ASSOCIATION OF YOUNG ECONOMISTS OF GEORGIA

CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Agricultural Value Chains in Imereti and Racha regions
Apiculture and honey production

1 Introduction

The present research was carried out by the Czech University of Life Sciences Prague (Faculty of Tropical AgriSciences) in collaboration with People in Need and the Association of Young Economists of Georgia from July 2013 to June 2014. This study is a part of regional value chain analysis for the main products of agricultural sector in the Imereti region.

The goal of this analysis is to provide background information and baseline data for subsequent implementation stages of the project Enhancing Small Farmers' Cooperation and Productivity in

Imereti Region financed in the framework of European Neighbourhood Programme for Agriculture and Rural Development in Georgia (ENPARD Georgia)- Small Farmers Co-operation component

This research would not have been possible without funding from the ENPARD Georgia and Czech Development Agency project "Support for Cooperatives in Imereti, Georgia".

2 Methodology

The research team followed an approach that allowed handling several issues concurrently. Data collection was organised and methods selected in order to assess specific issues from different angles supported by a triangulation of qualitative and quantitative methods. After the identification of the 8 local products with the highest development potential (based on local expert and government officials interviews), we carried out a more detailed survey thematically focused around each selected product. For beekeeping, the districts are depicted in Table 1:

Table 1 - Selection of beekeeping districts of Imereti Region

Beekeeping	Bagdati
	Tkibuli
	Kharagauli

The field data focused on agricultural product in the Imereti Region was collected in three stages:

- July 2013 - production systems for the 8 main products in 11 Imereti districts
- August 2013 - market screening and production systems analyses in 3 districts, which were identified as the key districts to be targeted for project implementation
- November 2013 - pilot data collection for first product
- March to June 2014 - gathering of data for remaining products and finalization

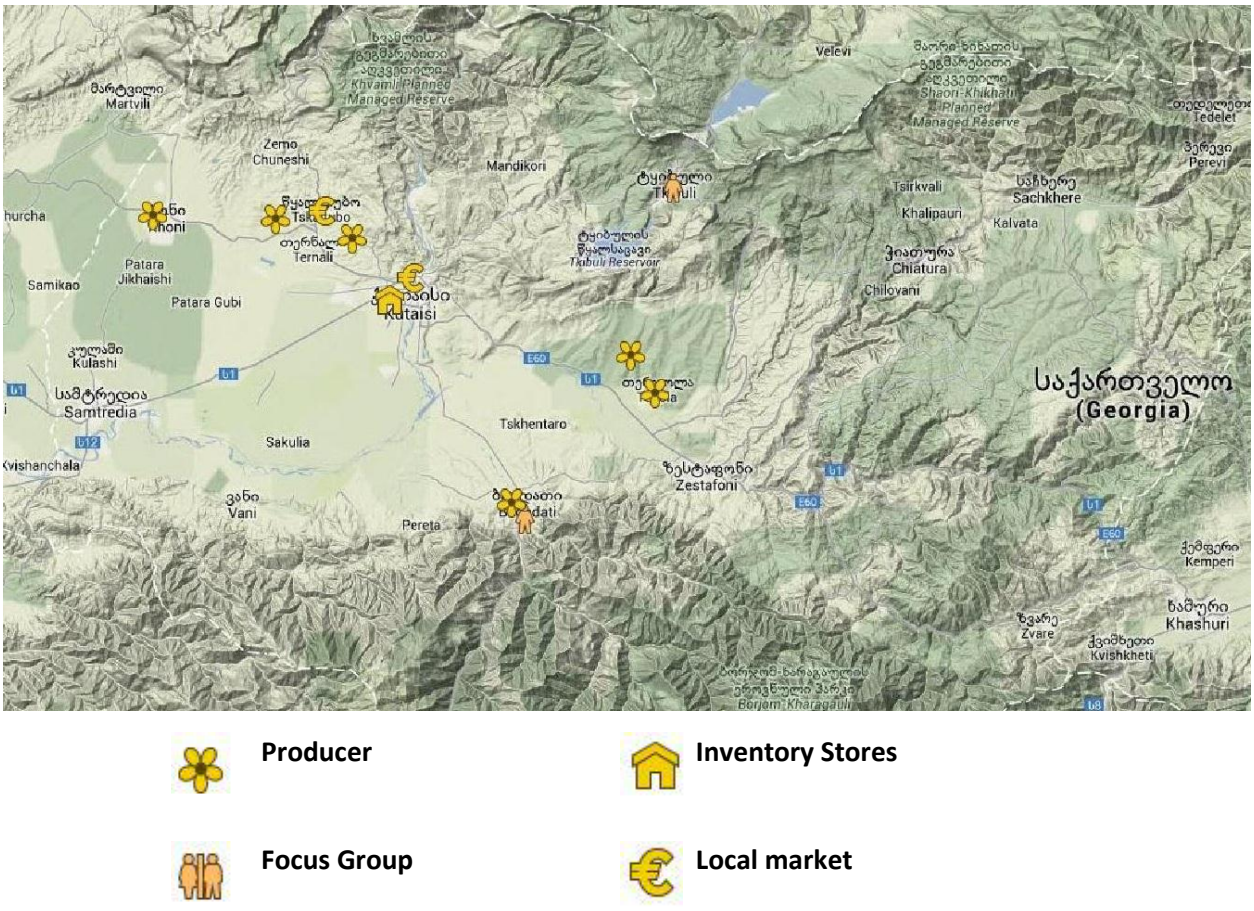
For the analysis mainly qualitative research based on key-informants and group of farmers is used,

which is designed to reveal a target group's range of behaviour and the perceptions that drive it with reference to specific topics or issues. As a main qualitative research method is used method of semi-structured in-depth interview. Interviews were conducted with small number of key informants who must have first-hand knowledge about examined issue. Each interview took from 1.5 to 2 hours. Diversity of key informants was important to cover whole value chain from suppliers to the local market. It means to identify and interview different-sized farmers (from small subsistence to commercials), collectors, middlemen, processors, sellers on a local market, exporters, together with agro-shops selling seeds or seedlings and different kinds of tools, technology, pesticides, herbicides, fertilizers or other inputs.

Main field data collection instruments for apiculture included (spatial distribution is visualized in Figure 1):

- Focus group discussions with beekeeping farmers
- Interviews with representatives of beekeeping farmers
- Interviews with representatives of the beekeeper association
- Interviews and observations of input supplier shops
- Honey market screening

Figure 1 - Map of locations for data collection in Imereti



However, it should be taken into consideration that qualitative research is only part of the project that generally reflects the most widespread information. The secondary quantitative and qualitative data is based on the unity of consolidated researches including official statistical data.

But still, it is necessary to bear in mind, that the qualitative research is only partially representative and captures mainly general and the most frequent information. The secondary quantitative and qualitative data relies heavily on an examination of existing, accumulated research, combining official government data with studies conducted by international organizations such as FAO, EU, etc.

Due to the lack of agricultural activity in Racha regions, National Statistical Bureau of Georgia does not publish any specific data regarding the agricultural sector.

3 Beekeeping as a sector of Georgian agriculture

The beekeeping is important not only as income generating activity for smaller farmers and thus value generationa for livelihoods in rural development, but it has its importance as a public good, because it allows pollination of other agricultural crops. When wild bees do not visit agricultural fields, managed honey bee hives are often the only solution for farmers to ensure crop pollination (In the US for example, the pollination services are a source of income for many professional beekeepers especially in almond pollination).

