

# Final Report



## Study on Private Service Providers in Organic Hazelnut Value Chain in Georgia

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## Executive Summary

This report covers the process and results from the value chain analysis conducted on the hazelnut sector in West Georgia. The study presents a basis to shape interventions of the forthcoming 'Phase II: Fairtrade & Organic Hazelnut Value Chain Development for Small Farmers in Western Georgia' project, which is to be implemented by the Consortium (ELKANA, HEKS/EPER, ANKA and PAKKA) with the financial support of DANIDA.

The main purpose of the study was to map the current hazelnut value chain, describe the key actors and the interrelations between them, identify the main constraints, and provide recommendations for further development. The study mainly focused on service providers.

Georgia is located in the Black Sea coastal area, which has suitable soil and climate conditions for the growing of hazelnuts. Although hazelnuts are grown in almost every region around Georgia, production is mainly concentrated in the three regions of Samegrelo-Zemo Svaneti, Guria, and Imereti.

In 2016, Georgia was placed 5<sup>th</sup> among hazelnut producing countries in the world by production amount, ranking behind Turkey (56.5%), Italy (16.2%), the US (4.6%), and Azerbaijan (4.6%), with Georgia contributing the final 4.0%. By the average yield per ha, Georgia ranked 7<sup>th</sup> in the world, while Turkey stood at 17<sup>th</sup>. In 2016, the export price of Georgian hazelnuts on global markets was 6.83 USD/kg, which was lower than the corresponding price for Turkish hazelnuts (8.68 USD/kg). Hazelnuts present an important crop in terms of employment in Georgia, as approximately 107,000 households are involved in hazelnut production.

The study area comprised three municipalities of West Georgia, namely Zugdidi, Tsalenjikha and Vani. The methodological approach chosen for this analysis is based on the current literature on the Georgian hazelnut sector and value chain analysis/development. Interviews with stakeholders and focus group discussions were conducted in March 2018.

The study identified the main constraints for the hazelnut value chain:

- **Low awareness** – There is a low level of awareness regarding the role of different services in farming. Traditionally, farmers do not treat their soil with pesticides and fertilizers. They are not aware of the need to improve the physical, chemical, and biological health of their soils. Therefore, they do not value the role of laboratory services. For instance, roughly 90% of interviewed farmers did not do any soil analysis and they apply fertilizers and pesticides in approximate quantities. In addition, farmers lack the proper skills and knowledge of pruning practices.
- **Lack of machinery services** – Not every municipality is equipped with state mechanization centers. Private service providers who offer machinery services to farmers do not have enough equipment to meet the demand. In addition, there is a lack of small scale machineries (e.g. drying and spraying facilities).
- **Access to finance** – The lack of access to finance is one of the main hindrances along the hazelnut value chain. On the one hand, farmers do not have enough financial resources to buy proper inputs for production; as agricultural production is associated with high risks, Micro

Finance Organizations (MFIs) offer loans to farmers at very high interest rates. However, different service providers including laboratories and machineries lack finances to develop their services by buying new technologies.

- **Lack of qualified workers** – There are no qualified agronomists in villages. Input shops are not equipped with qualified consultants who provide advice regarding the use of inputs. There are also insufficient numbers of qualified hired workers who can provide pruning services to farmers.
- **Lack of trust** - Farmers have very little trust in different services, service providers and other value chain actors. For instance, farmers do not trust the quality of inputs provided by shops. Farmers also have lack of trust in processing companies who provide drying and storage services.

Given the systematic nature of constraints in hazelnut value chain in Georgia, our recommendations below takes a holistic and systemic look at the sector:

Increase trust between value chain actors – In order to ensure synergy between the key actors in the hazelnut value chain, it is important to build trust along the whole chain. For instance, attaching qualified agronomists to each village might help farmers trust their recommendations and improve their farming practices. Regarding the drying and storage centers, farmers will no longer have trust-related issues if service providers use mobile drying equipment and farmers are able to observe the whole process.

Value chain financing – In order to improve value chain financing and ensure the sustainability of the process, contract farming practices should be adapted. Processing companies can play the role of facilitators in this process and should link the following actors: processing companies, farmers, input shops/extension provider and MFIs.

Partnerships to build knowledge, skills and attitudes – Creating partnerships and strengthening the dual education system would help to create the pool of knowledgeable and skilled young farmers and agronomists that in turn would increase youth employment in hazelnut production.

## 1. Objective and scope of work

The study constitutes an original article of research to contribute to shaping the interventions of the forthcoming 'Phase II: Fairtrade & Organic Hazelnut Value Chain Development for Small Farmers in Western Georgia' project, which is to be implemented by the Consortium (ELKANA, HEKS/EPER, ANKA and PAKKA) with the financial support of DANIDA. The study identified target groups in the key organic hazelnut producing areas of Georgia, their problems and needs, and came up with a well-defined systemic approach to strengthen the organic hazelnut value chain, mainly focusing on service providers.

The main purpose of the study was to analyse the current development status of the organic hazelnut sector in the key hazelnut producing areas of Georgia (Zugdidi, Tsalenjikha, Vani) and understand the entire core process of the value chain from production to processing. The study identified the structure and relevant actors of the organic hazelnut value chain in the target areas, with the main emphasis being placed on the service providers, such as laboratories providing soil and product analysis, seedling producers; husking, drying and pruning services; local providers of mechanization services; organic input producers/importers (fertilizers and pesticides); warehousing and associated service providers; intermediary cooperatives; credit and insurance providers; extension service providers, including international donors; associations, governmental institutions, experts and agents of change including those from international/non-governmental organizations; as well as other authorities. This helped in analyzing all support services at the core value chain and mapping all active service providers in the respective municipalities. The study discerns the main problems and challenges faced by value chain actors with regards to service provision. These results will help project to plan next steps and to develop possible interventions for the forthcoming Phase II project.

This study addressed the following research questions:

- What are the weakest and strongest aspects of the Georgian organic hazelnut sector?
- What are the main challenges (financial, technical, access to services) farmers in the organic hazelnut sector face?
- **Who are the main service providers for the organic hazelnut producers? What are their weak and strong points? Where and what kind of support do they need to improve their cooperation with (organic) farmers/their cooperatives?**
- **What kind of services do they offer to the organic hazelnut producers?**
- What specific financial and technical challenges do service providers in the organic hazelnut sector face?

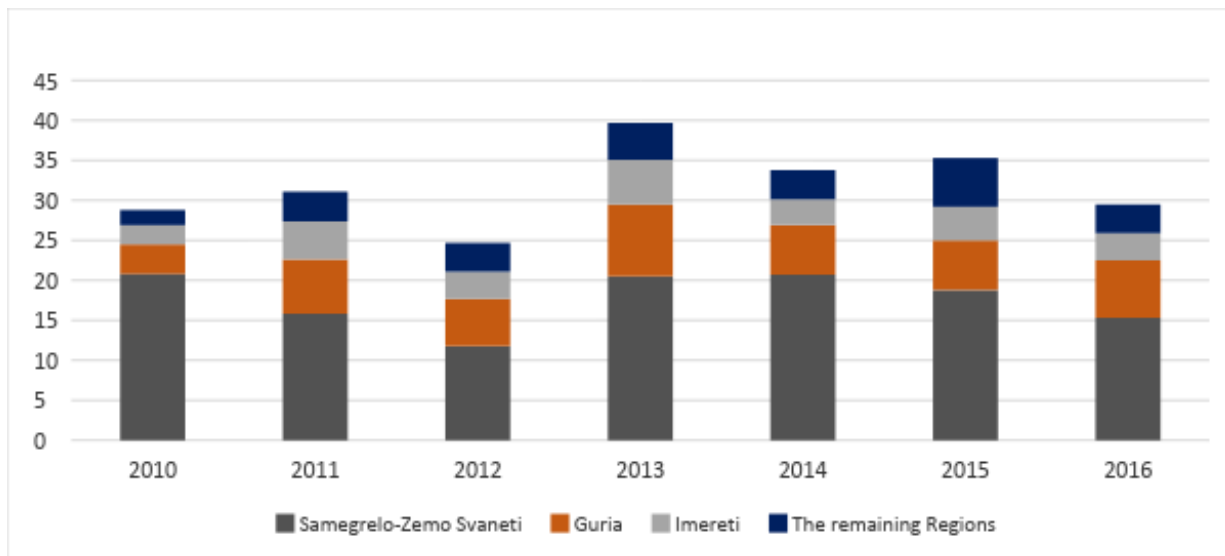
The ISET Policy Institute (ISET-PI) conducted this research in the period from February 15 to April 15, 2018.

## 2. Overview of hazelnut sector in Georgia

Hazelnuts are widely used in the food industry.<sup>1</sup> Hazelnuts kernels are rich in fats (60-70%) and proteins (15-16%), and also contain lecithin, which promotes brain function and cardiovascular circulation. Hazelnuts are mainly used in chocolate and cake production.

Georgia is located in the Black Sea coastal area, which has suitable soil and climate conditions for the growth of hazelnuts. Hazelnuts have historically had high economic value and generated income for Georgia's population even before the revolution of 1917.<sup>2</sup> In the 1990s, the coastal areas of Western Georgia began the rapid creation of new hazelnut plantations. Hazelnuts are not only one of the most important crops in terms of Georgian exports, but also in terms of employment: approximately 107,000 households are involved in hazelnut production.<sup>3</sup> Figure 1 shows the production of hazelnuts by region, and although hazelnuts are grown in almost every region around Georgia, production is mainly concentrated in three regions: Samegrelo-Zemo Svaneti, Guria, and Imereti. In 2016, Samegrelo-Zemo Svaneti accounted for 52% of Georgia's hazelnuts production, while Guria and Imereti contributed 24% and 12% respectively.<sup>4</sup>

Figure 1: Production of Hazelnuts by Regions (ths. tonnes)



Source: [http://geostat.ge/?action=page&p\\_id=427&lang=geo](http://geostat.ge/?action=page&p_id=427&lang=geo)

In 2016, Georgia was among the top five hazelnut producing countries in the world by production amount, with the rankings as follows: Turkey (56.5%), Italy (16.2%), the US (4.6%), Azerbaijan (4.6%),

<sup>1</sup> <http://srca.gov.ge>

<sup>2</sup> <http://geonuts.org/georgian-hazelnut/>

<sup>3</sup> [http://census.ge/files/results/agriculture/Agricultural\\_Census\\_2014.pdf](http://census.ge/files/results/agriculture/Agricultural_Census_2014.pdf)

<sup>4</sup> Note that regional statistics on hazelnut production refers only to territories being under Georgian political control; therefore, the analysis do not include Abkhazia as data is not available

and Georgia (4.0%) (Table 1).<sup>5</sup> Interestingly, the US has the highest yield per ha (2301.34 Kg/ha) among the top five hazelnut producing countries; next comes Georgia with an average of 1752.51 per ha. If the countries by the average yield per ha are examined, Georgia ranks 7th in the world, while Turkey stands at 17<sup>th</sup>.

Table 1: Top 5 Hazelnut Producing Countries in 2016

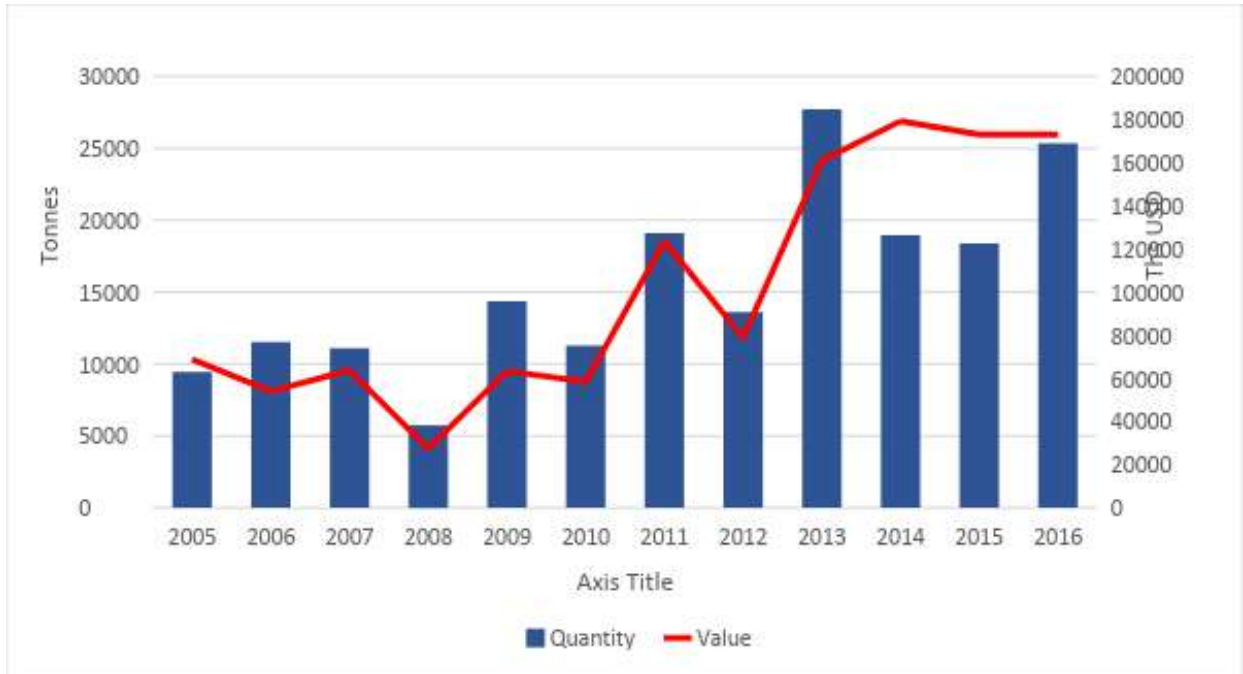
Country	Production (tonnes)	Area Harvested (ha)	Yield (Kg/ha)	Ranking by the Average Yield per ha
Turkey	420000	436869	961.39	17
Italy	120572	75050	1606.56	8
US	34473	14973	2302.34	2
Azerbaijan	33941	31821	1066.62	16
Georgia	29500	16833	1752.51	7

Source: <http://www.fao.org/faostat/en/#data/QC>

Georgia exports both in-shell and shelled hazelnuts. The quantity of exported hazelnuts (shelled) has increased since 2005 (Figure 2), although their value has fluctuated due to the USD/GEL exchange rate. The quantity of in-shell hazelnut exports is substantially lower than the quantity of shelled hazelnut exports. In 2010, Georgia exported 6.7 tonnes of in-shell hazelnuts, which was 37% of the country's total hazelnut exports. Since 2010, the share of in-shell hazelnuts in total hazelnut exports has decreased. In 2016, Georgia exported 1.7 tonnes of in-shell hazelnuts, a figure that accounted for only 6% of total hazelnut exports.

