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### Win-wins in forest product value chains? How governance impacts the sustainability of livelihoods based on non-timber forest products from Cameroon

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## Apiculture value chain<sup>1</sup>

This chapter presents the results of the in-depth analysis of the apiculture value chain originating from the Northwest and Adamaoua regions of Cameroon and extending to markets nationally, in Africa and in Europe. The findings are based on interviews, literature, participatory action research, observation, value chain analysis, market surveys, trade data and resource assessments (see Chapter 3). The values provided have been verified and triangulated with literature and in workshops with stakeholders and are believed to be valid for the specific chain and its geographic locations and population sample for the time period of the data collection. The sections deal with the research questions of how the value chain is arranged in terms of the species it is derived from, the products, location, actors, activities and values; how the chains are governed; what is their importance to livelihoods and their sustainability. The conclusion focuses on how governance arrangements influence sustainable livelihoods.

### The apiculture value chain

This section addresses the second research question of how the apiculture value chain is configured in terms of products, their uses, sources, actors, activities and values.

#### *Apiculture species, products and their uses*

Honey hunting refers to harvesting from wild bees, known as ‘going into battle’ *asasée bî ngour-ngou* by the Gbaya in Adamaoua. In contrast, apiculture is the science and practice of domestication and keeping of bees. This study concerns forest apiculture, where man-made hives are placed in forests. As hives are generally made from local natural resources and forests are major sources of nectar and pollen for bees, their products are considered NTFPs (Bradbear 2008). This type of beekeeping has a long history in the Northwest Highlands and in Adamaoua. Nearly half of the beekeepers noted family traditions, indicating apiculture has been practised for at least 150 years. Oral history has it that a century ago, during a period of famine in the Northwest, honey was used for food and as a medicine. Around sixty years ago it began to be bartered in

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<sup>1</sup> Data for this chapter is derived from peer-reviewed published articles written or contributed to by the author (Ingram 2009a; 2011b; Ingram *et al.* 2011b; Schure *et al.* 2013, Tangkeu *et al.* 2013, Tsafack Matsop *et al.* 2011).

Nkambe and at the Nigerian border where a ‘tin<sup>2</sup>’ was exchanged for two tins of red palm oil or salt, the main exchange commodities prior to monetary currency. This indicates the high social and economic value of honey. Literature confirms the existence of a centuries-long regional trade in honey and wax (Kaberry 1952; Paterson 1989), which was incorporated into European colonial commodity trade (Crane 1999).

Apiculture in Cameroon produces two product types – bee and hive products – and ecological and cultural services. Bee products are those directly derived from bees, in this study the African honey bee (*Apis mellifera adansonii*) and solitary bees (*Trigona*, *Meliponula*, *Dactylurina*, *Hypotrigona* and *Liotrigona* spp.). Products include royal jelly, pollen and bee venom. Hive products are produced by bees and include honey, beeswax (*Cera alba*) – shown in Photo 8.1 – and propolis. Honey is a natural sweet substance produced by honeybees from the nectar of blossoms, which honey bees collect, transform and combine with substances of their own and store in the



Photo 8.1 Freshly harvested honeycomb, Oku, May 2007

comb to ripen and mature (Codex Alimentarius Commission 1989). Tests of the biochemical composition of Adamaoua and Highlands honey show it contains between 18 to 24% water and 70 to 80% sugars (Appendix 15). The high sugar content means that it has a shelf life of several years. Bees secrete wax to form an energy-rich, protective structure, formed into combs for storing bee larvae, honey and royal jelly. Wax can be melted and processed further and stored for years, although it is susceptible to damage by wax moths (*Galleria mellonella*). Propolis is a resinous mixture created by bees from buds, resins, sap and other botanical sources. It is used to fill unwanted gaps in the hive. Bee and hive products can be processed into a variety of hive by-products (honey beer and wine, candles, soaps, creams, polishes, ointments etc.).

In both areas, all beekeepers use honey as a food. For consumers, 60% in the Northwest and 80% in urban areas use it as a high-energy food with 8% using it as part of a special diet. It is occasionally eaten with the comb, but mainly purchased filtered and eaten with bread and as a sweetener in drinks. In Ngaoundal 29% of beekeepers and 7% of Northwest beekeepers mix honey with water to brew a sweet, openly fermented alcoholic drink called *sha* or *shah* in the Northwest, *ntop* when mixed with raffia palm wine, and *kuri* or *koori* in Adamaoua. This used to be the main hive product but has declined in popularity with the increased availability of bottled beer and adherence to religious codes prohibiting alcohol.

Honey is well-known and valued for its medicinal use in Cameroon. The majority of beekeepers (71% in Adamaoua and 92% in the Northwest) use it to treat coughs, wounds, skin infections, asthma, stomach ache, burns and gonorrhoea. Knowledge of

<sup>2</sup> Appendix 8 for all calibration measures. In the Northwest honey is sold in pots and in kilograms and in Adamaoua in plastic bottles and in litres. One litre of honey weighs 1.5 kilograms.

medicinal uses varies significantly: 80% of consumers in the Northwest and 45% in Adamaoua use it medicinally, compared to 5% in urban areas. Honey is a popular ingredient in medicines prepared by traditional healers, frequently mixed with herbs to treat a wide range of illnesses.

Wax is used by metalworkers in Bamenda and Bali in the Northwest and Bamoun and Fouban in the West region in lost-wax casting for traditional artwork, cultural objects and tourist artefacts. This well-documented technique (Knopfli 1997) originated with the Tikar of Adamaoua, reaching a height of sophistication in the early 19<sup>th</sup> century (Gebauer 1979), but is now no longer practised in Adamaoua. These sources indicate that wax has been processed, traded and used in the study area on a small, specialised scale for at least two centuries. In the last five years wax has been increasingly processed and exported for use in pharmaceuticals and cosmetics. It is also used, especially in the Northwest, to manufacture candles and shoe polish, in cosmetics such as body and hand creams and to make soap, sometimes mixed with local medicinal herbs, honey and propolis. Around 1% of beekeepers reported using honey for cosmetic use in Adamaoua.

Propolis has medicinal value, confirmed by chemical analysis<sup>3</sup>, showing strong antioxidant and antiradical activity and high levels of phenols and flavonoids for propolis from both regions, with Ngaoundal propolis having the highest levels. Propolis extracts from traditional hives were found to be more active than that collected from tree boles, although the reasons for this finding have not yet been established. Propolis is used in traditional medicines, particularly in the Northwest by 42% of beekeepers and by 7% in Adamaoua. It is used powdered or dissolved in alcohol in ointments, creams and soaps for skin complaints, rashes, fungal infections and ringworm, and chewed for stomach upsets, sore throats and toothache. It is perceived as most effective when used fresh. Paterson (1989) reported that while it was used as a gum to plug leaking vessels and in carpentry, it was not sold. It has been increasingly traded locally and exported in the last five years for its antibacterial, hydrating and emulsifying properties for use in cosmetics and pharmaceuticals.

Bees provide ecosystem services, being important pollinators of flowering plants, including NTFP species in this study: *Prunus africana* (Hall *et al.* 2000), *Yushania alpina* (Mazeyose 2011), *Raphia* spp. and *Cola* spp. (Rodger *et al.* 2004). Interviews confirmed this and indicated that in Adamaoua 25%, and in the Highlands 24% of melliferous species are also subsistence food, cash and timber crops and have medicinal uses (see Appendix 18). This confirms studies showing that bees are major pollinators of tropical forests and crops (Cane 2001; de Marco Jr. *et al.* 2004; Eardley *et al.* 2006; Eilers *et al.* 2011). Bee pollination was recognised as important by beekeepers and is promoted as a major benefit of apiculture by beekeeping associations. Apiforestry<sup>4</sup> has been promoted in the Highlands to encourage forest conservation and afforestation, reduce erosion and landslides and to create and afforest water catchments.

Bees also have cultural value as sacred animals, with swarms implicated in witchcraft. In Oku, stylised bees are carved on the doorposts of the Fon's palace and it is believed that a bee entering a home signifies the arrival of a visitor. The relationship between bees and forests is heavily symbolised, with trees being popular symbols on

<sup>3</sup> Results presented in workshops (Ingram *et al.* 2010; Kosalec *et al.* 2010) and Appendix 1.

<sup>4</sup> Term coined by the North West Bee Association (NOWEBA) to describe integrating bee farming with afforestation or reforestation.

honey packaging from the Highlands. Bees are associated with warriors and fighting in Gbaya history, documented by Burnham and Christensen (1983). Honey is a highly valued cultural product, also derived from its forest origins. It is mixed with camwood (*Pterocarpus soyauxii*) as a body lotion for chiefs during cultural events and ceremonies and given to chiefs and important visitors. These practices date back to at least the 1920s (Chem-Langhee *et al.* 2011). It is also a prized gift around Ngaoundal, with comb-honey given to visitors a symbol of hospitality and *nakia* (honey cake) consumed during wedding ceremonies. The high social value indicated in interviews is supported by studies of the Gbaya (Howard 2005) and the Nso (Kaberry 1952; Mzeka 1996).

#### *Ecoregion sources and chain locations*

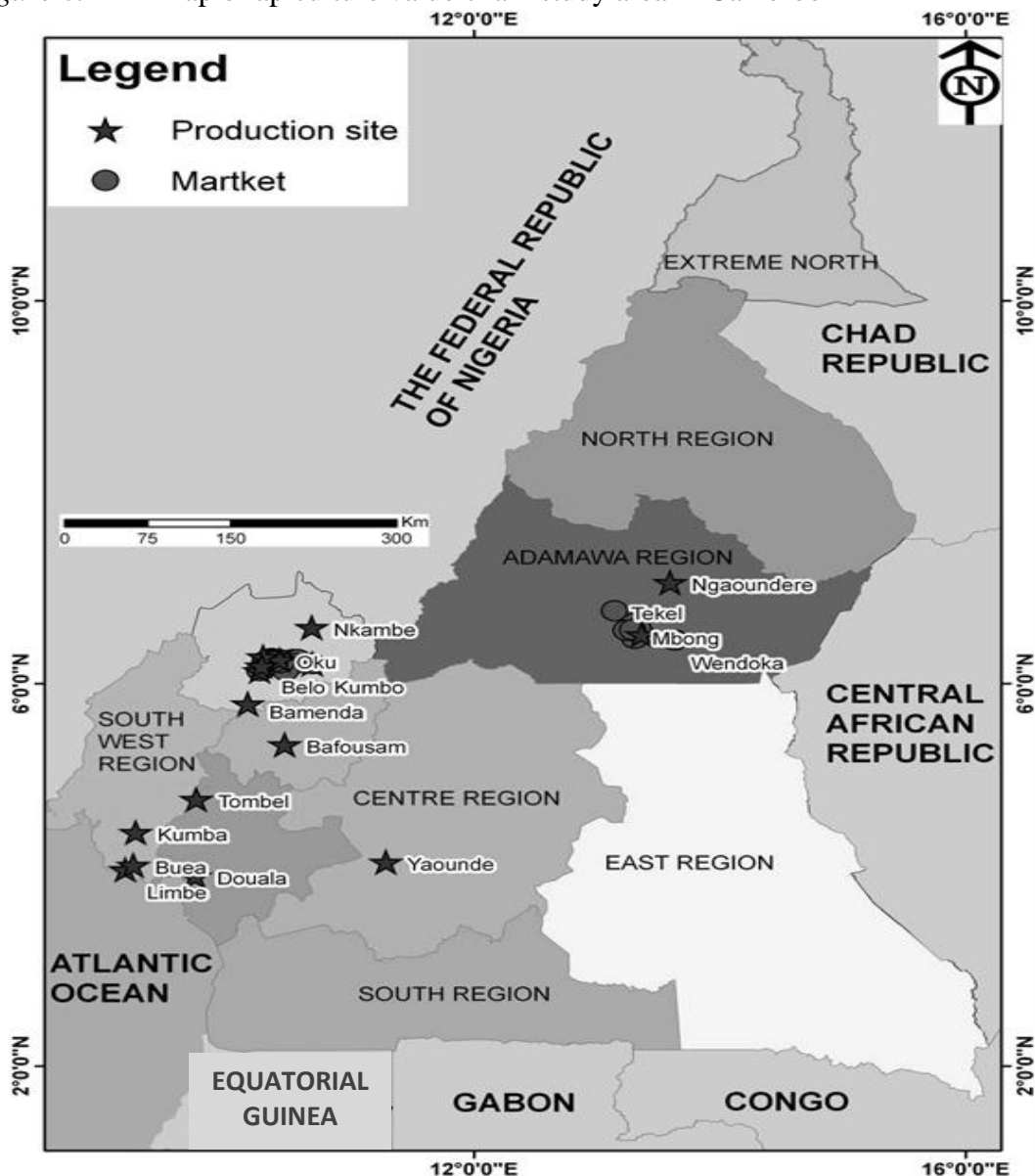
Tropical deciduous forests are some of the most optimum areas of the world for honey production (Gentry 1982). The forests in the savannah and montane ecoregions in Cameroon (Chapter 4) are rich in melliferous plants. Interviews and observations led to 155 melliferous species being noted: 58 forest plants in the Northwest, 34 forest species in Adamaoua and 65 crops and exotic plants in the Highlands (see Appendix 18). Both ecoregions have long dry seasons, allowing bee colonies to build up peak populations to take advantage of good nectar flows. These factors explain why the principal production areas in Cameroon are in Adamaoua and the Highlands, shown in Figure 8.1. In Adamaoua the zone covers around 14,000 km<sup>2</sup>, centring on Ngaoundal in Djerem division, stretching from Banyo to Meiganga and up to Ngoundéré. In the Northwest it covers around 9,900 km<sup>2</sup> of the Highlands, covering Bui, Belo, Donga-Mantung and Mezam divisions, focusing on the towns of Oku, Kumbo, Bamenda and Fundong. Smaller scale production zones were found around Mifi division in the West and Fako and Kupe divisions in the Southwest. In the humid forest ecoregions honey is highly prized and is mostly hunted with little beekeeping or trade. Interviews with beekeepers indicated that ecoregion factors influence honey characteristics, particularly where the hive is located, climate (rainfall, temperature and sunlight), altitude and soil quality, as the latter three determine the occurrence and abundance of melliferous species. The bi-annual flowering of many of the main forage species explains the production peaks every alternate year, when two harvests are possible.