The worldwide production of honey has globally increased to amount to 1.5 million tonnes in 2012 (FAO, 2014). The 10 biggest producers are: China (400 000 tonnes), Turkey and the USA (80 000 tonnes each), Ukraine (70 000 tonnes), Argentina (60 000 tonnes), Mexico and Ethiopia (55 000 tonnes each), Russia and Iran (50 000 tonnes each) and India (40 000 tonnes). EU as a whole is not self-sufficient in honey production at all. Its self-sufficiency ratio reached 62.0% in 2010. It means that around 40% of honey consumed in EU every year is imported (EC, 2003).

The number beehives and amount of production is on sharp increase in Asia, while in US and EU the production stagnate or even declines. It is due to the fact, that bee colonies in these countries are collapsing. The main threats are partially related to starvation, viruses, attacks by pathogens and invasive species, and poor bee nutrition but mainly to intensive agriculture practices - pesticide use, genetically modified plants, and environmental changes (e.g. habitat fragmentation and loss).

In Georgia, the beekeeping represents growing sector of national economy. Due to the climatic condititions and paradoxically due to the low level of intensification of agriculture and preserved and diversified environment, the honey production and export represent very promissing sector of agriculture. According to the data from GEOSTAT the number of beehives has increased more than three time since 2006 (Diagram 1) with four times higher production (Diagram 2).

Diagram 1 - Number of beehives in Georgia (ths beehive)[1]

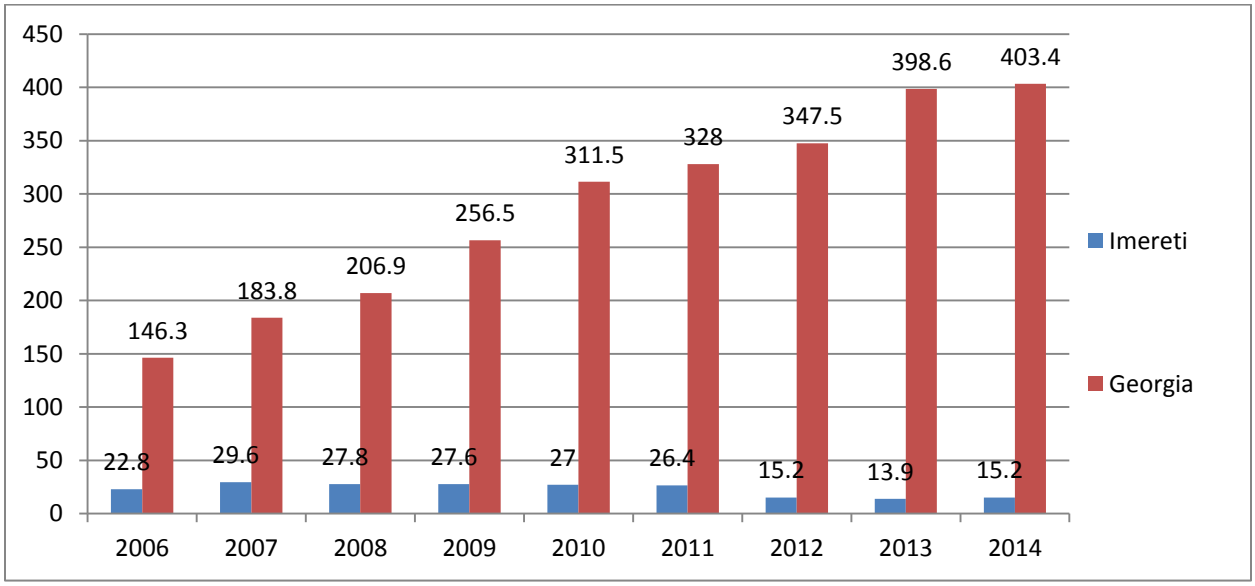
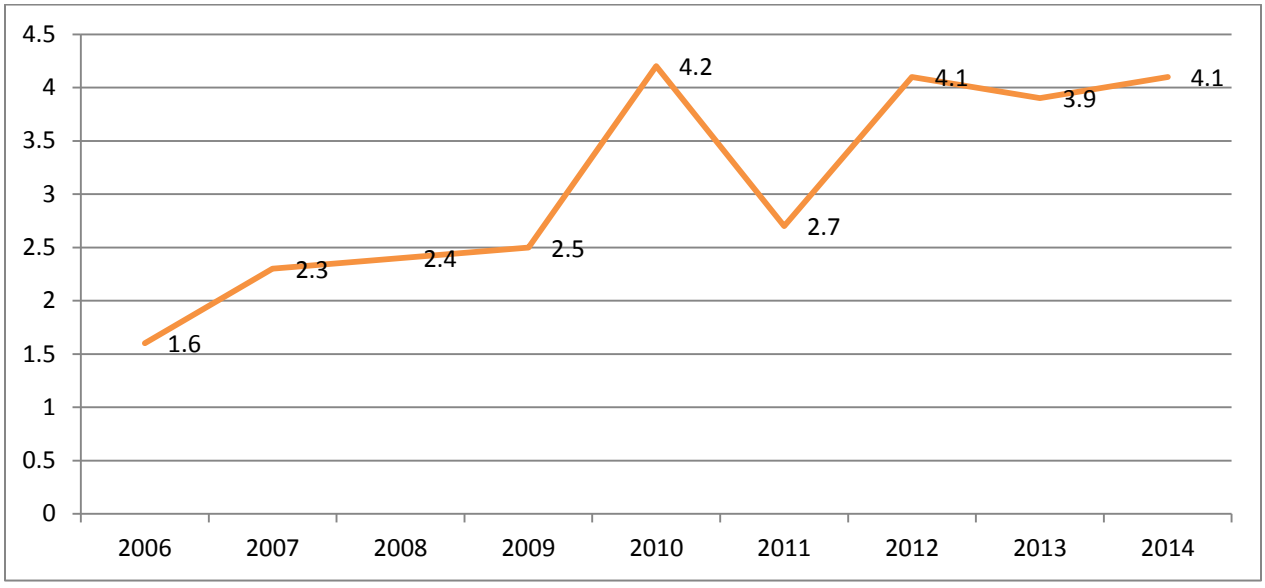


Diagram 2 – Honey production in Georgia (ths tons)[2]



More details of the regions of Georgia shows, that the highest increase of honey production is in Samegrelo and Zemo Svaneti region Diagram 3 shows number of beehives and diagram 4 production of honey, while in Imereti both indicators have been decreasing.

