4. Engaging Smallholders in Value Chains

Creating new opportunities for beekeepers in Ethiopia

Mengestie Alemu, 30, is a woman beekeeper in Mecha District
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An initiative in the Amhara region of Ethiopia has capitalized on the potential of local honey production to build a promising alliance between smallholder farmers and a private-sector export company. A coalition of facilitating partners has developed the value chain for honey and other bee-derived products by providing producers with technology inputs, training, and extension services, helping them to organize their production, and creating an enabling policy environment. Farmers who previously produced small quantities of low-quality honey have quadrupled their output and are now producing certified organic honey for export to international markets, which has significantly increased their incomes.
Introduction

Ethiopia is one of the poorest countries in the world, in 2010 ranking 157th out of 169 countries in the Human Development Index (UNDP). An estimated 77.5 per cent of the population live on less than $2 per day and the adult literacy rate is just 35.9 per cent (Ibid.). Beekeeping is an important economic activity, with the sector contributing around $1.6m annually to the national economy (Government of Ethiopia). The production of honey and beeswax provides a secondary source of income for smallholder farmers, who traditionally also grow cereals, pulses, oil seeds, and chillies. The country has more than ten million beehives, the largest number in Africa, and around two million people are involved in the value chain. Ethiopia is Africa’s largest producer of both honey and beeswax, and the fourth largest producer of beeswax in the world (Allafrica.com).

Ethiopia has the potential to produce 500,000 tonnes of honey and 50,000 tonnes of beeswax per annum, but currently production is limited to 43,000 tonnes of honey and 3,000 tonnes of beeswax (Government of Ethiopia). Moreover, the quality of Ethiopian honey is generally poor, as 95 per cent of beekeepers follow traditional beekeeping practices with no improved techniques or technology (Oxfam). Most honey (over 97 per cent of production) is sold via formal and informal domestic spot markets, and 85 per cent of this is purchased by brewers of tej, a honey wine (mead). Income from the sector is minimal, primarily due to low productivity and poor quality, but also because of limited market access, which forces producers to sell locally at low prices. Smallholders produce on average 5kg of honey per year from each hive, and must travel long distances to markets or sell at low prices to middlemen or local traders (Ibid.).

Globally, there is large and growing demand for honey and other bee products. From 2001 to 2005 the average annual growth rate of honey production globally was 2.3 per cent, although since then supplies have decreased, mainly due to the growing incidence of colony collapse disorder (CCD) in Europe, the USA, and South America.

There is a large unmet demand for organic honey in European countries and, according to the International Trade Centre (UNCTAD/WTO), East Africa has good potential for organic beekeeping. In the past few years, increasing demand has provided Ethiopia with opportunities to export small amounts of smallholder-produced honey to neighbouring countries such as Yemen, Djibouti, and Israel. It has also begun tentative moves to export honey to the European market, and is on a list of approved suppliers to the EU.
Starting out: the pilot project

In 2003, Oxfam initiated a three-year pilot project to promote the trade of honey and bee products in Amhara National Regional State. The evaluation of this programme coincided with the establishment of the Ethiopia Agricultural Scale Up programme, which ambitiously aimed to increase the incomes of one million smallholder farmers through empowerment and better access to market opportunities. As part of its approach, the programme identified specific commodities in which the development of value chains would offer opportunities to leverage private sector investment for poverty reduction and generate evidence to support advocacy activities related to regional and national rural policy.

The honey value chain in Amhara was selected as one of the focus commodities with potential for scale-up because it offered good potential for reducing poverty amongst smallholder farmers, particularly women and landless people. Beekeeping is one of the most sustainable livelihood options for landless people, as landowners pay beekeepers to set up hives on their land to enhance crop pollination. Generally, women do not own land in Ethiopia, and so over 50 per cent of the beekeepers targeted by the programme were women.

The regional government had already identified 31 districts with potential for commercial beekeeping and had developed a plan both to support beekeepers in the use of modern technology and to strengthen the capacity of farmers’ unions. To take advantage of this opportunity, Oxfam set out to modernize traditional beekeeping practices and transform small-scale, low-value production into a model of commercialized beekeeping. As people can keep bees in their spare time at home, this plan had good potential to involve women, as well as offering farmers the opportunity to diversify income sources.