The diversity and uniqueness of the flora in these ecoregions results in hive products with unique characteristics, especially propolis and honey (see Appendix 15). Honey from the savannah forest is liquid, rich in minerals and dark brown with a treacly taste. Honey from the montane forests of Kilum Ijim is sweet and citrusy, granulated and white in colour. Honey from the Highlands forest-farm interface is golden coloured and liquid. The colour and texture of propolis also varies according to its botanical source: brown and dry in Adamaoua, darker brown and waxier in the Northwest. Discussions with beekeepers resulted in ecoregion-linked honey profiles being developed using standard physical-chemical parameters (see Appendix 15). The profiles corroborate physical-chemical analysis which emphasise the regional and seasonal differences (Mbogning *et al.* 2011). From the production areas, the chain extends to consumers at different locations through six main channels, shown in Figure 8.2.

In common with other African producing countries (McAdam 2007), the majority of honey is consumed within the country. The largest proportion from the Northwest flows from beekeepers selling filtered or comb honey to processing organisations which retail to consumers. A second channel flows via wholesalers and processors buying and filtering comb honey to minimise adulteration and profit from the large scale. They

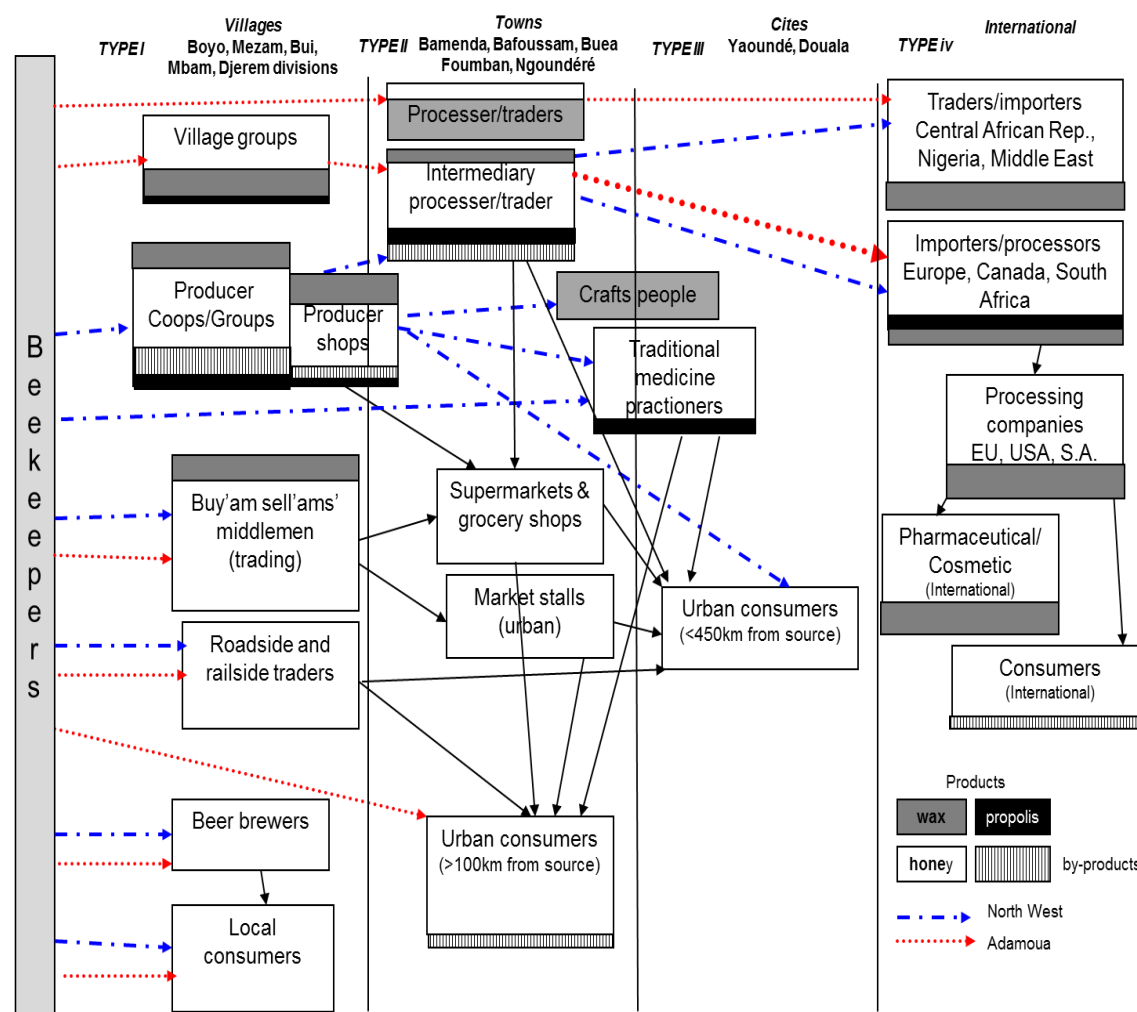
predominantly sell to local Type I markets and Type II markets in nearby towns. Approximately 60% of Northwest honey reaches Type II markets, supermarkets and shops in towns such as Bamenda and Bafoussam. A third channel from Ngaoundal for approximately 85% of production, is by rail to markets, shops and supermarkets in Type III cities like Ngoundéré, Douala and Yaoundé. A fourth channel for 25% to 33% of production is the traditional, small-scale channel from beekeepers directly to local consumers. A small proportion (estimated 11%) of wax is sold from beekeepers to processing associations to end users. A fifth, well-established export channel for honey (10% of production) and wax (30%) from Adamaoua and small volumes from the Northwest, flows by rail, truck and bus to Ngoundéré and onto Nigeria, Central African Republic, Lebanon, Chad, other northern African countries and the Middle East. The sixth and most recent channel for honey and currently the largest for wax and propolis are through importers of speciality organic, ethical trade and conventional hive products in the Middle East, USA, Canada and the European Union.

Figure 8.1 Map of apiculture value chain study area in Cameroon



The proportion and products sold has changed considerably since the 1940s when the only channels were for honey and wax from beekeepers direct to consumers, or for honey via small traders to Type I markets. Since the mid-1980s honey has increasingly been sold further afield, with Northwest honey sold in supermarkets and shops in Yaoundé (Paterson 1989) and hive products in Type II markets. By 2010 honey was sold in at least twenty one supermarkets, market stalls and pharmacies in Douala, Yaoundé, Bafoussam. Regional differences between longer chains from Adamaoua and the more diversified, shorter chains from the Northwest are apparent in the value chain map in Figure 8.2.

Figure 8.2 Apiculture value chain and product channels



Source: Research results

### Apiculture chain actors

This section introduces the main groups of actors in the value chain. In both study areas the numbers of beekeepers and related organisations have been increasing in the last decade and constitute the largest group of actors in the chain. By 2009 there were at least an estimated 21,417 beekeepers in Cameroon, the majority of which of whom are in Adamaoua (58%) and the Northwest (22%). These beekeepers represent a small proportion of the total population per study area region, shown in Table 8.1.

The way the chain is organised means that once beekeeping and processing skills are acquired there are few barriers to entry for conventional beekeeping. It is a low input activity, largely carried out during the off-season for agriculture. Apiculture produces multiple products with many uses, with not only an economic, but also high social value. These factors mean that a significant number of around 17,663 people) are active in chains from the two study regions. Men dominate all sections of the chain, and in Adamaoua, the Gbaya ethnic group predominates.

However, changing governance arrangements, notably collective action, using different hives and increased hive product processing (section below), have increased women's participation and provided them with increased legitimacy and visibility in the chain. Cultural, religious and societal gender biases have been redefined as women perform more than their traditional roles of cooperative secretary and retailers. Role models and increases in education and literacy appear to contribute to changes. These roles are not unique to the apiculture chain: empowering rural women without engendering their capabilities has been recognised as difficult in Cameroon and across Africa (Fonjong 2008; Shackleton *et al.* 2011).

*Table 8.1* Population statistics of study area and apiculture chain actors

Region/ Division	Capital	Surface area km <sup>2</sup>	Population <sup>1</sup>	Pop. density km <sup>2</sup>	N <sup>o</sup> value chain actors <sup>2</sup>				% total population
					Harvester	Trader <sup>3</sup>	Exporter	Nursery workers	
Northwest	Bamenda	17,812	1,728,953	100	4,615	447	5	56	0.00
Bui	Kumbo	2,297	321,969	32	1,216	60		16	0.00
Boyo	Fundong	1,592	124,887	31	2,241	20		20	0.02
Mezam	Bamenda	1,745	524,127	35	827	75		20	0.00
Adamaoua	Ngoundéré	63,691	884,289	14	12,315	190	22	15	0.01
Djerem	Tibati	13,283	124,948	9	10,000	100	20	9	0.11
<i>Total</i>					16,930	637	25	71	

<sup>1</sup> 2005 census population (National Institute of Statistics 2010) <sup>2</sup> Sources: Research results <sup>3</sup> Includes traders, retailers and processors.

The direct actors in the chain are categorised as beekeepers, processing organisations, exporters, importers and consumers. There are also international and national regulatory authorities and support actors including development and conservation NGOs and research organisations. The beekeepers studied had on average 5.6 years of experience, with 58% in Adamaoua and 46% in the Northwest having up to ten years' experience, and 23% and 25% respectively having up to 20 years' experience. One beekeeper had 40 years' experience. The average age of a beekeeper in Adamaoua is 43 (SD 15) and 39 (SD 15) in the Northwest. On average 56% have primary education in the Northwest and 18% secondary education, with 76% and 16% respectively in Adamaoua. For the uninitiated, working with bees can be frightening. The majority of beekeepers (61%) in Adamaoua have learnt by observation and hands-on practice passed on by family and friends, whilst in the Northwest, 97% received training from beekeeping organisations, NGOs and projects. Beekeepers tend to be married (94% in the Northwest and 100% in Adamaoua) and heads of their families, which have an average size of 8.25 (SD 4) in Adamaoua and 7 (SD 3) in the Northwest. Beekeeping is traditionally a male activity (Kaberry 1952) (Table 8.2), but an increasing number of women are becoming active. In both areas around a quarter of beekeepers are aided by women and 39% by their children. Although development projects have

encouraged communal apiaries, these efforts have not been very effective and most beekeepers own and manage their hives individually.

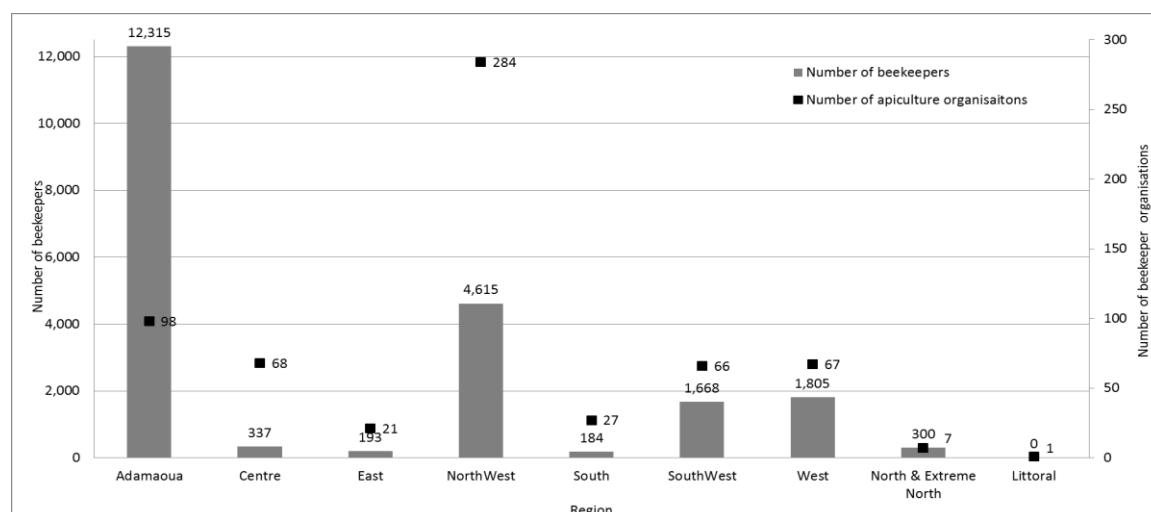
**Table 8.2** Beekeepers' characteristics in Adamaoua and Northwest regions

District and Region	% households involved in beekeeping <sup>1,3</sup>	% annual household income from apiculture <sup>1,3</sup>	Ratio male/female beekeepers	Livelihood (% primary activity) <sup>1,3</sup>	Average national household incomes <sup>2</sup>
Djerem, Adamaoua	68	48	86/14	55%	17% > 1\$ day; 50% > 2\$ day
Bui, Mezam, Boyo, Northwest	55	45	80/20	34%	
Average	62	47	83/17	45%	

Sources: <sup>1</sup> Research results. <sup>2</sup> UN Human Development Report 2007/2008, United Nations World Prospects Report 2004. <sup>3</sup> Averages over period 2007 to 2009.