<sup>5</sup> Note that figures might be slightly different by different sources such <https://www.nutfruit.org/>, <https://comtrade.un.org/data/>, <http://www.fao.org/faostat/en/#data/QC>

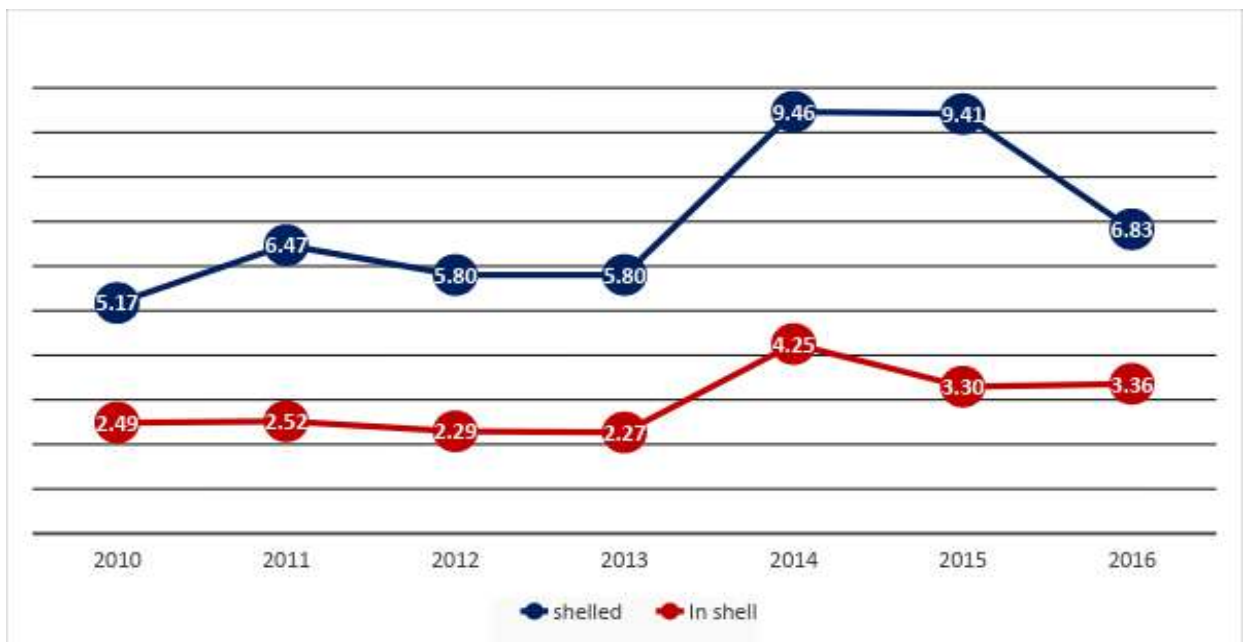
Figure 2: Export Quantity and Value of Shelled Hazelnuts



Source: <https://comtrade.un.org/data/>

Compared to other countries, the price of Georgian hazelnuts is low. In 2016, the export price of Georgian hazelnuts on the global market was 6.83 USD/kg, which was lower than the corresponding price for Turkish hazelnuts (8.68 USD/kg) (Figure 3).

Figure 3: Export Prices of Georgian Hazelnuts from 2010 to 2016 (USD per Kg)

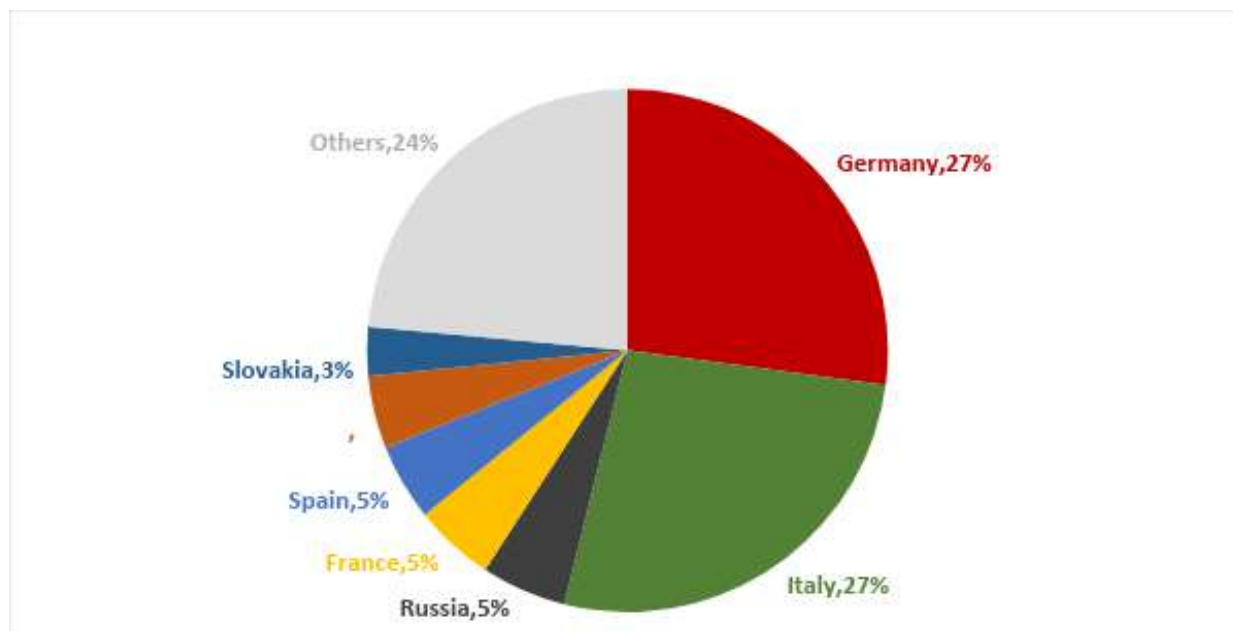


Source: <https://comtrade.un.org/data/>



Georgian hazelnuts are mainly shipped to European customers. In order to meet EU standards, Technical Regulations on Hazelnut Production came into force on June 1, 2016.<sup>6</sup> According to the new regulations, hazelnut production is under strict quality control, starting from the fields where the nuts are grown to the processing, transportation, and export of the product. The main export markets for Georgian hazelnuts are **Germany (27%)**, **Italy (27%)**, Russia (5%), France (5%), Spain (5%), Czech Republic (5%), and Slovakia (3%) (Figure 4).

Figure 4: Export markets for Georgian hazelnuts in 2016



Source: <https://comtrade.un.org/data/>

In 2017, the hazelnut sector suffered from various fungal diseases due to unfavorable weather conditions ([MoA, 2017](#)), and the Brown Marmorated Stink Bug (*Halyamorpha Halys*) invasion subsequently worsened the situation. Ultimately, hazelnut exports dropped dramatically in both value and quantity compared to 2016. In 2017, the export value of hazelnuts accounted for 83.1 mln USD, 53.7% lower than the same figure for the previous year (179.5 mln USD) ([Geostat](#)).

In order to fight against the Brown Marmorated Stink Bug (BMSB) and protect agricultural production, the Government of Georgia set a strategy for 2018<sup>7</sup> which consisted of four steps: an information campaign, a monitoring system, controlling measures against the BMSB, and research and development activities. The expected outcome of these measures is decreased damage on agricultural production and the economy.

The hazelnut sector has received a substantial amount of attention from the central government. The strategic vision of the development of the agriculture of Georgia includes the development of the

<sup>6</sup> Available in Georgian: <https://www.matsne.gov.ge/ka/document/view/3259738>

<sup>7</sup> Available in Georgian <http://moe.gov.ge/>

hazelnut sector as one of the most important sectors of the country's economy. Thus, there are several government programs to support agriculture, including hazelnut production in Georgia.

Since September 1 2014, hazelnut growers can benefit from an **agro insurance** programme supported by the government through the Agricultural Projects' Management Agency (APMA). Another supporting program, **Plant the Future**, includes the component of co-financing perennial gardens by provision of financial and technical assistance to the beneficiaries for arranging new perennial gardens.<sup>8</sup> Under this program, farmers are obliged to conduct a soil analysis first in order to get 70% of co-finance when buying seedlings. The garden component of the program includes 50% co-financing of the drip irrigation system.<sup>9</sup>

In partnership with APMA, Georgian banks finance agricultural activity under the Preferential Agro Loan: *"The Agency shall co-finance not more than 66 months interest rates in parallel with the amount paid by the borrower (if any), in the amount of annual 11% of the principal loan amount, not more than within 68 months upon granting of the loan or the first tranche thereof"*.<sup>10</sup>

Since 2017, the Danish Foundation "Danida" has provided small and medium-sized grants to encourage young people in the agricultural field of Georgia.<sup>11</sup>

The Agricultural Cooperative Development Agency (ACDA) undertakes the program "Fostering Hazelnut production development through promotion of agricultural cooperation" for hazelnut cooperatives.<sup>12</sup> The main objective of this initiative is as follows:

*"Fostering Hazelnut Production Development through the Promotion of Agricultural Cooperation, which aims to create the full cycle for hazelnut production, processing and marketing, reduction of the cost of the hazelnut and expand its export potential, via the provision of processing facilities and the formation of a large producer cooperative"*.

The Government of Georgia supports the agriculture sector by providing farmers with an extension service. Farmers are able to receive recommendations and advice through Regional Information and Consultation Centers (ICCs). The National Strategy for Agricultural Extension highlights the importance of knowledge and awareness among farmers in developing the agricultural sector.<sup>13</sup> The strategy mainly focuses on the tools that are employed to provide information to the farmers, including brochures, posters, radio and TV programmes, magazines, group extensions, and demonstrations. The National Strategy for Agricultural Extension aims to pilot projects regarding priority sectors (these sectors are not defined in the strategy). These projects might choose to target large producers that have export potential. According to the strategy, very small (less than 1.25 ha) and small-and-medium size (between 1.25-5 ha) farmers do not value the extension service properly and are not willing to pay for

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<sup>8</sup> [http://apma.ge/projects/read/plant\\_future/20:child](http://apma.ge/projects/read/plant_future/20:child)

<sup>9</sup> [http://apma.ge/projects/read/plant\\_future/20:child](http://apma.ge/projects/read/plant_future/20:child)

<sup>10</sup> <http://bankofgeorgia.ge/retail/en/business/agrocredit>

<sup>11</sup> <http://danida.apma.ge/>

<sup>12</sup> <http://acda.gov.ge/index.php/eng/static/169>

<sup>13</sup> Available in Georgian: [National Strategy for Agricultural Extension](#)

this service; accordingly, the main challenge is to consider very small (less than 1.25 ha) and small-and-medium size (between 1.25-5 ha) farmers in the extension strategy. The National Strategy for Agricultural Extension states that extension centers will offer differentiated extension packages for very small (1.25 ha), small-and-medium size (between 1.25-5 ha) and large farms (more than 5 ha).

Over the years, the Government of Georgia has expressed increased interest in organic farming. In 2014, the Law on Organic Farming came into force, which regulates the management of bio-food production, processing, processing, labeling, distributing, realization, and voluntary certification rules and related relationships.<sup>14</sup> However, the main purpose of the law is to support maintaining biodiversity in Georgia and environmental protection, and to ensure the efficient use of natural resources. The Law on Organic Farming protection aims to increase the country's export potential of organic products. According to the Basic Data and Directions Document For 2017-2020, more attention will be paid to the development and implementation of organic farming in Georgia.<sup>15</sup> Although most Georgian hazelnuts could be considered organic, there are few farmers that are certified as organic farmers. International studies claim that, in general, organic hazelnut prices are on average 15-20% higher than those for conventional products.<sup>16</sup>

Even though hazelnuts are an important agricultural crop for Georgia, few studies have been devoted to exploring the sector constraints and supply chain including:

- Food Safety and Quality Manual for Hazelnut Sector<sup>17</sup>
- Georgia Hazelnuts Assessment<sup>18</sup>
- Agricultural Value Chain in Imereti and Racha regions<sup>19</sup>
- Competitiveness of Georgian Agriculture: Investment Case Studies (AgriGeorgia Ferrero)<sup>20</sup>
- Hazelnuts<sup>21</sup>

### 3. Methodology

The study used the following research methods:

#### *Literature review:*

In order to gain a comprehensive understanding of the situation of hazelnut value chain in Georgia, an ISET-PI team reviewed existing national and international reports and studies by government agencies, donors, and other organizations concerning the organic hazelnut production and value chain.

#### *FGDs:*

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<sup>14</sup> <https://matsne.gov.ge/en/document/view/1978999>

<sup>15</sup> Available in Georgian <https://mof.ge/en/4543>

<sup>16</sup> <https://www.researchgate.net/publication/>

<sup>17</sup> [Food Safety and Quality Manual for Hazelnut Sector](#)

<sup>18</sup> [Georgia Hazelnuts Assessment](#)

<sup>19</sup> [http://enpard.ge/en/wp-content/uploads/2015/05/Market-Assessment\\_Hazelnut\\_AYEG\\_ENG.pdf](http://enpard.ge/en/wp-content/uploads/2015/05/Market-Assessment_Hazelnut_AYEG_ENG.pdf)

<sup>20</sup> [http://iset-pi.ge/images/Projects\\_of/APRC/Case\\_Study\\_AgriGeorgia\\_Ferrero.pdf](http://iset-pi.ge/images/Projects_of/APRC/Case_Study_AgriGeorgia_Ferrero.pdf)

<sup>21</sup> [www.ge.undp.org/.../UNDP\\_GE\\_ED\\_Hazelnut\\_Production\\_manual\\_201604.pdf](http://www.ge.undp.org/.../UNDP_GE_ED_Hazelnut_Production_manual_201604.pdf) available in Georgian only

In furtherance of drawing a qualitative picture of the current situation and identifying the specific needs of the organic hazelnut farmers in terms of service provision in the country, the research team conducted four focus group discussions (FGDs) in three municipalities of Georgia (Zugdidi, Tsalenjikha and Vani) from March 2-7, 2018.

These target municipalities are the biggest hazelnut producing municipalities in the country (out of total production, Samegrelo-Zemo Svaneti yields 52% and Imereti 12%). Geostat distinguishes between two types of holdings: holdings with trees in orchards and holdings with scattered trees. Out of the total holdings who have hazelnut orchards, 44% are located in Samegrelo. There are 177,141 holdings with scattered trees in Georgia. Out of these, 62,415 (35%) of holdings are located in the Imereti region.<sup>22</sup> According to the data, from Information-Consultation Centers (ICC) in the Samegrelo and Imereti regions, most of the farms in these regions are under 3 ha.

Although there is no formal typology of Georgian farms, some studies have attempted to classify Georgian farmers. A USAID study (2011) distinguishes between three categories of farmers in Georgia: (i) subsistence farmers, (ii) semi-commercial farmers, and (iii) commercial farmers and agribusinesses. According to the study, subsistence farmers have an average plot size of 0.42 ha and consume the majority of the food they produce. Semi-commercial (dynamic) farmers have an average plot size of 1.7 ha. The third type of farms are commercial farms and agribusinesses that constitute more than 5 hectares. Most farmers of this type have sufficient land to be engaged in commercial agriculture and accumulate high income from production. In the study, it is assumed that semi-commercial farms have high potential for becoming successful if they have proper infrastructure and access to information.

Based on the reviewed literature as well as expert knowledge, a purposive sampling to select farmers for FGDs was used. The selected farmers owned agricultural land between 1 and 3 ha. To understand the challenges faced by organic hazelnut farmers in the target municipalities, a database by ELKANA (a database on project beneficiaries from Phase I: organic farmers in conversion) was used. For the results to be comparable, the ICC database was used, with random selections of data of the same size from non-beneficiary hazelnut farmers.

FGDs were conducted in all three target municipalities on March 3-7, 2018. In Tsalenjikha and Vani, an FGD took place solely with project beneficiaries. In order to identify the differences (if any) between beneficiary and non-beneficiary farmers, one FGD with beneficiary farmers was conducted, with another separate FGD session carried out for non-beneficiary farmers in Zugdidi.

The number of FGD participants varied from 6 to 11 farmers. The average duration of the FGD was 67 minutes. Two researchers were responsible for each FGD, one of whom moderated the discussion while the other took notes. All the FGDs started with the moderators introducing themselves to the participants and explaining the purpose of the study. The participants also introduced themselves and briefly described the major activities of their farms.

All the interviews and FGD were recorded with the permission of the participants.

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<sup>22</sup> Agricultural Census 2014

### *Individual Interviews*

In order to obtain comprehensive information on the main actors operating in the Georgian organic hazelnut sector, the ISET-PI team conducted 37 in-depth interviews with different stakeholders. The aim of the interviews was to identify the barriers, gaps and synergies within the organic hazelnut sector value chain that represent potential opportunities to increase growth and competitiveness. This gave the team a better understanding of the main actors, their problems and opportunities in the organic hazelnut value chain in Georgia.