Furthermore, honey produced by smallholders is organic and environmentally friendly, and receives priority support from the Ethiopian government as a high-value commodity (Amhara Regional State). Oxfam’s programme capitalized on this by developing coordination groups, involving government offices at the local, regional, and national levels, as a forum for honey value chain stakeholders to discuss bee products. Additionally, the experiences of beekeepers were shared at an annual national learning event organized by Oxfam in close collaboration with the Federal Ministry of Agriculture and Rural Development.

The pilot project aimed to demonstrate the potential of commercial beekeeping for smallholders and was implemented by partner SOS Sahel, with funding from Oxfam. The project worked with this partner to support the development of six primary co-operatives, involving 2,100 farmer households, and created the Zembaba
Beekeeper Co-operatives’ Union to co-ordinate their activities. Through these organizations, it provided training in production techniques and the use of improved technology, notably the Kenyan top-bar hive, which enabled women to become more involved in honey production (previously honey production involved tree climbing, which was not seen as socially acceptable for women).

Local government offices for agriculture and the promotion of co-operatives were fully involved in extension services and in building the capacity of the co-ops. Evaluation of the pilot scheme showed that, on average, productivity improved from 5kg of honey per hive per year to 20kg per hive per year.

**Box 1: New markets, new income**

One key objective of the pilot project was to identify more profitable markets for the farmers’ growing honey supply. The project staff dedicated significant time to identifying potential buyers before engaging commercial agents Century Trading Ltd. and Beza Ltd., who promoted retail-packed honey to over 200 supermarkets and grocery outlets in Addis Ababa.

An evaluation report conducted in 2006 showed that, prior to the project, the price received by producers from local traders was Ethiopian birr (ETB) 5–6 ($0.30–0.40) per kg for crushed honey. Traders also often cheated producers on weights. Through the co-operatives, the producers now receive ETB 32 ($2.46) per kg for Grade 1 pure honey and ETB 28 ($2.15) per kg for Grade 2. Co-op members also receive dividends on the sale of processed bee products to the agents, Beza and Century. These dividends range between ETB 35 ($2.60) and ETB 674 ($50) per season, based on the number of shares the producer owns. Most producers are re-investing their dividends to expand their operations and also the processing centres.

‘Before the co-operative, we used to sell our honey at a low price to middlemen in the market. I was perhaps getting ETB 8–10 ($0.60–0.75) per kg, but now through the co-operative we are getting ETB 32 ($2.40) per kg. This is providing 40–50 per cent of my yearly income and covers nearly half of my family’s needs, including school and medical fees. With this I am able to send eight of my children to school,’ says Ato Workneh Addis, a beekeeper from Bahirdar Zuria.


Training was also provided in processing and, together with the government, the project constructed honey collection and processing centres in eight villages. Previously producers had to travel long distances to find buyers for their honey, which reduced their negotiating power and further excluded women from the market. The project also supported co-operatives to apply for organic certification and provided training in marketing, management, and business skills. A credit facility was established and managed by the Meket Micro-Finance Institute (MMFI), which enabled the co-operatives to purchase honey from member beekeepers through the collection and processing centres.
Oxfam GB’s target was to scale up its promotion of good practice in the beekeeping sector to reach 40,000 beekeepers in 20 districts. However, this would require further investment to convert traditional beekeeping techniques to modern ones, develop market linkages, diversify products and opportunities, and improve both institutional capacity and the provision of financial services, with a particular emphasis on women beekeepers.

**Scaling up: engaging with the private sector**

Oxfam’s intention was to build a scalable model that would link smallholders with formal markets. In the initial phase of the programme it was actively involved, providing the co-operatives with services such as training on marketing, contract management, and negotiation skills, together with technical support and periodic monitoring of quality standards and production. It also undertook market assessments and feasibility studies on bee products, developed new market strategies to promote the producers’ own-brand ‘Amar’ honey and beeswax, and facilitated market opportunities for bee products.

However, in the scale-up phase Oxfam’s plan was to act solely as a facilitator, and to identify private sector and government actors who could invest in services to develop the model. It was felt that private sector engagement would provide access to larger and more stable markets both within Ethiopia and for export, and would also leverage greater investment to develop the co-operatives’ processing and marketing activities. A stakeholder engagement process identified a private company, Ambrosia, as a promising partner with whom a joint programme could be developed. The company displayed a commitment to social responsibility, with a stated mission to create jobs and improve incomes for farmers. It had also already carried out a nationwide feasibility study and quality assessments of Ethiopian honey.