Shown in Figure 8.3, collective action varies greatly by region, with at least 8,600 beekeepers members of 639 registered groups in 2008. Reflecting the history of cooperatives and collective action described in Chapter 5, twice as many beekeepers (41%) in the Northwest are members of associations than in Adamaoua (21%). Nationally, the average length of time that associations have existed is six years (SD 1), in the Northwest 9 (SD 3) years and 6 (SD 2) in Adamaoua. This suggests that collective action is well established. In the Northwest, the majority of groups (61%) are registered, mainly (94%) as CIGs and cooperatives (4%). Most operate group savings (*njangi*), share information and techniques and around a fifth of groups met regularly. Just under half were set up by NGOs as a condition to obtain support. In Djerem division a third (36%) were registered and 61% operate *tontines* (saving groups). The majority of these groups have been set up with support of the now defunct Modern Beekeepers of Cameroon (MOBEC) in 2002 and by a group of beekeepers disenchanted with the results of MOBEC, the Djerem Union of Natural Honey Producers (UGIPROMNAD) around 2004 (Howard 2005; Tchana 2010) and 53 by Guiding Hope since 2006.

**Figure 8.3** Beekeepers and organisations per region, Cameroon 2008



Sources: Research results and MINEPIA 2008.

At least fifteen processing organisations in the Northwest and three in Adamaoua are currently active. Table 8.3 details the oldest and largest, which have vertically integrated activities to different extents. These organisations cover over 70% of beekeepers in the in the Northwest and around 70% of production, and around 12% and 2% respectively in Adamaoua. Most buy honey from members or beekeepers, process and package for wholesale and retail through their own shops. Four privately-owned honey shops in Bamenda also purchase directly from beekeepers and sell to supermarkets, shops, traders and individuals in cities, largely through ethically-connected and family networks. Most organisations have diversified into related services: training, conservation and development projects, plant nurseries and selling beekeeping equipment. Processing is generally of low quality and artisanal, although labelled and well packaged honey has increasingly appeared in the last decade. By 2010, fifteen brands were sold in Yaoundé and Douala, up from six in 2007. This growth reflects the increase of entrants to the market. In the West, Southwest, Northwest and Yaoundé at least five stores and one market stall dedicated to apiculture products existed by 2010. Processors have introduced innovations such as small honey sachets, media campaigns promoting health and medicinal properties of apiculture products, by-products, recipe books, and use of the media, fairs and exhibitions.

*Table 8.3* Overview of major apiculture processing organisations

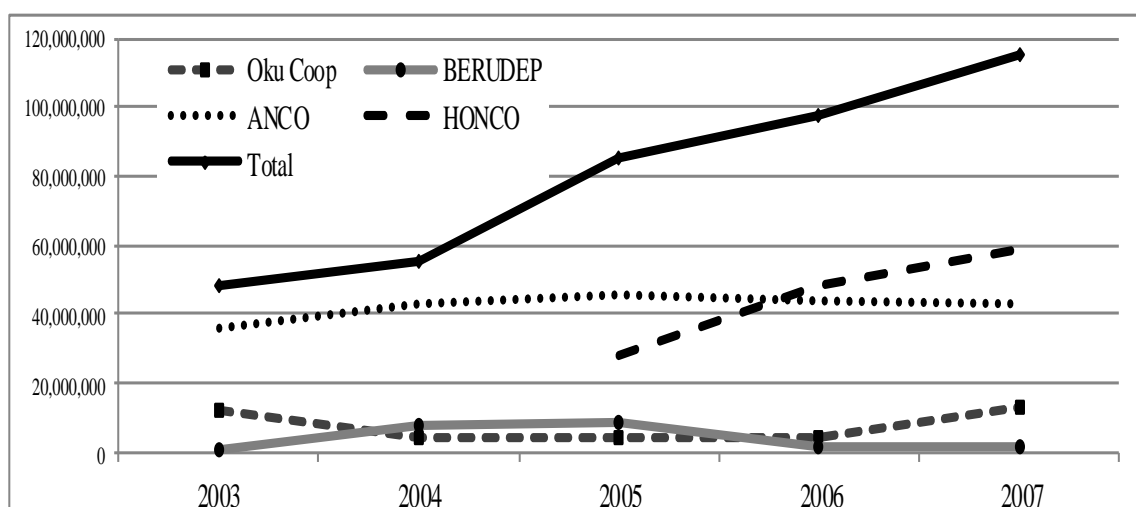
Organisation	Les Meilleries	Guiding Hope	ANCO	HONCO	BERUDEP	Oku Honey Coop	Oku Beefarmers	
Location	Yaoundé	Ngaoundal	Bamenda	Bamenda	Fundong & Belo	Oku	Oku	
Organisation type	CIG	CIG	NGO	Coop	CIG	Coop	CIG	
Date established	2009	2006	2002	1993/2003	1997	1987	1988?	
N <sup>o</sup> of staff	4	22	8	4	5	5	3	
N <sup>o</sup> members		6		1,080	215	216	28	
N <sup>o</sup> suppliers	50	1,400	80	80	1,550			
			<i>Average annual production</i>					
Honey (litres)*	est. 5,000	44,000	28,000	25,000	8,250	6,741	4,200	
Wax (kg)*		44,000	280	447	est. 50	264	15	
Propolis (kg)		70	3	3	est. 5	2		
Honey beer (l)						75	50	
			<i>Chain activities</i>					
Production			√	√	√	√	√	
Agroforestry		√	√		√	√		
Bulking	√	√	√	√	√	√	√	
Distribution	√	√	√	√	√	√		
Training	-	√	√	√	√	√	√	
Processing	√	√	√	√	√	√	√	
Packaging	√	√	√	√	√	√	√	
Retail	√	√	√	√	√	√	√	
Export	Potential	√	√	√				

*Source:* Research results. *Key:* \*Number of years used to calculate average production varies for each organisation. CIG= Common initiative group Coop= Cooperative NGO= Non-governmental organisation.

At its peak from the late 1990s to 2002, the North West Beefarmers Association (NOWEBA) had 6,000 members, 29% of whom were women. It had 250 cooperative groups with training, credit, collection and sales through its own shops and market stalls in the Northwest. In 2002, NOWEBA split into the NGO Apiculture and Nature Conservation Organisation (ANCO), which focuses on conservation, marketing and processing and the Northwest Honey Cooperative (HONCO), a production and sales

organisation. The non-profit Belo Rural Development Project (BERUDEP) generates revenues through volunteers, grants, tourism and apiculture from its own and members' products, financing beekeeping training, farming, conservation and development activities. The Oku Honey Cooperative Society (Oku Coop) and Oku Beefarmers Cooperative both collect, process and market honey, wax, propolis and beer and provide training, equipment and credit to members. Both self-initiated, the Oku Coop has secured several projects and support from the Bamenda Highlands Forest Project (BHFP). A member-manager coordinates its activities, gradually increasing production by building up credit to purchase honey. With BHFP support, low key forays to market honey outside of the production area were made. Annual average turnover ranges from 74,515 to 207,000 FCFA (152 to 422 US\$) per organisation for the period 2003 to 2007 (in Figure 8.4).

Figure 8.4 Annual revenue of apiculture processing organisations 2003 to 2007



Source: Research results

In Ngaoundal most beekeepers work individually, supported by families during harvest and in constructing hives. Beekeeping groups generally have a social function, and group sales are not common, although increasingly encouraged by NGOs since the mid-2000s and recently by international buyers. The strongly individualistic culture of the Gbaya ethnic group, large distances between villages, poor infrastructure, established traders and negative experiences with NGOs have combined to make collective action less common in Adamaoua. In Ngaoundal, Guiding Hope and a support organisation Programme d'Appui aux Initiatives Locales à L'Auto-Emploi (PAELLA-E) have been working with beekeepers since 2006. They have legalised, certified, worked with and trained 53 village-based groups to adapt traditional methods to produce organic, ethical trade apiculture products, obtaining Soil Association-certified organic status in 2008 and ethical trade certification in 2010. Wax and honey are sold nationally and exported worldwide. Guiding Hope also has links with ApiTrade Africa, a regional trade organisation. Les Meilleries buys from individual beekeepers and traders around Meiganga and Tibati and sells in Douala and Yaoundé. It is in the process of registering to export to Europe.

Despite collective action, 50% of beekeepers mentioned a lack of coordination and collaboration and the saturation of local markets as problems. This is corroborated by

support organisations (WHINCONET 2006; Ade 2009). In response, regional and national associations and unions have been established, with encouragement from donors. The Federation of Beekeepers' Associations of Cameroon was set up in 1995 led by NOWEBA, joining four beekeepers' associations from three provinces. However within a year the Federation failed due to internal conflicts and unrealised funding. Since 2007, apiculture groups, backed by SNV and the FAO, have supported a new association growing from the Southwest and Northwest regions with a strong collective, networking history (Ingram *et al.* 2007). In parallel, Guiding Hope, Les Meilleries and other traders have been collaborating since 2009 with the Ministry of Livestock, Fisheries and Animal Production (MINEPIA) to create an Apiculture Interprofession, a network joining chain actors and regional beekeepers associations. In August 2010, the Interprofession was legalised and is slowly developing national apiculture policies and honey quality standards. Learning from past lessons, the associations are concentrating on low level advocacy for quality standards, export regulations and raising consumer awareness. Guiding Hope and Les Meilleries also formed the Union of Apiculture Exporters in 2007 to represent exporters to the European market. In 2008 this Union set up a Council for National Apiculture Security to secure Cameroon's application to the European Union for a Honey Monitoring Residue Scheme (HMRS) for EU exports (see Box 8.1). In 2009 MINEPIA set up the 50 million FCFA (96,000 US\$) 'Projet d'Appui au Développement de la Filière Apicole' (PADFA). This focuses on providing training, equipment and setting up beekeeping groups, with 3,200 beekeepers and 310 groups registered to date. Market information systems have also been piloted to fill information needs, resulting in higher local market sales and prices (van der Goes *et al.* 2009; SNV 2010b).

In the Northwest, plant nurseries have been integrated into the activities of processing organisations. At least fifteen NGOs and enterprises have nurseries of multipurpose and non-native trees and plants, provide plant cultivation and beekeeping training and conduct beekeeping and agroforestry projects. Thirty small-scale planting schemes, some project funded, and forest enrichment by farmers, community forests and councils using native and exotic melliferous species were observed. Almost half of these had multiple objectives to secure water catchment protection, provide NTFPs for fuelwood, food and medicinal use, timber for carving, bee forage and demarcate forests and lands using live fences). These were largely supported by grants, the World Agroforestry Centre (ICRAF) and the government-funded Rural Forestry and Agroforestry Project (PAFRA). PAFRA reported that over 2 million trees, 60% of which are melliferous, were planted on private land, communal, community and council forests from 2005 to 2009. Small nurseries for indigenous and exotic fruit trees, bamboo and raffia were started in 2010 around Ngaoundal, set up by Guiding Hope and MINADER Community Education and Action Centre in Wassande, near Meiganga.

In Adamaoua about 15 Nigerian, Cameroonian and Lebanese intermediaries (known as wholesalers, transporters and 'buy'am-sell'ams') run informal, well-organised operations. They tour villages in Adamaoua and occasionally the Northwest during the harvest season to buy honey and wax. Most also trade in other products and two are also government officials. They often collaborate for large orders and work on command, processing honey for all market types. Some Cameroonian intermediaries work on a trust-based system, paying advance credit system to regular, larger scale beekeepers.

Retailers sell to individual consumers, restaurants, artisans, pharmacies, market traders and supermarkets. The estimated 447 traders in Kumbo and Bamenda markets in

the Northwest are predominantly female (66%). Typically they are between 36 to 45 years of age, married (75%), with 35% having attained secondary level education. They buy honey from wholesalers or direct from beekeepers in quantities of about 20 to 100 litres and retail it to consumers. An estimated 150 mostly young male hawkers sell low grade honey in Bamenda, Bafoussam, Yaoundé and Douala markets. In Adamaoua around 50 honey retailers with similar profiles operate in Ngaoundal, Meiganga, Tibati and Ngoundéré. At six of the stations along the Yaoundé to Ngoundéré train route, an estimated 10 to 15 women and children and a few male hawkers of all ages, announce their wares as the once-daily train briefly stops with cries of “*miel, miel, miel*”. They sell recycled 1.5 litre plastic bottles of low quality, crudely filtered honey. Honey beer vendors were not surveyed, but observations and informants indicated that they are often middle-aged women who own and operate small, informal bars and stalls in market towns or sell from their houses in remoter, large villages. For many brewers and vendors, honey beer is an additional source of income. Although this activity is not supported by law, it is usually tolerated by local municipalities because of its long history and tradition.

At least 25 projects<sup>5</sup> have been implemented in the last three decades, focussing mainly on the beekeeper, production end of the chain. Apiculture and especially forest-based apiculture has been heavily promoted as a way to attain conservation and development win-wins (Abbot *et al.* 2001; Timmer *et al.* 2005; Mazur *et al.* 2008). This has been encouraged by development and beekeeping circles (Bradbear 2004; DiN 2009; Lietaer 2009) and picked up by local conservation and beekeeping NGOs (API-CAM 1998; Abott *et al.* 2001; Fombad *et al.* 2006; Oyono *et al.* 2012). Evaluations of whether the dual aims have been met are not positive and the evidence presented is general and does not enable conservation ‘successes’ to be attributed directly, or only, to apiculture (Brown 2001; Purcell *et al.* 2005). Technical support and information has also been provided by API Trade Africa, the Technical Centre for Agricultural and Rural Cooperation (CTA) and CIFOR. SNV has been taking a value chain approach in the last six years. They have supported BERUDEP, the Oku Honey Cooperative and worked with Guiding Hope to develop standards, regional and national platforms. SNV and Guiding Hope are also working with the Kilum Ijim White Honey Association (KIWHA). Since 2010 the African Office for Intellectual Property (OAPI) and French International Agricultural Research Centre (CIRAD) have supported them to develop and implement a Geographical Indication certificate for montane white honey, financed by the French Development Agency (AFD). Final approval is expected in late 2012. Fluctuations in interest by donors appear related to preferences rather than sector performance.