In selecting the respondents for our interviews, purposive sampling was used. This sampling allows the unique knowledge of potential respondents on different aspects of hazelnut production to be taken into account. In addition to the purposive sampling, we also applied the so-called “snowball” sampling method, which allows us to ask current respondents to suggest other potential stakeholders who might possess some relevant information on the topic. For each service provider we interviewed important players in the region.

The questionnaires (Annex 1), with a mixture of open and closed questions, was designed for the survey.

Three different questionnaires were developed for different stakeholders:

- Questionnaire for Individual Interview with Government and Experts
- Questionnaire for Individual Interview with Farmers
- Questionnaire for Individual Interview with Input Suppliers and Service Providers

Semi-structure interviews helped to identify the particular bottlenecks existing on each level of the Georgian organic hazelnut value chain and obtain the insights of policy makers and experts on the further development of this sector.

### *Mapping of the value chain*

Once the interviews were conducted and all the important processes in the value chain identified, both processes and actors, as well as relationships between them, were mapped out in the form of a grid map. A value chain map graphically illustrates all of the actors of the hazelnut value chain and the relationships between them. Value chain mapping facilitates an understanding of the system's dynamics and has the capacity to reveal the key actors involved in the chain, how they work and connect with each other. This tool also maps various services that support the value chain.

### *Economic model*

Collected information from farmer and expert interviews, as well as secondary data, was used to develop an economic model of hazelnut farming in Georgia. It is a model simulating the costs, revenues and profits of hazelnut farmers in the Samegrelo and Imereti regions and can be used in a profitability analysis of the farms as well as a tool to support development activities in hazelnut farming in Georgia. We calculated the economic performances of organic and conventional farmers for two different types of farmers:

1. Those who apply all the recommended (and allowed) treatments, and use all the necessary services.

2. Those who only use some of the treatments and services (so-called typical farmers as identified based on the collected data as well as validation meetings with experts).

The economic model is based on the following basic assumptions:

- The annual inflation rate is 3% in Georgia;<sup>23</sup>
- The annual increase of the average monthly nominal earnings from employments in agriculture, hunting and forestry in Georgia equals to the annual inflation rate target of 3%;
- Agricultural land does not depreciate;
- The annual gain in hazelnut prices equals to the annual inflation rate target of 3%;<sup>24</sup>
- The taxation regime and rates remain unchanged in Georgia;
- The government-supported “Agro-insurance” scheme is kept with the current terms and conditions<sup>25</sup>;
- Farmers optimize their expenditures;
- The labor (hours worked as a self-employee in own hazelnut farm) of the owner of the farm is remunerative labor and included in the cost structure as a separate item.

## 4. Results

This section first summarizes the general results from the FGDs, interviews and literature by describing the general situation of the sector, as well as the main actors involved and their constraints and attitudes (4.1). The results on each service provider are provided in a separate section which discusses the current status and main constraints of each of the services involved in the chain (4.2). This is followed by describing the main results from the economic model on hazelnut farming (4.3). Finally, aggregated results on the main weak points and opportunities for growth are summarized in subsection 4.4.

### 4.1 General description of the hazelnut sector of the main hazelnut producing regions

Hazelnut production contributes significantly to the sustainable economic development of the regions of Samegrelo and Imereti. In 2016, 52% and 12% of hazelnuts produced in Georgia came from the Samegrelo and Imereti regions respectively. There are 100 officially registered hazelnut processing companies in Samegrelo region; of this figure, 53 are located in the Zugdidi municipality and 11 in the Tsalenjikha municipality.

According to the Agricultural Census 2014, overall there are 107,247 holdings which have hazelnut orchards in Georgia, of which 44% are located in the Samegrelo-Zemo Svaneti region (Table 2).

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<sup>23</sup> [Annual Inflation Target in Georgia – The National Bank of Georgia](#)

<sup>24</sup> [In-shell Hazelnut prices – The GIRE SUN Commodity Exchange](#)

<sup>25</sup> [Insurance tariffs – The Agricultural Projects’ Management Agency](#)

Table 2: Holdings with hazelnut orchard in Samegrelo-Zemo Svaneti region

Region/Municipality	Holdings with trees in orchards
<b>Samegrelo-Zemo Svaneti</b>	<b>46 788</b>
Abasha	2 075
<b>Zugdidi</b>	<b>15 806</b>
Martvili	7 213
Senaki	3 334
Chkhorotsku	6 099
<b>Tsalenjikha</b>	<b>6 196</b>
Khobi	4 827

*Source: Agriculture Census 2014, GeoStat*

It appears that in the Imereti region, there are only 12% of holdings with trees in orchards. However, in total there are 177,141 holdings with scattered trees in Georgia. Of this number, 62,415 (35%) holdings – more than one third - are located in the Imereti region (Agriculture Census 2014, GeoStat).

Table 3: Total area of hazelnut in target municipalities

Municipality	Area (ha)
<b>Zugdidi</b>	20 661
<b>Tsalenjikha</b>	5 612
<b>Vani</b>	2 231

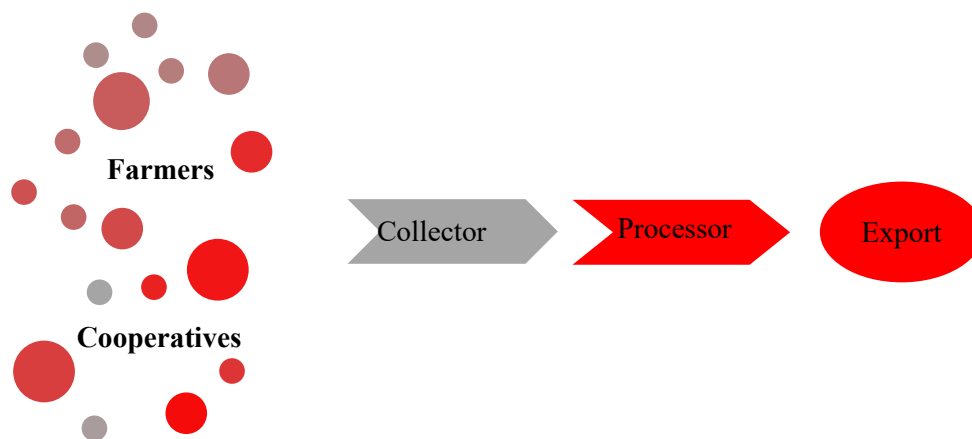
*Source: ICC, 2016*

According to data from the ICC, the total area of hazelnuts in Zugdidi is 20,661 ha, which includes both orchards and scattered trees of hazelnuts (Table 3).

#### 4.1.1 The general map of the (organic) hazelnut sector

Figure 5 presents the value flow map of the hazelnut sector from farmer to final consumer. If farmers and cooperatives have good quality hazelnuts, they prefer to sell them directly to processing companies, because in most cases processors pay higher prices than collectors. Processing companies sell hazelnuts to exporters, or they export it themselves.

Figure 5: Value flow of Georgian hazelnut export



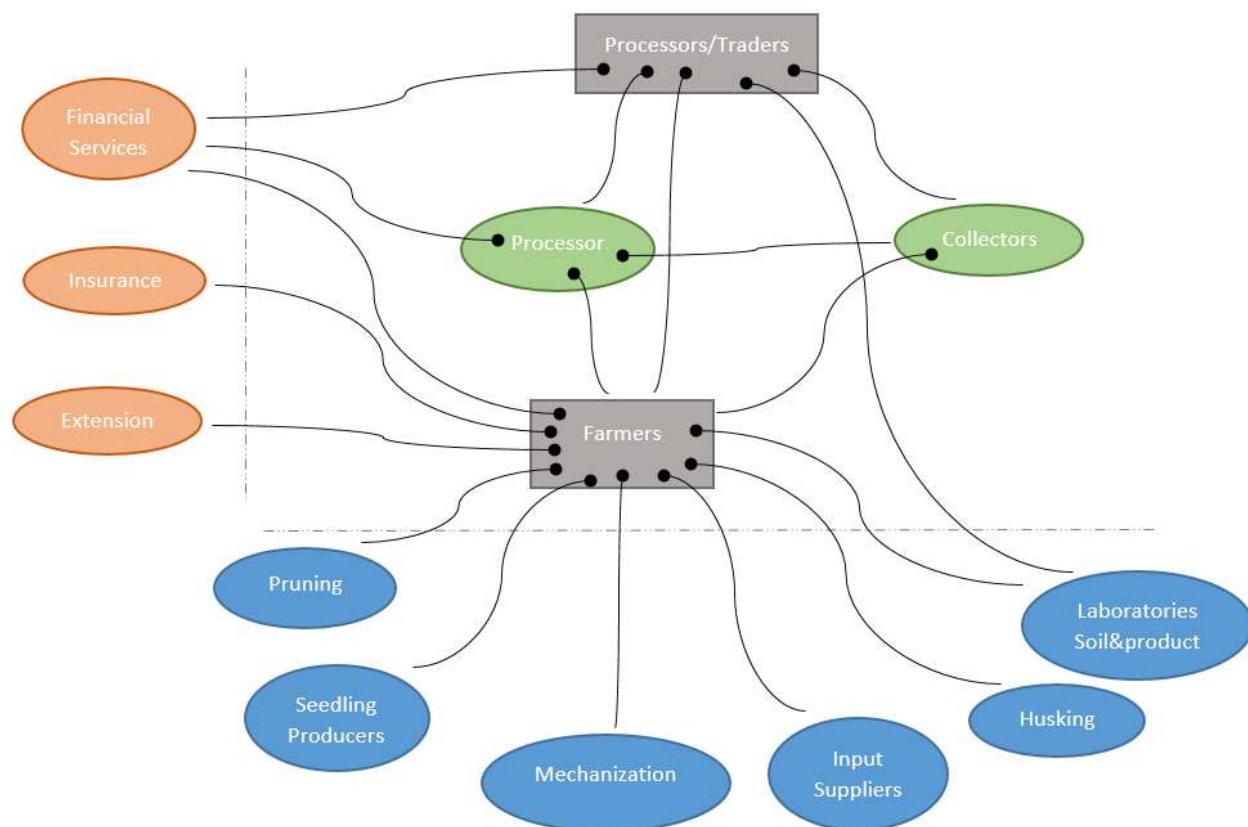
The grid map below (Figure 6) contains all the information from FGDs, interviews and from secondary data. This value chain includes all the actors (main as well as supporting) starting from laboratories to processing companies. The main actors of the value chain are processing factories, who set the standards and force them upon suppliers (collectors and farmers).

The study identified the following service providers and input suppliers in the hazelnut sector:

- Seedling producers
- Input suppliers
- Laboratories
- Pruning
- Husking
- Mechanization
- Insurance
- Financial services
- Extension



Figure 6: Grid map of organic hazelnut value chain



#### 4.1.2 General constraints and opportunities in (organic) hazelnut sector

Hazelnut production appears to be one of the main sources of income for the local population in Western Georgia. Last year was the worst year for hazelnuts: due to unfavorable weather conditions, hazelnuts suffered from the various fungal and bacterial diseases that wracked the country in 2017. Furthermore, the Brown Marmorated Stink Bug (*Halyamorpha Halys*) destroyed many hazelnut harvests that year. Even though the supply of the hazelnuts drastically decreased, according to the hazelnut producers, the maximum price of the 1 kg hazelnuts was 5 GEL in 2017, which was 58.3% lower than the same indicator in 2015 (12 GEL). This lower price was partly influenced by international prices; as Turkey produces around 60% of the world's production of hazelnuts, prices in Georgia (and elsewhere) depend on the Turkish market. However, the main reason was that the quality of shelled hazelnuts was very low: the hazelnut growers claimed that the price of hazelnuts mainly depends on the percentage of dampness.

The prices of organic hazelnuts, however, are generally higher than conventionally produced hazelnuts. In a transition period (the period before the certification process takes about 3 years, the price premium for bio-hazelnuts is 0.6 GEL per kg. After the certification process is over, the price premium is 1.8 GEL per kg.

Currently, similar to other agricultural sectors, the level of youth employment in hazelnut sector is very low. The country's young population is not interested in agriculture and many go abroad, or to Tbilisi and other big cities (such as Kutaisi and Batumi) for studying and/or working.

According to the hazelnut growers, the main constraint to hazelnut production is invasive pests and diseases. Traditionally, farmers have not treated their hazelnut trees with chemical fertilizers and pesticides because local varieties almost did not suffer from various bugs and fungal and bacterial diseases.<sup>26</sup> In 2017, it was necessary to spray pesticides and apply the fungicides in order to protect hazelnuts from fungal diseases and BMSB. Most farmers could not afford the necessary inputs, or they waited for government support programs. Belated treatments were not enough to protect the harvests. Another issue was that under governmental support, they used non-organic pesticides, and organic farmers could not benefit from this support.

With regards to organic farming, there is a low level of awareness of organic hazelnut production. Farmers do not have clear ideas on organic hazelnuts, their benefits and constraints. Furthermore, some respondents had not even heard about organic hazelnuts. The government does not have specific programs regarding organic hazelnuts, and for some projects such as "Plant the Future", they do not distinguish between organic and non-organic plants in general.

Another constraint regarding organic hazelnut production is the access to organic inputs. There are not many varieties of organic inputs in the local shops. In addition, the prices of organic as well as non-organic inputs differ by its country of origin. While some input providers claim that there is no price difference between organic and mineral inputs, others argue that the organic inputs are more expensive, and the price difference is about 25%. Farmers want to see the difference in incomes in the short-run, while organic farming has benefits in the long-run. According to organic farmers, they might not get as much harvest as in case of conventional farming with non-organic inputs in the short term. However, the use of organic inputs does not degrade the soil in long-run. A wide range of studies also suggests that conventional farmers might achieve higher yields than organic farmers, but conventional farming has significant negative effects on soil ecosystems.<sup>27</sup> Contrawise, the lower productivity associated with organic agriculture is balanced out by the environmental benefits and reduction of the impact of negative externalities on the soil.

According to some organic hazelnut producers, the price premium is not high comparing to the costs. Besides which, only one company buys the organic hazelnuts from farmers, which gives the company monopoly power to offer the price. The organic farmers stated that the main opportunity in the organic hazelnuts production is the price premium and increasing demand.

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<sup>26</sup> Some producers did not agree with this statement; they claimed that local varieties like "Anakliuri" are very sensitive to invasive pests and diseases

<sup>27</sup> [http://www.thinkcds.org/wp-content/uploads/2016/01/Final\\_Van\\_Beilen\\_2016.pdf](http://www.thinkcds.org/wp-content/uploads/2016/01/Final_Van_Beilen_2016.pdf)

### 4.1.3 Attitudes to organic hazelnut production and farmers need assessment towards service provision

The hazelnut producers have different attitudes regarding organic hazelnut production. Some of them see the potential for increasing demand, while some of them are skeptical about it. As mentioned above, there is a lack of awareness among farmers on organic farming in general. In addition, some organic farmers have concerns about the organic pesticides and their effectiveness against the invasive pests, fungal diseases and **BMSB**, because their harvest was very poor in 2017. In response, they are considering switching to conventional production. However, some input providers stated that insects might become resistant to the systematic fungicides while there is no resistance problem in case of organic products. In order to change the attitudes toward organic farming, it is important to provide consultations to farmers about the organic inputs and demonstrate the results. In addition, some respondents claimed that their neighbors might be interested in switching to producing organic hazelnut, but they do not have the necessary finances.

## 4.2. Description of services supporting hazelnut value chain

### 4.2.1 Laboratories

#### **Current status**

There are around seven laboratories that provide different tests for soil, plants, leaves and crops. With soil testing, farmers can avoid over-fertilization or applying unsuitable fertilizers that can lead to lower productivity. The laboratories provide different types of tests depending on the demand from farmers. Soil analysis is recommended to be done every four years.<sup>28</sup> According to the Agricultural Project Management Agency (APMA), the following soil analyses is needed in order to participate in the “Plant the Future” program:

- Mechanical content
- Humus
- Nitrogen
- Phosphorus
- Potassium
- Complex of cations
- pH level
- Carbonates
- EC - salinity

Above listed analyses should be done by one of the following laboratories: “Anaseuli”, “Multitest”, and “Test Lab/ Agruni”.