Owned by three Ethiopian entrepreneurs and a French-based company, STECA, Ambrosia was established in 2000, with initial capital of Ethiopian birr (ETB) 54m ($5.75m). The company has signed an agreement running to 2011 to supply CSV International, a honey buyer in France, and on the strength of this contract has established the largest honey processing plant in Ethiopia at Debubirhan, using working capital of ETB 21.5m ($1.6m) from the Development Bank of Ethiopia. The plant, which is being fitted out with imported machinery, is the only one in the country capable of exporting processed honey and has the capacity to process and pack 6,800 tonnes of honey and beeswax every year. Ambrosia’s ambition is to be the market leader for bee products in both the Amhara region and Ethiopia as a whole.
In 2008 Ethiopia received Euro Gap accreditation\textsuperscript{15} to export organic honey to Europe, and subsequently Ambrosia won an order from CSV International to export honey at a price of €3 (ETB 50) per kilo. However, due to the lack of an organized local supply, Ambrosia was unable to fulfil this export contract, which called for 2,300 tonnes of honey a year.

As a result, the company realized that the best way to ensure consistent supplies of honey was to invest directly to establish formal smallholder production, rather than depend on unreliable open wholesale markets. It estimated that it would require 42,000 beekeepers to ensure adequate supplies to meet its needs. It also realized that it would only be possible to reach out to so many farmers through organized beekeeper co-operatives and unions. In addition, it would require a coalition of training institutions, service providers, and facilitating NGOs to help develop efficient smallholder enterprises.

Oxfam and Ambrosia agreed to jointly develop a long-term business plan to systematically expand the operations established under the pilot beekeeping project. Together they established a training school for beekeepers in Mecha district with a joint investment of £66,000 ($105,400). Until now, the partners have focused on establishing sustainable supply chains, but Ambrosia has recently signed a memorandum of understanding (MoU) with the co-operatives and beekeeping union to purchase and market their produce, and was collecting honey in large quantities to start bulk processing in March 2010. Working at full capacity, with three shifts per day, its plant has the potential to produce 6,800 tonnes of honey and beeswax annually, although initially the target will be 2,200 tonnes. Once production has begun, the company hopes to offer farmers who successfully complete its training courses soft loans to purchase improved beehives and modern beekeeping equipment.

\textbf{Box 2: Investing jointly to train producers}

There are an estimated 20,880 bee colonies in Mecha district, 95 per cent of which are kept in traditional hives. Oxfam GB, in collaboration with Ambrosia, has set up a training and demonstration school here with the aim of transforming subsistence production into commercial beekeeping. Ambrosia has invested £34,000 and Oxfam £32,000. One hundred beekeepers have been trained in three rounds each for five days and will receive improved beehives on long-term loans that will be paid back as honey is sold. The school also provides technical support and other inputs such as honey extractors, veils, and foundation sheets, on a regular basis. As a result of the lessons from the training school, Ambrosia is now planning to work with 42,000 new beekeepers, linking them with formal markets.

Under the MoU, Ambrosia has undertaken to purchase 3,400 tonnes of honey annually (although this may not have been fulfilled in the first year) via the Zembaba Union. By early 2010, while the first harvest season was still in progress, Zembaba had collected over 100
The purchase price for the honey is decided by a regional committee at the start of each month. This committee includes representatives from the union, Ambrosia, the Co-operative Promotion Agency (CPA), the Bureau of Trade and Industry, the Marketing Department of the Bureau of Agriculture and Rural Development, and Oxfam GB. When setting the price, the committee takes into account honey prices in different markets in the region and other factors such as production costs. Both parties have the right to reject the price set by the committee if they think it is unfair.

Ambrosia collects the honey (using its own transport) when the volume gathered has reached at least 5,000kg. Once a co-op has proved itself to be a reliable supplier, producers are paid up to 30 per cent in advance, with the balance paid within a week of the honey being received from the union.

The role of facilitator: working with partners

Oxfam took a lead role in analyzing and planning the development of the value chain, acting primarily as a facilitator. It also played a key role in ensuring that information was shared on an ongoing basis and that different actors worked together to solve problems. It has helped to develop sustainable relationships between partners such as local agricultural extension offices, the Co-operative Promotion Bureau, the regional Bureau of Agriculture and Rural Development, the Ethiopian Quality and National Standards Authority, and research agencies. A regional taskforce has been established to act as a forum where producer organizations, co-ops, and the union can discuss issues with stakeholders from government and private companies. The taskforce also advises on strategy and lobbies to influence change at regional level (for example, it has persuaded the Bureau of Agriculture to take action on pest control).