There are distinct differences between women and men’s roles in the chain and benefits derived. Men dominate production and wholesale and women retail, determined by the physical work of carrying and climbing trees for hive installation and harvest, as women are traditionally barred from climbing trees. This is in contrast to Ethiopia and Zambia, where women are main beekeepers (Husselman *et al.* 2009). Project-promoted technologies and practices, such as using Kenyan Top Bar (KTB) hives<sup>6</sup> and placing

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<sup>5</sup> From WWF, Birdlife International, DFID, IUCN, FAO, SNV, GTZ, INADES, Bees for Development, HIPIC, Heifer International, Bees Abroad, VSO, Peace Corps, Oxfam, religious charities, monasteries and the RIGC project. See list of acronyms for meanings.

<sup>6</sup> Hives with sloping sides and bars of wood across the top to which the bees attach the comb.

hives close to family compounds and on stilts, avoids climbing and lifting and have encouraged women's participation. Increased processing has also favoured women. Organisations such as ANCO have actively targeted women, with a third of the 6,000 beekeepers trained being female. Promoting collective action and pooling finances have further resulted in their increased participation either in mixed groups and at least seven female beekeeper groups in Adamaoua and 22 in the Northwest. Women however indicated that as their trading activities are largely informal, they are invisible to policymakers, project and government support with little recognition for their multiple roles. Dynamic leading women in BERUDEP, HONCO, Guiding Hope, Paradise on Earth and large-scale traders (such as Jane Lailam, also head of the Kumbo Business Women's Cooperative Women), serve as role models.

Local consumers are of all ages and social status. Consumers belonging to ethnic groups from the major production areas are more knowledgeable about honey and have higher consumption rates: on average 10 litres annually in the Northwest, compared to two litres (SD 19) in Adamaoua. Nearly half (45%) of consumers did not know that honey is produced by bees from plants. In Adamaoua the 25 to 50 litres annually consumed per household was attributed to the prevalence of Islam, as the prophet Mohammed reportedly said honey is a remedy for every illness. Consumption is influenced by quality, price, visual attractiveness, colour and taste. The majority (60%) of urban consumers valued origin and quality (40%). In the Northwest 42% of consumers are influenced by packaging, associated with hygiene and quality. Many urban consumers were unfamiliar and sceptical about the source of different coloured honeys, concerned about adulteration and contamination. Tests, labelling and promotional material are seen as indicators of quality. Honey's multiple uses and benefits are most known in the Northwest and less in urban locations. Most consumers believe that honey is healthy, natural and a good replacement for sugar. Price sensitivity ranges from 500 FCFA (1.13 US\$) a litre with no regard for packaging, quality or origin, to half of Northwest consumers paying above 1,000 FCFA (2.27 US\$) a litre and 20% indicating they would pay 2,500 FCFA (5.68 US\$) or more per litre.

### *Chain activities*

The activities conducted in the chain are strongly influenced by the seasons and climate of the ecoregions, and are shown in Figure 8.5.

**Figure 8.5** Apiculture calendar

Activity	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Hive construction												
Install hives§												
Move hives to forest*												
Maintenance												
1 <sup>st</sup> harvest (biennially)												
2 <sup>nd</sup> harvest (annually)		#					#					
Honey processing												
Wax processing												
Season		dry				rainy					dry	

§ Northwest and Adamaoua \* Kilum Ijim area only # Adamaoua only

Hive construction differs per region due to traditional styles, materials and skills (detailed in Appendix 15). In Adamaoua traditional, tapered cylindrical hives are made by 99% of beekeepers, 78% of Northwest beekeepers build cylindrical hives and the

remainder purchase or make KTB hives. Hollow log, bark hives and clay pots are no longer used in either area. Hive type does not influence honey characteristics but affects the ease of harvest and management and therefore production, and the volume of propolis harvested. In the Northwest, higher annual average honey volumes were found from KTB hives (112 litres compared to 77 litres from traditional hives), attributed to the ease of harvesting (Tsafack Matsop *et al.* 2011). In Kilum Ijim, hives are initially placed on farms and once colonised, are head-portered and installed in the forest on supports or in trees around 1.5 to 2.5 m height. A small but growing trend of keeping hives around the home and farm was noted. In Adamaoua hives are installed directly high up (2 to 3 m) into trees in the forest. This minimises damage from bush fires and predation by honey-loving animals (ants, snakes, termites, honey badgers (*Mellivora capensis*) and African palm civets (*Nandinia binotata*), which were noted as the major production problem by 42% of Adamaoua beekeepers. Beekeepers indicated that maintenance results in higher colonisation rates, lower absconding rates and higher production. In the Northwest, this involves periodically checking hives for damage by pests, predators, storms, fallen trees, fires or strong winds, performing repairs and lightly clearing undergrowth around the hive. In Adamaoua, hives may be visually inspected once or twice a year.

In the harvest season, combs are harvested in the early evening in Adamaoua and during the day in the Northwest, as night harvesting<sup>7</sup> is increasingly taboo due to the higher bush fire risk. Most beekeepers do not use modern protective clothing or traditional raffia and grass ‘suits’ but do use smokers<sup>8</sup>. Smoke has a soporific, calming effect on bees but imparts an odour to honey. Most Adamaoua beekeepers harvest all comb from the hive. In the Northwest, 50% of beekeepers follow ‘best practice’ using metal smokers, leaving unripe combs and harvesting only two-thirds of ripe combs. Propolis is picked off hives in the Northwest and is mainly taken from wild colonies in Adamaoua, where it occurs in larger quantities. The call of the greater honeyguide (*Indicator indicator*) bird may be used to find wild colonies. A few (9%) beekeepers maintain records of hives and quantities harvested. Combs and propolis are then head-portered in buckets to the village.

The first stage of processing is to separate the honey from the wax. The honeycombs are gently crushed and filtered. Most individual beekeepers process at home: those belonging to processing groups send combs to collection centres for bulk filtering, usually within a day of harvest to avoid solidification, ensuring quality and allowing both honey and wax to be obtained. Filtering removes debris but results in losses of up to 30%. All use basic equipment (raffia or plastic sieves, buckets, raffia, stainless steel or fabric filters, recycled plastic food oil containers for storage). Around 33% of Northwest beekeepers package honey in recycled plastic containers, with and without labels. The processing organisations now use dedicated plastic pots for retailing. Four processing organisations have specialised equipment obtained through grants or gifts. After filtering the combs may be washed and the resulting honeyed-water may be made into honey beer. In the Northwest villages around 50 to 75% of honey is brewed. Two

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<sup>7</sup> Bees are poikilothermic and less likely to sting at night.

<sup>8</sup> A device that generates smoke from smouldering selected leaves and grasses to calm bees. Traditionally a verbena and euphorbia leaf and grasses ‘torch’, an imported or locally made metal smoker and bellow.

processing organisations make wine using the closed fermentation process, with a shelf-life of over a year.

Crushed, washed combs are melted to consolidate the wax. In the Northwest, a small-scale au-bain-marie method is used to produce a high quality, yellow wax. In Adamaoua, three methods are used. Combs are melted over charcoal and the wax collected in moulds, producing a low quality, dark brown, smoky-smelling black coloured wax. In the second method, honey is separated from combs using solar energy, the wax is then boiled in water in a metal drum over an open fire. The liquid wax is scooped into nylon sacks and wrung into moulds. This produces a slightly smoky, lighter brown coloured wax. While effective on a small scale, both techniques are labour, time, water and fuelwood intensive and produce low quality wax. Guiding Hope has experimented with large-scale solar and electric melting to produce a high quality yellow, smoke-free wax using fewer resources, at lower costs, and with less environmental and health impacts. Propolis is used fresh, stored in plastic or dissolved in alcohol, and then used in tinctures, soaps and creams.

#### *Apiculture product values*

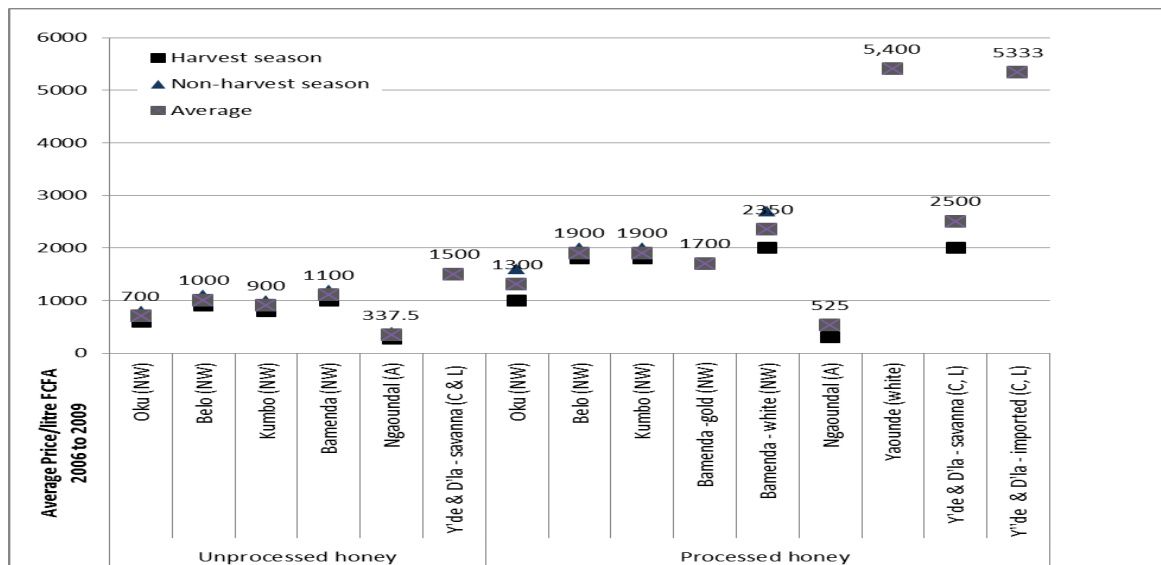
A small proportion of the honey harvest – shown in Figure 8.7 – is consumed by beekeepers and a smaller proportion is given as gifts. The majority, on average 88% of production, is sold. Most (62%) of beekeepers in the Northwest sell processed honey, the rest sell honey unprocessed. Other hive products are generally thrown away, with 28% of beekeepers extracting wax, although 100% harvest propolis. In Ngaoundal the majority (91%) of beekeepers sell unprocessed honey and 8% filtered. Only a small proportion (2%) also process wax and (7%) collect propolis. Average annual honey yield per hive per year in the Northwest was between 10 to 15 litres in 2009 and in Adamaoua in 2007 on average 7 to 10 litres per hive. This provides a net income per hive (if all by-products are collected) of 26,250 FCFA (54 US\$) annually in the Northwest and 19,999 FCFA (41 US\$) in Adamaoua<sup>9</sup>. More details about incomes are given in the section on livelihoods.

Honey prices vary per market and seasonally, shown in Figure 8.7. Product prices reflect classical demand and supply theory, with lower prices in the Adamaoua production zone due to high supply and low demand, and the inverse in the Northwest, where the higher population density and use creates higher demand. Seasonal variations in price occur in both regions, with price increases of up to 52% in Ngaoundal in the non-harvest season and 10% in the Northwest. In Type III urban markets, no seasonal retail price variations were noted. Value is affected by labour, hive and processing equipment, taxes, transport, storage and packaging costs. Labour constitutes the highest proportion of total costs for beekeepers at 50% in Ngaoundal and 80% in Oku. Most beekeepers however do not see their input or hives as costs when locally available ‘free’ natural materials are used. This negation of human and natural capital costs is common for forest products (Beauchamp *et al.* 2011; Tsafack Matsop *et al.* 2011). It is also attributed to the low opportunity costs: as apiculture activities commonly occur in the agricultural low season and at night.

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<sup>9</sup> The figure is based on average honey production of 12.5 litres in the Northwest and in 8.3 in Adamaoua and a retail price of 1,500 FCFA per litre to earn 18,750 FCFA; 2 kg of wax worth 5,000 FCFA and 0.5 kg of propolis worth 2,500 FCFA.

Figure 8.6 Average honey selling prices in Cameroonian markets 2006 to 2009



Source: Research results

Around Kilum Ijim, the distribution of average profit margins gained by producers (29%), wholesalers/distributors (46%) and retailers (25%) per litre of white honey. Those with dedicated managers have increased scale and professionalization to obtain higher profit margins through upscaling and accessing more Type II and III markets outside the production areas and vertical integration. However, issues of trust, ethnic ties and cultural relationships have sometimes made the appointing of capable and accountable managers difficult. In the Northwest, the propensity to work in groups has helped reduce individual transaction costs by linking buyers to groups. In Adamaoua, the groups selling to Guiding Hope also benefit from higher prices and long-term contracts. Profit margins in Adamaoua are slightly higher, with beekeepers earning 17% profit, processors 31% and wholesalers 15%. This is due to the larger economies of scale. Associations have reduced costs by cutting out intermediaries, giving producers a competitive advantage. The costs and risks that associations and wholesalers take, particularly in the regional and export channels by bulking volumes, travelling long distances, storing, packaging and exporting are seen as exploitative by some beekeepers and development organisations, due to the fact that on average in the Northwest a wholesaler/processor sells for 100% higher price than a beekeeper and a retailer (15%). Profits are also increased by marketing and packaging. For example, Guiding Hope uses leaflets stating laboratory results by the University of Yaoundé to promote quality and selling in pharmacies at 10 to 15% higher than street-vendor prices. ANCO, Guiding Hope and Rural Development through Apiculture (RUDA), a Southwest-based processor, all sell small 25 g sachets, popular due to their affordable price, while generating higher profits and turnover.