[1] http://pc-axis.geostat.ge/Table.aspx?rxid=c8ca81e9-2824-4c5b-a46a-c80202913531&px_db=Database&px_type=PX&px_language=ka&px_tableid=Database%5cAgriculture%5cAnimal+Husbandry%5cTABLE_3.02-13.px&layout=tableViewLayout1

[2] http://pc-axis.geostat.ge/Table.aspx?rxid=c8ca81e9-2824-4c5b-a46a-c80202913531&px_db=Database&px_type=PX&px_language=ka&px_tableid=Database%5cAgriculture%5cAnimal+Husbandry%5cTABLE_3.15-27.px&layout=tableViewLayout1

Diagram 3 - Number of beehives in the regions of Georgia (ths behaves)[3]

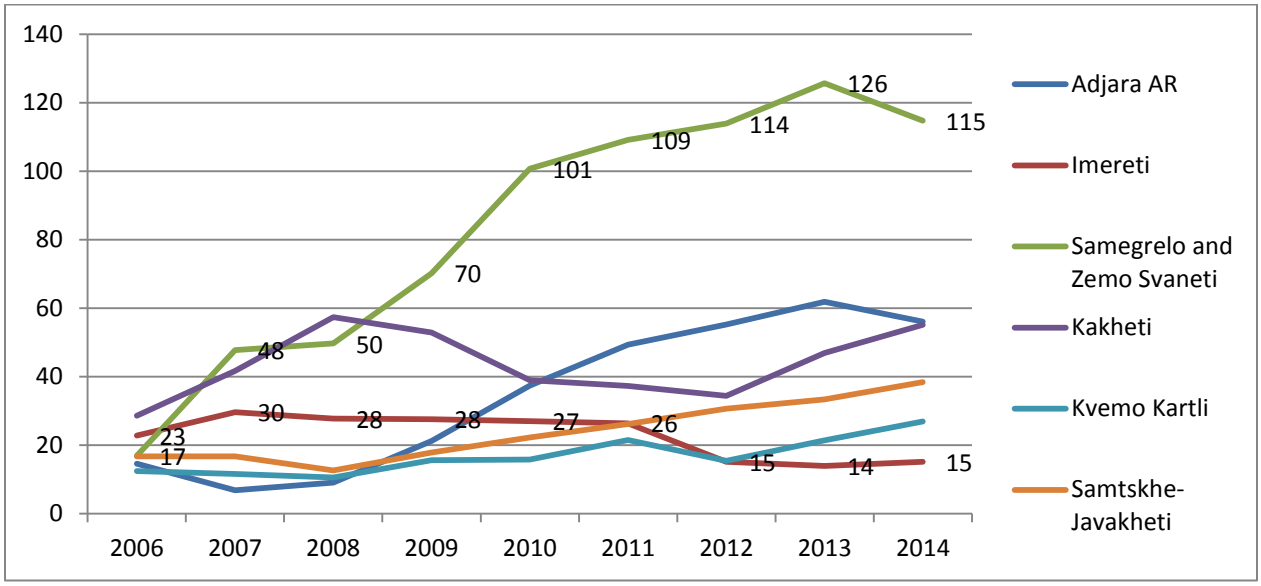
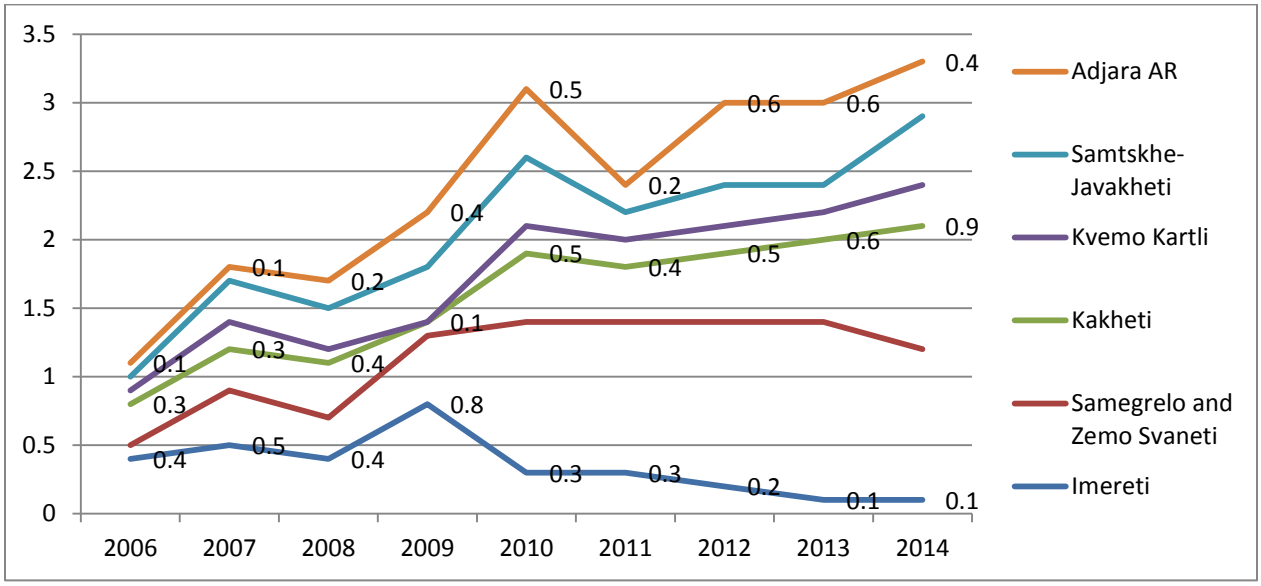


Diagram 4 - Production of honey in the regions of Georgia (ths tons)[4]



[3] http://pc-axis.geostat.ge/Table.aspx?rxid=c8ca81e9-2824-4c5b-a46a-c80202913531&px_db=Database&px_type=PX&px_language=en&px_tableid=Database%5cAgriculture%5cAnimal+Husbandry%5cTABLE_3.02-13.px&layout=tableViewLayout1

[4] http://pc-axis.geostat.ge/Table.aspx?rxid=c8ca81e9-2824-4c5b-a46a-c80202913531&px_db=Database&px_type=PX&px_language=en&px_tableid=Database%5cAgriculture%5cAnimal+Husbandry%5cTABLE_3.15-27.px&layout=tableViewLayout1

4 Honey value chain

4.1 Production systems

Even though there is decline according to the official statistics, honey production in Imereti reaches still high popularity. The main districts identified for the honey production were Bagdati - where 20% of farmers produce honey with 250 tons of total district production, 70% goes to the market, Tkibuli - 5% of farmers produce honey with around 4000 beehives and Kharagauli.

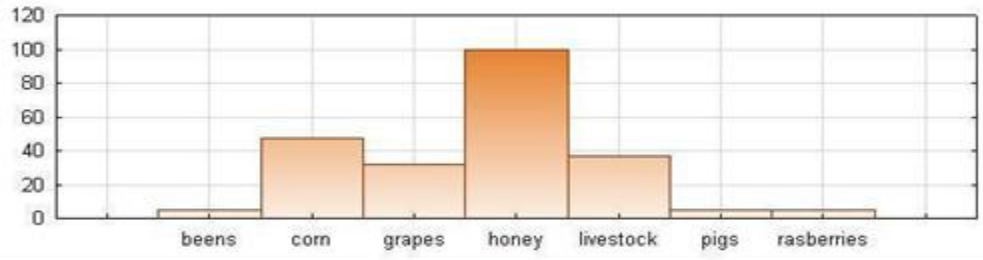
Besides Bagdati high number of farmers is processing honey only for their own consumption. Number of beehives per farmer can range between 50-240. In general, there are only few professional beekeepers as honey production is viewed mainly as a sideline business. But, distinction between professional and non-professional beekeepers is usually a challenging issue. In Georgia more than 100 beehives is considered as a bigger and professional honey producer. In Imereti there are only two or three farmers with more than 1000 hives.

