the time in minutes to obtain the diastase number (DN). This number expresses the diastase activity as ml 1 percent starch solution hydrolysed by the enzyme in 1 g of honey in 1 h at 400°C. This diastase number corresponds with the Gothe-scale number. Diastase activity = DN = ml starch solution 1 percent)/g honey/h at 400°C.

7.8 Spectrophotometric determination of hydroxymethylfurfural (HMF) content (Type II Method) According to the AOAC method (AOAC, 14th Ed., 1984, Hydroxymethylfurfural in Honey, Spectrophotometric Method, 31.153).
83. 6.1 ORGANIC CERTIFICATION OF APICULTURE PRODUCTS

83.5.1. Example of Organic labelling standards, Soil Association, UK

The organic status of your bee products depends on:

- your hive management and the treatments you apply
- the quality of the foraging area, and
- how you harvest, process and store the honey.

You can sell bees and bee products as organic when:

- you have kept them to full organic standards for at least 12 months, and
- we have added organic bees and bee products to your trading schedule.

Origin of your bees and conversion

You must choose a breed of bee that is:

- able to adapt to local conditions
- vigorous, and
- resistant to disease

Note – we would expect this to be a European breed or local ecotype of Apis mellifera or a native species or breed from the area where you are producing the honey. You must establish your organic apiaries and increase your stocks by dividing your own colonies or bringing in colonies or swarms from other organic units. You may convert your existing hives, but you must keep your bees to these standards for at least 12 months before you can sell any of their products as organic. During this time you must replace their comb with organic wax comb or foundation.
83.5.2. Bringing in non-organic replacements

You may bring in up to 10% non-organic replacements as queen bees and swarms only if you place them in hives with comb or foundation from organic production. These bees will not need to go through a conversion period.

With our permission, you may bring in more than 10% non-organic bees when:

- organic swarms are not available, and
- a high percentage of your bees have died due to health problems or catastrophic circumstances. You must then keep the bees to full organic standards for 12 months before you can sell any of their products as organic.

83.5.3. Keeping organic and non-organic bees.

If you keep organic and non-organic apiaries in the same area, you must keep them all to these standards. With our permission, you may have apiaries in nearby non-organic areas, but you must manage them to all other aspects of beekeeping standards. You must not sell products from non-organic apiaries as organic.

83.5.4. Keeping bees healthy

To keep your bees healthy you should select appropriate hardy breeds. You should encourage resistance to disease and prevent infections by:

- renewing the queens regularly
- carefully inspecting your hives to detect health problems
- controlling the male brood in your hives
- disinfecting materials and equipment regularly
- destroying contaminated material
- regularly renewing beeswax, and
- leaving enough reserves of honey and pollen in your hives.

If, despite taking all preventative measures, your colonies become infected you must:

- treat them immediately, and
- if necessary place the colonies in isolation apiaries.

If you use any veterinary treatments you must:

- make sure their use is allowed by law
- use complementary therapies provided they are effective for the condition you are treating, and
- only use other veterinary treatments, under the responsibility of your vet, if complementary therapies haven’t worked, or are unlikely to prevent your bee colonies being destroyed.

If you treat any colonies with veterinary treatments other than complementary therapies or those we allow against varroa mite, you must:

- put them into isolation during the treatment period
- replace all the wax with organically produced wax, and
- put the treated colony into a 12 month conversion period, starting from the date of treatment.
For the treatment of Varroa jacobsonii, you may destroy the male brood to contain a Varroa infestation. You may use:

- formic acid, lactic acid, acetic acid, oxalic acid
- menthol, thymol, eucalyptol or camphor, and
- veterinary treatments which are compulsory under national or community legislation.

**83.5.5. **Welfare of bees

You may kill and replace the queen bee.

You must not:

- clip the wings of the queen bee
- use artificial insemination.

**83.5.6. **Feeding bees

You must leave your colonies with enough honey and pollen reserves to survive the winter.

You may only artificially feed your bees:

- between the last honey harvest and 15 days before the start of the next nectar or honeydew flow period, or
- when they are in danger of dying due to extreme weather conditions.

You must record the type of feed, dates, quantities and the hives that you artificially feed.

You should use organic honey, preferably from your own unit. If suitable organic honey is not available, such as when it has crystallized you may, with our permission, use:

- organic sugar syrup, or
- organic sugar molasses.

You must not feed your bees artificially with any other products.

**83.5.7. **Siting and managing your apiaries

EU member states may have identified regions or areas where organic beekeeping is not practical. You must not site or manage your apiaries in those areas. When you are siting your apiaries you must:

- place the hives on areas of land certified as organic
- ensure your bees have enough natural nectar, honeydew, pollen sources, and access to water
- make sure nectar and pollen sources, within four miles of your apiary, consist essentially of:
  i. organic crops, and/or
  ii. uncultivated areas with natural vegetation, and
  iii. crops that have only been managed with low environmental impact methods (such as those grown under Regulation (EEC) No. 2078/92) and which cannot significantly affect the organic description of beekeeping, and
- keep them far enough from potential sources of contamination, such as urban centres, motorways, industrial areas, waste dumps and waste incinerators.
With our permission, you may site your apiaries on land that:

- only has naturally occurring vegetation, and
- has not been treated with any substances we do not allow.

You must provide us with:

- evidence that your colonies only have access to land that meets these conditions, and
- a map of a suitable scale that shows the location of your hives and the foraging area of your bees.

With our permission, you may reduce the four mile distance if you can demonstrate that the organic integrity of the honey will not be lost. You must provide us with evidence of this, such as:

- a pesticide residue analysis of the honey, and
- details of how the land in the region around the apiary is managed.

You must:

- identify each of your hives individually
- inform us, within a timescale we have agreed with you, when you move your apiaries, and
- record all details of your hive management operations, such as removing supers and extracting honey.