The geography of key production sites in relation to consumer markets, transport hubs and support services has implications for the value of apiculture products. Both production areas are isolated: on average 70 km from regional capitals, largely on partially and unpaved roads and over 400 km from the main cities. The benefits of isolation include sufficient forest forage which is naturally organic. However remoteness also brings disadvantages in increasing costs, difficulty in physically

accessing markets, information, equipment and support. Collective action has lowered costs to overcome some barriers. For example, three organisations have retail outlets in regional capitals from where products are marketed to the major cities and sold up to 110% above the production area selling price (US\$ 3.3 per kg in mid-2010). Many associations use their strong social networks via ethnic and cultural societies to distribute and sell honey via friends and family. Trust-based credit systems are common, although anecdotes of losses and theft were encountered. To counter this, Guiding Hope has been experimenting with advance purchase and marketing incentives.

With increased commodification the economic value of apiculture products has also risen over time, with (inflation adjusted) prices in Bamenda increasing by 220% from the 1989 average price of 500 FCFA per kg (0.81 US\$) (Paterson 1989). The economic and cultural value of honey is reflected in its selling price and differs by region. Figure 8.7 shows that the price of honey from Adamaoua is lower than from the Northwest in all market types. This difference is attributed to lower costs (Ingram 2011a; Tsafack Matsop *et al.* 2011), increased economies of scale, greater supply and lower local demand. The much smaller production quantities and higher cultural and multiple use values of honey from the Northwest and especially Oku, increase the price, especially of white but also golden honey. This means that the price of white honey in type II and II markets is comparable to average honey prices in European and USA consumer markets (CBI 2006). High transaction costs, complicated logistics, small-scale bulking and meeting stringent export standards (shown in Box 8.1) combine to make exported

#### **Box 8.1** Import requirements for honey and wax

Water content, hydroxymethylfurfuraldehyde (HMF) and diastase are used by importers to measure honey purity. This is despite strong criticism (White 1994), as diastase varies largely depending on botanical origin and high water content (up to 25%) and high HMF (over 100 mg/kg) which is common in tropical honey (Sanford 1996). It is even a sign of non-adulteration. Testing is expensive at around 25 US\$ per sample. Cameroonian exporters see this as an unfair trade barrier as it translates into an unequal market requirement for tropical honey. They have had high HMF honey rejected as only saleable as lower quality (lower priced) 'bakers honey'. In response, Guiding Hope is trialling different logistics, storage methods and refrigerated containers to reduce transport time and avoid the high temperatures which create high HMF levels. The European Union Honey Monitoring Residue scheme (HMRS) (European Council 2002) regulates pesticide and chemical levels in honey imports to the EU, responding to adulterated honey from large-scale exporters such as China and Argentina. It applies to all imports, regardless of Cameroonian production being dominated by organic, forest-based beekeeping with no evidence found of chemicals used in beekeeping. The Cameroonian HMRS was recognised by the government and approved by the EU prior to any exports being made. Guiding Hope proposed and led the challenging 18 month process with MINEPIA. The HMRS was approved in 2009 (see Ingram and Njikeu 2011). Individual exporters have to register in Cameroon and be approved by the EU. A similar process is required for wax. To date only Guiding Hope has maintained its annual registration since 2009. Annual testing of honey samples is required before honey is accepted for export. Tests can only be conducted in EU-certified labs (which do not yet exist in Cameroon, adding further costs). To date the HMRS costs Guiding Hope around 2,000 US\$ annually. Other industry standards requirements add to the considerable barriers small companies face in export (Ingram *et al.* 2011b). For example, South Africa requires imported honey to be irradiated and in certain types of containers. The USA and Canada have different phyto-sanitary requirements. Organic certification does not allow irradiation and the containers specified are not accepted by other exporters, creating further barriers to enter different import markets.

Cameroonian honey expensive compared to honey from major exporting nations such as China and Argentina. This situation mirrors other developing country experiences (Bees for Development 2006; van Loon *et al.* 2006). It means that only high value, niche export markets, such as organic, ethical and fair trade certified, create sufficiently high margins to be economically viable.

Honey is the highest volume and value apiculture product traded in the chains, shown in Table 8.4. Domestic and regional markets for table honey were reported by traders and exporters to have increased in the last three decades. In the Northwest, an estimated 112 tons was produced in 1988 (Paterson 1989) and in 2008 at least 158 tons. Almost 95% of beekeepers reported increasing production in the last three decades and 93% in the last five years. In Adamaoua, production also increased in the last 30 years according to 78% of beekeepers and 85% in the last five years. Honey production and value per region are shown in Table 8.4. Adamaoua is the largest zone producing around 93% of national production followed by the Northwest and West regions. Export data is difficult to verify, with official statistics focusing on the Port of Douala and not capturing the porous road borders. Annually an estimated 30,000 to 50,000 litres is exported to Congo, the CAR and Gabon and 50,000 to 150,000 litres to Nigeria and Chad. Corruption was not as a major cost on road transport routes; however during its exports from Douala and rail it was reported to be increasing.

*Table 8.4* Annual average apiculture production and value per region 2003-2009

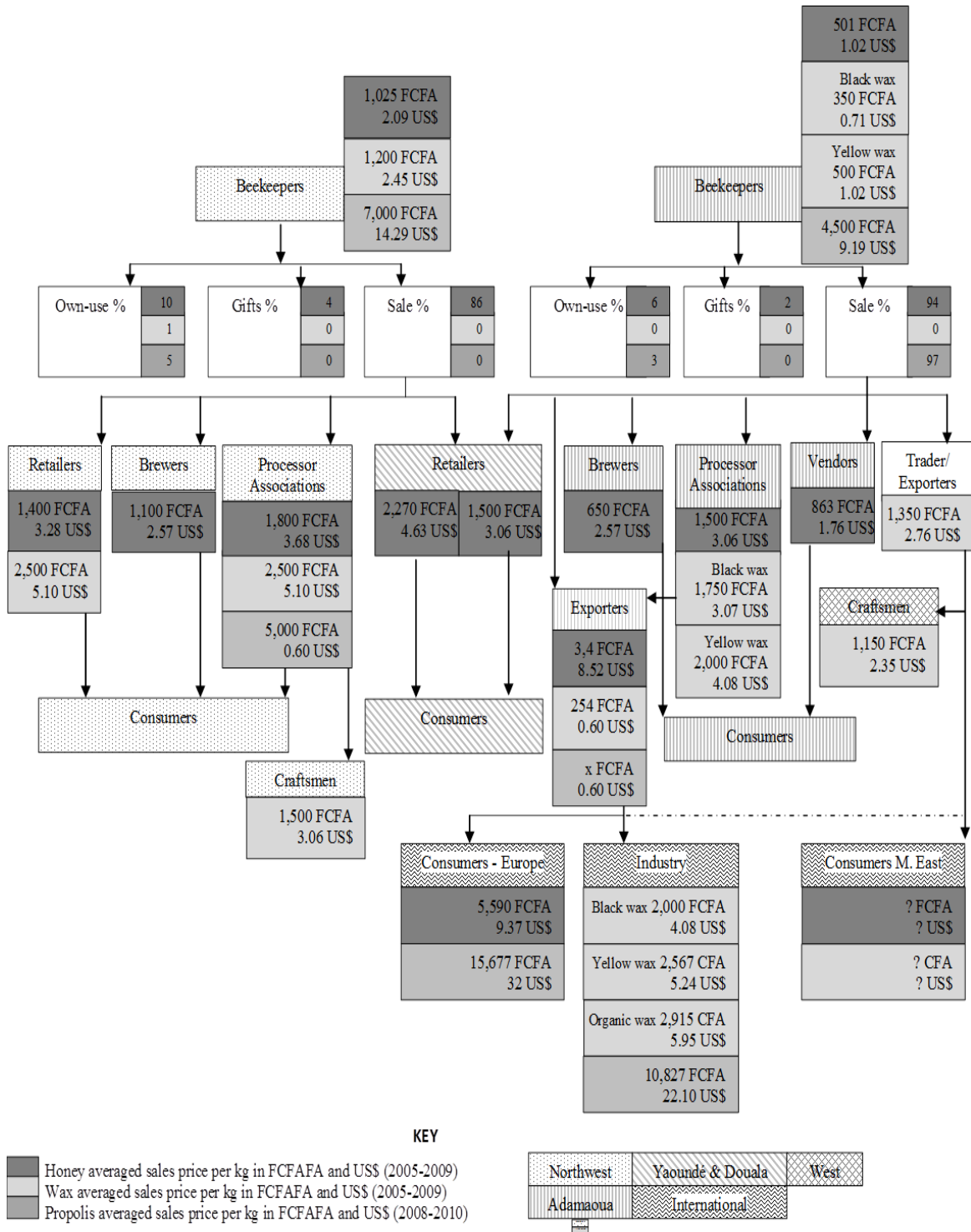
Region	Honey production (litres)	Honey value (FCFA)	Wax production (kg)	Wax value (FCFA)	Hive product value (FCFA)	Total value Apiproducs (FCFA)
Adamaoua	3,101,700	1,723,400,000	225,000	519,126,090	342,000	2,242,868,090
Centre	15,026	22,499,104	-	-	-	22,499,104
East	347	51,470,000	20	-	-	51,470,000
Northwest	104,006	51,802,475	1,861	1,595,012	1,155,500	54,552,987
South	1,068	1,598,416	40	-	-	1,598,416
Southwest	39,689	43,638,000	106	7,200	-	43,645,200
West	48,900	66,825,000	106	-	-	66,825,000
North & Ex. N	28,434	42,575,503	20	-	-	42,575,503
Total	3,339,170	2,003,808,497	454,200	520,728,302	1,497,500	2,526,034,300
Value US\$		4,483,802		1,016	3,351	5,652,355

*Source:* Research results *Key:* - No data available

Shown in Table 8.5, a smaller volume and value of wax is traded annually, primarily exported. Wax production is influenced by hive type, as KTBs are easier to harvest, with on average 7.18 kg obtained from KTBs compared to 5.5 kg from traditional hives, although the differences are not statistically significant (Tsafack Matsop *et al.* 2011). Wax production varies widely between regions and villages, attributed to beekeepers' skills and knowledge in wax processing and if they have links to buyers. If there are no links, beekeepers generally do not process wax and often throw it away as a by-product of honey processing. From Adamaoua, an estimated 157 tons of black wax is sold annually to type IV markets in Nigeria and the Central African Republic. The international type IV wax export market has been growing in the last five years with demand outstripping supply, to around 66 to 120 tons annually. This market is further price and quality differentiated, as shown in Figure 8.7. The low relative profit margins

have been increasing as prices and demand have consistently risen for Cameroonian wax, particularly certified organic, in the last five years. This has occurred as wax production worldwide has declined (Grünewald 2010) as a result of climatic changes, pests such as varroa, and increasing monoculture agriculture lowering yields (UNEP 2011).

Figure 8.7 Apiculture value chain and prices



Source: Research results Key: regions: A = Adamaoua NW = Northwest, C = Centre, L = Littoral

Conventional wax producers however find it difficult to meet pharmaceutical and cosmetic use requirements for yellow wax and the stringent EU quality standards for pesticide and chemical-free wax (see Box 8.1). Despite growing demand, production increases have been slow and upscaling difficult, reflecting other African experiences (CBI 2006). The volume of wax entering type II markets for craft and metal working is estimated at around 500 to 1,200 kg in Bamenda and 800 kg in Foumban. The odour makes no difference to craft workers but smoky, overheated wax works less effectively and thus lowers the price. High quality wax is sold up to 50% above the average selling price shown in Figure 8.7. Sales of hive by-products, occurring mainly from the Northwest, were also reported to have grown in the last decade to a value of at least 2,359 US\$ annually in the study period. Around Ngaoundal, annual honey beer production is estimated at 9,360 litres, worth 2,808 million FCFA (5,732 US\$) and in the Northwest, the estimated 6,864 litres of beer is valued at 2,059 million FCFA (4,203 million US\$). Propolis is the most valuable hive product by weight. It is hardly traded in Adamaoua but in the Northwest is in high demand and usually only available in small quantities. Guiding Hope has been buying from both study areas and exporting 10 to 60 kg annually to South African, European and American pharmaceutical, cosmetic and health companies since 2008.

## Governance of the apiculture chain

To answer the third research question, this section presents and analyses the governance arrangements and trends in the apiculture chains. Although the apiculture sector and small business context in which it is played out is notable for its regulatory and policy void, governance arrangements are present in the form of beekeeper and association-led market standards and recent voluntary initiatives. The last two decades and especially the last five years, have seen major changes in chain organisation and governance.

### *Absent statutory regulations*

There is currently, and appear never to have been statutory regulation concerning beekeeping or apiculture products. National quality standards and definitions have been discussed since 2008, mainly by major processing associations as a way of differentiating their products and quality. No formal regulations have yet emerged and the pushing has not been too forceful, due to fears of government interference, excessive formalisation and higher costs that formalisation may bring, particularly fears of corruption. This uneven playing field however benefits organised groups more than individuals, allowing innovators to set their own 'rules of the game'. The only regulation is recent and concerns the requirement by MINEPIA for production and collection centres for the collection and marketing of all animal products (including honey) to be accredited. Most processor organisations and local MINEPIA agents outside of Bamenda and Ngaoundal are unaware of the regulation and it is generally not enforced. Only Guiding Hope and Oku Honey Cooperative were accredited by 2011. For exports, although the EU HMRS (Box 8.1) has been implemented, no other measures have been introduced for exports to other countries. The HMRS was pushed into place by Guiding Hope to their competitive advantage. For exports to other countries, no rules exist and no regulation was reported as being exercised by any government department. Whilst forest and wildlife regulations (see Chapter 6) are

important for the maintenance of forest-based bee forage, they do not specifically mention beekeeping or honey hunting.