In the Anaseuli facility, the price of soil analyses is 100 GEL. The laboratory also provides analysis of the residuals of different heavy metals at the request of the client. The additional cost for each metal is 15 GEL.

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<sup>28</sup> <http://www.livepress.ge/ka/komentari/article/19887-rogorgavashenothdamovuaroththkhilisbaghebsagronomisrchevebivideo.html>

Some laboratories in the Samegrelo region offer farmers a package of soil and leaf analysis, scheduling the agro calendar and providing recommendations, and the inclusion of four or five visits in the field. The price of this package is 350 GEL. The price and duration of this service for bio and conventional farmers are the same. Demand for their services increased, but they do not have many clients, as the price is not affordable for many farmers; last year they served around 70 farmers, although they did not provide this service to organic hazelnut farmers. However, the procedures of soil and leaf analyses do not differ between conventional and organic hazelnuts.

With leaf analyses, farmers understand whether soil treatment is appropriate for the plant in use. In some cases, the soil might have enough minerals but the plants were not able to absorb them. With food analysis, farmers/processors/traders understand whether their product is healthy to eat. The laboratories mentioned that few actors are aware of the need of the leaf and food analysis; therefore, the demand on these services is very low. Few service providers offer micro-biological analyses of the soil that include measuring nematodes and eggs of insects.

Not only do laboratories such as “Anaseuli”, “Multitest”, “Agro house”, and the Public and University Laboratory Centre of the Agrarian University of Georgia conduct soil analyses for farmers, but input providers also offer farmers a package of soil analysis with suggestions for necessary inputs based on the particular soil composition (“Cartlis”, “Bio Agro”). Furthermore, there is a laboratory in the Gurjaani municipality in Kakheti, together with a mechanization center, which also provides soil analyses.

According to the service providers, their clients are satisfied with the provided services. In addition, interviewed farmers did not complain about the quality of the conducted soil tests. Table 4 provides the list of service providers and the price of their services.

Table 4: List of the service providers who do the soil/ product analysis and costs of services

	<b>Provided Service</b>	<b>Price of the service</b>
<b>Anaseuli (Ozurgeti)</b>	Soil, food and leaf analysis	Soil analysis: 100 GEL (+15 GEL per additional metal) Food analysis: 122-170 GEL Leaf analysis: 150 GEL
<b>Cartlis (Zugdidi)</b>	Soil analysis	80 - 100 GEL
<b>Bio Agro (Tbilisi)</b>	Micro-biological analysis	Free
<b>Agro House (Zugdidi)</b>	Soil and leaf analysis	350 GEL
<b>Test Lab/ Agruni (Tbilisi)</b>	Hazelnut full test (microbiological analyses of food)	450 GEL Only Aflatoxins – 120 GEL
<b>Laboratory in Gurjaani</b>	Soil analyses (phosphorus, potassium, nitrogen)	60-70 GEL
<b>Multitest</b>	Soil analysis	375 GEL

## **Constraints**

One of the main constraints to hazelnut (and not only) production is the lack of awareness of the laboratory service role. Roughly 90% of interviewed farmers did not conduct any soil analysis, and they apply fertilizers and pesticides in approximate quantities. Farmers are not aware of the need to improve the physical, chemical, and biological health of their soils. They do not realize the importance of soil analysis in determining fertilizer needs and doses, and also about the economic benefits of soil test-based fertilizer application.

Other factors that determine low demand on the laboratory services highlighted during the interviews were:

- Unavailability of soil testing labs and services in the neighborhood areas;
- Price of the soil and leaf analysis;
- Non-availability of scientists/ subject matter specialists in their area to guide them or interpret soil test values.

Laboratories also claim to lack modern technologies. Considering the low demand for their services, they do not have incentives to invest in expensive equipment and offer additional services to farmers.

There are several donor organizations that work towards the increase of awareness of the laboratory service roles. One of them is the Georgian Hazelnut Growers Association (GHGA), which subsidized soil analyses for the members of this association. Soil tests were carried out in the “Anaseuli” laboratory. According to the GHGA farmers, their contribution to soil analysis price is only 10 GEL. Respondents claimed that some farmers were not willing to pay even 10 GEL for this service.

Other organizations, such as the Cartlis Academy and Agro Georgia who provide extension services for the farmers, offer free training courses to farmers in farming practices and highlighted the importance of soil analysis, and how and where they can do it.

According to the respondents, recent events (such as the BMSB invasion and fungal diseases) contributed to farmers’ increased awareness of better agricultural practices including soil analysis. Therefore, the demand on soil analysis is expected to increase, as farmers understand how important it is to know the composition of the soil before treating it with inputs.

### **4.2.2 Warehouse/storage/drying**

#### **Current Status**

All the hazelnut processing factories in the Samegrelo and Imereti regions have their own storage and drying facilities. Storage, as part of the list of activities performed by processors, is generally well-developed but poorly managed at a farmer’s level. There are several processing factories which provide storage services for its farmers (Anka Fair Trade, Darcheli Cooperative, and Ferrero). Typical hazelnut farmers rarely use storage services. They either sell hazelnuts directly after the harvest or keep them at

home in their basements. In contrast, project beneficiary farmers use storage services, especially when they are provided free of charge.

A drying service is also provided by the same processing factories. However, drying services are the least-developed compared to other services, and only a few farmers used these regularly.

The GHGA currently unites 1000 farmers. They started to build drying and warehouse centers for its farmers; one of these centers will be located in the Samegrelo region and will start functioning from August 2018. The capacity of the center will be 1000 tons. From their calculations, this is the total amount of hazelnut harvest from their farmers, and so there is a high probability that the availability of these services for non-member farmers will be limited. According to the GHGA, the price of the drying service will be 0.20 GEL per kg, and price of storage will be 0.03 GEL per kg per month. 50% of the drying expenses will be covered by Ferrero.

### Constraints

The majority of farmers sell wet hazelnuts to the processing factories immediately after harvest. According to processors, after a hazelnut is harvested it needs to be dried within ten days, otherwise the quality will deteriorate. In most cases, farmers dry hazelnuts under the sun by themselves if the weather is favorable. Thus, farmers cannot dry hazelnuts properly during rainy days, often leading to a decrease in the quality of their hazelnuts.

There are several factors that might be affecting farmers' behavior with regards to using drying services:

- The awareness level of farmers (they do not understand the potential benefits of this service and so prefer to sell directly after harvest);
- The price of this service (farmers are not used to paying for this service);
- Farmers do not trust processing companies and do not want to mix their product with other farmer's hazelnut harvests, because after drying the weight of the hazelnut decreases at different rates.

The study identified different needs of services for different size farmers:

- **Small farmers:**<sup>29</sup> farmers who have less than one tons of total hazelnut harvest state that they do not need a dryer; they dry hazelnut manually and according to them the quality does not decrease when compared to drying with a machine.
- **Average size and large farmers**<sup>30</sup>: these farmers state that drying and storage services are essential for them, as they do not have enough place at home to dry and keep the product.

The problem from the side of processing factories who can provide drying services is that the economies of scale in drying can often only be reached if sufficient quantities are dried in the machine (at least ten tons). According to processing companies, many farmers bring small amounts of hazelnuts (200kg).

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<sup>29</sup> Farmers who have less than 1 ton of hazelnut harvest

<sup>30</sup> Average yields observed is 1 ton and more.

According to the processing factories, the quality of hazelnut is the same whether dried manually or by machine, the main principle being to keep the hazelnut well dried. Cost-wise, it does not make any difference for them if they buy wet hazelnuts and then dry them, or they pay a premium fee for dried hazelnuts. However, they stated that as a processor company, they should already receive dry hazelnuts. In order to achieve a higher quality hazelnut, they introduced drying and storage services to farmers.

According to the respondents, in previous years it was simple to dry and keep hazelnuts at home, because people had small gardens and a maximum 500 kg of harvest, but now most farmers have a larger harvest and it is very difficult to dry it all manually and then keep it at home.

### 4.2.3 Husking

#### **Current status**

In previous years, most farmers were cleaning hazelnuts from the husk by themselves, with the help of family members or hired workers (by hand). Anka Fair Trade took the lead and introduced husking services to farmers. In the beginning, farmers were relatively skeptical, but they started using this service while it was provided free of charge. Nowadays, most farmers who have more than one ton of hazelnut harvest use husking services; the availability of husking services increased the quality, and correspondingly, the price of the hazelnut. Husking machines are mobile, and this service is offered at the farm gate. During the husking period there are five or six husking machines available per village, which is enough for everyone in the village. There are cooperatives who provide husking services for their cooperative members, and there are also private service providers who bring husking machines from Zugdidi. The quality and the price is the same for all service providers.

Most of the interviewed farmers stated that they are satisfied with the quality of this service. Some farmers have handicraft husking machines, but the quality can be poor enough that sometimes they can damage the hazelnut. The price of husking is 10 GEL per 100 kg. Cooperatives who provide husking services stated that there is a 50% discount price for cooperative member farmers.

#### **Constraints**

There are no significant constraints regarding husking services. However, service providers state that they had fewer clients last year, because many farmers did not collect their harvest. Due to poor harvests and low prices, for many farmers it was more profitable to do husking by hand, and this decreased the use of this service in 2017. Roughly 15% of farmers conducted husking by hand last year.

### 4.2.4 Pruning

#### **Current status**

Pruning services include cutting back branches on a hazelnut tree to remove any dead or diseased growths, as well as to shape the plant and limit its size. Hazelnuts can be pruned in winter, spring, or

summer. In previous years, few farmers conducted pruning activities and they did not know how to take care of hazelnut plantations. After training and some educational campaigns run by different donors and the government, the awareness of farmers increased. They either prune trees by themselves or hire additional workers for this task (roughly 50% prune themselves). Pruning as a service is provided by private farmers in the villages. There are 6-10 farmers available per village who provide this service.

According to the respondents, many young people from the villages are migrating abroad to find jobs and older people stay at home. These older people have hazelnut gardens, and with age they cannot take good care of the gardens by themselves anymore. In particular, they are not able to prune hazelnut gardens. According to expert interviews and some farmers, farmers are ready to pay for these services if the quality will be high.

The price of the pruning service is 1.50-2.00 GEL per tree (including cleaning from residues). One worker can prune 20-30 trees per day at a maximum, and so one person needs approximately one month to prune one ha of a hazelnut plantation.

The age of the farmers who provide pruning service to other farmers ranges from 30 to 60. Many farmers who are using this service stated that pruning – as a service - is not well developed. Only one or two farmers in a village can provide a good quality service. Some farmers stated that they allow workers to work only under their supervision, to teach them how to prune correctly. Another important, and positive, aspect revealed during the interviews is that young people are involved in providing this service.

### **Constraints**

Those farmers who do pruning by themselves stated that they have poor quality pruning equipment, and this of course increases the time spent on pruning.

For pruning service providers, this year was also problematic. The price of hazelnuts was low, and their income decreased respectively because fewer people were willing to hire them. Of course, for the farmers who have more than 1 ha of hazelnut garden it is very difficult to prune the garden alone, but such farmers also state that they did not have enough income for hiring additional workers for that service.

Farmers stated that if an organization provides this service, then the quality should be better than what is already offered in the market; otherwise they prefer to pay their neighbor rather than a company.

## **4.2.5 Mechanization**

### **Current status**

The state mechanization center “Mechanizatori” operates only in the Abasha municipality. It is very expensive (1 km 0.50 GEL) to bring tractors from there to villages nearby Zugdidi. Also, if someone will hire a tractor from Abasha it will be unable to fit in the agro calendar. Another issue is that



“Mechamizatori” does not have small tractors, and the big vehicles are not suitable for most hazelnut gardens.

In many cases people hire machines from Zugdidi, Tsalenjikha and Vani, where the municipalities have some tractors. However, they do not have all the necessary equipment. Municipalities have the same problem as mentioned above: the size of the tractors is large, and not suitable for hazelnut gardens. Private mechanization services are mostly provided by cooperatives for their cooperative members, but they cannot provide this service for non-member farmers because of the limited number of tractors they have.

Mechanization services are also provided by private farmers; however, because of higher prices, they are not affordable for all farmers. The price of the pesticide spraying service is 50-80GEL per ha, and on average 3 ha can be sprayed in a day and 50 ha in a season. There are few farmers with the necessary technology and techniques who can apply pesticides to 10 ha of hazelnut garden in a day.

Table 5: Cost for different treatments

Treatment	Unit	Price	Comments
1. Lime	1 tons (enough for 0.5 ha)	100-120 GEL	
2. Herbicides		40-60 GEL	
3. Nitre	50 Kg 1 Liter	40 GEL	Enough for 2000 m <sup>2</sup> 0.3 ha
4. Fungicides / insecticides	1 liter	15-20 GEL	3 liter = 1 ha

According to farmers, ploughing/ cultivation/ fertilization are not always accessible; they claim they often have to wait because there are few service providers or private people who own the necessary equipment. Farmers also do not have access to drainage machinery and mostly do this manually.

### Constraints

Almost all the farmers interviewed stated that the most problematic issue for them is the lack of pesticide sprayers in the villages. They have small pesticide spraying equipment, which is not effective because hazelnut trees are high and they cannot reach the top of the tree. Also, using hand spraying machine is very difficult because of the need to apply pesticides several times in a season. There are farmers who privately provide this service, but it is expensive and not enough for everyone in the village.

Service providers state that before the recent emergence of invasive pests and diseases farmers were not used to spraying hazelnuts. This year, the demand on this service is extremely high due to the BMSB, but from the beginning of the season the demand was lower, as farmers were waiting for government service providers for spraying, as it was available for free. Their business is mainly affected by climate conditions and the weather.

## 4.2.6 Extension

### Current Status

There are several extension service providers in the target area. First, there is one Regional Information and Consultation Center (ICCs) in each municipality where farmers are encouraged to request qualified advice. Furthermore, ICCs serve to deepen farmers' knowledge and provide all the information about government initiatives.

Input providers such as “Cartlis” and “Agro House” also provide consultations to farmers regarding agricultural production. In 2017, “Cartlis” started a new project, the “Cartlis Academy”, and offers training courses to around 300 large farmers in different regions and cities of Georgia (Zugdidi, Abasha, Kutaisi, Gori, and others). During the courses, farmers learn the importance of soil analysis in general, and where they can get this service. In addition, they learn the use of different inputs for different crops, how to irrigate the land and fight against invasive pest and diseases. Most importantly, farmers are taught what is needed to garner the maximum amount of harvest. Trainers are experienced local and foreign experts, agronomists and specialists, and courses are free of charge. Apart from equipping farmers with proper knowledge, “Cartlis” also attempts to increase the awareness on their products and then provide farmers preferential conditions when purchasing the inputs at their shops. In addition, they have printed informational brochures for farmers on different topics (fertilizers, pesticides, fungicides, hazelnuts, etc.). It should be mentioned that “Cartlis” do not provide training regarding organic hazelnut production.

“Agro House”, which is also an input provider, delivers training courses cooperating with the Ministry of Agriculture (MoA), Ministry of Education and Science Development (MoESD), the UN, and USAID's NEO project. The company offers special Training of Trainers (ToT) and specialized programs for farmers. Currently, “Agro House” works with the MoESD to acquire the legal recognition of certificates from the program. The service package offered by “Agro House” includes soil analysis, leaf analysis (which provide information respectively on nutrient supply and nutrient status), selling different organic and non-organic pesticides, fertilizers, and training courses. Training courses on hazelnut production includes 10 modules and covers all stages from production to farm management. This course is for trainers and the duration of the course is ten months. The main purpose is to have a pool of subject-specific specialists in the region. In the hazelnut sector, “Agro House” retrained 15 specialists, and now has the list of trainers to recommend others. As for training for farmers, “Agro House” chooses farmers to attend the training programs in coordination with the ICCs. The actual price of the training course is 600 GEL and the duration of the course is five days. This year, “Agro House” received funding from ZRDA and its course was free of charge for farmers.