If you have put your hives in areas where flowering is not taking place or if they are dormant, you must keep them on organic land. However you do not need to meet the other conditions of siting apiaries for this time.

83.5.8. Hives and materials you can use

Your hives must be made basically of natural materials which give no risk of contaminating either the environment, the bee products or the bees themselves.

You may only use:

- natural products in the hives, such as propolis, wax and plant oils
- physical cleaning treatments such as steam or direct flame
- appropriate products, listed in standard 4.11.4, 4.11.5, 4.11.6 and to protect frames, hives and combs against pests, and
- appropriate substances listed in standard 10.12.14, for cleaning and disinfecting your beekeeping materials, buildings, utensils or products.

You must use organic wax:

- for all your new foundation
- to replace comb during a hive’s conversion period, and
- to set up a new hive or installation.

With our permission, you may use non-organic wax from cappings if organic wax is not available.
83.5.9. **Extraction**

You must make sure you adequately extract, process and store your bee products.

You must not:

- use chemical synthetic repellents during honey extraction operations
- destroy bees in the combs to harvest bee products, or
- extract honey from combs that contain brood.

84. **6.2 WILD HARVEST STANDARDS**

84.5.1. **Example of Organic Certification Section on Wild Harvest Standards - KRAV**

- Wild Harvest crop production includes anything that is harvested or gathered without, to any considerable extent, being actively cultivated.
- The producer in charge of gathering or harvest should enter into a certification agreement with KFAV
- Wild production shall come from a clearly defined area that meet the criteria below
- The area may not have been treated with artificial fertilizer or chemicals in the three years prior to harvest. Plants treated with pest control agents may not be planted during the last three years. Liming is permitted.
- Area shall be situated such that contamination does not reduce the value of the products as food for human consumption or animal feed.
- A 25 metre wide buffer zone shall be provided beside roads with traffic intensity above over 3000 vehicles a day on a yearly average, or other source of contamination (e.g industries or neighbouring land to which artificial fertilizer or chemical pesticides and herbicides have been applied). Limited values have been laid down for calcium in land, see Appendix 6.
- The harvest/gathering of the product shall not have a negative impact on the environment or endanger the existence of any species of plant or animal.
- All places of purchase shall have personnel who are well versed in KRAV’s standards.
- Persons who gather or pick shall have access to maps of KRAV approved areas so that all gathering and picking is confined to these areas. All information, including instructions and standards, shall be available in the appropriate language of the parties at the point of purchase.

84.5.2. **Example of Sustainable Harvesting Protocols for bee products**

Top Bar Hive. Only full honey combs may be cut off the bars, and the bar not yet capped should be moved towards the brood. The other bars with less honey or less comb drawn should follow and the empty (just harvested bars) should be placed at the far end. During this action use as little smoke as possible in order not to contaminate the honey with a smoky flavour.

The fully capped combs can be placed in a dish or container. These are ready for extraction.

Leave enough honey for the bees to continue their work. Towards the end of the honey flow leave at least two fully capped combs for the bees as well as all the unfinished combs further away from the brood section.

It is good practice to obtain top quality honey to leave capped honey comb for an extra week (or two) so the bees can dehydrate the honey better. Disadvantage is that the beekeeper must regularly empty top bars otherwise the bees may find there is not enough storage space and they may stop collecting or even abscond. This process disturbs the colony and disrupts nectar collection.
Frame hive. The best practice is to keep on adding supers above the brood box (with queen excluder) until the end of the mayor honey flow. Add an empty super when the last one is filled by two thirds. The great advantage here is that the colony is the least disturbed thus able to continue their hard work of harvesting nectar and producing honey. Once the honey flow has stopped the bee keeper may now collect the supers in their totality, ensuring to leave at least one super for the bees to survive the winter months. The supers can be taken by using a bee escape board thus allowing as many bees to be saved from death.

Traditional hive. Open the hive at the far side away from of the opening. Proceed to cut away comb with honey only. Once you reach brood combs stop the ‘robbing’ and close the hive immediately as tightly as possible. The disadvantage here is that the harvester has to cut away newly drawn comb not yet filled with honey, honey comb with young honey not yet capped and s/he may even (unintentionally) cut away brood-comb. The colony is most disturbed when residing in this type of hive. As a result the harvested quantity may be low, the bees may get very aggressive and/or abscond.

Moving bees. Bees must be moved in the early hours of the evening when the entire colony is inside the hive, busy with cleaning, making honey, drawing out comb and ventilation. The opening should now be closed preferably with a single newspaper sheet. The hive with its contents should now be moved at least 3 kms from its original place. The newspaper can now safely be removed from the entrance and the bees will wake up in a new and hopeful nectar rich environment. If a hive needs to be moved within the apiary/compound one can move the hive 1 meter every other night until the final destination has been reached.
VALUE ADDITION
– BEESWAX FORMULAS

84.5.3. Some examples of retail products that incorporate bee products

There is potential also for new SME’s to develop as the applications of these products into retail products can easily be made:

- Lip Balm can be made with 2 ingredients-Beeswax and a fixed oil like Olive or Sunflower
- Skin Protecting barrier balms (for workers or even nappy rash) can be made with a minimum of two ingredients (as above)
- Floor sealing products for Earth floors to combat dust and damp Beeswax and Linseed
- Leather Protection creams can be made with mixing equal parts of Beeswax, Tallow and Neatsfoot.
- Beeswax mixed with Linseed and Cedarwood oil can make a furniture polish that keeps away termites, moths and other insects.
- Propolis could be included with herbal Teas especially Artemisia which is used for Malaria treatments. The addition of Propolis could help support the immune system, add anti-microbial properties and help with the many other healing properties of Artemisia.
- Reusable ‘cling film’. Cotton cloth can be soaked in Beeswax