Government actors have been only sporadically active in regulating the chain and their interplay has been confused, with at least four entities<sup>10</sup> promoting beekeeping over the last 20 years. Their objectives have varied widely from stimulating beekeeping as an agricultural or livestock practice, for forest conservation and for rural development. These have changed largely on a project-by-project basis or related to the personal skills and interests of staff. In 2008 MINEPIA claimed the apiculture sector and allocated resources to develop and regulate it through the PADFA. This was partly due to pressure from apiculture trading enterprises and interest by development organisations such as SNV and FAO. This void of formal governance echoes the lack of many of the design principles seen as important for governance (Ostrom *et al.* 1994; Vollan and Ostrom. 2010).

#### *Sticky dash*

Many of the large trader-intermediaries and enterprises such as Guiding Hope maintain relations with government agents to minimise bureaucracy, manage corruption and secure access to government training and support through projects such as PADFA. Some of these relations are nuanced when officials are also large-scale traders. Corruption levels are not however generally perceived as high in the chain and do not strongly influence either access to resources or markets. There are fears that this may change with formalisation, noted by many in the Northwest as a reason not to formalise or become 'visible'. Whilst exporters and larger traders indicated that they are often checked and pay bribes at border crossing and roadblocks, these were seen as everyday occurrences and not specifically related to the product. A warning signal was raised by Guiding Hope of the problems negotiating exports of honey and wax from the Port of Douala, despite having all the required permits indicates that large volumes of this at the time unfamiliar product attract unwanted calls for dash, negatively affecting honey quality and costs whilst negotiations ensued to speed its exit from the port.

#### *Customary regulations*

Although customary rules governing beekeeping have existed for at least fifty years, it is not strongly regulated in Adamaoua, where no customary rules relating to beekeeping were found. In the Northwest however, in common with other areas of the Bamenda highlands, traditional authorities around Kilum Ijim have decreed 'country Sundays' which determine when farm and forest work should cease. Traditional rules prohibiting killing bees exist in the three Fondoms covering the Kilum Ijim Forest. There are no rules granting rights or setting boundaries specifically for beekeeping or honey hunting, which works on a first come basis. Some beekeepers however try to secure their rights with annual gifts of honey to the palace. Many of the processing organisations also maintain relations with customary authorities.

The governance of forests as sources of bee forage and hive materials also differs between regions. In Adamaoua, customary regulation of forage sources currently does not appear to exist nor has it in the past. The forest is open access and only specific, valuable resources, such as fertile riverine gallery forests popular for farming are

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<sup>10</sup> MINADER, MINFOF, the Northwest Rural Development Agency (MIDENO) and MINEPIA.

traditionally controlled. Beekeepers' access to relatively scarce bamboo (*Oxytenanthera abyssinica*) groves for hive construction is permitted by the village 'owning' the resource. Other apiculture activities impacting the use of hive materials and forage sources are not customarily controlled, monitored or enforced. For example, there is no control of access to multiple use species such as kofia (*Lophria lanceolata*), the main melliferous species and favoured fuelwood species (including for wax production), source of edible caterpillars, cattle forage and medicinal oil seeds (also used in soap making). Bush burning, practised by semi-nomadic herders, is not controlled and was reported as the main reason for installing hives high in trees. Beekeepers noted only very occasional conflicts with grazers and with other collectors of hive materials. These were mainly resolved through traditional authorities. In the Northwest, as explained in Chapter 6, the Highlands forests were strongly customarily regulated, creating a favourable environment for bee forage and beekeeping and strong cultural symbolism relating to honey and bees. But increasing pluralism and decreasing traditional authority's power and ability to control and enforce customary regulations, combined with increasing pressures in population and use, have led to significant deforestation and degradation (elaborated in Chapter 4).

#### *Buzzing voluntary governance*

The high level of voluntary collective action among beekeepers in the Northwest and its gradual emergence in Adamaoua has influenced how the chains are governed. The popularity and success of cooperatives and associations in the Northwest stems from the historical cultural, political and trade context in the region (Chapter 4), making collective action more common than in Adamaoua. Beekeepers' groups and the integrated chain activities of processing organisations have created voluntary rules about how, where and when collection, processing and marketing take place. This has supported economies of scale, increased the bargaining power of producers and their ability to compete in the market and sometimes enhancing communication but also creating mistrust and miscommunication as product values and roles change.

Alternative organisational forms, such as NGOs which act as enterprises, have been adopted to avoid some of the problems associated with cooperatives, upon that premise that avoid formalisation minimises corruption and costly government interference. However, collective action has not always been successful. Internal corruption, inexperienced management and marketing have led to the failure of several collective arrangements. Many organisations engaging in collective purchasing have struggled to balance cash flows and pay beekeepers a good price direct on delivery. Despite this, there have been repeated attempts to organise beekeepers to benefit from collective action, mainly stimulated by donor organisations, NGOs and the government. Collective action and formalisation has often been a prerequisite for accessing grants, capital and ethical and organic niche markets.

Another recent voluntary arrangement is the organic and fair trade certification (see Chapter 6) by Guiding Hope of its honey, wax and propolis operations in 53 villages in Adamaoua. It is extending collective action and certification across Adamaoua and gradually to other areas in Cameroon. In 2006, the GIC spotted a market opportunity in the large quantities of good quality, naturally organic products, high production potential and growing demand from international clients (Ingram et al. 2011b). As the first and only certified apiculture organisation in Cameroon and Central Africa, this involved a steep learning curve and significant investment funded by the founding

members, costing approximately 4,000 US\$ in start-up costs and 3,200 US\$ annually. The annual costs of maintaining certification and traceability systems mean that selling honey, wax and propolis as certified organic at a higher price than conventional products is essential to cover costs. Considerable human and physical capital was also required to achieve and adhere to the standards. Only Guiding Hope is certified, although BERUDEP and Oku Honey Cooperative are interested, but deterred by the costs. The high retail prices in the Northwest, strong demand and lack of regulation mean that the costs of certification are not perceived to outweigh benefits in terms of higher selling prices and access to new markets. Similar experiences have occurred in Ethiopia and Zambia (pers. comm. M. Husselman, CIFOR; (Mickels-Kokwe 2006; Husselman et al. 2009). The chain of custody for organic honey requires a system of documentation, traceability and quality control which was difficult to set up given the largely illiterate beekeeping population and undocumented and informal trade systems. The benefits were professionalization, increased scale, process and product innovations and the connection of actors along the value chain (see Ingram and Njikeu 2011 for details). Organic certification allowed Guiding Hope to apply for the ethical trade certification and qualify to export under the preferential terms of community trade status to the international cosmetic company The Body Shop. Guiding Hope exports to Tropical Forest Products which sells organic apiculture products in Europe. These trading relationships have been built slowly, based on trust, mutual learning, capacity building and long-term orders. The risk is however dependence upon international clients and sometimes lower prices than the prevailing market prices, as demand has been increasing significantly for both organic products and conventional wax. The Body Shop and Tropical Forest Products also have Zambian and Ethiopian honey producer associations as clients. This creates a competitive dimension between suppliers from the three countries but also opportunities for cross-country learning, including through trade associations such as ApiTrade Africa.

#### *International agreements*

Involuntary regulations such as the European Union's HMRS (see Box 8.1 and above) have had a moderate influence. Whilst the Cameroonian HRMS was voluntarily set up, it was in response to the EU requirements that effectively control access to the European market and set quality standards for products (albeit that this is irrelevant for the production methods used in Cameroon). Whilst rights are clearly stated in the regulations, Cameroonian actors have no control over rule-making, monitoring, sanctions. This has had significant consequences for the practices and production methods for organisations that sought to supply European-based buyers and has deterred some organisations from entering this market.

#### *Project governance*

In the Northwest, new governance mechanisms were first driven by the BHFP (see Chapter 6). The 17 community forests introduced under the BHFP in the early 2000s cover the main honey production areas and created new rights, responsibilities and institutions impacting the apiculture chain. Realising the then importance of customary regulation and lack of formal regulations about sustainable forest management and beekeeping specifically, the BHFP sought to officialise customary governance and project-developed guidelines in what was known as Fondom Agreed Wide Rules in 1999 (Asanga 2002). This resulted in rules that all community forests should have at

least one area where all use was forbidden except beekeeping, allowing only smokers to be used for harvesting and prohibiting the felling of melliferous species such as *Podocarpus* spp., *Carapa grandiflora*, *Prunus africana* and *Scheffleria* spp. The BHFP encouraged beekeeping, seeing it as conservation positive: “the Oku beekeepers are in no way harmful to local ecosystem” (Paterson 1989: 6). Recognising the long tradition of beekeeping in the Kilum Ijim forest, the project tried to enshrine this right in forest management plans, including it as a permitted activity in most community forests areas. Individual and collective action was promoted and supported through two associations, the Oku Honey Cooperative and NOWEBA (Paterson 1989). These conservation-focussed strategies attempted to increase the forest’s livelihood value by commoditising forest product, epitomised by Birdlife International (2000):

“Technicians with skills in natural resource management and specific technologies such as beekeeping, will provide training and advice in areas that will help to enhance livelihood opportunities derived from the forest in a sustainable manner (...) provid[ing] training, advice and support for activities which enhance the value of forests to communities (e.g. beekeeping).”

Enforcing compliance with new rules through monitoring and on-the ground presence was successful while the project was well-funded, but with diminished funds after 2004, locally-initiated projects and NGOs filled this gap. Whilst building on the BHFP’s legacy, skills and networks, they did have not had the same level of assets, but were often more integrated into the local communities. They also aimed to halt and reverse forest degradation, but often more pragmatically with the focus first on livelihoods and secondly on conservation.

A Geographic Indication (GI) (see Chapter 6) Oku White Honey project funded by the Organisation for Intellectual Property in Africa (OAPI) was started in 2010. The idea originated with the French Development Agency (AFD) and Centre for Agricultural Research (CIRAD). They selected the product and recruited local actors to implement the GI: Guiding Hope and SNV Cameroon, which helped set up a legally registered multi-stakeholder Kilum-Ijim Oku White Honey Association (KIWHA). The association aims to improve the production and quality of Oku White Honey and other bee products, protect the natural environment of the GI through forest management institutions, to judiciously manage the Kilum Ijim forest to meet producer’s interests and to work with Government and OAPI partners on the GI product. This process is expected to culminate in the award of a GI in 2013, valorising the white honey and local culture, and promoting development. It is a new concept for the African apiculture sector and for agriculture and forest products in general. The project has been strongly process-orientated in obtaining the GI. Initially the GI was strongly externally influenced, however now that GI attribution is almost finalised hybrid forms of governance are appearing as local ownership and implementation occurs. In 2012 KIWHA started to focus more attention on maintaining and securing sufficient bee forage and marketing, but without external funding. It is too early to determine the effects of the GI on apiculture product values, livelihoods and sustainability.

The BHFP, the GI Oku White Honey project and the many geographically specific, small-scale conservation and beekeeping development projects in the Northwest have largely focussed at the start of the chain, on beekeeping. Most donor-led initiatives have also focused only on beekeepers. This is despite beekeepers and organisations repeatedly stating that their main problems are running enterprises, up-scaling and marketing. An outcome of projects has been the gradual evolution of sustainable and production-enhancing ‘good practice’. These include rules about leaving unripe combs

in the hive and harvesting only two-thirds of ripe combs – to maintain brood, reduce fermentation and moisture content, leave food for the colony and promote post-harvest re-colonisation; using smokers and daytime harvesting – to reduce the risk of bushfire<sup>11</sup>; light clearing of vegetation and no felling around hives and not using bark or hollow trees as hives – as conservation measures. Many of the grasses and plants used for hive thatching and in smokers are now cultivated around beekeepers' homes and farms, as are multi-purpose melliferous plants. These practices have been documented (API-CAM 1998; Bonu 2001; CTA 2007) and have gradually disseminated into other beekeeping areas in the Northwest, Southwest and nationally by the local NGOs and processing organisations providing training and running projects, such as HONCO, ANCO, BERUDEP, the Riba Agroforestry Resource Centre (RARC) and the Oku Honey Cooperative.

Other impacts created by the projects are the incongruences that new institutions, such as community forest management institutions, have caused. Producer organisations and beekeepers have been confronted with donor and support organisation's models for upscaling and collective action. 'Modern' beekeeping has been favoured by projects as providing immediate, tangible outputs. For example, the RIGC project gave KTB hives to beekeeping groups around Kilum Ijim but up to 20% were unused and a low rate (18%) colonised in the first year in 2010, ascribed to poor management (Ministry of Forestry and Wildlife 2009a; b; c). At least three other projects in the Northwest and one in Adamaoua (MOBEC), have promoted 'modern' beekeeping techniques, despite the ineffectiveness of this type of intervention being well documented in other developing countries (Howard 2005; Tchana 2010; Wright *et al.* 2010a). Responses have ranged from acceptance to rejection, to tailoring and creating hybrid practices and arrangements with different outcomes at individual, group and community level. The differing efficiency of management and harvesting techniques associated with different hive types and feelings of ownership and engagement resulting from 'gifts' of hives have left beekeepers divided about the efficacy of project interventions, particularly when the focus has been on production but not on commercialising apiculture products, and projects have resulted in changes in power relationships in their communities. Projects and NGOs have had sufficient presence and resources to change activities and norms, but not always enforcement. This has depended upon the local presence and follow up contact with beekeepers, particularly over more than one harvesting season, as well as the ability and resources to enforce compliance with new governance arrangements.