GHGA also provides an extension service to member farmers, and it has both agronomists and agro consultants at its disposal. The membership fee of GHGA is 2 GEL per month. Agro consultants ensure that farmers' groups get together once per month in one of the farmers' houses and discuss the common problems they have related to hazelnut production. These newly-established farmers' groups explain how to take care of their plantation, and sometimes they also visit the hazelnut plantation of a host

farmer for demonstrations. Currently, GHGA is going to an open farmer's consultation center in Zugdidi, where the association will also sell high-quality products and technical equipment.

The LEPL Shota Meskhia State Teaching University of Zugdidi is established at the Zugdidi Branch of Ivane Javakhishvili Tbilisi State University, Zugdidi Professional Lyceum and LEPL Senaki Agrarian-Economic College. In this university, academic and vocational programs are implemented simultaneously, with consultation services carried out by the University Extension Center. Due to high demand on professional educational programs and training in agriculture at Senaki base, the administration decided to also offer training also at the Zugdidi base. In this way it would be easier for farmers to attend the programs without moving from one town to another. Consultation services are carried out by the University Extension Center. Currently, Shota Meskhia State Teaching University of Zugdidi has contracts with different farmers including 3 medium-size hazelnut producers, and students have the opportunity to gain practical experience in the field, under the supervision of professional farmers (dual learning). Furthermore, farmers train the students themselves, the best of whom are offered the chance to continue working with them. It should be mentioned that University does not offer a special module for hazelnut production, but the administration plans to work on the module if there is enough demand. As for th organic farming, the university does not offer students a separate course, but this topic is included in the curriculum.

During the interviews, farmers also mentioned “Elkana”, which delivers training on organic production and the usage of organic inputs in production. They claimed that these training programs were very useful for their business.

According to the interviewed farmers, they do not trust the Regional ICCs as they have different suggestions on every consultation. In addition, farmers are skeptical regarding input providers, because they think input providers try to sell possibly unnecessary inputs to them. As for the other service providers, they claimed that farmers are very satisfied with the provided consultations and advices. While some providers (“Cartlis”) deliver the consultations and trainings for free, others (such as “Agro House”) have a fee. This year, however, “Agro House” received funding from ZRDA, and its services were free of charge for farmers.

There are two internet platforms, “tractor.ge” and “Agronaut”, who provide online consultations for farmers. These consulations are free of charge for farmers. Tractor provides small videos where farmers and experts provide information and advice about the production stages of different agricultural products. Tractor also has an online shop where farmers can buy different agro inputs from different input shops around the country. Eleven different input shops are offering their products through this application. They can order the products and they will be delivered directly to their houses.

“Agronaut” is providing price information for 100 different agricultural products. They also have information about the production cycle of 60 different products. In this platform, information about climate and the land across different regions can be found. This application is also free of charge for farmers. These two online applications mostly focus on small and medium farmers. However, none of our respondents have ever used or heard about these applications.

Farmers stated that the most effective source of information for them is television, and especially “Saperavi TV”, where they claim they can find a lot of useful information. They also get information from ICCs about different programs and government initiatives.

### **Constraints**

Despite the fact that there are some extension service providers in the target area, the main source of the information for interviewed farmers seems to be TV programs such as “Saperavi” and “With Farmer”. Farmers clearly have low awareness of available services, as well as a lack of trust for ICCs and input providers.

Another constraint is the lack of qualified agronomists. According to the extension service providers, it is very difficult find an experienced agronomist. Apparently, there is a need to train and educate future agronomists. In this regard, teaching universities such as Shota Meskhia State Teaching University of Zugdidi play an important role.

Another issue is organic farming. Extension service providers do not have any specific program to equip farmers with relevant knowledge and experience. Nowadays, there are no demo plots in the region. According to interviews, some service providers (e.g. “Agro House”) are interested in growing demonstration plots with organic crops, but they do not have enough material resources.

## **4.2.7 Insurance service**

### **Current status**

State agricultural insurance programs have existed since 2014 in Georgia. Wind is one of the insurable risks and this was the main risk insured by hazelnut farmers (95% insured for this). Two insurance companies are working in the Samegrelo region: IC and Aldagi. Aldagi’s share in overall agro insurance was 60% in 2017. The number of policies sold and ha insured are presented on Table 6, while the number of ha of hazelnut plantation has decreased in 2017 compared to 2014 by 26%. This could be explained by the fact that in 2014, 95% of insurance premiums were subsidized by the state; this number has now decreased to 70%.

Table 6: Insurance of hazelnut plantations

Year	Number of policies sold	Hectares insured
2014	4 508	2 683
2015	741	576
2016	2 363	1 858
2017	2 777	1 984

Source: APMA, 2018

Most hazelnut farmers (95%) do not use agricultural insurance. There are several reasons for this:

- Low awareness of potential benefits
- Farmers do not trust insurance companies (their sale against, loss adjusters)
- Farmers prefer to be insured against spring frost, which is not covered by the programs

According to respondents, their neighbors were insured and had a bad experience with these services. Farmers stated that different insurance companies were offering different conditions (related to loss adjustment) and damage was compensated differently. The technical capacity for administering agricultural insurance (e.g., loss adjustments and distribution of policies) is still underdeveloped in the country. The availability of farm and weather data is extremely limited in Georgia, constraining the development of insurance products.

### **Constraints**

According to the Agricultural Project Management Agency (APMA), for hazelnut and any other crops risk maps (absent in Georgia) are important for risk underwriting. Moreover, insuring other risks (e.g., spring frost) is desired by many farmers. However, it is very difficult to estimate the potential risk, and insurance companies are reluctant to develop the related insurance packages. In general, good (historical) meteorological data is essential for developing appropriate and affordable insurance products (including spring frost insurance).

According to APMA representatives, pilot projects could be developed in this area. For example, installing the required equipment would be helpful. Abroad, farmers even have their own devices to collect weather information (this helps them better plan spraying and other activities).

One of the constraints of this service is insurance companies who still lack qualified staff. They mostly rely on rural microfinance organizations to sell insurance products, but since the sale agents lack experience in this field, they cannot correctly explain to farmers what they are selling and all the aspects of offered insurance policies.

Last but not least, farmers lack understanding of agricultural insurance mechanisms. It would be more efficient to elaborate more effective tools for information provision.

## **4.2.8 Credit service**

### **Current status**

There are six major micro finance organization operating in target regions: Credo, Cristal, Finca, Laziaka, BIJ and Swiss Capital, which all offer credit and installment services. They offer credit with preferential paying period. This means that farmers can take loans in March or April and pay them back in September, October or November, when they already have hazelnut harvest and can pay back the credit. 90% of their clients are hazelnut producers.

Financial institutions are also offering instalment services. They introduced this service two years ago. They provide instalments on fertilizers, pesticides, and small pieces of technical equipment. Credit

organizations collaborate with input shops, and together with them they take inputs and equipment to the villages. They choose a village in advance, and two days before arrival they send their representative to spread the information about the sales of different inputs. Then they visit the village to do instalments on-site. People are very satisfied with this arrangement, as they do not have transportation expenses.

According to the majority of respondents, interest rates in micro finance organizations is very high.

Table 7: Interest rates

Loan Amount	Annual Interest Rate
1000 GEL	20-25%
15000-20000 GEL	Minimum 16%

Source: Interviews

95% of farmers have credit-incurred debts. In previous years, the number of farmers who were taking loans was increasing, but this year, micro finance organizations have 50% less clients, because of the bad harvest many people (60-70%) could not pay back their loans. “In this year we abstain from giving loans those who have hazelnut plantations and no other source (transfers from abroad, other income) of income”.

In 2016, out of 3000 clients, problematic payers were 150-200, while this number was around 800 (they did not pay during one month) in 2017. “If they cannot pay, we are rescheduling the debt paying period”.

### Constraints

According to the farmers, one of the most problematic issues for them is access to credit. They want long term credits and banks (and other financial institutions) do not usually give them, and they want their money back soon. They stated that they need 4-5 years to grow new orchards, develop their business and earn enough income to pay the credit back afterwards.

## 4.2.9 Input suppliers

### Current status

The biggest hazelnut seedling producers in Georgia are located in the Zugdidi municipality, which has around 15 hazelnuts seedlings producers. They mostly produce “Anakliuri” type hazelnut samplings. The main advantage of these seedlings is that it is more resilient to the local environment. The biggest seedling producer has an output of about 30 thousand units. According to seedling producers, 80% of hazelnut producers buy saplings, while 20% make saplings themselves. Mainly their clients are large scale farmers with more than 1 ha of land, and they have only a few farmers who produce organic hazelnut. However, there is no difference in hazelnut seedlings whether they are organic or conventional.

There are four big input supplier shops in Zugdidi and three in the Vani region. They sell both bio and non-bio fertilizers and pesticides. There are two organic input producers in Georgia: “GeoFert” and “Agrobio”. They sell their products either in Tbilisi or in local input shops. Organic input producers have a lot of field visits including workshops/training sessions. When they sell their products, team members accompany farmers in the field. Experts study the situation in detail, understand the needs and give advice to the farmers about best practices. Some input suppliers organize 100-200 meetings a year, and they provide this service for free because they want to develop the awareness of organic farming in the country. According to respondents, the market for organic inputs is growing, and the capacity of the Georgian organic input producers is not enough to satisfy the growing demand.

Input shops in target regions stated that roughly 50% their sales come from pesticides/fertilizers for hazelnuts; most of the farmers who ask about bio inputs are hazelnut farmers. The main benefit of their product is the quality and non-toxicity of organic fertilizers/pesticides.

Compared to the previous year, the prices of pesticides and fertilizers have increased because of the exchange rate. A representative from “Agro House” in Zugdidi stated that they always recommend farmers to use bio inputs. In many cases, farmers trusted their recommendations and bought bio fertilizers. They were very satisfied with the quality of fertilizers and the results they received. The price of bio and regular fertilizer do not differ too much (price of bio fertilizer might be higher by 25-30GEL).

Many farmers buy inputs and pay for it in the fall after selling their hazelnut harvest (with installment). According to the farmers, mostly shops have the same brands of fertilizers and pesticides and there is little choice.

Respondents complained about the quality of inputs. According to them, different input shops give different advice over which products are more effective, and so they cannot trust the sellers in the shops because they want to sell their products and do not care if they work or not. Farmers always take risks about trying different inputs every year. The information about which input works better they eventually find from their experience; if it is good they buy the same input in following year.

### **Constraints**

According to farmers, every year input shops are changing the brands of the fertilizers and pesticides. They state that there is no agronomist in the shops to ask for proper advice. The inputs shops give description of the input, but it is not enough. Farmers need specialists for different advice related to applying inputs in different stages of hazelnut production. When a shops sell a product, it should be tested in advance: farmers should not take all the risks related to the quality of the input.

The GHGA stated that they are going to open a farmers’ consultation center in Zugdidi, where they will sell high quality inputs and equipment. The idea came from the fact that farmers often ask them for advice on where to buy inputs. For the GHGA, it is difficult to advise any input shop because they are not sure about the quality of inputs provided in the market, and so they plan to open a shop wherein

they will have qualified agronomists who can properly counsel farmers. They will sell only tested products and try to gain farmers' trust.

### 4.3. Economic and growth potential of organic hazelnut farming

This section presents the main results of the calculation of the economic model of hazelnut farming in Samegrelo. For both conventional and organic farming, two separate models were employed: one with best farming practices and another with typical practices as identified from farmers and expert interviews in three municipalities of Georgia. It should be noted that the obtained data showed significant heterogeneity in terms of hazelnut yields among farmers; it varied from 800 to 1600 kg per ha. Moreover, the main limitation of this analysis is related to the small number of interviewed farmers (25 in total). Nevertheless, the figures used in the calculations were validated by different experts of the sector.

#### Gross margin analysis for planting a new intensive or semi-intensive hazelnut orchard (with best practice)

Calculations are based on the following assumptions:

- **Trees per hectare:** interviews revealed that the average number of hazelnut trees (planted with a distance between trees and rows by 4x4m) are 625 trees per hectare. It was similar for organic as well as for conventional farms.<sup>31</sup>
- **Yield:** interviews with experts revealed that the average yield from new intensive or semi-intensive hazelnut orchards (fully harvestable), 5 and 4.5 kg per tree in conventional and organic farms respectively.<sup>32</sup>
- **Price:** we took prices for organic and conventional hazelnut (in shell) as 6GEL/kg and 5GEL/kg respectively. This was based on the various data sources and adjusted with an expected inflation rate within next 15 years.

It turned out that **newly planted** (Table 8) organic hazelnut farms have the negative cash flow for the first five years of operation because they do not have harvest for the first four years, and the amount of harvested hazelnuts is low for young orchards (1kg per tree for the 5<sup>th</sup> year). Starting from the 6<sup>th</sup> year, the farm starts to acquire positive profits (corrected with inflated prices) from hazelnut production due to increased harvest amounts (2kg per tree for the 6<sup>th</sup> year, 4kg per tree in the 7<sup>th</sup> year, and 4.5kg per tree for the next 3 years). At the end of the 11<sup>th</sup> year, the accrued cash flow balance (sum of all previous years' cash flows) becomes positive — 3064 GEL, — and continues growing. At this time, the harvest per tree is back from 4.5Kg to 4kg per tree. Based on the assumption involved (including that the price of the organic hazelnut equals to 6 GEL/kg in the 1<sup>st</sup> year, and there are 625 trees per ha), when the

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<sup>31</sup> However, some farmers prefer to plant trees with different combinations, such as 3x4m (833 trees/ha), 3x5m (667 trees/ha) and 5x5m (500 trees/ha).

<sup>32</sup> This might be very optimistic yield/ha, but experts believe that it is realistic if all necessary and recommended treatments and services are properly applied/done.



initial investment costs (land, seedlings, planting and additional services) is disregarded, an organic hazelnut orchard is capable of breaking even in the 8th year of operation.<sup>33</sup>

Table 8: Annual Cash Flow for Organic Hazelnut Growers – Best Practice

Year	Cost	Harvest (kg)	Income	Balance
1 <sup>st</sup>	26,178.50	0	-	(26,178.50)
2 <sup>nd</sup>	6,097.35	0	-	(6,097.35)
3 <sup>rd</sup>	6,357.41	0	-	(6,357.41)
4 <sup>th</sup>	6,444.38	0	-	(6,444.38)
5 <sup>th</sup>	7,758.00	625	4220.7	(3,537.35)
6 <sup>th</sup>	8,349.24	1250	8694.6	345.32
7 <sup>th</sup>	9,479.88	2500	17910.8	8,430.90
8 <sup>th</sup>	9,979.51	2812.5	20754.1	10,774.61
9 <sup>th</sup>	10,263.52	2812.5	21376.7	11,113.22
10 <sup>th</sup>	10,556.05	2812.5	22018.0	11,461.99
11 <sup>th</sup>	10,605.38	2500	20158.7	9,553.37
12 <sup>th</sup>	10,908.17	2500	20763.5	9,855.34
13 <sup>th</sup>	11,220.04	2500	21386.4	10,166.37
14 <sup>th</sup>	11,541.27	2500	22028.0	10,486.73
15 <sup>th</sup>	11,872.14	2500	22688.8	10,816.71
<b>Total</b>	<b>101,463.84</b>	<b>12812.5</b>	<b>94974.9121</b>	<b>44,389.59</b>

As for the **newly planted** conventional hazelnut farms, similar to organic hazelnut farms, the distance between the tree rows equals to 4m, and the distance between the trees in a row is the same. The cash flow is negative for the first six years of operation, while the accrued cash flow balance of the farm becomes positive (2231 GEL) at the end of 11<sup>th</sup> year. Compared to the organic farms, it is assumed that the price of conventionally-farmed hazelnuts is lower (5 GEL/kg), but the harvest per tree is higher in the high yielding period (5kg per tree during the 8<sup>th</sup>-10<sup>th</sup> years, and 4.5 during the 11<sup>th</sup>-15<sup>th</sup> years). When disregarding the initial investment costs, conventional hazelnut farm breaks-even at 8th year of operation.