Picture 1 - Typical small scale production of honey

Crucial issues for beekeepers are a question of transhumance. Farmers must migrate with their beehives during the year. beehives are transported from the lowlands, where they are kept during winter (in Tkibuli for instance), to mountains in the summer (in Racha for instance). The beehives can be distributed across 2-3 localities at one time. The main reason is different flowering, quality and composition of available plants. The quality and color of honey also varies according to the location. The value of median for the size of the land under beekeeping per one farmer and location is 0,62 ha.

Besides beekeeping, farmers cultivate in lower zones grapes, corn, beans, vegetables, fruit, livestock products and partially tea. From listed products, only livestock products (meat, milk, cheese) and tea are available for sale, other products are for family consumption. The high zone beekeepers are more focused on cattle breeding and corn production

Diagram 5 - Main products cultivated together with bees



Even for small farmers the beekeeping is the unique or major source of income for the whole family. According to the respondents, average share of family income from beekeeping is around 70 %. The family participates in the production and maintenance of beehives.

The typical local breed of bee is "gray Caucasus mountain honeybee" (Apis mellifera caucasica), which allegedly has a legendary ability to produce large amounts of honey despite cold weather and bad conditions (Corso M, 2013). It is a sub-species of the Western honey bee and it has several regional sub-types.

4.2 Productivity

For beekeeping, weather strongly affects flora and bee behavior, which explains high volatility of production between years and seasons. According to the international statistics, the production from beehive is around 15 kg of honey annually. Some farmers claim they can get up to 50kg/hive per year, when the weather is optimal. For comparison with EU - farmers in Poland - 9kg per hive, Germany - 34 kg per hive, Sweden - 51 kg (FAO, 2014). High variability is related to different climate, nectar quantities, density of bee colonies, and variable size and forms of the hives used in each region.

There are 3 seasons of production - May, June and October. The second season is the most productive. Some of the honey from last season farmers leave in hives as a winter feeding. The amount of production from average farmer is around 1,5 - 4 tons of honey per year.

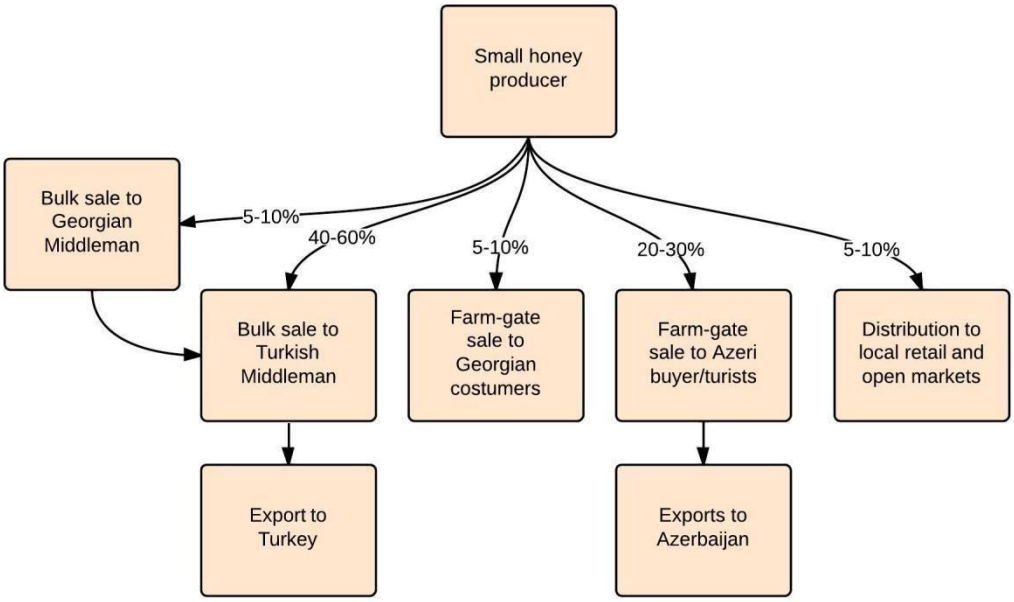
Farmers use mainly traditional vertically arranged hives with movable frames comparable with Langstroth type of hive, which facilitate the treatment of hives against diseases without risking that the products employed also affect the honey. This type of hives, compared with horizontally arranged Layens model usually produce higher yields. Some of the farmers have simple machinery for production of spare parts (mainly wooden frames), which they sell to other farmers directly or to the local shops with beekeeping tools, material and accessories. The machinery was distributed to some farmers in the framework of previous development interventions by international NGOs. Some beekeepers experiment with special methods and hives for production of mother queens.

Beehive management, nutrition and migration conditions as well as sanitary treatments are all very basic in Imereti. Farmers are aware that the use of inappropriate treatment measures is influencing the levels of pathogen infestation in colonies among others, but the appropriate services and modern technologies are not available. On the other hand, most of respondents during the survey mentioned plans for expanding the production. Mainly through extensification - new beehives, but also through intensification - new mother queens.

There is no targeted breeding available. Targeted breeding might be used to generate honey bee varieties with traits beneficial to the beekeeper, such as high disease and parasite resistance, good honey production, prolific breeding, and low aggressiveness.

4.3 The product chain typical for Imereti

Scheme 1 - Main supply chains of honey in Imereti



The honey value chain is very simple and short with only few actors involved. Honey is sold both directly to customers or in bulk to the middlemen, which sell it in Georgia or abroad. No additional industrial processing or packaging is practiced. Only marginal amount goes to local markets in villages, district or regional cities, where the honey is sold in plastic or glass jars usually in 100g to 500g quantities. Farmers sell different types (colours based on locality and type of flowers) at the same time. Only 4-5 honey producers in Imereti sell honey in packages to retail in bigger shops or small supermarkets. In the whole country there just few producers with required quality and quantity, which allows them to sell to international supermarkets chains located in Georgia. The main trade channel to costumers in Imereti is a farm-gate sells directly from farmer's house. At the farm gate farmers sell honey usually in various jars brought by costumers.

Picture 2 - Honey on the local street market

Most of the production of honey (and other honeybee products) is sustained thanks to sells in bulk and exports to Turkey or Azerbaijan. Some farmers sell it directly (some of the Turkish buyers go directly to the farmers with trucks), while majority uses middlemen (sometimes Georgian and Turkish middlemen is involved at the same time), who usually trade with total quantities of 5-6 tons. Azeri buyers usually

buy smaller quantities (some farmers call them Azeri tourists), why mainly Turks trade in bulk. They use 10-20kg plastic containers with lid and transports honey on trucks mixed with other products. Only minimum and unstable quantity is exported to Russia. Some farmers transport their honey to Batumi or to the smaller towns on borders with Turkey in order to sell their honey there by themselves.