### *Sticky bricolage*

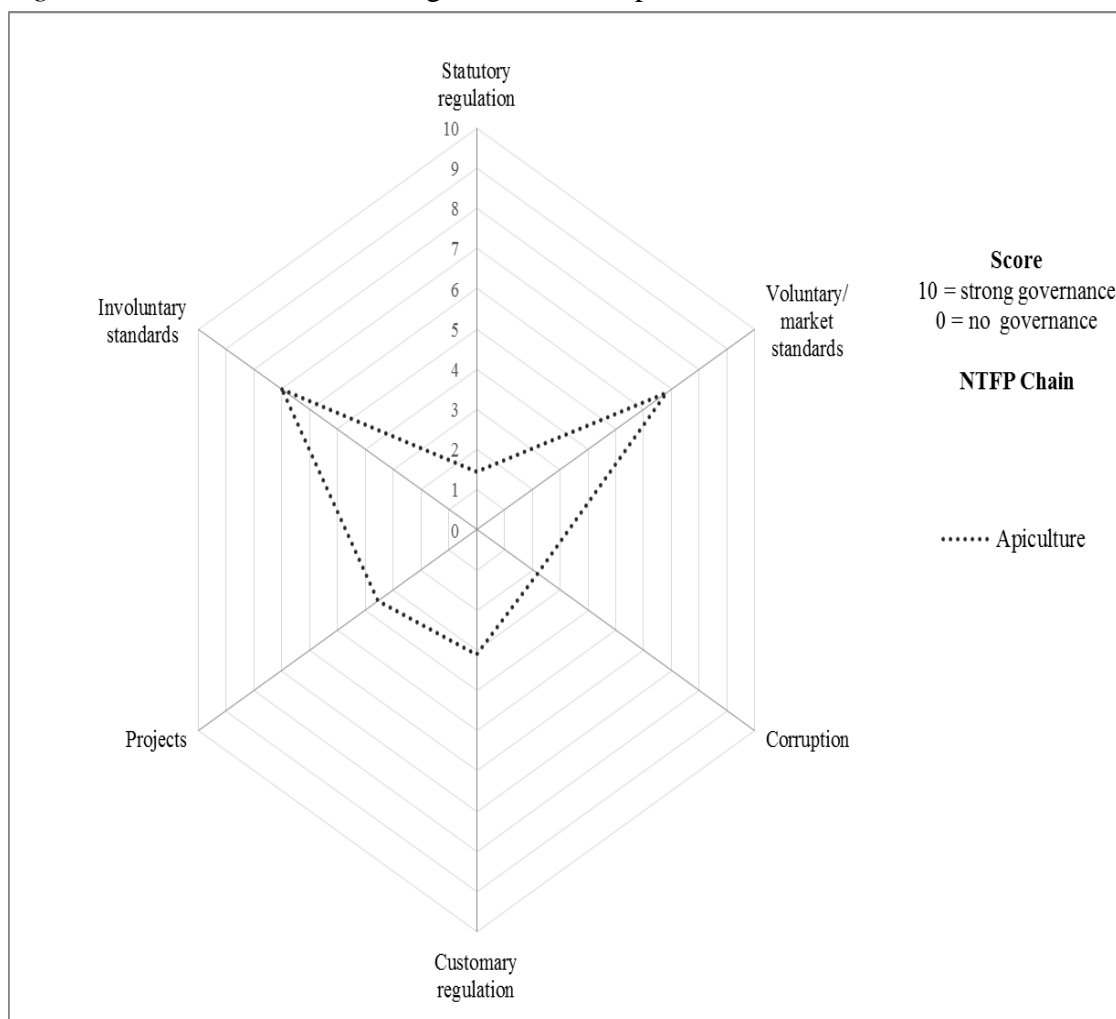
The chain is characterised by a situation of multiple arrangements and institutional bricolage (Cleaver 2002). In the Northwest the lack of formal arrangements concerning beekeeping and ineffective forest management regulations, combined with once strong customary arrangements, project-based rules and new, hybrid forest management arrangements such as community forests have led beekeepers and their organisations to create their own institutions to enable and regulate chain activities. This dynamic situation has emerged to claim assets, in response to struggles, and to avoid conflicts between multiple forest users. Many actors, particularly processing organisations, have

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<sup>11</sup> Night-time use of grass smokers in Kilum Ijim forest caused bushfires covering 5,000 ha in 2003 and 2000 ha in 2008 and the deaths of two beekeepers in the period 2000 to 2010.

played all available options by joining or engaging in different degrees, with CF institutions, maintaining links with traditional authorities, collaborating with projects, donors and development organisations and collaborating with government officials. In Adamaoua, where formal and traditional regulations have been little felt, the effect of projects has been more minimal and conflicts fewer due to its lower population density. Market-led institutions such as the certification schemes and chain platforms developed by Guiding Hope have blended local practices with the requirements of new markets. This has supported up-scaling, professionalising, adapting and improving local technologies and engendered ownership by beekeepers, countering past negative experiences of external, project-led arrangements. Seeing that the lack of formal rules and unauthorised exports to Europe could jeopardise exports, Guiding Hope and Les Meilleries have pushed regulatory systems – such as the Cameroonian HMRS – into place, institutionalising and formalising new rules on quality and processing. The major processing organisations, the Interprofession and regional Associations have also been toying with introducing regulatory honey quality standards, aiding competitive advantage and maintaining market control as lead organisations. Scored using the system introduced in the methodology in Chapter 3 and detailed in Appendix 18, the arrangements are illustrated in Figure 8.8.

*Figure 8.8* Governance arrangements in the apiculture chain in Cameroon



## Governance and livelihoods in the apiculture chain

This section addresses the fourth research question of how governance arrangements affect the livelihoods of actors along the chain, using the sustainable livelihoods approach. Table 8.5 shows that in both areas beekeeping contributes to nearly half of annual household income. In the Northwest a third of respondents (SD 40) indicated that beekeeping is their primary income-generating activity. They have up to six (SD 2) other activities and all practise farming. Just over 30% indicated they are primarily farmers, 12% were wood workers, 10% were civil servants, 12% collect other NTFPs including hunting, 12% in trading and 1% were traditional healers. The majority (45%) have at least one and up to four other income sources such as commerce, medical practices, crafts, livestock and labouring.

*Table 8.5* Average income range of beekeepers from apiculture

Region	Northwest	Adamaoua	Average
Average annual income apiculture <sup>3</sup>	207,000 FCFA	281,000 FCFA	244,000 FCFA
Difference from average incomes <sup>1</sup>	587 US\$	433 US\$	510 US\$
	-30%	-1%	-38%
Annual average income range FCFA	% of beekeepers		
	<i>Mezam</i>	<i>Boyo &amp; Bui</i>	<i>Djerem</i>
			<i>Average</i>
10,000 - 100,000	44	18	87
100,000 - 500,000	50	25	11
500,000 - 1,000,000	3	19	2
1,000,000 - 2,000,000	3	31	0
>2,000,000	0	7	0

Sources Research results and <sup>1</sup>National Institute of Statistics 2002.

Average annual incomes are shown in Table 8.5. These are lower than the Cameroonian average incomes detailed in Chapter 4. Variables influencing production and incomes are the number of hives per beekeeper, the average of which varies widely by and between regions. The national average is 11 hives, varying from 68 in Adamaoua (with 5% owning up to 400 hives), 16 in the Northwest to three in the Southwest and West. Investing in large numbers of hives counters low occupation rates, with between 30 to 85% of hives colonised in Ngaoundal and 18 to 56% in the Northwest depending on season, location, pests, management and experience. Skills also determine the activities conducted and extent of processing hive and by-products. For most intermediaries in Kumbo and Bamenda markets trading provides 80% of household incomes, farming 5% and other activities 15%. Their average annual income was 1,083,867 FCFA (250,000 FCFA, SD 510 US\$) (2,007 US\$, SD US\$) in the period 2007 to 2009. Average incomes of traders in Adamaoua were lower, at 900,000 FCFA (SD 445,000 FCFA) (1,666 US\$, SD 908 US\$).

Taking into account average household sizes in each region, an estimated 130,678 people benefit from apiculture incomes. For an estimated 16,930 beekeepers in the Northwest and Adamaoua, beekeeping contributes on average to just under of their half of annual household cash income. However, many continue to struggle and few emerging above a 2 US\$ a day poverty level. Beekeepers therefore generally use a range of income-generating and subsistence activities. Some of these paradoxically contribute to degrade or diminish the source of bee forage, such as livestock grazing, live fuelwood collection, and unsustainable *Prunus africana* harvesting collection (see Chapter 9), hunting and, in Adamaoua, shifting cultivation. Much higher incomes and profits are possible when beekeepers professionalise, join together, increase scale and

diversify production to include other hive and bee products. Although less people work further along the chain in processing organisations (96), as intermediaries and wholesalers (20), retailers and hawkers (737) and exporters (40) – specialisation in these value adding activities results in higher than average incomes for these actors, fewer income-generating activities and higher levels of dependence on apiculture.

The mix of collective action with voluntary market-based governance arrangements reflects attempts, particularly by processing organisations, to increase the value of apiculture and the economic and political power of beekeepers and their organisations. New arrangements have been productively bricolaged (Batterburry 2001; Ros-Tonen 2012) to diversify apiculture income sources by producing more hive and associated products, such as seedlings. Building economies of scale and extending to regional, national and international markets outside the saturated local type I markets has resulted in increases in volumes sold, prices and profits, illustrated by Guiding Hope<sup>12</sup>. These distant markets are also less vulnerable to price fluctuations linked to supply peaks, making incomes and livelihoods more stable. Collective action has enhanced the ability of organisations to gather and use market information and improved their bargaining power, particularly in type III urban and type IV export markets, mirroring other NTFP and smallholder experiences (Komarudin *et al.* 2006; Markelova *et al.* 2009; Awono *et al.* 2010a). It has enabled scale and specialisation, leading to innovative marketing and product profiling, helping diversify income sources.

Further livelihood improvements have faced challenges which institutional arrangements have tried to overcome, with mixed success. The multi-tiered associations enable several thousand members to be connected. However they have struggled to access sufficient economic, human and physical capital to upscale, maintain information flows and enter new markets with different standards and products. Although increasing scale and professionalization reduce transaction costs, compensating for market weaknesses (Markelova *et al.* 2009), increasing size amplifies transaction costs which has undermined performance. This delicate balance is highlighted by the collapse of the largest associations. Producer associations' fluctuating levels of service provision, ability to purchase bee and hive products in season and invest in equipment and infrastructure are dependent on the availability of capital from internal sources and external (donor, financial or support) institutions, as traditional credit sources (tontines and social networks) are generally insufficient and micro-finance institutions absent and wary of cooperatives, given their mixed track record in Cameroon. Although two of the groups have bank loans, they are difficult to obtain due to a lack of collateral and trust. Guiding Hope is an exception having leveraged significant capital: its business model as a formalised, ethical enterprise is attractive to investors. Many cooperatives have raised funds by initially rapidly increasing membership, but became overwhelmed providing services and support to the remote, dispersed members. Without sufficient capital, managing cash flow becomes difficult and seasonal price fluctuations continue as beekeepers cash in their products directly post-harvest to generate income, despite their long shelf life. As most beekeepers prefer profits to be paid immediately in the form of higher buying prices, the operating profit margins of processing organisations can support only a minimal level of services. This cash crunch has driven organisations to acquire skills (e.g. project writing) and orientate themselves to external actors'

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<sup>12</sup> For example, Guiding Hope won the Best New Small, Medium and Micro Enterprise in Africa Award in 2011. [http://www.africagrowth.com/Press\\_Release\\_SMME\\_Award\\_Winners.pdf](http://www.africagrowth.com/Press_Release_SMME_Award_Winners.pdf).

requirements, such as certification which also requires major economic and social capital investments. The rises and falls of groups such as NOWEBA, HONCO, MOBEC and UGIPROMNAD and the continuing low average apiculture incomes indicate that collective action has had only marginal impact on livelihoods for the majority of actors in the chain.

Corresponding to Bernard *et al.*'s (2008) findings, the performance and range of services provided by collective processing organisations are also constrained by low professional management capacity. Whilst new skill sets have been acquired and human capital increased, an increase in empowerment (i.e. social capital) to a level enabling beekeepers, their associations and intermediaries to shape niche markets and increase their bargaining power with large, international buyers has not yet occurred. Guiding Hope's difficulties in setting-up the Body Shop's community trade scheme, achieving ethical and organic certification and entering the EU market illustrate this (Ingram *et al.* 2011b). However, collective action attracted support, provided a voice and legitimacy to interact and develop formal governance arrangements with donors and the government, illustrated by the emerging Interprofession. The success and failures of regional federations shows however that whilst many actors recognise the benefits of collective action, several attempts and configurations are needed before appropriate institutions have developed and benefits can then be returned to beekeepers in the form of timely hive product purchase and higher buying prices.

New markets have driven new chain configurations, relationships and institutions and vice versa. These have increased profits, by adding value and by marketing hive products previously thrown away or little harvested, such as wax and propolis. Choices of whether to develop new markets with higher profit margins and risks, or invest in the burgeoning local and regional market, both have implications for the sustainability of livelihoods and require security of supply. A balance of power in the new relationships is apparent. Benefitting from the experience of partners and support organisations to enter speciality export markets with high entry and maintenance barriers carries a risk of dependence. This has been balanced against generating sufficient, immediate profits to convince beekeepers of the initial additional costs of new production methods and institutions.

The range of arrangements, strategies and channels used by different organisations reflect Thomas *et al.*'s (2003) suggestion that forest-based enterprises should focus on either quality or quantity and Macqueen and colleagues' (2006) recommendation that standards increases the likelihood of accessing niche markets with better prices. Addressing quality, quantity and regularity of supply has enhanced access to type III and IV markets and improved livelihoods. Formalisation and scale are constraining factors in the transition from local to international markets, explained in Chapter 5. This is a common complaint from small-scale rural entrepreneurs (Vermeulen *et al.* 2008). Networking and using support partners has partially helped to overcome this, enabling accumulations of political and human capital, echoing studies showing the importance of these capitals to livelihoods (van den Berg *et al.* 2007; Devaux *et al.* 2009).