<table>
<thead>
<tr>
<th>Lip Balm</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Beeswax</td>
<td>15-18%</td>
</tr>
<tr>
<td>Vit E (mixed tocopherols) if available</td>
<td>0.10%</td>
</tr>
<tr>
<td>Olive Oil/Fractionated Coconut/Mixed fixed oil</td>
<td>84.9-81.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hand Balm Beauty</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Beeswax</td>
<td>10-12%</td>
</tr>
<tr>
<td>Vit E (mixed tocopherols) if available</td>
<td>0.1-0.2%</td>
</tr>
<tr>
<td>Rosehip oil/Jojoba Oil/Avocado</td>
<td>q/s</td>
</tr>
<tr>
<td>Essential oils: Geranium/Frankincense/Chamomile</td>
<td>0.50%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hand Balm protective(Barrier)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Beeswax</td>
<td>10-14%</td>
</tr>
<tr>
<td>Mineral Oil (White) or Fractionated Coconut Oil</td>
<td>90-86%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vitamin E Cream</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Di Glycerides of Fatty Acids/Emulsifying wax</td>
<td>8-12%</td>
</tr>
<tr>
<td>Beeswax</td>
<td>2-4%</td>
</tr>
<tr>
<td>Cocoa Butter or Shea if Available</td>
<td>2-4%</td>
</tr>
<tr>
<td><strong>Mixed or pure fixed oil (Grapeseed etc)</strong></td>
<td>24-36%</td>
</tr>
<tr>
<td>Preservative mix</td>
<td>0.5-1%</td>
</tr>
<tr>
<td>Water</td>
<td>q/s</td>
</tr>
<tr>
<td><strong>Shoe Polish Base</strong></td>
<td></td>
</tr>
<tr>
<td>Beeswax</td>
<td>9.00%</td>
</tr>
<tr>
<td>Turpentine (White Spirit if no alternative)</td>
<td>22.50%</td>
</tr>
<tr>
<td>Water</td>
<td>67.70%</td>
</tr>
<tr>
<td>Pearl Ash (Potassium Carbonate)</td>
<td>0.28%</td>
</tr>
<tr>
<td>Suitable Dye</td>
<td>0.35-0.40%</td>
</tr>
<tr>
<td><strong>Typical Lipstic Base</strong></td>
<td></td>
</tr>
<tr>
<td>Castor Oil</td>
<td>qs</td>
</tr>
<tr>
<td>Candelilla wax</td>
<td>7%</td>
</tr>
<tr>
<td>Beeswax</td>
<td>6%</td>
</tr>
<tr>
<td>Carnauba wax</td>
<td>3%</td>
</tr>
<tr>
<td>Ozokerite</td>
<td>4%</td>
</tr>
<tr>
<td>Mica 3</td>
<td>1.50%</td>
</tr>
<tr>
<td>Lake colouring</td>
<td>2.25%</td>
</tr>
<tr>
<td><strong>Phase b (to be added after above is melted)</strong></td>
<td></td>
</tr>
<tr>
<td>Tocopherol acetate</td>
<td>0.05%</td>
</tr>
<tr>
<td>BHT</td>
<td>0.03%</td>
</tr>
<tr>
<td>Flavouring/Peppermint Oil</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Propolis Tincture (strong)</strong></td>
<td>50%</td>
</tr>
<tr>
<td>Propolis</td>
<td>50%</td>
</tr>
<tr>
<td>Strong Vodka/Brandy 80% proof (40% volume)</td>
<td>50%</td>
</tr>
</tbody>
</table>

1) Break propolis into small (pea sized) segments
2) Add to equal volume of warmed Vodka/Brandy which has been warmed to 40-50°C to aid absorption of propolis. Leave to stand 12 hours min. And filter through coffee paper.

Cool tincture in fridge overnight and refilter through filter paper.

**Beeswax Furniture Polish**

| Beeswax | 33% |
| Turpentine | 33% |
| Boiled Linseed | 33% |
| Lavender oil/Fragrance | 1% |

Melt first 3 ingredients in Baine Marie (Pot in water pot) at around 65-70°C When all melted allow allow to cool a little stir in Fragrance.Oil
Ultra Rich Skin Cream
- 2-½ oz (weight) beeswax
- 4 ounces (weight) anhydrous lanolin
- 2/3 cup baby oil
- 1-teaspoon borax (sodium borate, C.P.)
- Fragrant essential oil (optional)

Borax is sold with laundry detergents, but chemically pure borax, which is required for cosmetics, is sold by drug stores and chemical laboratories. Lanolin is sold by drug stores.

In a microwave or double boiler, melt the oil, lanolin and beeswax to 160 degrees F. Heat the borax and water in a separate container to 160 degrees F. Be sure the borax is dissolved and the wax is melted. Add the water mixture to the oil mixture while stirring briskly. When white cream forms, stir slowly until the mixture cools to 100 degrees F. Pour it into small wide mouth jars.

Massage Bar
- 3 oz. Bees wax
- 3 oz. Coconut oil
- 3 oz. Sunflower oil
- Essential Oils or Fragrance Oil

Melt coconut oil and bees wax in microwave or double boiler. Stir well. Add sunflower oil and stir well. Allow mixture to cool a bit and then add 1 tsp. of essential or fragrance oil. Stir some more. Pour into candy or soap molds and allow to harden.

Leather Softener
- 1-ounce (weight) beeswax
- 8 ounces (weight) petroleum jelly

Melt the ingredients in a microwave or double boiler. Brush the hot mixture onto the leather and allow it to penetrate. If possible, place the item in hot sun to help the mixture penetrate the leather. Polish the leather with a cloth to remove excess.