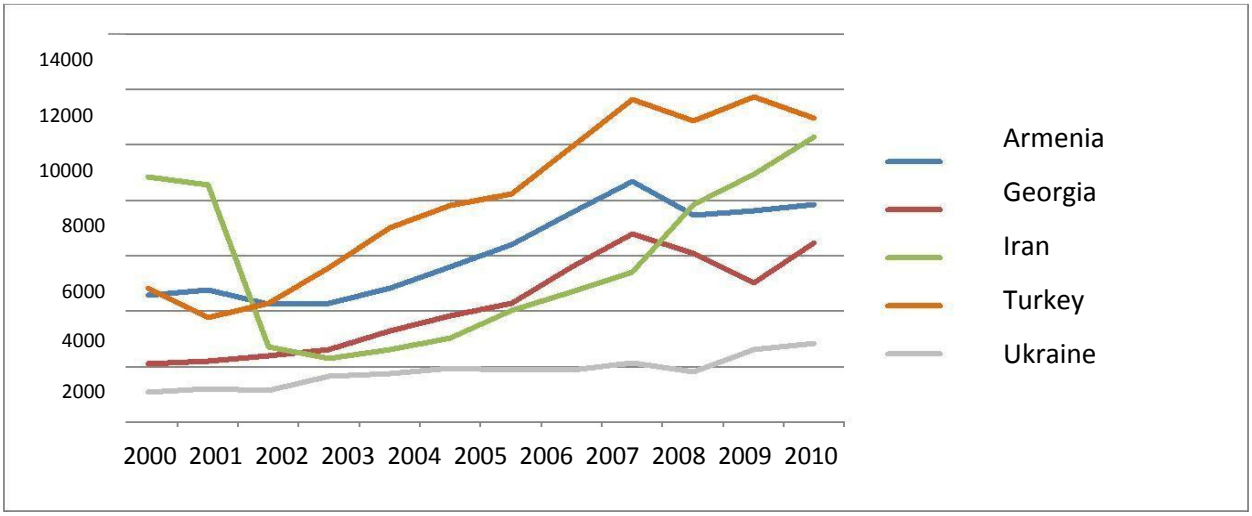
It must be stressed that exports are illegal since Georgian honey does not have necessary export certificates for product quality. For example Turkey officially allows import of up to 1000t of Georgian honey, but only with certificate of quality. The demand and therefore the price of honey is dependent on the demand from Azerbaijan and Turkey. This fact makes the whole honey production sector very unstable and volatile.

Some of the respondents had been selling honey under the longer-term contract to the state agencies and Georgian army. However, they had problems with stability and reliability of demand and requirements by the state institutions.

4.4 Production prices

According to the international statistics the production price in Georgia is 6,81 USD/kg (12 Georgian Lari). Respondents usually stated the production price between 8-15 Lari, where the lower range is applied to sells of 100-300kg at one time, while the higher range for small quantities. Compared with neighboring countries of Turkey, Iran or Armenia, the price is competitive (see diagram 6). However, compared with Ukraine or countries with more advanced agricultural sector, the price is very high. EU import prices are currently around USD/kg (EC, 2013). Even some of the respondents mentioned high production price as the main inhibitor of potential growth and exports. Due to the unstable demand from abroad, the price has been very volatile in the last few years.

Diagram 6 - Producer price of honey in USD/ton (source of data: FAO, 2013)



Farmers are trying to fetch better price for monofloral honey. Even though the monofloral honey is

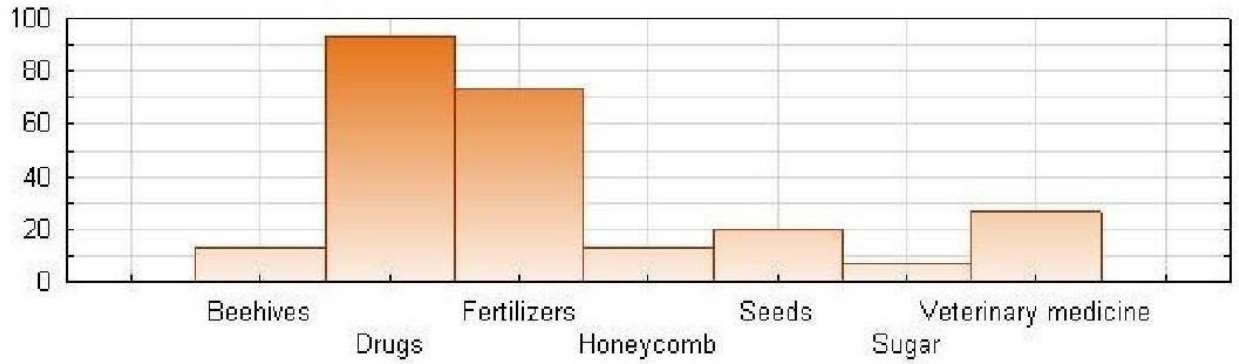
usually more expensive then polyfloral, due to the lack of labelling and customer preferences there is no significant price difference in Georgia.

A lot of farmers recently focus their attention on alternative beekeeping product apart from honey, like production of mother queens, royal jelly, honeycombs or wax, which promises higher prices and profits. They will be dealt in more details in chapter 5.3.

5 Competitiveness diamond – input condition, demand conditions, related industries, context

5.1 Supply of inputs

Diagram 7 - Main Inputs Purchased by Honey Farmers



The major type of supplies for beekeeping farmers are wooden frames, queens, equipment and tools, honey combs, sugar and veterinary medications. Especially wooden frames are the most essential inputs for restocking of hives. Responding farmers that cultivate also some secondary products to beekeeping need fertilizers and seeds as well.

There are several local shops that provide farmers with basic inputs (see additional photos of available equipment in Annex). There are three specialized shops in regional capital Kutaisi. Some districts markets sell basic equipment as well. However, the quality of available tools and medications was questioned by farmers several times. This is the reason why some respondents purchase the equipment directly from Turkish input providers or in Tbilisi. They claimed that the quality is better and price lower.

5.2 Demand

Majority of farmers does not sell to the local market through classical retail. They sell only at the farm-gate. Need of official governmental licence and quality standard for selling in retail was perceived as too costly and complicated. Even in the case the laboratory analyses of the quality of honey was widely available, farmers are afraid that the cost of analyses would limit their changes of official registration and licence. Besides quality issues, official distribution to retail would require registration and taxation of turnover and property, which is perceived as an big obstacle. Therefore, the quality of packaging and

marketing is not the issue of importance to them. Only few of them mentioned that the improvement of attractiveness of their packaging might improve their sold quantity and profitability. Some farmers see the opportunity in local touristic shops near tourist places in Imereti (caves, castles, monasteries etc.). But the idea of improved marketing was very vague. Besides, even the highest tourist highlights in Imereti are not well prepared for tourist-based marketing of local products.

There are almost no bigger supermarket chains available in Imereti or regional capital Kutaisi. However, some of the bigger farmers claim that they tried to negotiate with some supermarkets in Batumi or Tbilisi, but they were not allowed to sell their honey due to the missing "licence" required as indication of quality of their honey. Together with the retail entry barrier of quality and licensing they frequently mentioned that local bigger shops and supermarket in Batumi or Tbilisi sell honey from Iran, which is very cheap. Farmers claim the quality of honey from Iran is very low and that is the main reason why they cannot compete with their honey.

The market for industrial honey is practically non-existent in Imereti and the whole Georgia. The industrial honey is usually important distribution channel for lower quality honey. It does not meet fully all the criteria for table honey; for example, the hydroxymethylfurfural (HMF) content may be higher than 40 mg/kg. In this case, it still qualifies in countries with high food standards for use in the food industry, for the manufacture of bakery goods, confectionery, breakfast cereals, sauces, tobacco, and products such as honey-roasted nuts and pharmaceutical products.

The honey is important part of Georgian traditional cuisine and serves for production of various cakes and sweets for children. Typical family consumes around 2 - 5kg of honey per year. There are also new trends in honey consumption appearing on the local market - such as honeys mixed with fruits, nuts or essential oils. Tapping potential in adding value through such a simple processing might be way forward for making honey more profitable business. Some farmers are already experimenting with this approach.