As well as buying honey, Ambrosia is investing in training and marketing services (collection, transportation, packaging, finance, and market information), while Oxfam and other partners are responsible for targeting new farmers for beekeeping training and co-operative membership; strengthening the capacity of producer organizations; research and value chain analysis; and identifying opportunities to add value to products (branding, certification, and standards). Oxfam has also established partnerships with a wide range of stakeholders including government departments, local NGOs, research agencies, and producer organizations. Actors who have played crucial roles in the value chain include the following:

- The Zembaba Beekeepers Co-operatives’ Union has organized beekeepers under one umbrella, working with individuals to boost their productivity while building the capacity of primary co-operatives and taking responsibility for quality control, processing, and marketing.
The regional Co-operative Promotion Bureau – a government body – provides co-operatives with technical and managerial support. Part of the regional taskforce, its role is to organize farmers into co-operatives and to facilitate the flow of market information.

Another government organization, the Bureau of Agriculture and Rural Development, has provided extension services to beekeepers via local development agents.

Oxfam GB has worked closely with the government’s Agriculture Research Institute to provide information to beekeepers on disease and pest control, especially of the Varroa destructor mite, a parasitic pest of honeybees.

NGO partners such as SOS Sahel and ORDA have helped to build the capacity of farmers’ organizations and have provided technical support on production and marketing. In particular, the project has worked with the Quality and Standards Authority of Ethiopia on packaging and organic certification.

SNV Netherlands (the Netherlands Development Organisation) has provided technical support on business planning for the Zembaba Union, and has worked to facilitate organic certification, which is essential to gain access to new markets. As well as being part of the regional taskforce, it helps to co-ordinate (with the Chamber of Commerce) a national-level steering committee to help develop the beekeeping sector nationally. A national regulatory framework would eventually allow Oxfam and other partners to exit the intervention, but more work on this is needed; discussions with the Federal Ministry of Agriculture are ongoing.

Achievements to date

From six co-ops in the pilot phase, the programme now involves 36 registered co-operatives with approximately 10,500 members. Of these organizations, nine are members of the Zembaba Beekeepers Co-operatives’ Union. Eight village-level honey collection and processing centres have been constructed under the six pilot co-ops. The Zembaba Union serves as a hub for beekeeping development in Amhara, and has built capacity by improving members’ skills and knowledge, which has helped to increase productivity by up to 400 per cent and to boost incomes by 200–400 per cent (Oxfam). Increased incomes have enabled smallholders to invest in education and other services.

Most beekeepers have switched their bee colonies from traditional log hives to transitional Kenyan top-bar types, while some have switched to modern frame hives. Some have also started producing beeswax, which offers additional opportunities to increase income. The Bureau of Agriculture and Rural Development and the Regional Agriculture
Research Institute, which makes wax foundation sheets on which bees can build honeycombs, currently purchase the wax. Beeswax could potentially be produced for sale to cosmetics and pharmaceutical companies in future, but this needs further organization.

As well as expanding the number of processing and collection centres, the union has developed a market information system, linking smallholders to markets and improving their awareness of quality, demand, and prices. This improves farmers’ negotiating power, allowing them to meet buyers’ requirements and identify the most profitable markets for their produce.

Box 3. Building capacity through the beekeepers’ co-operative

‘We have capital of £4,300 [$6,865]. Our total membership has increased to 2,600,’ says Tenawu Mehiratu, manager of the Zembaba Beekeepers Co-operatives’ Union, based in Bahir Dar. ‘Our union supports beekeepers on technical training and facilitating markets. Now the farmers know about markets, and how to get better prices. Before, 1kg of honey sold for 30–40 cents (ETB 5–6); now with improved quality, farmers can sell for up to $1.60–$2.40 (ETB 21–35) per kg.’

Mehiratu recognizes that the union still needs to work with farmers to increase awareness of improved beekeeping techniques, quality, and production. ‘We need policies to restrict the use of chemicals and to facilitate retailing. This year we have taken a loan of £3,500 [$5,588] to buy honey from farmers. We have 40 quintals [4,000kg] of honey in stock,’ he says.

Through the link with Ambrosia, the producers are able to access potentially larger-scale international markets. However, the co-operatives know that dependence on a single buyer is very risky for farmers. So although Ambrosia is a key player in the honey value chain, the co-operatives continue to market their own ‘Amar’-brand organic honey through local traders and supermarkets. In addition, some beekeepers still sell their honey at informal cash markets.