Grafting Wax
- 10 ounces (weight) rosin
- 2 ounces (weight) beeswax
- 1 ounce (weight) charcoal powder
- 1-tablespoon linseed oil

Grafting wax scales the union of plant tissue. Heat the beeswax and rosin at 250 degrees F. until they melt. Stir in the remaining ingredients.

Chapped-Lip Balm
- 1 tablespoon shredded beeswax
- 1-tablespoon petroleum jelly
- 1 teaspoon Honey 1 tablespoon lanolin
- 3-4 drops of oil of peppermint, wintergreen, eucalyptus or some other essential oil.

Melt the wax, lanolin and petroleum. Add the honey and essential oil. Stir the mixture until it is cool.
CHAPTER 6. ANNEX DOCUMENT OF THE ZAMBIA HONEY ROADMAP

EQUIPMENT FOR SMALL SCALE MANUFACTURING OF APITHERAPY BASED BODYCARE PRODUCTS – EXAMPLES.

This annex provides a snapshot of equipment that can be sourced within eastern Africa. These examples are of companies based in Kenya:

84.5.4. Benmah Engineering, Nairobi, Kenya.

Benmah Engineering Services Ltd is a private company registered in 1998. The company’s formally business is “Mechanical and Electrical Services and Supplies”. The core business of Benmah Engineering services is “extraction of all types of seed’ oil, distillation of essential oils from various species of plants, and herbal extraction and processing”.

Body/face cream making equipment

<table>
<thead>
<tr>
<th>Type &amp; Description</th>
<th>Capacity</th>
<th>Price</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cream blender</td>
<td>100kg per cycle</td>
<td>100,000.00</td>
<td></td>
</tr>
<tr>
<td>Double jacketed cream cooler</td>
<td>100kg per cycle</td>
<td>250,000.00</td>
<td></td>
</tr>
</tbody>
</table>

Soap making equipment

<table>
<thead>
<tr>
<th>Type &amp; Description</th>
<th>Capacity</th>
<th>Price</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soap blender</td>
<td>50kg per cycle</td>
<td>125,000.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75kg per cycle</td>
<td>150,000.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100kg per cycle</td>
<td>180,000.00</td>
<td></td>
</tr>
<tr>
<td>Soap extruder</td>
<td>50kg per cycle</td>
<td>165,000.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75kg per cycle</td>
<td>195,000.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100kg per cycle</td>
<td>250,000.00</td>
<td></td>
</tr>
<tr>
<td>Body soap molder/shaper</td>
<td>75,000.00</td>
<td>Includes jig &amp; 1 selected styling mold</td>
<td></td>
</tr>
<tr>
<td>Bar soap stamping unit</td>
<td>25,000.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Combined Soap & Cream blender

<table>
<thead>
<tr>
<th>Type &amp; Description</th>
<th>Capacity</th>
<th>Price</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal blender</td>
<td>50kg per cycle</td>
<td>150,000.00</td>
<td>Has variable speed to suit requirements for soap &amp; cream blender</td>
</tr>
</tbody>
</table>

### Kenya Industry Research Development Institute KIRDI, Nairobi, Kenya:

KIRDI is a research division of the Government of Kenya that develops low-cost industrial technology to meet the needs of consumers. The machinery development center is located in Nairobi. In addition to machinery development, KIRDI also trains interested applicants in the operations of specific equipment.

#### KIRDI's catalog of machinery relevant to Bee extract processing

<table>
<thead>
<tr>
<th>Machine</th>
<th>Description</th>
<th>Cost (Ksh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soap plodding machine</td>
<td>Geared motor 5HP, 3 phase</td>
<td>250,000.00</td>
</tr>
<tr>
<td>Soap plodding machine</td>
<td>Geared motor</td>
<td>180,000.00</td>
</tr>
<tr>
<td>Volumetric filler</td>
<td>Manual, 250 to 1000mls</td>
<td>60,000.00</td>
</tr>
<tr>
<td>Candle making machine</td>
<td>40 candles per cycle</td>
<td>55,000.00</td>
</tr>
<tr>
<td>Pulper</td>
<td>Motor driven, 2HP, single phase</td>
<td>139,000.00</td>
</tr>
<tr>
<td>Bottle cupping machine</td>
<td>Manual</td>
<td>48,000.00</td>
</tr>
<tr>
<td>Press</td>
<td>Engine driven, Approtech</td>
<td>160,000.00</td>
</tr>
<tr>
<td>Alternative press</td>
<td>Motorized, Approtech</td>
<td>135,000.00</td>
</tr>
</tbody>
</table>

### PACKAGING:

#### Asami Limited (ASL, Nairobi, Kenya)

ASAMI Ltd stocks various packaging products, including polythene paper and security sealing machinery for home and industrial use. ASAMI’s catalog of sealing machinery is as shown here below:

<table>
<thead>
<tr>
<th>Technology &amp; Purpose</th>
<th>Machine</th>
<th>Description</th>
<th>Cost (Ksh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sealer</td>
<td>Electric cup sealer</td>
<td>Small</td>
<td>25,000.00</td>
</tr>
<tr>
<td></td>
<td>Electric cup sealer</td>
<td>Big</td>
<td>35,000.00</td>
</tr>
<tr>
<td>Security seals</td>
<td>Black &amp; Decker for bottle packaging</td>
<td>Air blow polythene sealing</td>
<td>9,500.00</td>
</tr>
<tr>
<td></td>
<td>Impulse sealer for polythene packaging</td>
<td>8 inches</td>
<td>2,800.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 inches</td>
<td>5,600.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16 inches</td>
<td>9,500.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Foot operated</td>
<td>28,000.00</td>
</tr>
</tbody>
</table>
84.2. TRAINING:

JKUAT Chemistry department in Kenya adapts the training to meet specified needs of the trainees. Below is a summary of the bee extract processing training package by JKUAT.

