Value Chain Analysis of Fruits (Apple, Pear, Plum), Vegetables (Tomato, Cucumber), Beekeeping and Non-Timber Forest Products in Mtskheta-Mtianeti Region

Research

ELKANA

With funding from
Austrian Development Cooperation

Organic Agriculture and Rural Tourism Development in Mtskheta-Mtianeti Region

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Vegetables (Tomato, Cucumber),
Beekeeping,
Non-Timber Forest Products

Implemented by Biological Farming Association ELKANA
Funded by Austrian Development Cooperation
Research Conducted by PMC Research

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GLOSSARY

ARDA	-	Agricultural and Rural Development Agency
EUROSTAT	-	Statistical Office of the European Union
FAO	-	United Nations Food and Agriculture Organization
GEOSTAT	-	National Statistics Office of Georgia
LQ	-	Location Quotient
MSMES	-	Micro, Small and Medium-sized Enterprises
NBG	-	National Bank of Georgia
NTFP	-	Non-Timber Forest Products
OA	-	Organic Agriculture
VC	-	Value Chain
VCA	-	Value Chain Analysis

1. INTRODUCTION

The Project "Organic Agriculture and Rural Tourism Development in Mtskheta-Mtianeti Region" is implemented by Biological Farming Association ELKANA and funded by the Austrian Development Cooperation. It is carried out in two geographic areas – Tianeti Municipality and Lower Pshavi area (Dusheti Municipality) of Mtskheta-Mtianeti region.

The overall objective of the project is to create economic opportunities for men and women in deprived rural areas with high potential for sustainable tourism and organic agricultural development. By focusing on generating economic opportunities in these two sectors, the expected impact of the project is to reduce poverty through sustainable local economic development in the Mtskheta-Mtianeti region.

One of the components of the project is to support rural households in target areas to improve their agricultural practices and start sustainable local development initiatives. The project will develop the capacities of target groups by organizing training courses, consultations, and study visits for farmers and businesses.

The first activity under the component was to select organic agricultural products with maximum potential for income generation, simultaneously considering other factors such as climate change and economic opportunities for vulnerable groups.

The second activity was to conduct value chain studies for selected organic agricultural products in target areas, focusing on the following issues:

- Understand the market system for organic agriculture (OA)
- Identify opportunities for green growth within these sectors in the project areas
- Understand the challenges and potentials for vulnerable population
- Develop recommendations for the project to ensure maximum benefit of the poor and vulnerable groups as well as the environment; these recommendations to be in line with national development plans and commitments

To achieve the project objectives, at the first stage, PMC Research carried out a thorough selection process for organic agriculture value chains, as a result of which, the following value chains have been selected for detailed study:

- Fruits (apple, pear, plum)
- Vegetables (tomato, cucumber)
- Beekeeping
- Non-timber Forest Products (NTFP)

For selected value chains, keeping focus on a vulnerable population, PMC research conducted the following activities:

- Market analysis of selected OA products
- Value chain analysis of selected OA products - Mapping of individuals/organizations involved in selected value chains and constructing a grid map, depicting the situation in Tianeti Municipality and Lower Pshavi
- External stakeholder analysis
- Profitability analysis
- SWOT analysis
- Recommend interventions to support inclusive and sustainable development

2. RESEARCH METHODOLOGY

The research methodology includes a selection of OA VCs, which have the potential for income generation and value chain analysis of the selected OA products.

2.1 SELECTION OF OA VCS WHICH HAVE THE POTENTIAL FOR INCOME GENERATION

The first step of the project was to select the agricultural VCs with potential for organic production and income generation in target municipalities. For this reason, PMC Research conducted mapping of agricultural products in target areas. For this purpose, statistics were gleaned from Agriculture information-consultation centers in Tianeti and Dusheti municipalities.