Market of specialized and niche honey products like dark honey, royal honey, honey with pollen or monofloral honey is undeveloped and needs additional investments into the consumer knowledge and preferences.

5.3 Related industries and non-farm income

Several farmers in Imereti diversified production to the production of other beekeeping related products. Importance of non-honey beekeeping products is in Georgia unusually high thanks to the fact, that beekeeping has a long tradition but market with honey is still undeveloped.

For instance, there few beekeeping farmers that started with production of honeycombs. They sell their products in the local shops (one of the shop in Kutaisi is owned by producer of honey combs) or directly to other beekeepers. The small family business can produce around 4-7 tons per honey comb per year and employs 1-2 people in the factory. In the season the number can grow to 5-6 employees. Employees are usually from the same village. There are only 2-3 competitors in honey comb production in Imereti

and around 10 in the whole Georgia.

Some farmers recently started to produce and sell mated mother queen bees. This new business opportunity makes production of honey only secondary product. They keep the queens in special home-made beehives, which vary between producers. Farmers are trying to develop the most efficient technique of queens production by experimenting with different methods. The production of bee queens can reach up to 1500 queens/year. Some of the queens are produced for local markets, but the best distributional channel goes through the small middlemen to Turkey or Azerbaijan. There are several places on the Turkish border, which trade with queen bees between Georgian producers and Turkish buyers. However, exports of queen bees are illegal as is the case of honey. The production can be very profitable when price for bee queen vary around 10-11 USD per queen. In Turkey the Georgian queens allegedly enjoy high popularity thanks to the heterosis effect of mixing with Turkish breeds. On the other hand, according to the internationaly accepted regulations of cross-border distribution of bees, the importation of queens from other races might jeopardise the conservation of the characteristics of the local populations. The trade with live bees is strictly regulated in EU.

Some farmers earn additional income from selling of wooden beehives and spare frames. They sell them directly to the other farmers or through local shops in Kutaisi. They need basic machines for processing and assembling frames. Some of them were distributed in the framework of development projects of international NGOs.

There is also other marginal product that farmers try to produce and sell on the market:

- **Royal jelly** - produced by glands in the throats of worker bees. It is a highly nutrient product containing among others carbohydrates, proteins, B vitamins, sugar and water. It has various applications in naturopathy for its strengthening effects and anti-depressive properties. Local farmers produce royal jelly on demand from buyers from Azerbaijan and Turkey
- **Honey wax** - produced by glands of worker bees and is generally used in cosmetics, pharmaceuticals and candles. Some farmers in Imereti are experimenting with cosmetics and candles. But on very small and local lvel.
- **Propolis** - resin coming from trees. It contains components that suppresses bacteria and other microorganisms and is widely recognised for its anti-bacterial, anti-virus and anti-fungal properties. It is use in the world through dermal and internal application in naturopathic treatments. Some local farmers mix propolis with spirits.
- **Pollen** - the flowers' anthers. It is a highly nutrient product containing proteins, amino acids and B vitamins. It is sold as a food additive.

5.4 Competition

All respondents perceive as the main competitive product honey imported from Iran. They claim that the Iranian honey is sold so cheap that they are not able to compete on the local Georgian market. They see the low quality (mainly added water and sugar) of honey from Iran as an unfair treatment compared

with their "100%" natural and healthy product. They demand from Georgian government more strict standards and laboratory checks for imports. These measures might help them to be competitive also on the Georgian market.

6 Strategic productivity and quality

6.1 Honey in relation to food safety and quality

The main challenge for growth of production for local retail and supermarket chains as well as international markets are issues related to quality and food safety. All potential importers of honey from Georgia limits their imports on account that the honey does not meet quality requirements. However, the main problem is not the quality itself, but the fact that Georgian farmers have no change to have their honey exports supported by required documentations and certificates of consumers safety.

The modern legislative and system of monitoring of food quality and safety standards is missing in Georgia. There are no food safety management systems, no defined responsibilities within the food supply chain, the application of HACCP and traceability principles as well as requirements about labelling and packaging are not properly defined and enforced.

Exports of honey to the EU are restricted to countries which are on the so-called 'third country list'. The list (regulation no. 2012/302/EU) states the 38 non-EU countries which are allowed to export honey to the EU. Georgia is not on the EU imports-allowed list, since any accepted "third country" must have a residue monitoring plan and international accredited laboratory that would issue for each exported batch of honey necessary health certificate signed and stamped by an authorised veterinary officer.

The EU Council directive 2001/110/EC of 20 December 2001 in relation to honey specifies: definition of types of honey for export to EU, different categories of quality, composition, labelling and minimum amount of information, presence of other ingredients, definition of colour, amount of fructose, glucose, sacharose, water, electric conductivity etc.

There are several very well documented cases when EU interrupted imports of honey due to concerns with quality. For example, Chinese honey was banned from 2002 to 2004 because chloramphenicol was found in the honey; in 2011, Chinese, Argentinean and Chilean honey were temporally banned because GMO pollen were found in the honey; in 2007, a ban was imposed on honey from Brazil because no agreement could be made on testing procedures and standards (EC, 2013). These bans have huge impacts on international trade and prices.

The proposed and partially implemented Deep and comprehensive Free Trade Area agreement (DCTFA) between Georgia and EU provides framework for support in area of Sanitary and Phyto-sanitary standards and measures to support laboratories carrying out analyses of the physico-chemical properties of honey, however it is only in its initial stages

6.2 Phyto-sanitary, hygienic and quality requirements required for export

The quality of honey is widely discussed topic among farmers in Imereti. The main issues is comparison and competition between local and imported honey. However, without national regulatory standard or codex of national honey quality the discussion cannot be supported by facts and measurable evidence.

One of the most typical problems in relation to quality of honey not only in Georgia is "adulateration" of honey, which consists in adding cheaper similar substances to honey or in pushing thermic treatments too far. The honey can be mixed with sugar, syrup or water. The problem is that withou quality control measures, the adulterated forms of honey are competing with quality products, pushing prices down.

On the other hand, national legislation on honey can improve market and quality segmentation, which can improve profitability of beekeepers producing some higher quality and up-market type of honey. The EU legislation, for instance, divides types of honey according to various criteria into honeydew honey, chunk honey, bakers' honey, etc. Monofloral honey are other potentially interesting categories of honey quality. Floral origins including heather, eucalyptus, orange blossom, honeydew and forest, sunflower, acacia, rapes can also bring premium price due to their organoleptic or pharmacoactive properties. The example of EU specification on honey quality requirements and categories is available in Annexes. Production of organic honey in Georgia is another promising category for exports since production of organic honey in Europe and other industrialized countries is very limited because of the presence of the varroa and the lack of unpolluted areas. Increased importance of quality, integrity, sanitation and nutritional value of honey among consumers also contribute to a rising demand for organic honey.

7 Operational productivity – processing, transhumance, diseases and biological threats

7.1 Processing of honey

Technological development is a key factor of productivity and profitability. With regard to processing of honey, after it is collected by bees it passes through several processing steps. Farmers in Imereti use only basis equipment of varying, usually lower quality. Majority of beekeepers use the centrifugal extractor for extracting the honey from honey comb. The extractor can be made of wood or aluminium.