<table>
<thead>
<tr>
<th>Training Field</th>
<th>Duration</th>
<th>Training Fee (Per Person)</th>
<th>Minimum Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bee extract– Health &amp; Beauty Products</td>
<td></td>
<td>Ksh. 50,000. 00</td>
<td>5 participants</td>
</tr>
<tr>
<td>body &amp; washing soap</td>
<td>15-days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>body cream</td>
<td>(3 weeks)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>body lotions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hair shampoo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hair conditioners</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hair treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hair jelly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality control &amp; assurance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Packaging &amp; labeling</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes on Training Fee**
Includes training fee, training materials, 10.00 am tea and 4.00pm tea, certificate
Participants cater for their breakfast, lunch, dinner & accommodation
85. BUSINESS PLAN:

A business plan is in essence a proposal of business objectives and how to address the objectives. Purpose of a business plan: The purpose of a business plan is to make business ideas more clear and concrete. The business plan aids the entrepreneur in identifying weaknesses and gaps in their business. A business plan clarifies the business identity, the business trend and how to achieve proposed business objectives and activities.

A comprehensive plan provides a clear description of business, and includes a description of the business products, markets, personnel, and financial status. The plan also narrates a planned forecast of the business from the period of planning, and the duration of the specific plan. Further, a business plan aids the entrepreneur to identify and define business problems and risks.

The planning process entails the entrepreneur narrating and appreciating the strength of their business. That is to say the entrepreneur requires describing positive internal factors that offers the business comparative advantage over competitors. Conversely, the entrepreneur requires narrating weaknesses, that is to say negative internal conditions that reduces the likelihood of the business succeeding. The planning process also entails the entrepreneur describing the opportunities that raises the possibility of the business succeeding. Another point of consideration is the threats that the business faces from the external business environment.

Example:

<table>
<thead>
<tr>
<th>Business Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary</td>
</tr>
<tr>
<td>- Introduction</td>
</tr>
<tr>
<td>- Brief introduction of the business</td>
</tr>
<tr>
<td>- Brief summary of each module contained in the business plan that indicates the content of the business plan</td>
</tr>
<tr>
<td>- Purpose of Executive Summary</td>
</tr>
<tr>
<td>- Introduces the business</td>
</tr>
<tr>
<td>- Indicates the content of the business plan</td>
</tr>
<tr>
<td>- Offers incentive towards reading the entire business plan</td>
</tr>
<tr>
<td>- Acts as quick reference for the business plan</td>
</tr>
<tr>
<td>Business</td>
</tr>
<tr>
<td>- Business name</td>
</tr>
<tr>
<td>- Nature of business or trade</td>
</tr>
<tr>
<td>- Business site or location</td>
</tr>
<tr>
<td>- Description of the business site &amp; its suitability &amp; appropriateness for the business</td>
</tr>
<tr>
<td>- Business plan phase &amp; duration</td>
</tr>
<tr>
<td>- A statement of whether the business is new; old; newly defined; or newly acquired</td>
</tr>
</tbody>
</table>
## Business Plan

### Product
- Identifying product or service
- Description of product or service
- Description of expected & potential customers/clients
- Description of the product or service' 'selling points. How unique is the product or service?
- Desired areas of improvement for higher quality, efficiency & lower costs
- Sources of raw materials
- Consideration for alternative source of raw materials

### Management
- Description of personnel to manage the business
- Illustration of skills of the business manager
- Commitment of the business manager
- Description of manager’s past experience
- Description of manager’s training in operating a business or managing a business
- Strengths that the management contributes towards the business (commitment, close supervision, strong activity control etc.)
- Factors to ensure survival & growth of business
- Projected business growth
- Major difficulties, problems or challenges for the business plan
- How to overcome problems and challenges
- Controls towards security of business
- Identification of risks to the business (uncertainties, assumptions etc.)
- Precautions & contingency measures against threats

### Finance
- Assets required
- Innovations & provision to address need for costly machinery or equipment
- Monthly operating costs
- Innovations & provisions to minimize costs
- Review of all cost items towards starting as small as possible in terms of costs
- Capital to introduce to the business
- Sources of capital
- Affordability of additional regular capital until business stabilizes
- Innovations to cope with financial demands before business stabilizes
- Financing balance above available capital (considering formal & informal lenders)
- Possibilities of financing assets or current expenses (such as raw materials) on credit terms
- Projected monthly sales for at least 24 months
- Describe expected costs towards making the sales
- Projected time for the business to break-even (making some profits)
- Projected profit margin
### Business Plan

**Market**
- Potential market segment
- Size of projected market segment
- Innovations, creativity & efforts to access larger market segment
- Identification of competitors & their ramification to the business
- Interventions to retain market share & market segment
- Innovativeness for growth amidst aggressive competition
- Product or service selling points
- Innovations to ensure selling points more special, suitable & convenient to your market segment & customers
- Strategies to reach customers
- Promotional plans
- Efficiency of distribution network
- Pricing for profitability
- Pricing to ensure customers get value for what they pay for products or services
- Implications if you lower or raise your prices
- Market potential & consideration for diversifying or expanding market

**Human Resource**
- Special skills necessary for business
- Planning for the right workers
- Compensating & motivating workers while keeping costs low
- Planning to get value from workers
- Managing workers for effectiveness & success
- Plans to sub-contract some business
- Plans to hire casual & part-time workers with a view to keep cost low

**Financial Projections**
- Cash Flow Statement
  - Cash flow statement indicates cash health of the business. The statement stipulates:
    - Money flowing in (owners capital, loans, sales etc)
    - Cash flowing out (buying assets, daily running costs, loans repayments, owners drawing etc.)
    - Cash balance
    - Trading, Profit and Loss account
- An indication of the items affecting the profitability of the business. In essence, this is a consideration of expected bottom line of the trading of the business
- Balance Sheet
  - A balance sheet shows the assets of the business, owners investment in the business and contribution of outsiders (liabilities)

### 86. FEASIBILITY STUDY:

The feasibility study is an evaluation and analysis of the potential of a proposed project which is based on extensive investigation and research to support the process of decision making. Feasibility studies aim to objectively and rationally uncover the strengths and weaknesses of an existing business or proposed venture, opportunities and threats present in the environment, the resources required to carry through, and ultimately the prospects for success. In its simplest terms, the two criteria to judge feasibility are cost required and value to be attained.