<sup>33</sup> The investment payback period (including all costs) is 11 year.

Table 9: Annual Cash Flow for Conventional Hazelnut Growers – Best Practice

Year	Cost	Harvest (kg)	Income	Balance
1 <sup>st</sup>	25,931.75	0	-	(25,931.75)
2 <sup>nd</sup>	5,134.81	0	-	(5,134.81)
3 <sup>rd</sup>	5,366.00	0	-	(5,366.00)
4 <sup>th</sup>	5,423.22	0	-	(5,423.22)
5 <sup>th</sup>	6,706.22	625	3517.2	(3,189.00)
6 <sup>th</sup>	7,265.90	1250	7245.5	(20.43)
7 <sup>th</sup>	8,364.04	2500	14925.7	6,561.61
8 <sup>th</sup>	9,060.79	3125	19216.8	10,155.99
9 <sup>th</sup>	9,317.24	3125	19793.3	10,476.04
10 <sup>th</sup>	9,581.39	3125	20387.1	10,805.69
11 <sup>th</sup>	9,601.47	2812.5	18898.8	9,297.35
12 <sup>th</sup>	9,874.15	2812.5	19465.8	9,591.64
13 <sup>th</sup>	10,155.00	2812.5	20049.8	9,894.76
14 <sup>th</sup>	10,444.28	2812.5	20651.3	10,206.98
15 <sup>th</sup>	10,742.23	2812.5	21270.8	10,528.56
<b>Total</b>	<b>92151.36</b>	<b>13750</b>	<b>85085.47</b>	<b>42453.41</b>

### Gross margin analysis for an existing, mature plantation

- **Trees per hectare:** interviews revealed that the average number of hazelnut trees planted with a distance between trees and rows by 4x4m, there are 625 trees per hectare. It was similar for organic as well as for conventional farms.<sup>34</sup>
- **Yield:** interviews with farmers revealed that the average yield from mature (already fully harvestable) trees is 2.5 and 2.25 kg for conventional and organic farms respectively.<sup>35</sup>
- **Price:** we took prices for organic and conventional hazelnut (in-shell) as 6GEL/kg and 5GEL/kg respectively, based on the various data source (including interviews with farmers and prices provided by Elkana) as an average wholesale prices of last 5 years.

The cost calculations given above represent the “best practice” cases, when the orchards (either organic, or conventional) get all the [allowed] necessary and recommended treatments and services. Consequentially, the productivity figures, likewise the costs themselves, are higher than those faced by a “typical farmer”. Alternatively, the calculations for the typical farmer **who already owns a harvestable orchard** is given below. Here, the number of trees per ha is again 625 for both, organic and conventional hazelnut farms, but the yields and prices of the produce are lower, due to the lack of (or poor quality)

<sup>34</sup> However, some farmers prefer to plant trees with different combinations, such as 3x4m (833 trees/ha), 3x5m (667 trees/ha) and 5x5m (500 trees/ha).

<sup>35</sup> We calculated the average production in Georgia, based on the Geostat’s agricultural census 2014 and it showed that hazelnut tree gives from 1.5 to 2 kg on average in Georgia (it was the same for only Samegrelo region). It seems that the farmers we interviewed are above the average yield per hectare.

services and treatments the orchards receive. The cost structure here consists of fewer items, and the expenditures for some items are cut, thus the total costs are lower than they are for the “best practice” scenario cases.

It should be noted that we considered all costs related to run a one-hectare hazelnut plantation in West Georgia, including the costs for managing the farm, transportation, labor costs for pruning/trimming, harvesting and salary for field guards during harvest time. In reality, the typical farmer does most of those activities by him/herself to save costs.<sup>36</sup>

Table 10: Annual Cash Flow for Organic Hazelnut Growers – Typical Farmer (already owns hazelnut plantation)

Year	Cost	Harvest (kg)	Income	Balance
n	6,380.33	1406.25	7031.3	650.93
n+1	6,722.37	1406.25	7312.5	590.13
n+2	6,912.45	1406.25	7605.0	692.55
n+3	7,108.23	1406.25	7909.2	800.97
n+4	7,309.88	1406.25	8225.6	915.68
n+5	7,517.59	1406.25	8554.6	1,037.00
n+6	7,731.52	1406.25	8896.8	1,165.25
n+7	7,951.88	1406.25	9252.6	1,300.77
<b>Total</b>	<b>57634.24</b>	<b>11250</b>	<b>64787.53</b>	<b>7153.29</b>

Table 11: Annual Cash Flow for Conventional Hazelnut Growers – Typical Farmer (already owns hazelnut plantation)

Year	Cost	Harvest (kg)	Income	Balance
n	5,739.53	1562.5	6562.5	822.98
n+1	6,207.06	1562.5	6759.4	552.31
n+2	6,331.66	1562.5	6962.2	630.50
n+3	6,515.68	1562.5	7171.0	655.34
n+4	6,705.23	1562.5	7386.2	680.92
n+5	6,900.47	1562.5	7607.7	707.27
n+6	7,101.56	1562.5	7836.0	734.41
n+7	7,308.68	1562.5	8071.0	762.36
<b>Total</b>	<b>52809.87</b>	<b>12500</b>	<b>58355.96</b>	<b>5546.08</b>

<sup>36</sup> Nonetheless, if we exclude all those costs listed above, the costs per hectare would halve and therefore increase the net profit gained from one-hectare hazelnut plantation. However, time spent by owner has its opportunity cost.

The details of those calculations, including various indicators and sensitivity analysis (considering price and yield combinations), are provided in the excel spreadsheets attached to this report.

The economic model suggests that organic hazelnut growers acquire more profit than the conventional farmer in the long run. However, organic production requires more material resources than conventional variants in the short term. Estimated investments in new hazelnut plantation are 26,178 GEL, and a break-even happens during the 6th year of operation. After cash flow becomes positive, in the first year an investor generates a 345 GEL income.

#### 4.4. Aggregated results of FGDs and interviews – weak and critical points, opportunities for growth

The most critical issues for hazelnut growers were invasive pests, fungal diseases, and the BMSB that destroyed harvests and lowered the quality of hazelnuts; this in turn decreased the price of hazelnuts. During the discussions, farmers claimed that the price of hazelnuts decreased, and buyers were willing to pay less this year than the previous one for hazelnuts. They also mentioned that hazelnut prices were lower this year in Turkey.

Farmers faced the need of consultations on how to protect their crops from these diseases and bugs. There is a lack of knowledge among farmers about the use of fertilizers and pesticides. This problem was even more critical for non-beneficiary farmers; it was revealed that they had less access to information compared to the beneficiary farmers. Additionally, non-beneficiary farmers were skeptical about the organic inputs; they think such inputs are not efficient against the BMSB and fungal diseases.

Apparently, access to services (soil analysis, drainage, spraying machinery, husking, pruning, and drying) differed for beneficiary and non-beneficiary farmers. Beneficiary farmers had more access to machinery services. They seem to be more business-oriented as they have contracts with “Anka Fair Trade” about selling their hazelnuts for them. Considering current situation in the sector, the most needed service appeared to be spraying machines and inputs. There was significant difference between beneficiary farmers in the Samegrelo and Imereti regions. Farmers in Vani did not use any fertilizers or pesticides, and they do not have any tradition of taking care of hazelnut plantation. In contrast, in Zugdidi and Tsalenjikha, farmers are aware of farming practices and accustomed to apply fertilizers and pesticides.

During the interviews, farmers highlighted that some people do not offer pruning or other services to neighbors because they are afraid of losing pecuniary social assistance (subsistence allowance).<sup>37</sup> The problem is that the Social Service Agency (SSA) will terminate social assistance to socially vulnerable families as long as someone from the family has income. Accordingly, socially vulnerable people are reluctant to do temporary jobs for neighbors as they do not want to exchange seasonal income at the expense of a permanent monthly income from social assistance.

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<sup>37</sup> [http://ssa.gov.ge/index.php?lang\\_id=ENG&sec\\_id=35](http://ssa.gov.ge/index.php?lang_id=ENG&sec_id=35)

According to the interviewed farmers, they lack access to finances. This year this problem seems to be more crucial than ever considering the fact that farmers did not receive a subsistence amount of harvest in 2017. Accordingly, their income from selling hazelnuts decreased. However, farmers need to buy inputs and treat their soil and crops in order to combat diseases and bugs and gather a harvest.

As for the youth employment in hazelnut production, it is very low, as young people are less involved in agriculture in general. From this point of view, teaching universities might play an important role in involving more young people in the sector.

During the focus groups, women were actively involved in discussions. FG participants stated they are involved in hazelnut production to every possible extent, including pruning, husking, and other activities. Additionally, the participants raised the issue of female migration to Turkey leading to decreased employment of women in agriculture as well as the hazelnut sector.

FG participants discussed the opportunities for organic as well as conventional hazelnut sector growth. They suggested to attach one trained agronomist to one village who would be able to give consultations to farmers regarding the use of both non-organic and organic inputs and the farming activities. Conventional farmers might consider switching to organic hazelnut production if they see the clear benefits of organic production in terms of the price premium and increasing demand.

## 5. Summary conclusions and recommendations

From this study we identified all the services in hazelnut sector. There are key factors which affects the availability and quality of different services. Table 12 summarizes constraints and needs as well as the main recommendations for different services:

Table 12: Summary of the results on service providers

Service	Constraints	Farmers attitude toward service quality and price	Recommendation
Input suppliers	<ul style="list-style-type: none"> <li>● Farmers do not trust the quality of inputs provided by shops</li> <li>● High input prices</li> <li>● Lack input variety</li> <li>● Trustworthy shops (located in Tbilisi) are not represented in the regions</li> </ul>	<ul style="list-style-type: none"> <li>● Farmers are not satisfied with the quality of input</li> <li>● Farmers think that price of quality input is high</li> </ul>	<ul style="list-style-type: none"> <li>● Increase availability of shops with qualified staff who will be able to provide expert advice to farmers regarding the use of different inputs</li> <li>● Provide brochures for different crops with agro calendar and detailed guidelines how to use inputs properly</li> </ul>

	<ul style="list-style-type: none"> <li>● Lack of qualified agronomist</li> </ul>		<ul style="list-style-type: none"> <li>● Increase availability of different bio inputs in local shops</li> </ul>
Laboratories	<ul style="list-style-type: none"> <li>● Awareness on the laboratory service role</li> <li>● Price of the soil and leaf analysis is perceived high by farmers</li> <li>● Lack modern technologies</li> <li>● Demand for their service is low</li> </ul>	<ul style="list-style-type: none"> <li>● Farmers are satisfied with the service quality</li> <li>● In most cases farmers consider that soil analysis is expensive, and they cannot afford it</li> </ul>	<ul style="list-style-type: none"> <li>● Laboratories need equipment to perform different types of analyses</li> <li>● Support training of staff</li> <li>● Private laboratories need help to get official certification</li> <li>● Soil analysis could be subsidized</li> </ul>
Pruning	<ul style="list-style-type: none"> <li>● Poor quality of equipment</li> <li>● Lack of qualified hired workers</li> </ul>	<ul style="list-style-type: none"> <li>● Farmers are not satisfied with the service quality provided by hired workers</li> <li>● Farmers do not complain about the price of this service</li> </ul>	<ul style="list-style-type: none"> <li>● Establish the service of pruning</li> <li>● Train existing farmers who provide pruning service</li> </ul>
Drying/Warehousing	<ul style="list-style-type: none"> <li>● Lack of trust in processing companies who provide this service</li> <li>● Non-availability of small scale drying machines</li> <li>● Lack of culture of using these services</li> </ul>	<ul style="list-style-type: none"> <li>● Farmers do not have bad experience regarding these services</li> <li>● Farmers do not directly pay for these services; they dry hazelnut at home manually or sell wet hazelnut to</li> </ul>	<ul style="list-style-type: none"> <li>● Introduce small scale drying machines in the villages</li> <li>● Offer this service free of charge in the beginning to convince farmers the benefits of this service and gain their trust</li> <li>● Introduce small storage facilities in the villages, where farmers will be able</li> </ul>

		processing companies	to take back their hazelnut on demand
Mechanization	<ul style="list-style-type: none"> <li>• Non-availability of state mechanization centers in every municipality</li> <li>• Lack of small size machineries</li> <li>• Lack of proper spraying machines</li> <li>• Not every village is equipped with enough number of machineries</li> </ul>	<ul style="list-style-type: none"> <li>• Quality is not considered as a problem</li> <li>• Price is considered high by non-beneficiary farmers</li> </ul>	<ul style="list-style-type: none"> <li>• Equip cooperatives with additional machineries</li> </ul>
Extension	<ul style="list-style-type: none"> <li>• Non-availability of product specific specialist</li> <li>• Farmers are not willing to pay for trainings</li> <li>• Lack of interest from farmers to attend the trainings</li> </ul>	<ul style="list-style-type: none"> <li>• Farmers do not complain about quality of extension services, rather they want to see more practical use of acquired knowledge</li> <li>• Mostly trainings are provided free of charge</li> </ul>	<ul style="list-style-type: none"> <li>• Create demo plots and offer practical courses to farmers</li> <li>• Provide training for trainers</li> <li>• Increase awareness about bio production among extension service providers through trainings and literature</li> </ul>

It was revealed that it is difficult to distinguish the main actors in the hazelnut value chain as different service providers offer packages of several services to their consumers. Given the systematic nature of constraints in the hazelnut value chain in Georgia, our recommendations below take a holistic and systemic look at the sector.

### Increasing trust between value chain actors

The research showed that farmers have very little trust with regards to different services, service providers and other value chain actors. Farmers do not trust processors, and they do not want to use the drying or storage services provided by processing factories. Accordingly, many of them cannot dry or store hazelnuts properly, and so the quality of the hazelnuts decreases. Presumably, creating drying and storage centers in the villages, where farmers can better monitor their products, might solve the trust problem involved in this element of the value chain. This could be in the form of mobile drying equipment, which serves farmers with rather small quantities. Farmers will be able to observe the whole process and will start to see the benefits of having this service. Similarly, small storage facilities in the villages might solve the trust problem and contribute to the development of this service.

Farmers also have trust issues with regards to input shops and agronomist. According to them, there are no specialists in the shops who can provide reliable advice. In particular, giving controversial information and advice on input use and other agricultural practice makes farmers very skeptical. The lack of this competence at input shops notably decreases the trust from the farmers. To overcome the trust issue, a systemic approach is needed as indicated in the previous recommendations. The agro specialists should be properly trained to be able to give professional advice to farmers. The input shops (e.g., Cartlis, Agro House) who sell organic inputs should coordinate and develop a shared vision on how they want to guide farmers, what products they suggest and how to improve awareness and trust in the chain. This will increase interest toward bio inputs and create more income for input shops.

### Value chain financing

Access to finance was identified as one of the important constraints in the study (at least from a farmer's perspective). Farmers want to finance inputs and other activities related to hazelnut production in the spring, but they lack financial capital for these activities. The study showed that most of the farmers take loans and do instalments for different inputs in spring time and then pay it back in September or October. Furthermore, interest rates in micro finance institutions (MFIs) are very high because of the high-risk profiles of the farmers. This situation hinders the development of the sector and creates obstacles not only for farmers but also to all the actors of the value chain.