The void of formal governance arrangements has created a space in which many people use apiculture to enhance and diversify livelihoods based largely on subsistence agriculture. Collective action, projects and voluntary market led schemes have been to increase the value, particularly economic worth of apiculture products and craft higher than average livelihoods, while allowing social values to be extended to more people in the chain. Those specialising in apiculture have introduced institutions to recognise and

guard environmental, social and economic origins and values of apiculture products to create and maintain market niches and further add value to their products. As a last resort, formal regulation has been selectively fashioned as a tool to support these new institutions and market positions.

### Governance and sustainability in the apiculture chain

This section answers the fifth research question of how governance arrangements impact product sustainability.

The governance arrangements described result in activities in the apiculture chain being conducted fairly sustainably with a generally neutral to positive impact. The majority of apiculture products continue to originate from domesticated bees foraging and hives predominantly located in forests. Some of the most unsustainable practices in the Northwest notably honey hunting; bark hives and night harvesting are no longer practised. These have been discouraged by customary, project-based and voluntary regulations which have evolved into best practices. However, some unsustainable practices remain as beekeepers engage, often unknowingly, in activities that in the long term negatively affect forest bee forage. In the Northwest, traditional smokers are used and a minority of beekeepers engage in hunting, livestock grazing and collecting medicinal plants. In Adamaoua, practices occur such as honey hunting and collecting propolis from wild colonies, harvesting unripe combs, over-harvesting scarce hive materials, using torch-smokers and the wood of melliferous species as fuel for wax processing. Processing innovations introduced by Guiding Hope, planting and protection of bamboo and raffia are early signs of changes to increase sustainability.

Focus group discussions highlighted that anthropogenic and climatic fluctuations are negatively affecting forest resources and apiculture, echoing the changes described in Chapter 4. Just over a third of beekeepers indicated increasing variations in the length of the dry season, variability in the onset of seasons and increases in the number of bush fires and extreme rain events. These were perceived to negatively affect apiculture by changing the vegetation and causing new and increased pests and diseases. A concern voiced by beekeepers around Kilum Ijim was that forest fragmentation, deforestation and degradation is decreasing the availability of forage sources creating Oku white honey, noting a decrease in melliferous species such as *Prunus africana*. In the Northwest, the changing forest governance arrangements described in Chapter 6 have been unable to sufficiently maintain the forests as sources of bee forage, hive materials and fuelwood for product processing and specific agriculture chain arrangements have also been inadequate. In Adamaoua, nearly half of the beekeepers indicated increased climatic changes. Increases in cattle grazing, bush burning and encroachment for agriculture were also noted, but not reported as affecting apiculture. Increasing numbers of beekeepers require scarce bamboo and raffia for hive building – affecting the NTFP chains described in Chapter 10 – pest outbreaks are more frequent and the demand for fuelwood, including for wax production, has augmented. Beekeepers noted a decrease in the melliferous species *Lophira lanceolata* and *Terminalia macroptera*. Such increasing degradation and deforestation threatens the sustainability of the apiculture chain in the long term. However this hazard is perceived only by the larger

processing organisations and charismatic ‘ambassadors’<sup>13</sup> – individuals with years of experience. On a beekeeper level, the generally small-scale production and growing numbers have enabled supply increases to keep pace with demand, despite the diminishing forest forage supply, meaning that only beekeepers with long-term experience noted changes, as those with less experience are confounded by the natural bi-annual production fluctuations. This leads most beekeepers to not see forage sources as the limiting factor, but access to type III and IV markets.

Some project-based and voluntary governance arrangements to enhance sustainability have been ‘bricolaged’ in response to deforestation and degradation, the decline in traditional authority and the absence and/or ineffectiveness of formal forest governance arrangement. Many bricolaged arrangements aim to tackle the problem by planting trees. The integration of nurseries and tree planting into apiculture projects and processing organisations has become institutionalised. This is most evident in the Northwest where forest loss is greatest. In Djerem, bamboo and raffia nurseries and planting out around three villages commenced in 2010. Exchange visits from Adamaoua to the Northwest led to ideas being mooted, but not yet put into action, to designate village ‘beekeeping forest areas’ and create community forests. However the process of obtaining a community forest and costs were seen as too high, with an uncertain outcome and long timescale. Donors and the ambassadors have driven this change by setting an example, providing training and raising awareness. A result is that an estimated 15% of beekeepers plant multi-purpose melliferous species on farm, confirmed by Nkamleu and Manyong (2009) and Asaah *et al.* (2011). Only where tenure is secure, such as in community forests, or forests with still strong customary tenure, such as sacred forests and in parts of Oku, Bihkov and Mbiame, has forest enrichment or regeneration taken place. Few beekeepers reported actively protecting or conserving forests to support beekeeping. Thus most beekeepers and their organisations are not conservationists per se, but pragmatic interventionists, managing forage sources, planting melliferous and hive material-producing species. Some organisations combine enterprise and conservation as a way to maintain sustainable livelihoods. For example BERUDEP and ANCO have used customary rules and created community forests, such as Mbiame.

However the opportunity costs of other forest uses (for agriculture, hunting, grazing, fuelwood and *Prunus africana* bark harvesting) are too high for apiculture chain actors to compete with. Beekeepers, alone or collectively, do not have sufficient economic or social power or tenure rights to maintain sufficient forest cover to maintain or increase production, despite the support of projects such as the BHFP and the SNV value chain capacity building project which aimed to add value to the forest and apiculture. The hailed ‘successes’ of collective action securing forest conservation (Asanga 2002) in hindsight did not wait to assess a sufficient time period to evaluate the impact of the introduction, embedding and then hybridisation of the new governance arrangements. This resonances with the contention of Carter *et al.* (2007) that sustainable forest management is linked to greater local people’s involvement in decision-making through forest-based enterprises. The Cameroonian apiculture chain is not unusual in this

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<sup>13</sup> Notably Paul Mzeka, ANCO director (see footnote 1) and George Kangong, Riba Agroforestry Resource Centre director and 2010 Equator Prize winner.  
[http://www.equatorinitiative.org/index.php?option=com\\_content&view=article&id=597%3Aribaagroforestryresourcecentre&catid=175&Itemid=689](http://www.equatorinitiative.org/index.php?option=com_content&view=article&id=597%3Aribaagroforestryresourcecentre&catid=175&Itemid=689). Retrieved 21 January 2012).

respect, as the success of collective action in securing forest management depends on diverse variables, all of which need to be mastered to ensure sustainable livelihoods and resources (Bradbear 2004; Donovan *et al.* 2006; Ostrom 2007).

With increasing demand for apiculture products, beekeepers and especially processing organisations have become more aware of the fragility of the resource base. This implies they are more aware of the positive indirect impact on ecosystem services (Holvoet *et al.* 2004), such as the pollination of a wide variety of subsistence and cash crops. Voluntary market-based arrangements such as organic certification and GI are founded upon forest-based apiculture and thus depend on a sustainable, continued supply of forest forage. The characteristics and organic nature of white honey are a unique selling point, evidenced by the forest images used on packaging and stress on this aspect in funding applications by processing organisations. Marketing strategies such as the Geographic Indication branding of 'Oku White Honey' and organic certification for 'Miel Royal de Savanne' help consumers differentiate between honey profiles and internalise ecosystem and biodiversity values. In Adamaoua, the majority of hives are forest based, on average 3 to 20 km from villages. The results of HMRS tests and annual organic certification audits confirm beekeepers' reports that the environment and beekeeping practices are organic. Guiding Hope however had to introduce rules to prove and check this, such as storing products in separate, registered collection centres to avoid a reoccurrence of contamination from chemicals and banning the traditional practice of smearing cow dung on hives, a transmission vector of chemicals used in livestock to apiculture products. In the Northwest, despite a belief that honey is organic, the practice of hive transhumance means that bees also forage on crops, particularly coffee (confirmed by beekeepers, observation and pollen analysis, see Appendix 15 for details). Observations, discussions with coffee cooperatives and literature (Nchare 2007) indicate that chemical use on coffee is widespread and not well controlled. This affects bee health, honey quality and poses problems for potential organic certification of Oku white honey, although governance arrangements to control this have not yet been enacted.

New practices and systems of governance have enabled new actors to enter the chain which may cause further changes in aspects of sustainability. For instance, as it is now easier and acceptable for women to keep bees, the home and farm become the main forage source, rather than the forest, although depending on distances, forests may still be foraged. With this development, product characteristics are likely to change, with the most highly valued characteristics such as the whiteness of Oku honey, being lost. The SNV and FAO support for chain-integrated activities contributed to an awareness of the benefits and failures of past production-focused and 'modern' technology orientated interventions (Macqueen 2006; Simukoko 2008; Vabi 2010). As development rhetoric has moved to a pro-poor, sustainable chain and consumer-orientated focus, consciousness of the link between the sustainability of forest resources and livelihoods has grown, building on project-led arrangements such as the BHFP where forest benefits were stressed, and market-led arrangements such as organic certification and geographic indication which also emphasise the importance of sustainable resource use.

The mix of arrangements constructed and employed by direct actors emphasise how natural capital has produced economic assets, aided by inputs of social capital. Although there are some trade-offs with natural capital, such as the hive materials and resources used in processing and practising activities which damage forest forage, these are now generally of limited scale. The apiculture chain has not been the major driver

degrading forest resources. The chain is however threatened by anthropogenic forest use and climatic changes. In the Northwest tree planting and the geographic indication scheme aim to secure access and tenure and reverse forest losses. However, community forests have failed to meet many institutional design principles and are largely ineffective. The quasi-tenure and changed institutional landscape created by community forests, protected areas and decreasing traditional authority have meant that neither community forests, government, traditional authorities nor beekeeping organisations have been able to counter the scale of anthropogenic forest degradation. In Adamaoua, only recently have governance arrangements been introduced to tackle problems of scarcer forest resources. Once aware of the threats to the sustainability of their livelihoods, beekeepers and organisations have become bricoleurs, responding by planting forage on secure land and creating voluntary, market-based systems to internalise the environmental costs and benefits of apiculture. However, the tendency to use multipurpose and non-native trees means that the ecosystems which create the prized white honey in Kilum Ijim are not being replaced. In Adamaoua, only selected species are being regenerated. The Highlands chain thus appears sustainable only as long as the rapidly diminishing forest resources continue to exist. In Adamaoua, recent actions may be sufficient to maintain production and continue to increase livelihood benefits. Although the forest resource is substantially larger, the lack of comprehensive, strong governance arrangements encompassing the majority of actors represents a mounting risk to the livelihoods of those engaged in the chain as well as product sustainability, which ultimately affects the viability of the entire chain.

## Conclusions

The analysis of the apiculture chains originating from Adamaoua and the Northwest of Cameroon indicates that governance arrangements have significantly influenced how apiculture products are sourced, harvested and traded. This section summarises the conclusions, responding to research questions two to five, on how the value chain is configured in terms of products, actors, activities and values; the governance arrangements in place; how these impact the livelihoods of actors; and how these impact chain and product sustainability.

Apiculture products are highly valued. These products are an important source of cash income and providing food, medicines and culturally important symbols, as well as ensuring pollination, a valuable ecosystem service. Alongside honey, the economic value and quantity sold of products such as wax, propolis and by-products has been increasing. The significant economic and social values of apiculture products have become more visible as their chains have extended further than the traditional local and regional markets. However the apiculture product chains have been largely invisible for policy makers, similar to many other NTFP chains in the Congo Basin (Ingram *et al.* 2012a). Only recently has recognition grown of their value by policymakers and state actors.

However, the dispersed and remote nature of the chains and trade has meant that governance arrangements in the chain have been characterised by voids in formal governance. This gap has allowed new voluntary, market-led and statutory arrangements to be relatively easily bricolaged by direct actors in the chain, often building upon traditional customs, and pushed largely by local enterprises, when perceived to contribute to livelihoods. Customary arrangements are more prominent and

intense in the Highlands than the savannah forest ecoregion, in part due to factors such as high population density and pressure on forests and their products. In the Highlands, customarily control has now given way to pluralistic hybrids of customary, project and voluntary arrangements, such as geographic indication and best practices. Although apiculture products are derived mainly from domesticated bees, the sources of forage and hive materials in Adamaoua, the main production area, are loosely customarily controlled or open access. This context has allowed actors to create and influence arrangements. Stringent voluntary and formal regulations in some importing countries have influenced the chain and stimulated a plural array of bricolaged, voluntary arrangements that allow actors to gain access to high value nice markets. This has affected a small but growing proportion of beekeepers and actors in the chain to date. The trade has not yet generated such revenues that informal regulation through corruption is significant or large scale. There are signs however that this is changing as formalisation increases visibility.

Trade in generally sustainably produced products apiculture products has a centuries-long history and in the last decade has generated positive livelihood impacts for a significant number of people. The product characteristics: seasonal but with a long shelf life and a high value-to-volume ratio, are advantageous to creating wealth. For the majority of small-scale actors, apiculture has not constituted a path out of poverty, despite contributing nearly half of average household income. Major changes in governance arrangements and markets in the last five years are however providing new opportunities for beekeepers, processors and exporters to professionalise and to scale up. As the value of products increases, the benefits they generate for actors in the chain has risen, increasing access to new markets for some actors, mainly members of groups.

The main impact of governance arrangements on apiculture products and chain sustainability has been to increase control over access to resources. Recent voluntary and market arrangements have focussed on access to markets as an explicit way of increasing and demonstrating the sustainability of the chain: coupling access to assets with access to markets. However if these tentative arrangements are sufficient to ensure product sustainability is highly debateable. Faced with weak forest governance generally, and strong anthropogenic and climatic pressures, the Highlands chain is threatened by swiftly increasing forest degradation and deforestation. In Adamaoua, the small scale of voluntary and market actions to date may be sufficient to maintain production levels if other threats to the ecoregion do not endanger either bees or forage sources. Significant scaling up of production may pose a mounting risk to resources, but also act as a trigger to introduce arrangements that safeguard the availability of bee forage and species used in apiculture, securing and possibly improving the livelihoods of the largest group of most marginalised and low income actors involved in the chain.