A well-designed feasibility study should provide a historical background of the business or project, a description of the product or service, accounting statements, details of the operations and management, marketing research and policies, financial data, legal requirements and tax obligation. Generally, feasibility studies precede technical
development and project implementation. A feasibility study evaluates the project’s potential for success; therefore, perceived objectivity is an important factor in the credibility of the study for potential investors and lending institutions. It must therefore be conducted with an objective, unbiased approach to provide information upon which decisions can be based.
Starting bee products business

<table>
<thead>
<tr>
<th>Business site</th>
</tr>
</thead>
<tbody>
<tr>
<td>The decision for a business site should be based on diverse factors, among them:</td>
</tr>
<tr>
<td>- Access to market segment</td>
</tr>
<tr>
<td>- Access to means of communication (roads, telephone, post office, internet, printing services etc.)</td>
</tr>
<tr>
<td>- Access to amenities such as water and electricity</td>
</tr>
<tr>
<td>- Access to hygiene &amp; sanitation facilities and services</td>
</tr>
<tr>
<td>- Access to raw materials</td>
</tr>
<tr>
<td>- Premises</td>
</tr>
<tr>
<td>This will be based on some or all of the following factors:</td>
</tr>
<tr>
<td>- Rental space &amp; layout</td>
</tr>
<tr>
<td>- Monthly rental fee</td>
</tr>
<tr>
<td>- Rental agreement &amp; conditions (monthly, quarterly, bi-annual or annual payments for rent)</td>
</tr>
<tr>
<td>- Other hidden costs (electricity, stamp duty, legal fees, service charges, water fee etc.)</td>
</tr>
<tr>
<td>- Cost of renovation or other construction work to ensure your premises suits your business (partitioning, painting, furnishings, extensions, installation of water point, electric cables &amp; socket, telephone cables etc)</td>
</tr>
<tr>
<td>- Equipment required to suit your business (desks, tables, chairs)</td>
</tr>
<tr>
<td>- Store facilities</td>
</tr>
<tr>
<td>- Provision for ventilation &amp; air conditioning</td>
</tr>
<tr>
<td>- Statutory Requirements</td>
</tr>
<tr>
<td>- Business registration</td>
</tr>
<tr>
<td>- Business licenses, permits &amp; tax requirements</td>
</tr>
<tr>
<td>- Regulations specific to your business (Environmental assessment, product certification etc.)</td>
</tr>
<tr>
<td>- Finance</td>
</tr>
<tr>
<td>- Consider minimum initial capital for your business</td>
</tr>
<tr>
<td>- Funding for the business (entrepreneur, loans, credit etc.)</td>
</tr>
<tr>
<td>- Consider availability of reserve funds to maintain the business until it stabilizes</td>
</tr>
<tr>
<td>- Provide for a strategy to sustain healthy cash flow; borrowing should be considered an option only when it is mandatory for the business to survive; spend sparingly for business or personal</td>
</tr>
</tbody>
</table>

Starting bee products business

<table>
<thead>
<tr>
<th>Record Keeping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record all transactions of the business</td>
</tr>
<tr>
<td>Consider the value to derive from any expenditure</td>
</tr>
<tr>
<td>Establish tools for financial management</td>
</tr>
<tr>
<td>Ensure that all sales are properly accounted for</td>
</tr>
<tr>
<td>Production</td>
</tr>
<tr>
<td>Establish strategies to ensure that goods or services are competitive in the market segment</td>
</tr>
<tr>
<td>Ensure that production flows consistently</td>
</tr>
<tr>
<td>Establish a production system that attains and guarantees quality</td>
</tr>
<tr>
<td>Create &amp; maintain a favorable business and product name</td>
</tr>
<tr>
<td>Availability of products or services where and when needed is essential for good sales process needs to ensure stability of the business</td>
</tr>
<tr>
<td>Consider statutory requirements (Quality control, quality guarantee, certification etc)</td>
</tr>
<tr>
<td>Personnel</td>
</tr>
<tr>
<td>Establish personnel requirement</td>
</tr>
<tr>
<td>Establish a system for recruiting personnel professionally</td>
</tr>
<tr>
<td>Establish strong values for a positive culture on human relations and personnel management</td>
</tr>
<tr>
<td>Marketing</td>
</tr>
<tr>
<td>The rule is that an establishment is not in business until there are sales for products or services</td>
</tr>
<tr>
<td>Establish a strategy to attract, retain and expand market segment</td>
</tr>
<tr>
<td>Ensure fair pricing &amp; quality that guarantees value for the price customers pay</td>
</tr>
<tr>
<td>Treat customers well and fairly</td>
</tr>
<tr>
<td>Listen to customers to ensure that the product addresses their needs</td>
</tr>
<tr>
<td>Managing</td>
</tr>
<tr>
<td>For business to grow, good management is essential</td>
</tr>
<tr>
<td>Establish a feedback strategy for purposes of keeping track of customer satisfaction</td>
</tr>
<tr>
<td>Ensure that management structures roots a system of quality control &amp; assurance</td>
</tr>
</tbody>
</table>
Product branding and marketing: For apitherapy and beauty products to penetrate the present market of conventional health and beauty products, the micro-processors have to position or situate bee extract brands in the mind of potential consumers. Positioning of bee health and beauty products will ensure that the target consumer perceives bee extract product as distinctive with a value better than the conventional health and beauty products. Positioning of bee health and beauty products is essential since there are myriad other competitors with conventional and refined brands in market that bee extract products is attempting to penetrate. The ultimate goal in positioning bee health and beauty brands is to occupy the perceived space in the mind of target consumer.

