Apiculture products in Cameroon

Apiculture products include honey, wax and propolis, all of which are non-timber forest products (NTFPs) of animal origin. They have medicinal and cosmetic uses and local, national and international trade, which is important for both rural and urban populations in Cameroon.

What are apiculture products?

The most well known is honey, produced by bees (Apis mellifera). Often collected in the wild from hollow tree trunks, it is also harvested from domesticated bees living in hives. There are two types of honey: from the nectar of flowers and from honeydew. The biochemical composition of both types of honey is largely naturally occurring saccharose, which is extracted by bees from flowers and transformed in a complex process to produce a compound containing about 18% water and 80% sugars (mainly fructose and glucose). Wax is secreted by bees to form an energy rich, protective structure in which young bee larvae, honey and royal jelly are stored. Propolis is a resinous mixture that bees gather from tree buds, sap and other botanical sources. The bees use it like cement to fill unwanted open spaces in the hive. Its colour varies according to its botanical source, but it is commonly dark brown.

Where do you find honey in Cameroon?

Honey is found wherever you find bees! In Cameroon this is mainly in the savannah and montane forest areas, and in fields where there are melliferous trees and plants. The principal honey zones in Cameroon are Adamaoua, producing more than 3 million litres annually, the North West with 92,843 litres and the West region with 48,900 litres (Figure 1). The largest wax production zone is in Djerem around Ngoundal, also in smaller quantities in the North West around Bui, Belo and Mezam divisions, in the South West in Kupe division and Mfi in West. In the humid forest zone, honey is mostly harvested from the wild, with little beekeeping practiced.

What are the principal uses of apiculture products?

Honey is used as a high energy food. It is also valued for its medicinal properties (coughs, skin infections and burns) and it is sold to earn cash income. It has an important cultural value in communities in the West, South West and North West regions, and in the humid forest zone for the Baka pygmies. Beekeeping can contribute to environmental integrity, as some beekeepers protect the forest to ensure their harvests, meaning that beekeeping can often be used as a support to forest conservation initiatives. Bees are also major pollinators, essential for agriculture and fruit-bearing trees. Wax is used to manufacture candles and is used in cosmetics and pharmaceuticals, particularly for its hydrating and emulsifying properties. In Cameroon, traditional metalworkers also use wax to create moulds. Propolis also has medicinal value, and is used in traditional medicines, and there is a large demand from European and American pharmaceutical companies.

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3 A melliferous flower produces substances (nectar, pollen) gathered by insects and transformed into honey. Examples are Prunus africana (pygeum), Lophira lanceolata (kofia), Dacryodes edulis (safou), Bombax pentandrum (Fromager), Vitellaria paradoxa (Karitie) and exotic trees like eucalyptus, mango, avocado, coffee and papaya.
Who are the actors in the apiculture chain?

**Producers:** Known as 'beekeepers' or 'beefarmers', on average a beekeeper has 5 years of experience, ranging up to 40 years. It is estimated that there were at least 20,000 beekeepers in Cameroon in 2009. More than 8,600 bee-keepers were known to be members of 639 groups (Common Initiative Groups, co-operatives or non-governmental organizations) in 2008. There is a great variation in the level of collective action, with most organisations in the Anglophone zone. These organizations have been on average working for 5 years, indicating that the sector is stable and established, but also growing. The numbers of hives per beekeeper varies widely per region: the average is 11, but in Adamaua 45, North West 16, and in the South West and West 3 per beekeeper. Average annual production of honey per hive/year in the North West was 10 to 15 litres in 2009. This provides an income per hive, if all by-products are collected, of about 26,250 CFA annually. The majority of beekeepers however, harvest only the honey and throw away other hive products. An average Oku and Belo beekeeper’s annual income from apiculture was 281,000 FCFA in 2007, calculating for all associated costs, average profit is 29,760 FCFA. In Ngoundal average annual income from apiculture in 2007 was 207,000 FCFA, 43% of their total household income of 436,000 FCFA. A litre of honey from a producer in Adamaua sells for at least 250 FCFA and is resold between 1,500 FCFA and 2,500 FCFA in the cities. The producer sale price in the North West is higher, about 1000-1500 FCFA, due to the lower quantities, larger customer base and higher market demand. This appears to be a major inflation of price and profit. However, it is important to note that this margin includes transport, storage, packing and sales cost. It is the intermediary who carries the risk of selling (or not) the honey. A small proportion of the harvest (2 to 10% in Oku and Belo) is consumed by beekeepers; the majority of honey is sold in Cameroon. From Adamaua, honey is also exported to adjacent countries in Central Africa and the Middle East. For the first time in 2010, 22 tons of certified organic and ethical trade honey was exported to Europe. Yellow wax (not black, smoky wax) sells for about 2,500 FCFA per kilo. Propolis prices range between 4,500 to 10,000 FCFA a kilo, but this is often only available in small quantities (less than 100kg nationally).