Contract farming<sup>38</sup> provides a potential solution to access to the finance problem. While some attempts existed in hazelnut sector as well, the outcomes were not always as positive as expected. While the most common problem in contract farming is side-selling by farmers, this was less of the issue in organic hazelnut value chain in Samegrelo. Namely, only one certified processor currently operates in the market and if a farmer wants to sell their hazelnut with organic premium, side-selling will not work. However, at this stage of organic value chain development, the issue of producing good quality

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<sup>38</sup> **Contract farming** involves agricultural production being carried out on the basis of an agreement between the buyer and farm producers. It can include different actors and agreement between them.

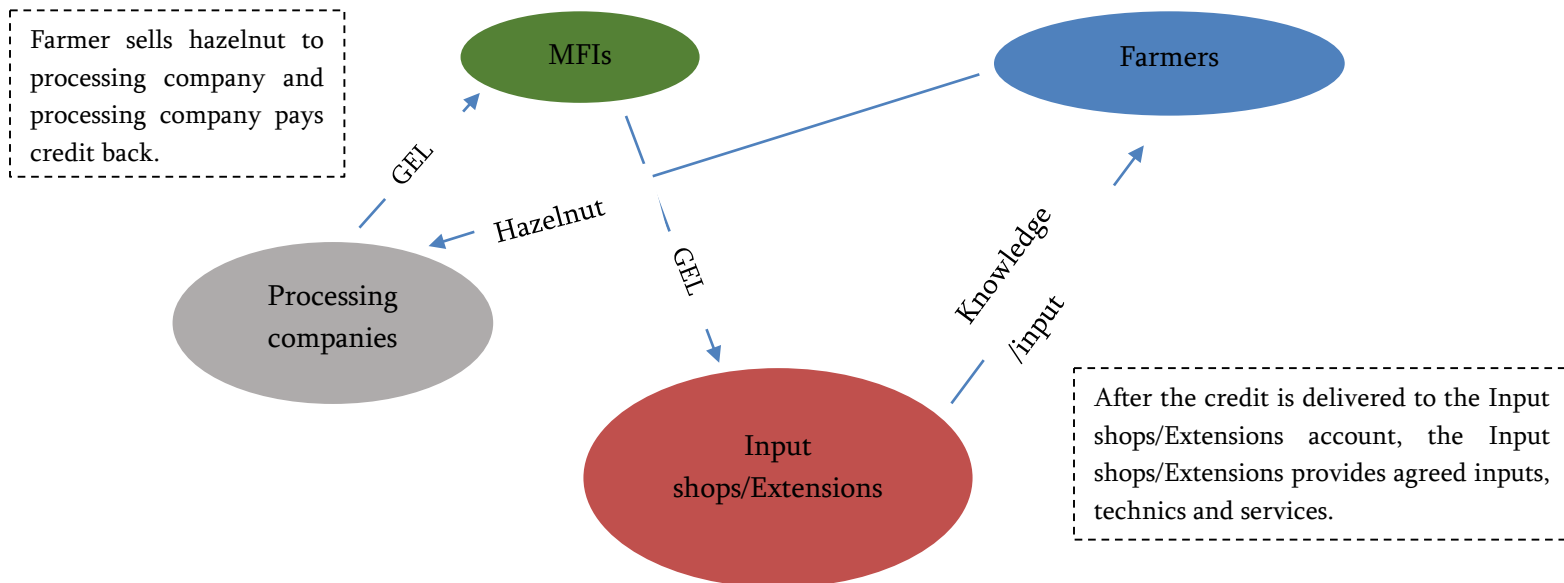


hazelnuts (fulfilling the standards set by the processing company) was the main constraint to success of contract farming type arrangements.

To insure the sustainability of the process and improve value chain financing, more coherent practices should be adapted. There are many synergies between different actors in hazelnut value chain, but there is the lack of coordination between different actors. There is a possibility to make contract farming work better by improving its design as well as approaching problems in a more systemic way. Processing companies can play the role of facilitator in this process, and should link the following actors: processing companies, farmers, input shops/extension provider and MFIs. A processor will work together with focal points in this sector, who provide training with farmers and also have their input shops. With training they help farmers to gain knowledge and awareness about bio production.

- Farmers acquire new knowledge
- Input shops give advice on which input they should buy
- Input shops provide inputs for farmers
- MFIs transfer loans to the input shop account, but the loan is issued under the name of a farmer. The shop/service provider is obliged to provide the farmer with the agreed inputs, technics and services. The burden of the risk should be divided between processing company, input shop and the farmer. When the hazelnut is sold, the processor returns the money (loan + interest) to MFI.

Figure 7: Model structure



Therefore, linking different actors (for examples thus that were identifies as focal points) and integrating different services can provide win-win outcomes for everyone in the chain.

### Partnerships to build knowledge, skills and attitudes

The low level of awareness alongside the lack of qualified agronomists appeared to be one of the most problematic issues in Georgia's hazelnut sector. In addition, farmers do not realize the need of different services such as soil analysis and treating the soil (farmers' attitudes). From this point of view, strengthening teaching universities might improve the synergies in the value chain. Currently, there is one teaching university in the Zugdidi municipality, and it has contracts with only three small-scale hazelnut producers. Students practice what they preach at the farms, and receive scholarships from donor organization (UNDP, USAID NEO), while farmers receive free helpers. It would be positive to create firm partnerships and allocate funds for dual education; students would be attached to the one exemplary farmer chosen under the project. The exemplary farmers will train future agronomists and equip them with relevant experience in organic hazelnut growing. Strengthening the dual teaching system would help to create a pool of knowledgeable and skilled young farmers and agronomists that in turn would increase youth employment in hazelnut production. After graduating, graduates would be able to provide relevant training programs and consultations to farmers that would help to change their attitudes towards organic farming. Without building knowledge, the organic hazelnut sector will continue in its vicious cycle: farmers have a lack of knowledge and skills, which only shapes and encourages wrong attitudes of farming practices.

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## Annex 1

### Focus Group Discussion Guide

#### **RAPPORT BUILDING [10 minutes]**

Moderator: Welcome participants to group meeting

Thank you very much for accepting to take part in the focus group discussion. The topic of the research is the organic value chain of hazelnuts in Western Georgia. The research is undertaken upon the request of the organic hazelnut develop consortium consisting of Swiss HEKS EPER, ANKA, PAKKA and Biological Farming Association ELKANA. The aim of the research is to see how and where the consortium could provide effective assistance to local and national services to hazelnut farmers.

Present overview of the topic that will be discussed during the focus group session

#### **OPENING QUESTION [15 minutes]**

Let's take a few minutes so that you can share with us a little about yourselves.

1. Tell us your name, where you live, when did you start hazelnut farming, what did you do before? What is the size of your hazelnut orchard and how important is it for your family economy and your community?

#### **(KEY QUESTIONS [60 minutes])**

1. How (organic) hazelnut prices have developed in the last years? What was the reason of the price changes?
2. How (organic) hazelnut costs have developed in the last years? What was the reason of the cost changes?
3. What natural factors are obstacles to growing your business (early frosts, heavy winds, heavy and long spells of rains, lengthy and/or frequent draughts, highly acid soils, soil erosion by (rain)water, soil nutrient deficiency, invasive pests and diseases: BMSB, fungal and bacterial diseases or others.)
2. What type of services do you currently use in hazelnut production?
3. What services you need are not available on the market? (if any)
4. Which are the most critical services available/not available? And why are they critical?
5. Are you satisfied with the quality of services from various providers? Please explain answer about each service provider (**why it is satisfactory (quality, price, timing, geography etc.) or why not – what are the gaps from your point of view**)
6. What do you think how each service can be improved (if needed) to become more effective and/or accessible to you (e.g. price, interest rate, location, quality etc.)?
7. What are your major needs/opportunities in the areas of input cost, quality, and availability?

### ENDING QUESTIONS [15 minutes]

8. How active are young people in (organic) hazelnut production? Are they involved in service provision? In what kind of activities (e.g., farming, providing pruning services)?
9. How actively are women in your household involved in organic hazelnut production?
10. What is the benefits of organic hazelnut production for farmers?
11. Do your neighbors want to start organic hazelnut production?
12. Before we conclude, is there anything we missed or is there anything that we should have talked about but we didn't?

### Questionnaire for Individual Interview with Government and Experts

#### Introduction

Thank you very much for accepting to talk to us and taking time. The topic of the research is the value chain of Hazelnuts in Western Georgia. The focus is on the development of organic hazelnut value chain.

Category	Code	Tentative respondents
Extension service providers including international projects, associations, governmental	A	-Information-consultation Center of the MoA in Zugdidi -Anguli Miqava , representatives from other two municipalities Ferrero - Irakli Moistrapishvili UNDP - Konstantine Kobakhidze Teona Kubulava- Zugdidi University + Tractor, GGFA – Agronaut team in Tbilisi
Experts and agents of change including those from international / non-governmental organizations	B	OXFAM – Levan Dadiani CARE – Gia Glonti Rati Shavgulidze
Authorities	C	APMA – Levan Magradze National Food Agency - Nikoloz Meskhi

## General Information

1	Name of the interviewer	
2	Date of the interview	
3	Name of the respondent	
4	Organization	
5	Field of activity	
6	Position	
7	Location of the interview	
8	Contact information (telephone, e-mail)	

### Situation in (organic) hazelnut value chain

1. As hazelnut sector is one of the key priority sectors for government of Georgia, what are the main directions of government support? What projects are planned for sector development? Is there any project in progress?
2. What are the main obstacles for hazelnut sector development and, in general, productivity/profitability? Is it the same for organic hazelnut sector development?
3. In your opinion, what part of the (organic) hazelnut value chain needs assistance most at this stage? (production-processing-realization/marketing)
4. How you see the development of (organic) hazelnut value chain? What should be the roles?
5. Can you please name organizations, apart from the Governmental ones, which seek to develop the sector, including organic hazelnut sub-sector? Which are most important in your opinion and why?

### Service availability

6. What is the current situation regarding infrastructure and government policies/regulations related to hazelnut sector?
7. Which are the most critical services available/not available? And why are they critical?
8. What do you think how each service can be improved (if needed) to become more effective and/or accessible for farmers?
9. What do you think who should pay for extension services for farmers in four years' time? What should be the role of the government?

10. In your opinion, how important is to develop the following services?

	1. not at all	2. Little	3. Important	4. Very important
1.Laboratories providing soil & product analysis				
2.Husking services				
3.Pruning				
4.Drying				
5.Mechanization				
6.Warehousing				
7.Credit and insurance providers				
8.Extension				

**Access to Information (A)**

Are you providing extension services directly to the farmers?

1. How do you reach the farmers? (Please specify geographical coverage)
2. What extension methods do you use?
3. What are the most effective extension methods as of your experience? (e.g. trainings, individual consultations, using social media or e-applications etc.)
4. How often do farmers use your services? Did the frequency of use those services change during the last year?
5. What are most sought after info and knowledge?
6. What are most problematic topics among farmers judging by the requests?
7. Do you provide any information about organic pesticides, fertilizers? If yes, please specify.
8. Are you going to introduce new services for organic hazelnut producers?
9. What kind of support do you need to improve your services? Please prioritize
10. Is there anything we missed or is there anything that we should have talked about but we didn't?

[Questionnaire for Individual Interview with Farmers](#)

**Introduction**

Thank you very much for accepting to talk to us and taking time. The topic of the research is the organic value chain of hazelnuts in Western Georgia. The research is undertaken upon the request of the organic hazelnut development consortium consisting of Swiss HEKS-EPER, ANKA, PAKKA and Georgian Bio farming Association ELKANA. The aim of the research is to see how and where the consortium could provide effective assistance to West Georgian organizations and individuals offering services to hazelnut farmers.

## General Information

1	Name of the interviewer	
2	Date of the interview	
3	Name of the respondent	
4	Field of activity	
5	Location of the interview	
6	Place of Residence	
7	Organic and/or UTZ Status	
8	Size of hazelnut plantation / of which organic	
9	Contact information (telephone, e-mail)	

## Opening questions

1. How (organic) hazelnut prices have developed in the last years? What was the reason of the price changes?
2. How (organic) hazelnut costs have developed in the last years? What was the reason of the cost changes? How prices of (organic) hazelnut differ according to quality and seasons?
3. **What natural factors are obstacles to growing your business? Please select the most important issues.**

1. Early frosts	•
2. Heavy winds	•
3. Heavy and long spells of rains	•
4. Lengthy and/or frequent draughts	•
5. Highly acid soils	•
6. Soil erosion by (rain)water	•
7. Soil nutrient deficiency	•
8. Invasive pests and diseases: BMSB, fungal and bacterial diseases	•
9. Other: Specify	•



## Services and Inputs

4.

		Quality of the Service		
1.Laboratories providing soil, leaf & product analysis	•	1.Poor	2.Average	3.Good
2. Purchase of seedlings	•	1.Poor	2.Average	3.Good
3. Machinery: ploughing/ cultivation/ fertilization	•	1.Poor	2.Average	3.Good
4. Machinery: spraying	•	1.Poor	2.Average	3.Good
5. Machinery: drainage	•	1.Poor	2.Average	3.Good
6. Purchase of inputs: fertilizers, pesticides, lime	•	1.Poor	2.Average	3.Good
7. Harvesting services	•	1.Poor	2.Average	3.Good
8.Husking services	•	1.Poor	2.Average	3.Good
9.Pruning	•	1.Poor	2.Average	3.Good
10.Drying	•	1.Poor	2.Average	3.Good
11.Warehousing	•	1.Poor	2.Average	3.Good
12.Credit	•	1.Poor	2.Average	3.Good
13. Insurance	•	1.Poor	2.Average	3.Good
14.Extension	•	1.Poor	2.Average	3.Good

5. Which are the most critical services available/not available? And why are they critical? What services you need are not available on the market? (if any)
6. Are you satisfied with the quality of services from various providers? Please explain answer about each service provider (**why it is satisfactory (quality, price, timing, geography etc.) or why not – what are the gaps from your point of view**)
7. What do you think how each service can be improved (if needed) to become more effective and/or accessible to you (e.g. price, interest rate, location, quality etc.)?
8. Have you ever used organic fertilizers, pesticides? (*question is irrelevant for farmers with organic status*)
9. Is the price of the organic fertilizers, pesticides affordable to you? What is the price difference between organic and non-organic fertilizers, pesticides?
10. Are you satisfied with the quality of organic fertilizers, pesticides you use? Non-organic?
11. Where do you get information about organic fertilizers, pesticides?
12. What are your major needs/opportunities in the areas of input cost, quality, and availability?

### Acceptance of organic hazelnut production and informal services

13. What are the benefits of organic hazelnut production?
14. How many of your family members are involved in (organic) hazelnut production? Man? Woman? Young?
15. Are young people in your village involved in (organic) hazelnut production (as farmers or service providers (e.g., pruning, husking))?

16. Who takes care of your hazelnut orchard?
17. Do you use neighbors help with some services?
18. Is it common in your community when someone (neighbor) takes care of others orchards?
19. If yes, what are the services they need help in?
20. Is compensation in kind or money?