While prices at these markets tend to be lower and more variable, they are still a useful outlet, especially for women looking to meet immediate household needs.

Since the beginning of the pilot project, it has been a goal to increase the participation of women in the beekeeping sector. This has been a challenging task, but growing numbers of female beekeepers have learned how to manage the improved hives and beekeeping tools and equipment, through the introduction of new hives and targeted training. However, women’s levels of participation are still relatively low and this is a priority for further action. For example, the union and the co-operatives are changing their rules to allow two members per household to join; previously, it was only one member per household, and this was nearly always a man. New training on technology and marketing will target women, and women’s beekeeping groups will be formed. Increasingly, also, female beekeepers are taking leadership roles in existing co-ops.
## Box 4. New economic opportunities for women

Although there are few specific cultural barriers in Ethiopia to women becoming beekeepers, the sector is traditionally male-dominated. When Oxfam began its intervention in Amhara region, it found that only 1 per cent of beekeepers were female, although 24 per cent of households were female-headed. Building the honey value chain promised significant opportunities for greater economic empowerment of women.

The introduction of new technologies and new types of beehive has benefited both men and women, but in particular it has helped to involve more women. The new hives are easier to handle and can be kept at the homestead, where they are easy to access. They are not kept in trees like the traditional types, and beekeepers’ gloves and veils have reduced the risk of being stung when harvesting the honey. This has helped to increase women’s confidence.

Elements of the programme have been designed specifically to benefit women. For instance, establishing honey collection centres in villages has given women better access to information and has allowed them to engage in marketing. Previously they had to make long, unsafe journeys to distant markets. Women were often not allowed by their husbands to leave their village to attend training sessions, but this problem has been solved by setting up training centres in villages and providing training at times when women can attend.

The new value chain has also created employment opportunities: for example, women are making the specialist overalls, gloves, and veils required to handle bees. They are also involved in processing honey at the co-op collection centres.

Over the past two years, women’s engagement in beekeeping and their role in markets have increased significantly, accompanied by increases in income of up to 100 per cent. The number of female co-op members has increased by 25 per cent and women now account for 17 per cent of total membership. More women are involved in leadership and governance of the co-operatives, and this is likely to increase as a result of new initiatives taken by the co-ops and the union.

### Enabling factors and constraints

A number of positive factors have helped to enable development of the value chain and to scale up honey production in Amhara. These include:

- **Market demand**: Demand for the product and strong motivation to exploit the supply opportunity presented by smallholder agriculture were essential prerequisites in establishing the business case for private sector investment.

- **Suitability of the product**: Local knowledge was important in commercializing smallholder production, allowing appropriate technological improvements to be made to improve the quality and scale of production. With suitable flora and environmental conditions, the sector is well suited to smallholder production.
conditions, smallholders were able to meet the requirements of organic production and now have opportunities to access niche markets as international demand continues to increase.

- **Policy environment**: The scale-up was directly linked with the policy environment. Such projects can only be replicated if ministries and local authorities support the value chain with policies on the provision of market services, trading, certification, and revenue that allow private companies to enter into service provision and contract farming arrangements. In Ethiopia, beekeeping has been identified by the government as a high-value sector. Commitment from the government, the potential of production, and high market demand all encouraged actors in the chain to come together. The regional taskforce identified additional advocacy issues related to production, quality, and pricing.

- **Flexibility in working methods**: Engagement with the private sector requires the building of confidence between smallholder farmers and private companies. Typically smallholders lack organization and access to communication, and this gives market players a negative picture of their strengths and credibility. In engaging with Ambrosia, dialogue was made possible by Oxfam’s facilitation through value chain forums and by increased communication through information sharing and visits to project sites. In addition, the farmers’ union had already been established to represent the primary co-operatives, and with the assistance of Oxfam and its partners was able to build a credible relationship with the company.

- **Ability to link with diverse markets and service providers**: Dependence on a single purchaser creates a high level of risk for smallholders. If that company stops buying or providing services, it can have a catastrophic impact on smallholders’ incomes. In this case, it was possible to work with government agricultural extension services, the co-operatives union, and Ambrosia on service provision. The agreement with Ambrosia has helped to improve production and the quality of the honey, as well as guaranteeing a market. The co-operatives are also developing their own brand and exploiting domestic and regional markets as well as European markets through Ambrosia.