The goal of positioning Zambian apitherapy and beauty products is to ensure that in the perception of target consumer, bee extract health and beauty products offers distinctive and persuasive value far superior to that of competing health and beauty products.

Given that Zambian health and beauty products are relatively young in the market, the micro-processors require putting extra-ordinary efforts to have their products find a place in the consumers’ perception of the variety of health and beauty products accessible to the consumer. The consumer’s perception is largely subjective and is defined by consumer’s orientation that is defined by values, beliefs, needs, experience, environment, etc. Thus, Zambian bee health and beauty products are likely to have more appeal to target consumers who value medication in health and beauty products. Conversely, the micro-processor may attempt to ensure that target consumers can access data and information that enable them to appreciate the medicinal and therapeutic value in Zambian bee extract health and beauty products.

The strategy for bee extract MSEs should be to nurture a perception for Zambian health and beauty products in the potential consumers mind so that the products stand uniquely from competing brands. For relative advantage, the strategy should ensure that the Zambian health and beauty products approximates intimately to what the consumers value and want.

If the young Zambian bee extract MSEs has to have an impact in the world with massive conventional health and beauty products, then the MSEs have to successfully compete and carve a niche in the consumers’ mind. The success of this will be determined by how the MSEs define and communicate their products to the prospective consumer. Capturing a sustainable niche in the mind of the consumer will be determined by how effective the MSEs present their products with a view to have target consumers perceive the products as uniquely endowed with both medicinal and therapeutic competencies.

Defining Positioning: Product positioning refers to a brand’s objective and functional attributes in relation to other brands. It is a characteristic of the physical product and its functional features. Position, on the other hand, refers to a brand’s subjective (or perceived) attributes in relation to competing products. This perceived image of a brand belongs not to the product rather is the property of the consumer’s mental perceptions and in some instances, could differ widely from a brand’s true physical characteristics.

Fundamentally, positioning creates a unique, credible, sustainable and valued place in consumer’s minds for the brand. The “position” of a brand is its perception among target consumers.
The International Centre of Insect Physiology and Ecology (ICIPE) was established in Nairobi, Kenya in April 1970 as a centre of excellence for research in insect science and its application in Africa. The centre’s mandate includes the protection of biodiversity in Africa and its sustainable utilisation for the development of local communities and small-scale farmers, particularly women groups. ICIPE seeks to fulfill this mandate by developing technologies to provide additional food sources and increase rural income in Africa. It acts as a nucleus of research that addresses basic problems in the conservation of beneficial insects and their judicial utilization.

Training at ICIPE addresses three major areas: professional scientific training at post-doctoral and post-graduate levels; short-term courses in useful insects and harmful pests management for beekeepers, silk farmers, NARS agriculturists, insect scientists, and technicians; and short training courses for farmers as trainers. ICIPE has pioneered the development of successful community enterprise around commercial insects and bioprospecting in Africa. ICIPE has established 14 honey, silk and wild harvest operational Marketplaces in East Africa and five honey quality control laboratories in North Africa and one silk quality control lab at ICIPE through community and government participation giving them ownership to control their own business and conserve the forest in collaboration with the local government.

The ICIPE Environmental Health Division and other specialized divisions in agricultural and horticultural crops, pest management, bioprospecting and commercial insects already working in collaboration with KFS, IFAD projects, Forest and Agriculture Departments in all project countries and the UNDP-GEF operations. ICIPE has GIS unit to assess the impact of climate change in various ecological zones. The center has technical, physical & extension capacity to develop adaptive measures for assisting poor communities in Kenya and other African countries. ICIPE has a data-base of international knowledge and experience in rural development, natural based community owned businesses, adaptation and extension of commercial insect enterprises to rural communities across Africa and Near East. The implementing partners have expertise in biodiversity monitoring and participatory forest management. http://www.icipe.org/images/stories/pdf/books/CIP-book2.pdf

The ICIPE’s research and development mandate in collaboration with stakeholders in various disciplines are highly interlinked, such areas include the Assessment of the impact of climate change on the rural poor in project areas in Africa to create a body of information to inform the development of a coherent framework of prioritised research and identify scientific themes to address issues of food security and livelihood and forest biodiversity. The Activities seek to strengthen forest departments to increase the forest cover through PCFM. ICIPE also engages in rural poverty alleviation in Africa through adaptive measures in dissemination, knowledge management, experience sharing and capacity building services on insect science and agro biodiversity functions.
Icipe works within four H’s programmes framework and provide direct technical and supervision support to IFAD- and UNDP supported rural development projects in the region. Icipe has also extended its operation. Working in collaboration with KFS and Ministry of Energy in Kenya to implement Bioenergy projects for the rural poor. Thus icipe has comparative advantage in all the above proposed work and has published its research and development in reputed national and international Journals.

Summary description of the bee health project: The project develops a coordinated regional innovation centre for research, development, advocacy, capacity building and strategic networking for honey bee disease and pests programme in Africa. It coordinates an action plan along the bee health service chain. The overarching goal is to preserve and maintain healthy wild and domesticated bee colonies for sustainable beekeeping and pollination services in Africa to enhance food security. The purpose of the project is to establish regional centre for Bee diseases and pests to safeguard food security in Africa. In order to raise the profile and protection of pollinator bees from the perspectives of food security and sustainable agricultural production along the bee health service chain, this project will contribute in developing the science of risk analysis for bee health. The specific objectives are:

A). Provision of an understanding of the fundamental processes and phenomena, baselines & benchmarks of bee diseases and pests risk analysis.
B). Development of validated efficient field based diagnostic methods for surveillance and detection, including on-site technologies.
C). Developing new methods for socio-economic & environmental impact analysis to benefits beekeepers, farmers, and growers who use bees for pollination and honey production.
D). Integration of capacity building and awareness programs with these activities through the development of appropriate training tools for the protection of bees from pests and diseases.