Picture 3 - equipment for honey extracting in one of the shops in Kutaisi

Only few bigger beekeepers (15 out of total 15 000 beekeepers in Georgia) can afford to use stainless steel, which is the norm in countries in higher food safety standards. Next step is usually straining: the honey is heated to 30°-35°C and then filtered through a strainer (mesh size 0.8 to 1 mm) or a tubular sieve (0.4

to 0.5 mm) and put in the honey ripener. Wax particles and foreign matter (e.g. bee fragments, small pieces of propolis, wood splinters etc.) are removed. Decantation follows: the honey is put into the honey ripeners, maintained at 25°C, so that the air bubbles and the waxy and other impurities (except the pollen grains) come up to the surface. The liquid honey is then kept for about 2 weeks at 15°C for ripening. The honey can then be drawn off, generally by pumping, and distributed into containers. Even if using the simplest technologies and methods honey processing is very costly according to respondents. Simple technologies require a lot of human labor. Besides, official distribution of processed production come under higher taxation which means lower profit for producers.

7.2 Transportation and transhumance

The biggest need and challenge identified during the data collection was the access to improved means of transports. The beehives are usually transported from the lowlands, where they are kept during winter, to mountains in the summer. The main reasons are the flowering, quality and composition of available plants. The farmers use various means of transport including old Russian trucks and tractors with trailers. The transport also represents highest demand of labour after the processing. During peak times of transport, one farmer usually employ 6-7 additional people. They can be relatives or neighbours.

7.3 Diseases and chemical threats

Health issues are among the main threats for beekeeping in the whole world. High and unpredictable rates of colony losses for example threatens the sustainability of the European production systems. In Georgia, due to the low intensity of beekeeping, generally low awareness and clean natural environment, the debate about the health condition of bee colonies is not so urgent.

Picture 4 - Tools and medicaments used by farmers for protection and treatment of bee colonies

Only bigger and more intensive farmers recognize high potential threat of uncontrolled spreading of potential diseases. There is for example high number of viruses infecting bees. Well-researched and potentially problematic viruses to date are: Deformed Wing Virus (DWV) Black Queen Cell Virus (BQCV) Israel Acute Paralysis Virus (IAPV). After viruses, the parasitic mite Varroa destructor is the biggest threat, because given the present state of scientific knowledge and medical capacity, it is an ineradicable problem (EC, 2013). Nosema apis and Nosema ceranae fungi and Acarapis woodi are the three other most commonly mentioned biological threats. American foulbrood (AFB) and European Foulbrood (EFB) are caused by fungi spores and are two of the most destructive diseases for bee brood. EFB can be treated by antibiotic treatments. AFB being a lot more dangerous, it consequently leads to the destruction of

contaminated hives. Some biological threats, like Asian hornet (Vespa velutina), which in Europe represents a new introduced threat to honeybees, is still unknown in Georgia. There is a lack of coordinated control of varroasis and other infectious diseases by the government. Farmers usually try to control or cure diseases by medicaments, which represent high additional costs. However, they frequently mentioned lack of specific knowledge and limited access to effective medicaments as the problem. Another element reducing the profitability of the sector is that the price of treating bee diseases properly and in time has increased to the extent that the cost of treatments may equal or exceed the income from a colony for an entire year. Besides that some of low quality medicaments and chemicals available in Georgia may end up as residues in honey and other bee products. Potential advantage of beekeeping in Georgia is the fact that honeybee is unusually sensitive to a range of chemical insecticides. Agricultural and apicultural pesticides are lipophilic and accumulate in the wax, increasingly contaminating the combs where the brood develops and where honey is produced. Three known neonicotinoid insecticides are particularly considered as damageable for bees and pollinators - clothianidin, imidacloprid and thiamethoxam as seed treatment or as granules (EFSA, 2014). Cropping regimes and intensive land management also contributes to problems for bee colonies. Therefore lack of intensive and chemical agriculture provide window of opportunity of beekeeping in Georgia.

8 Supply chain management – flow of goods and information in the chain

The honey value chain in Imereti is very short with no dominant stakeholders controlling or governing the chain. It is based on personal contacts. However, the contacts are irregular and they are former ad hoc from the side of buyers. There are no written contracts or agreements specifying trade conditions in place.

Lack of long-term and formal commitments is also a reason why spread of knowledge and innovation in the supply chain is very limited.

9 Human resources, capital, and know-how in the honey supply chain

9.1 Know-how and access to extension services

Most of the beekeepers in Imereti learned the techniques from their fathers and grandfathers. Only few respondents received training at beekeeping colleges. However, beekeeping is practiced also as an additional activity of farmers with university degree.

The governmental system of extension and training does not exist. Some farmers are members of beekeeping associations and frequent trainings provided by the association. However, several respondents also mentioned that the association is useful mainly for farmers with no or little experiences. For most advanced bee-keepers the association does not provide adequate trainings and topics. Some farmers look for the information on the Internet. It seems, they look for the information ad hoc and do not follow any professional advisory services. The language barrier is the main limiting factor of access to efficient and reliable information on-line

9.2 Opportunities for formal education

There are 3 colleges in Georgia offering courses on beekeeping. All have courses of 9 weeks lenght:

- Tsinamdzgvrishvili's Vocational Education and Training Center (Tsinamdzgvriantkari, Mtsketa District)
- Kachreti's Vocational Education and Training Center (Kachreti, Gurjaani District) Kobuleti's Vocational Education and Training Center (Rustaveli st. Kobuleti

9.3 Social capital and cooperation

The social capital involved in beekeeping is very low. There is neither formal nor registered group of farmers or official cooperative producing honey. Beekeeping remains an essentially individual activity, which harms the possibilities of cooperation. On the other hand, there are several informal groups of farmers that cooperate mainly in transportation of beehives. Some farmers cooperate in joint purchase and sharing of inputs like medicaments or wooden frames. Usually bigger beekeepers more often informally cooperate in procurement of vaccination and transportation of honey or beehives. Majority of farmers cooperate in sharing of information, informational materials in order to jointly increase the level of technical knowledge of the sector, making possible, among other, better sanitary practices and reduced bees' losses. Other beekeepers in region share the experiences on processing and labelling of production.

In Mukhura village beekeepers informal cooperative was established in last year by 4 members; they reported that they managed to reduce beehives and honeycombs production expenses by joint work. At the same time they were able to sell honey in bulk. One year later, the number of members has increased to 12. At this stage they are trying to register as official cooperative and to expand the area of activities.

Picture 5 - Interview with farmer specializing in production of mother queens

Bigger potential of economies of scale (including, but not limited to, the purchase of medicines against varroa and various equipment elements) and pooling of resources (e.g., access to equipment owned communally and potential use of processing or other facilities) is nevertheless unexplored.

Compared with honey sector in other countries, the potential for cooperation and related social capital lies idle. It is for example common to have packer-cooperatives and official groupings beekeepers which purchase, process, pack and market honey, often under their own brand label. Under other

arrangement of the honey supply chain, cooperatives sell most of their honey in bulk to independent packers and distributors. By concentrating larger production amounts, the cooperatives gain some bargaining power and are able to obtain better prices, as wholesalers are more dependent on them (they cannot replace so easily the quantity of honey sold by the cooperative or completely do without it, and have to conduct less agreements to acquire the same amount of honey so can afford some slightly higher price). If prices are higher selling through cooperatives in this case, it should be even more the case when the cooperative packs and sells its own honey (according to the regular functioning of cooperatives, members receive an equal share of the profits). On the other hand, the honey value chain, which at the moment is not based on sustainable and solid domestic demand, is very volatile and fragile. It does not support creation of formal, bigger and long-term structures on the production side.