**Transformation:** Filtering, bottling and processing hive products into other products is usually conducted by small groups and companies to add-value. Processing is largely of low quality and on an artisanal scale, although nicely labelled and securely packaged honey has recently started to appear in the large cities of Cameroon. In the West, South West, North West and Yaounde, some dedicated apiculture product stores exist. Recent innovations include selling honey in sachets and new recipes and uses in food (yoghurt, honey bread and cake for example). Wax from honeycomb is one of the easiest by-products to process, and is used for a diversity of products, often in combination with honey and propolis (soaps, candles, shoe polish, pomades, body lotion, creams, cosmetics, medicines, honey wine and mixed with palm wine or corn beer), albeit in small but growing commercial quantities. Major costs include transport and sufficient packaging to enable transport along the bad roads, as rural production zones are remote.

**Intermediaries** in the network include wholesalers, transporters, co-operatives and groups and ‘buyam-sellams’. At the end of the chain are retailers who sell to individual consumers and households, such as restaurants, tradesmen, pharmacies, market traders and supermarkets.

**Are there rules and regulations?**

Apiculture is under the competence of the Ministry for the Livestock, Fisheries and Animal Industries (MINEPIA). There is not yet regulation on honey quality or beekeeping. An “Apiculture Interprofession” platform is emerging which wants to introduce standards for Cameroon. In regions which received more training and support (such as the Northwest, Southwest and West) many beekeepers follow good hive and honey management principles, which are widely documented (see Information). Organizations which want to sell honey in Cameroon, or to export, need MINPIA accredited production and collection centres. For export specifically to Europe, there is a ‘Honey Monitoring Residue Scheme’ set up in 2009 to ensure honey exports are free from chemical residues. Organizations must register with MINEPIA and conduct a laboratory analysis of honey samples that prove the quality of their honey, before it is accepted for export.

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5 Average honey production 12.5 litres & retail price of 1,500 CFA a litre = 18,750, 2kg of wax = 1,000 FCFA and 0.5kg propolis = 2,500 FCFA).
Constraints and Opportunities

Sustainably developing the apiculture sector in Cameroon actually requires little investment. Cameroon has an ideal natural environment for beekeeping, and using traditional and adapted methods can produce superb, high quality, large quantities of honey with relatively low production costs.

- **Quality standards** for honey, adapted to the Cameroonian sector, are needed, to assure good prices, and a quality that ensures consumer and buyer confidence. By-products (candles, wine, cream, etc.) currently produced are often of basic and variable quality and crudely marketed, making it difficult to compete with more sophisticated and manufactured products on a price/quality basis. There is however expertise readily available in Cameroon (see Information box) on production techniques and training services for beekeepers that can provide solutions to these issues.

- **Marketing** working in groups can increase the scale of production, particularly for processing and selling the by-products and adding significant extra value to hive harvests, especially for wax. Transformation adds yet more value and provides locally demanded products with a ready market (candles, soaps, creams etc)

- Most **packaging** is unsatisfactory; the majority of honey containers are re-used bottles or inadequate plastic containers. There are however some innovations (for example mini plastic sachets and new labelling). SNV has started an initiative to produce on a large scale a specially designed bottle for the honey sector in Cameroon.

- **Marketing as a group:** Quantities of honey are often too small to create economies of scale to larger scale marketing and sales that permit producers to charge reasonable prices. Working as a group can overcome these disadvantages but requires business expertise and well-organised producers.

- Few organizations operate along the **whole chain** (exception a handful in North West), who embrace production to transformation, wholesale and retail. Greater specialization is an alternative option to focus on one aspect of the chain, as is greater collaboration and exchange between actors in the chain.