To meet these objectives, regional bee diseases and pests innovation centre will be established as key results. On a multi stakeholders and multi-sectoral base such as agriculture, health, environment, education, communication and capacity building, they will foster public-private interactions by linking farmers, civil society organisation and the scientific society. They will facilitate more efficient knowledge management, provides skills and resources necessary to raise awareness and profiles of the stakeholders, provide policy makers and regulators advice with the aim to harmonize procedures and legislation relating to bee-health issues and develop regional frame work on bee-health. These activities which focus on identifying and piloting policies and best practice options will have far reaching importance in achieving the envisaged goal of the project. The project will attract women, youth, local entrepreneurs, scientists and will facilitate inter-professional clusters based on innovation system and effective public and private partnership.

The main results flowing from the Regional centre to the satellite stations and farmers federation on bee diseases and pests management to safeguard food security in Africa will be:

- Provision of Innovative technologies development facilities on honey bee health research and training
- The science of Risk assessment and integrated testing strategies for Bee health
- Awareness of the honey bee health and pollination services and decision-making options for policy, institutions and markets
- Beekeepers/Farmers federations and NARS research and bee health management systems at the national satellite stations (one in each country) strengthened and coordinated
- Consistency with EC policy, programming framework and aid effectiveness agenda

The Animal Health Strategy for the European Union (2007-2013 – “Prevention is better than cure”), was adopted in 2007 and was followed up in 2008 by an Action Plan 2 with specific actions grouped under four pillars. In the spirit of the Strategy beekeeping organisations concerned about bee health in the EU recently called for more focus on to the issue. In 2008 European parliament passed a resolution on the situation in the beekeeping sector (2010/C 16 E/14). The concerns were raised that no methods exists
as yet to eradicate certain bee diseases which result in a reduction in their resistance and the loss of hives. The instructions and good practice applicable to the use of biocides are too often ignored. Whereas the continued presence in hives of the parasitic bee mites, varroa spp., colony collapse disorder and the spread of Nosema ceranae are among the causes of the crisis in bee health. Therefore there has been a drastic decline in the number of bee colonies in the world. Beekeeping has a beneficial impact on the ecosystem as a whole and is essential for the agricultural ecosystem in particular. It is essential to preserve biodiversity to which apiculture makes a significant contribution through cross pollination activities. Globally, 76% of the production of food for human consumption is dependent on beekeeping sector whereas 84% of the vegetable species cultivated in Europe depend on pollination. Recently the European commission has adopted a regulation no. 87/2011 of 2nd February 2011 designating the EU reference laboratory for bee health laying down additional responsibilities and tasks for that laboratory and amending Annex VII to Regulation (EC) no. 882/2004 of the European Parliament and the Council.

The timely proposed icipe/AU-IBAR Regional research and training center for bee diseases and pests in Africa are in line with the strong engagement of the EU on bee health in Europe and in Africa’s agriculture and associated food industries, the latter, in co-ordination with Joint Africa-EU Strategy. The EU priority in Africa is to support The Comprehensive Africa Agriculture Development Programme (CAADP), in the implementation of its food security agenda as outlined in CAADP Pillar III 38 by widening the scope of interventions to domains such as nutrition, social protection and access to food. Icipe/AU-IBAR African bee health programme is intended to support the crop productivity in Africa through pollination services to the crops resulting in the increase in the food production thus contributing directly to the EC mandate for the food security in Africa under its strategic priority in Component 3. The interventions in the bee diseases and pest control measures should result in enhanced capacities of African institutions and farmer’s federations to comprehensively analyze and plan a strategy for pollinator’s health as one of the food security issues, and incorporate these observations into operational plans. In addition, the regional centre will support African beekeepers and farmers’ federations to improve pollinators value chain, crop production and incentives for quality products within regional economic communities. (see flow chart).
### Detailed Product Description

**Specifications:**

*Ethiopian Natural Honey.*

Natural honey is solid and this is the best way to prove its genuineness. This is the only way to maintain its aroma and fragrance, its nutritional and therapeutic properties.

The honey is an energetic and rapidly absorbed food, being constituted by monosaccharides (fructose and glucose), which don’t need any further digestion. From time immemorial it is considered a medicinal product.

Therefore, it is very important to use only “virgin” honey, not subjected to any refining treatment. Actually, it is well known that technological processing removes or inactivates its numerous vital properties, and in particular, vitamins, enzymes and trace elements. Refined honey is therefore reduced to a simple solution of sugars. It is easier than sugar to digest but it lacks all those medicinal properties.

Ethiopians like their honey and over the years have exploited bees to the full.

And Ethiopia is a major producer of beeswax, only surpassed by Mexico and China.

It is also the world’s 10th biggest honey producer.
As a food, honey is an excellent source of carbohydrate. It also has health benefits, improving the capacity of blood to carry oxygen, and preventing dehydration of the intestine and the softening of bone.

As a medicine “honey is used in hospitals as Apytherapy, for surgical dressings, high fever, burning skin, intestinal and gastric ulcers, colds and coughs, bronchial disease and diseases of the mouth and mucus membrane”. Honey is also used as an ingredient in cosmetics.
By:

Mr. Jim Krigbaum, International Consultant
Mrs. Susan Wren, International Consultant
Ms. Bridget O’Connor, National Consultant