10 Institutions and business environment

10.1 Association of beekeepers

There are 4 organizations of honey producers in Georgia. The most influential in Imereti is the Association of Georgian Professional Beekeepers (www.bestbee.ge) established in 1999. The aim of the organization is to support the development of beekeeping in the country, to assist beekeeping farmers, to provide them with introductory information on different technologies and to support them in searching for high quality equipment. It has around 200 informal members. Only 60-70 members are formal members that pay membership fees regularly. The association has been partially financing from USAID (used for example for member bulletin). From September to April the trainers of the association (experienced members) provide trainings every month in different regions of Georgia. Besides that the association provides consultations and organizes joint purchase of medicaments where 20% of discount from wholesalers can be negotiated. It also sells in bulk for several Lari cheaper than normal market price.

As a advocacy and lobby activity, the members on behalf of the association are participating in designing and collaboration on national legislation (which is still not ready) - code for honey production, which can improve standards for quality and general situation in the sector. There is currently discussion whether separated piece of legislation is necessary or whether the paragraph in the general veterinary code would be sufficient.

None of the 4 associations is aiming on development of a quality label which is common marketing tactic for national beekeeping associations. The lack of capacities and resources is the primary reason.

10.2 Governmental support

The support of government is non-existent in any way - from legislative and regulatory support, through training and financial support to affordable services of governmental laboratory. As discussed previously farmers would mainly appreciate possibility of testing of their products in the internationally accredited laboratory for sanitary and phytosanitary quality, which would provide necessary quality certificates. Besides that they demand bans to inport of low-quality Iranian honey based on its low quality.

11 Conclusions and recommendations

11.1 SWOT

• Natural production in low-risk contamination environment • Productive and resilient local breed of honey bee • Long tradition of beekeeping	• Low productivity and high production price • Only basic beekeeping management and low sanitary • treatment of bee colonies No internationally accredited laboratory for certification • Underdeveloped local market and awareness of costumers • Low food safety standards of honey production • Lack of national support, monitoring systems and applied research • No targeted breeding
• Competitive price for exports to neighboring countries • Untapped potential of local market • Cooperation of farmers in purchase of inputs processing, marketing and selling in bulk • Potential for organic honey exports • Exports to Russia • Recognition of importance of pollination services of beekeepers	• Competition of low quality imported honey due to lack of quality control of the government • Uncontrolled and unmonitored honeybee diseases biological and environmental threats • Illegal character of major exports to Turkey and Azerbaijan • Georgia is not on the EU “third country” lists of allowed exports to EU

11.2 What is the potential for improving or upgrading of honey product chain for higher returns to small farmers

- It is important to have internationally accredited laboratory, which will be able to examine the quality of local honey and provide the quality certificate;
- The farmers should have more access to modern technologies, which will reduce their physical labor efforts and increase the productivity;
- Cooperatives should be created to supply the products for large companies;
- The honey producers should be educated in modern knowledge of beekeeping;
- More small enterprises should be available, which will buy the honey from local small farmers

12 References and bibliography

- FAO. 2014. FAOSTAT. Food and Agricultural Organization, Rome

- Nation
-
-
- al Statistics Office of Georgia. 2014. GeoStat. Available from: http://geostat.ge/index.php?lang=eng
- Bees for development. 2014. (on-line). Available from: http://www.beesfordevelopment.org
- Simon GP, Stuart P, Roberts M, Dean R., Marris G., Brown MA, Jones R, Neumann P and Settele J. 2009. Declines of managed honey bees and beekeepers in Europe.
- EFSA. 2014. EFSA identifies risks to bees from neonicotinoids. (on-line) Available from: http://www.efsa.europa.eu/en/press/news/130116.htm
- Corso M. 2013. Georgia Offers a Super Bee to Help Ailing American Bees. (on-line) Available from: http://www.eurasianet.org/node/66821

13 Annex

13.1 Directive 2001/110/EC - honey specifications

Designated product names	
According to origin	i) *blossom honey or nectar honey*: obtained from the nectar of plants ii) *honeydew honey*: obtained mainly from excretions of plant sucking insects (*Hemiptera*) on the living part of plants or secretions of living parts of plants
According to mode of production and/or presentation	i) *comb honey*: stored by bees in the cells of freshly built broodless combs or thin comb foundation sheets made solely of beeswax and sold in sealed whole combs or sections of such combs ii) *chunk honey or cut comb in honey*: contains one or more pieces of comb honey iii) *drained honey*: obtained by draining decapped broodless combs iv) *extracted honey*: obtained by centrifuging decapped broodless combs v) *pressed honey*: obtained by pressing broodless combs with or without the application of moderate heat not exceeding 45°C vi) *filtered honey*: obtained by removing foreign inorganic or organic matter in such a way as to result in the significant removal of pollen
Baker's honey	Suitable for industrial use or as an ingredient in other foods which are then processed. Baker's honey may have: • a foreign taste or odour, or • begun to ferment or have fermented, or • been overheated

Requirements	
Sugar content	1) Fructose and glucose content (sum of both): • blossom honey not less than 60g/100g • honeydew honey, blends of honeydew honey with blossom honey not less than 45g/100g 2) Sucrose content: • in general not more than 5g/100g • false acacia (*Robinia pseudoacacia*), alfalfa (*Medicago sativa*), Menzies Banksia (*Banksia menziesii*), French honeysuckle (*Hedysarum*), redgum (*Eucalyptus camadulensis*), leatherwood (*Eucryphia lucida*, *Eucryphia milliganii*), Citrus spp. not more than 10g/100g • lavender (*Lavandula spp.*), borage (*Borago officinalis*) not more than 15g/100g
Moisture content	• in general not more than 20% • heather (*Calluna*) an baker's honey in general not more than 23% • baker's honey from heather (*Calluna*) not more than 25%
Water-insoluble content	• in general not more than 0,1g/100g • pressed honey not more than 0,5g/100g
Electrical conductivity	• honey not listed above, and blends of these honeys not more than 0,8 mS/cm • honeydew and chestnut honey and blends of these except with those listed above not more than 0,8 mS/cm • exceptions: strawberry tree (*Arbutus unedo*), bell heather (*Erica*), eucalyptus, lime (*Tilia spp.*), ling heather (*Calluna vulgaris*), manuka or jelly bush (*leptospermum*), tea tree (*Melaleuca spp.*)
Free acid	• in general not more than 50 milli-equivalents acid per 1000 grams
Diastase activity and hydroxymethylfurfural content (HMF) determined after processing and blending	a) Diastase activity (Schade scale): • in general, except baker's honey not less than 8 • honeys with low natural enzyme content (e.g. citrus honeys) and an HMF content of not more than 15 mg/kg not less than 3 b) Hydroxymethylfurfural content (HMF): • in general, except baker's honey not more than 40 mg/kg (subject to the provisions of (a), second bullet) • honeys of declared origin from regions with tropical climate and blends of these honeys not more than 80 mg/kg