The relationship of producers’ organizations with Ambrosia is based on value chain principles (not as in a supply chain where the buyer dictates terms to suppliers). Agreements will be effected if both parties see benefits in them. Producers can break off relationships with any private sector actor if they feel that these are too risky. As producer organizations are autonomous, they do not face the risk of being dependent on a single buyer. Oxfam is working to help the beekeepers’ union and co-operatives reduce such risks by 1) ensuring that the agreement with Ambrosia is fair, transparent, and based on
value chain principles; and 2) building the producer organizations’ capacity to identify alternative markets.

Despite the opportunities created, there are still some factors limiting the potential to achieve wider change.

- **Inexperience in export markets:** Farmers’ organizations are knowledgeable about immediate local markets, but a lack of experience in accessing international markets is a constraint on their profitability. However, in the scale-up phase of the programme, the union is undertaking a planning exercise to develop a viable business plan over a number of years. Potentially interested buyers from the Middle East have started negotiations to buy table honey, and discussions have taken place with regards to long-term engagement with the Fair Trade Labelling Organization (FLO), with further action planned.

- **Maintaining quality and supply:** The growing number of farmers in the beekeeping sector poses the challenge of maintaining democratic systems and governance of farmers’ organizations, which have a direct bearing on quality and supply. The capacity of co-operatives can affect production levels and the quality of produce, for example.

- **Limited exploitation of other bee products:** To date, smallholders have focused on the production and marketing of honey and beeswax. Other bee products for which there is high potential market demand – such as propolis and venom – are not currently being considered due to lack of technology and skills.

- **Financing and policy constraints:** There are currently only limited financial services available from mainstream financial institutions for co-operatives and unions, while trade barriers can prevent small producers from developing their own brands and market promotion strategies.

- **Environmental degradation:** The beekeeping sector is dependent on healthy flora and a healthy environment. Recent years have seen environmental changes in Ethiopia in terms of erratic rainfall patterns and deforestation. If these problems worsen, the beekeeping sector could be affected.

**Conclusion**

Oxfam’s work on the honey value chain has been successful in demonstrating good practice in the commercialization of beekeeping in terms of improving productivity, organizing producers, strengthening farmers’ capacity, and linking farmers with formal markets. The intervention has reduced poverty among smallholder farmers, particularly women and landless people. The organization of farmers, the introduction of new technology, the equal
participation of women, adding value to produce, awareness and information on markets, and linkages with the private sector are all factors with potential to sustain growth of the value chain. It is vital that there continues to be a body which can play a facilitating role between the different actors involved in the honey value chain. Ultimately Oxfam’s exit strategy must enable market players to take over this role. It has therefore avoided continued subsidization of market services in order to allow an eventual exit.

This case demonstrates that private sector linkages can clearly benefit smallholder farmers. However, farmers’ organizations need to understand market mechanisms and build their capacities accordingly. Maintaining levels of supply and the quality of produce are key priorities if farmers are to benefit from formal markets. Organization through value chain forums can play a crucial role in addressing policy issues, through joint action by farmers and their partners. Finally, the scaling up of honey production must be incorporated into national agricultural policy, so that Ethiopian beekeepers can realize their full production potential.
Notes

4 Ibid.
7 Oxfam (2008) Partner Progress Report. The honey produced in traditional hives is often mixed with wax, pollen, dead bees, and extraneous matter. This means that it cannot be used for processing or for export as table honey, but is only suitable for use in tej brewing.
10 Bee venom is used in medicinal products, royal jelly in medicines and beauty products, and propolis in medicines, varnishes, and chewing gum.
13 http://www.sahel.org.uk/ethiopia.html
14 Traditional hives are typically made of hollow logs sealed with mud and sticks or reeds; the ends are opened to harvest honey, which disturbs the bees and damages the combs. The hives cannot be inspected without breaking them open. Top-bar hives consist of a simple box (which can be made of local materials by beekeepers themselves) with wooden bars that can be lifted and inspected individually. Modern hives are rectangular boxes with frames inside that can be drained of honey and then returned with the comb intact. These require precision carpentry work to construct.
15 For free trade with European countries. Euro Gap accreditation is granted only after the applicant has fulfilled the strict requirements and standards of the European Union Trade Commission. These include high production standards, quality assurance, and sound environmental practices. Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN). http://www.fanrpan.org/, accessed 3 February 2010.
17 Quality and Standards Authority of Ethiopia. http://www.qsae.org
18 http://www.snvworld.org/en/Pages/default.aspx