	Cost (GEL)	Farmer Estimation
<b>Land</b>		
Purchasing	10 000	
Renting	---	
<b>Fencing the land</b>		
Fencing poles	1 400	
Barbed wire	630	
Labor for fencing	300	
<b>Preparing Soil for Planting</b>		
Purchasing lime	275	
Lime transportation cost	250	
Applying lime by tractor	50	
Soil treatment with manure	400	
<b>Planting the seedlings</b>		
Planting the seedlings	250	
<b>Treating the orchard (1st year)</b>		
Weeding/hoeing around the plant	150	
Cultivating among the rows by tractor	260	
Pruning the trees	25	

**Expenses for planting 1 ha orchard in West Georgia (in GEL)**

**Treating 1 ha harvestable [organic] orchard**

	Cost (GEL)	Farmer Estimation
Purchasing and applying organic fertilizers	300	
Soil treatment with manure	440	
Pests and disease handling with organic pesticides	150	
Weeding/hoeing around the plant	300	
Mowing the grass between the rows/plants and Cleaning orchard from the grass (2 times)	400	
Pruning & trimming the trees; cleaning orchard from the branches	200	
Harvesting	500	
Husking	250	

**Processing costs related to 1-ton hazelnut**

	Cost (GEL)	Farmer Estimation
Drying (in-shell)	---	
Storage / warehouse (in-shell)	---	
Cracking / shelling	---	
Sorting / grading (shelled)	---	
Laboratory analysis (shelled)	---	
Packaging and labeling (shelled)	---	

***Other key questions for [organic] hazelnut processing:***

Average yield per ha

\_\_\_\_\_ kg

Average price per kg in-shell hazelnut

\_\_\_\_\_ GEL

What is the average weight loss from newly harvested (raw) hazelnut to dried hazelnut (in-shell)?

\_\_\_\_\_ %

If hazelnut is stored, what are the losses caused by weight and caused by spoiling.

\_\_\_\_\_ % \_\_\_\_\_ %

Ratio of shelled hazelnut out of 1 kg in-shell hazelnut.

\_\_\_\_\_ %

How many man/days are needed to sort out 1 ton of shelled hazelnut? (1 man/day costs 25 GEL).

\_\_\_\_\_

Average price per kg shelled hazelnut

\_\_\_\_\_ GEL

20. Is there anything we missed or is there anything that we should have talked about but we didn't?

## Questionnaire for Individual Interview with Input Suppliers and Service Providers

### Introduction

Thank you very much for accepting to talk to us and taking time. The topic of the research is the organic value chain of hazelnuts in Western Georgia. The research is undertaken upon the request of the organic hazelnut develop consortium consisting of Swiss HEKS-EPER, ANKA, PAKKA and Georgian Biological Farming Association ELKANA. The aim of the research is to see how and where the consortium could provide effective assistance to West Georgian companies and individuals offering services to hazelnut farmers.

Input Providers:

Category	Code
Seedling Producers	A
Organic input producers/importers	B
Service providers	C

### General Information

1	Name of the interviewer	
2	Date of the interview	
3	Name of the respondent	
4	Main products and/or services	
5	Location of the interview	
6	Geographic coverage	
7	Location of wholesaling point(s) – only own	
8	Location of retail selling point(s) – own or through other retailers	
10	Number of staff members	
11	Legal form	
12	Year of establishment	
13	Contact information (telephone, e-mail)	

### Production, products (A, B)

1. Are you a producer or importer/seller of seedlings/inputs?
2. If you are a producer what varieties of seedlings /organic inputs (organic (only) fertilizers, pesticides) do you produce?

3. What is the niche of organic fertilizers/pesticides in Georgia/your product range? How many organic inputs do you produce/sell?
4. If you are a producer what is your actual production rate and maximum capacity?
5. If you are a retailer/seller where do you get your (organic) product (from local producers/importers, direct import)?
6. To what extent is the hazelnut sector central to your business?
7. What are the market advantages of your products for (organic) hazelnut sector?
8. What are the main strengths and weaknesses of your products in terms of quality? And how you test their effectiveness for local conditions/hazelnut production?
9. Which key internal and external factors affect your production/business (phytosanitary regulations, taxes, infrastructure, wheatear, natural factors and availability of specialists/expertise in Georgia, innovations, technological difficulties etc.)?
10. Have you introduced new varieties of organic products (seedling, pesticide, fertilizers) during the last three years? Please, specify
11. Do you accompany your product with relevant instructions/guides for use? If yes please specify the type and if it's done verbally and/or through documentation.

#### **Services (C)**

12. What kind of services do you provide? (Laboratory – soil/leaf, product, mechanization, warehousing. etc.)
13. What are your products (in case of insurance and credit institutions)
14. What is your actual service provision rate and maximum capacity
15. To what extent is the hazelnut sector central to your business?
16. What are the market advantages of your services for hazelnut sector?
17. What are the main strengths and weaknesses of your service in terms of quality/affordability? How often farmers use those services? Did the frequency of use change during the last three years?
18. Which key internal and external factors affect your services to hazelnut farmers (regulations, taxes, infrastructure, wheatear, natural factors and availability of specialists/expertise in Georgia, innovations, technological difficulties etc.)?
19. Have you introduced new services/new configuration of service packages during the last three years? Please, specify
20. To what extent does serving organic farmers make difference (in terms of time, difficulty, price of service)?

#### **Clients**

21. Who are your main clients?
22. What is the size (in terms of ha) of the farmers who often approach you? (small, medium, large)
23. How often are you approached by hazelnut farmers?

24. How many farmers did you serve last year? How many of them were organic farmers?
25. On average, how many hazelnut farmers out of ten buy hazelnut seedlings / (organic) fertilizers, pesticides? Please specify which product? (A,B)
26. On average, how many (organic) hazelnut farmers out of ten use type of services you provide in your area (e.g. how many for 10 farmers have credits or use mechanization in general)? Please specify which service? (C)
27. Are farmers satisfied with quality, scale, price or timeliness of your products/services? If not why?
28. Do farmers complain about the price and/or quality of your (organic) products/service? Is it perceived to be high?
29. What do you think is required to boost your number of clients among organic hazelnut grower farmers? What is needed to offer better quality services?

### **Market and sales dynamics**

30. What is the share of your products/organic inputs for hazelnuts on Georgian or regional/local market? Please explain even if zero share(A,B)
31. What is the share of your business in Georgian or regional/local market? Please explain even if zero share(how many service providers are in the municipality, region, country)(C)
32. What is the market dynamics for seedlings/organic inputs/services on Georgian or regional/local market? (increase/decrease/stable)
33. What is the demand for your service on Georgian or regional/local market? (Increase/decrease/stable)(C) Please specify the answer
34. What is the price dynamics for seedlings/organic inputs on Georgian or regional/local market? (increase/decrease/stable)(A,B)
35. What is the price dynamics for your service on Georgian or regional/local market? (increase/decrease/stable)(C)
36. What is the price of the seedlings you sell (local, imported)? (A)
37. What the price range is for inputs you sell (local, imported, retail, wholesale, organic, and conventional)? (B)
38. What is the price/interest rate of each service you offer? (C)
39. What is the average cost margin (per/ha) for fertilizers, pesticides for organic hazelnuts, production cost per ha?(B)
40. What factors affect sales of your products/service (high price, low awareness, etc.)?
41. Are there any quality standards / guidelines you follow? If yes, please specify
42. Do farmers face difficulties paying back the credit? What is the average rate of default? (E)
43. Do you have formalized contracts with farmers outlining the details of your service delivery (timing, price, etc.)? Is there a need for such contracts? (C)

### Cost for different treatments

Treatment	Unit	Price	Comments
1. Lime			
2. Herbicides			
3. Nitre			
4. Fungicides / insecticides			

### Problems and needs, future plans (organizational, regulations, infrastructure etc.)

44. What kind of financial and technical, legislative/normative challenges do you face while working with hazelnut farmers? Please, explain
45. What are you doing to counter the challenges?
46. What do you expect from authorities, international organizations and farmers to do to alleviate the issues that you raised?
47. Considering all the above said please elaborate on your needs by order of priority
48. If informal service provider: How many service providers like you operate in your village? Approx. how many are there in the municipality?
49. If informal service provider: What time does your service take?
50. If informal service provider: What is the compensation for your work?
51. Is there anything we missed or is there anything that we should have talked about but we didn't?

### Questionnaire for FGD respondents

Name, Surname	
Date of birth	
Number of Household members	
Number of household members actively involved in (Organic) hazelnut production	
Number of woman in household actively involved in (Organic) hazelnut production	
Size of the Hazelnut Plantation	
Organic and/or UTZ Status	

### What natural factors are obstacles to growing your business? Please select the most important issues.

1. Early frosts	•
2. Heavy winds	•
3. Heavy and long spells of rains	•

4. Lengthy and/or frequent draughts	•
5. Highly acid soils	•
6. Soil erosion by (rain)water	•
7. Soil nutrient deficiency	•
8. Invasive pests and diseases: BMSB, fungal and bacterial diseases	•
9. Other: Specify	•

**What type of services do you currently use in hazelnut production?**

		<b>Quality of the Service</b>		
1.Laboratories providing soil, leaf & product analysis	•	1.Poor	2.Average	3.Good
2. Purchase of seedlings	•	1.Poor	2.Average	3.Good
3. Machinery: ploughing/ cultivation/ fertilization	•	1.Poor	2.Average	3.Good
4. Machinery: spraying	•	1.Poor	2.Average	3.Good
5. Machinery: drainage	•	1.Poor	2.Average	3.Good
6. Purchase of inputs: fertilizers, pesticides, lime	•	1.Poor	2.Average	3.Good
7. Harvesting services	•	1.Poor	2.Average	3.Good
8.Husking services	•	1.Poor	2.Average	3.Good
9.Pruning	•	1.Poor	2.Average	3.Good
10.Drying	•	1.Poor	2.Average	3.Good
11.Warehousing	•	1.Poor	2.Average	3.Good
12.Credit	•	1.Poor	2.Average	3.Good
13. Insurance	•	1.Poor	2.Average	3.Good
14.Extension	•	1.Poor	2.Average	3.Good



### Expenses for planting 1 ha orchard in West Georgia (in GEL)

	Cost (GEL)	Farmer Estimation
<b>Land</b>		
Purchasing	10 000	
Renting	---	
<b>Fencing the land</b>		
Fencing poles	1 400	
Barbed wire	630	
Labor for fencing	300	
<b>Preparing Soil for Planting</b>		
Purchasing lime	275	
Lime transportation cost	250	
Applying lime by tractor	50	
Soil treatment with manure	400	
<b>Planting the seedlings</b>		
Planting the seedlings	250	
<b>Treating the orchard (1st year)</b>		
Weeding/hoeing around the plant	150	
Cultivating among the rows by tractor	260	
Pruning the trees	25	

### Treating 1 ha harvestable [organic] orchard

	Cost (GEL)	Farmer Estimation
Purchasing and applying organic fertilizers	300	
Soil treatment with manure	440	
Pests and disease handling with organic pesticides	150	
Weeding/hoeing around the plant	300	
Mowing the grass between the rows/plants and Cleaning orchard from the grass (2 times)	400	
Pruning & trimming the trees; cleaning orchard from the branches & sanitary measures	200	
Harvesting	500	
Husking	250	

### Processing costs related to 1-ton hazelnut

	Cost (GEL)	Farmer Estimation
Drying (in-shell)	---	
Storage / warehouse (in-shell)	---	
Cracking / shelling	---	
Sorting / grading (shelled)	---	

Laboratory analysis (shelled)	---	
Packaging and labeling (shelled)	---	

*Other key questions for [organic] hazelnut processing:*

Average yield per ha

\_\_\_\_\_ kg

Average price per kg in-shell hazelnut

\_\_\_\_\_ GEL

What is the average weight loss from newly harvested (raw) hazelnut to dried hazelnut (in-shell)?

\_\_\_\_\_ %

If hazelnut is stored, what are the losses caused by weight and caused by spoiling.

\_\_\_\_\_ % \_\_\_\_\_ %

Ratio of shelled hazelnut out of 1 kg in-shell hazelnut.

\_\_\_\_\_ %

How many man/days are needed to sort out 1 ton of shelled hazelnut? (1 man/day costs 25 GEL).

\_\_\_\_\_

Average price per kg shelled hazelnut

\_\_\_\_\_ GEL

## Annex 2

### List of Respondents

Respondent	Telephone	Organization	Service	Date of the Interview	Start Time	Place of the Interview	Interviewer
Ali Kizildag	574765959	Anka	warehousing	2.03	17:00	Zugdidi	Ia Katsia
Bacha Gergedava	568343427	Ind. Farmer	warehousing/Drying	5.03	14:21	Tsalenjikha	Salome Deisadze
Koba Gabiskiria	558532511		Mechanization	4.03	11:30	Orsantia	Salome Deisadze
Gogita Nanava	568151422		Organic input provider	6.03	15:00	Zugdidi	Dato
Badri Kakachia			Organic input provider	6.03	13:50	Zugdidi	Dato
Beka Mardaleishvili	599 12 65 88		Organic input provider	7.03	14:30	Vani	Ia Katsia Dato Zhorzholiani
Kakha Khutsishvili	597 170703	Agrovita	Organic input provider	5.03	15:00	Tbilisi	Pati Mamarddashvili
Karlo kioria	599 582 420	Bio Agro	Organic input provider	6.03	12:00	Tbilisi	Pati Mamarddashvili
Irine Tirqia	579079125		Seedling producer	2.03	18:00	Zugdidi	Dato Zhorzholiani
Inga Gogokhia	555160997		Seedling producer	2.03	14:00	Zugdidi	Dato Zhorzholiani
Giorgi Kakulia	558583522		Seedling producer	3.03	17:30	Zugdidi	Salome Deisadze, Dato Zhorzholiani
Avtandil Kalandia	591052900		Conventional Farmer	2.03	2:30	Narazeni	Ia Katsia
Bichiko Otxozaria	568955303		Conventional Farmer	4.03	14:00	Darcheli	Ia Katsia
KhuKhuti Kvarackhelia	571176338		Conventional Farmer	5.03	14:00	Jgali	Ia Katsia
Maia Mikava	599 34 84 33	Agro House	Laboratory/Extension/Input supplier	3.03	15:00	Zugdidi	Ia Katia
Rusudan Takidze	599 928 761	Anaseuli	Laboratory	20.03	17:00	Phone Interview	Salome Deisadze
Liana Shubladze	577 710 181	Test Lab/Agruni	Laboratory/Extension/Input shop	6.03	17:00	Tbilisi	Pati Mamarddashvili
Ninutsa Nanitashvili	599 52 00 43	Tractori	Extension			Tbilisi	Ia Katia
Giorgi Kvaraia	599 32 50 15		Zugdidi Extention	6.03	16:30	Zugdidi	Ia Katia
Teona Khupenia	577 49 90 41		VET (extention)	6.03	16:30	Zugdidi	Salome Deisadze, Dato Zhorzholiani
Ivane Sanadiradze	599 91 96 98		Vani Extension	7.03	14:00	Vani	Ia Katia
Irakli Moistsrapishvili	577080640		Ferrero (USAID)	6.03	10:00	Zugdidi	Ia Katia, Salome Deisadze

Tengiz Kalandia	577204593		Bio Farmer	4.03	14:30	Narazeni	Dato Zhorzholiani
Jambul Ekhvaia	593425764		Bio Farmer	2.03	13:30	Khurcha	Salome Deisadze
Tamaz Gereldava	592190149		Cooperative/husking	5.03	14:50	Pakhulani	Ia Katsia
Leri Kheladze	595 90 85 29		Cooperative/husking	7.03	13:30	Vani	Dato Zhorzholiani
Vakhtang Merkvilishvili	574 380370		Cooperative	7.03	12:00	Vani	Dato Zhorzholiani
Kakha Golandzia	577312570		Mechanization (Cooper)	4.03	14:00	Orsantia	Salome Deisadze
Giorgi Mebonia	595011968		Credo	4.03	17:00	Zugdidi	Ia Katsia
Lekso Shengelia	593 400 180		Crystal	5.03	20:00	Zugdidi	Ia Katsia
Levan Magradze	595 511915	APMA	Insurance/Government	6.03	15:00	Tbilisi	Pati Mamardashvili
Nikoloz Meskhi	577 08 07 08	NFA/MoA	Authority	5.03	17:30	Tbilisi	Pati Mamardashvili