- Creating valuable **by-products** from processing, using local technology, can generate better quality products, albeit with some investment. Income is simply thrown away when hive by-products are not harvested or used, especially the wax which is always harvested together with honey. Creating and selling by-products for the local market in rural areas can fill basic needs: candles, polishes (wood, shoe, floor, etc), creams, wine and awareness rising of how to cook and mix honey with other product (for example nuts).

- **Environmental risks** are present in using traditional smoking during harvest. Even though this is an ancient technology, it is effective, as long as the beekeeper pays attention to avoiding bush fires and not over-smoking (which affects honey taste). Harvesting unripe or immature honeycombs both risks the health and existence of the bee colony in the future and results in honey with excessive moisture content, often leading to fermentation. Using local trees and materials to build traditional hives is effective and cheap, with production capacity equivalent to that from modern hives. However, traditional hives are less easy to harvest sustainably and to check. Ensuring the sustainability of local materials used is also essential for long term viability of the sector.

- **Markets** for apiculture products do exist in Cameroon and abroad. What is missing is information exchange on demand and supply between buyers, seller and consumers. The majority of organizations sell in nearby villages and towns. This results in a local abundance and competition, and lower selling prices. Cameroon is however currently importing honey! There is a large, unsatisfied market close by in Douala, Yaounde and the North, and regionally in Central Africa and the Middle East.

- The **gender** imbalance in the sector (women are under-represented) is mainly because of the physical nature of traditional (tree-based) hive placement. In several African countries however, women are increasingly involved in beekeeping, keeping their hives close by or in the house in Ethiopia and placing modern hives in nearby fields, and not up high, reducing risk of theft, enabling easier monitoring and increasing the ease of harvesting.
Production and marketing techniques

Production equipment is rudimentary both at beekeeper level and within many organizations. Generally beekeepers use grass smokers, traditional hives (used by 97% of beekeepers, costing on average 1,500 FCFA each) and basic filtration using wire mesh or fabric. Wax is often separated from honeycomb using the boiling water technique and moulded in enamel basins. Due to the way honey is extracted from the comb, up to 30% of the honey is lost. In some areas this washing water is used to make wine and honey beer, in others it is thrown away. While effective and low-cost on a small scale, for larger scale and good quality production, these techniques are ineffective and time consuming. Where honey hunting is the main harvest method, fire often results in colony decimation.

Contribution to livelihoods

In the Northwest beekeeping is often not a principal source of revenue, but an important secondary source. Incomes from beekeeping contribute from 10% to 70% of total annual income (average 30%), with more than 80% of beekeepers deriving 30% to 60% of their annual income from apiculture. In Adamaoua beekeeping is traditionally by done by individuals or families, and not a collective activity. On average, 68% of households in Djereem are involved in beekeeping, for 55% of these it is their primary income source, providing up to 48% of total household income. The seasonal character (in some years 2 harvests are possible) and large flowering variations (alternating years of good and bad production in the savannah and mountain forests), and weather changes strongly influence the output and quantity of production, resulting in extremely variable incomes. In Cameroon, despite incomplete and missing data about the sector, it is estimated that 3.3 million litres of honey is produced annually, valued at around 2,000 million FCFA. Approximately 10% is consumed by the beekeepers About 235 tons of wax is produced annually, primarily for regional export; with an estimated value of 530 million FCFA. Other apiculture products add about 1.5 million FCFA to total revenues from the sector annually.

Priority actions for a sustainable apiculture chain

1. Creating a database and market information system, using media such as local radios, newspapers and mobile phones, to understand, support and monitor the apiculture market across the country and over time.
2. Research the impacts of climatic change and its effects on beekeeping, the effects of using different hive types and alternative management, harvest and transformation to increase profits and decrease workloads.
3. Ensure dissemination of designs and production of key beekeeping equipment (hives, harvesting clothes, smokers, filters, solar melters for wax, etc.) to support local adaptation of technology and enable access to equipment.
4. Support and research on apiculture development and strengthening the market chain honey is encouraged.
5. Creating specific training centres for bee-keeping and processing.
6. Supporting the establishment of transformation activities for honey and its by-products in the production zones can help combat youth and rural un-employment.

Key References

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