After completing the mapping of agricultural products, the VCs were selected by using the methodology developed based on the European best practices and finetuned by the PMC Research team over the course of the past VC studies. The selection of organic products was based on three criteria:

- Concentration
- Competitiveness
- Impact

Each of the above-mentioned had several sub-criteria (see table 1). For each criterion, the scores ranged from 1 to 10 points (the higher the score, the better), and then weighted sum was calculated. The products having the maximum weighted sums were selected for further analysis.

Table 1: VC selection criteria

SELECTION CRITERIA	DESCRIPTION OF CRITERIA	WEIGHT
Concentration		**10%**
Concentration	The concentration level of a product in the target areas.	10%
Competitiveness		**60%**
Local market demand potential	Existing and projected demand for organic product (primary as well as processed) on national level (across Georgia)	20%
EU market participation (export) potential	Potential of the product to be exported to the EU market	20%
Climate conditions – current state and future climate change	Current climate conditions and possible climate changes, which may have an impact on production in target areas	20%
Impact		**30%**
Job creation potential in the frame of the project	Potential of the product, in the frame of the given project, to spur job creation process in target regions, if developed	10%
Economic opportunities for women and vulnerable groups	Potential of a product to create economic opportunities for women and vulnerable groups in target regions	10%
Potential, a large number of producers to be involved	Potential of a product to involve a large number of producers in target regions considering barriers to entry (need for initial investment)	10%

For scoring agricultural products together with desk research, the fieldwork was done. To analyze the consumption/demand for organic products, consumer characteristics and preferences were analyzed.

The analysis was based on the interviews conducted with the actors in retail trade and restaurant sector related to organic agriculture: Shavi Lomi, Carrefour, soflidan.ge, Georgita, and Tserti. Furthermore, the interviews were conducted with Export Development Association, Elkana experts, and Caucascert representatives, to establish export trends and possibilities of organic production sector.

Moreover, the focus group was assigned in Tianeti, with 14 farmers, representing production of vegetables, berries, maize, potato, bean, beekeeping, fruit, non-timber forest products, cattle breeding and diary, sheep and pig breeding, chicken and turkey farmers. Discussed topics were:

- Production patterns and difficulties
- Organic farming and certification issues
- Infrastructural issues such as water, roads, availability of machinery, etc.
- Demand on agricultural production, sales
- Rural tourism patters and existing infrastructure
- Situation for vulnerable population women, youth, people with disabilities
- Land availability and registration issues
- Export possibilities and related issues
- Availability of finances

The detailed scores of each agricultural product existing in Tianeti and Lower Pshavi are given in chapter 3 of this report. The list of conducted interviews is given in Annex 1 (1.VCA Selection – Interviews and 2.VCA Selection - Focus group)

2.2 VALUE CHAIN ANALYSIS OF SELECTED OA PRODUCTS

After the value chains were selected, detailed study was carried out for each of them. First, the desk research was done. This was followed by the telephone interviews conducted[1] with representatives of each selected value chain.

- The value chain analysis includes:
- Market analysis of selected OA products
- Value Chain analysis of selected OA products
- External stakeholder analysis
- Profitability analysis
- SWOT analysis
- Recommend interventions to support inclusive and sustainable development

2.2.1 DESK RESEARCH

In order to conduct market analysis of selected OA value chains, the following data was obtained from National Statistics office of Georgia:

- Population in target regions
- Volume of production on national, regional levels
- Land area operated by agricultural holdings according to land use type

[1] Due to the given circumstances created by COVID-19, telephone interviews were conducted

- Prices of products, in supermarkets and farm-gate
- Trade statistics (volume and prices of export and import)

To analyze the volume of production at local level, the statistics were gleaned from Information-consultation center in Dusheti and Tianeti municipalities.

To complete the analysis of demand and supply patterns, in addition to the above-mentioned, the data about organic and non-organic agricultural product prices as well as the existing organic products in Georgia was collected online.

To determine the availability of support programs and the existing situation in obtained grants, the data about the available projects in Tianeti and Lower Pshavi was gathered from Agricultural and Rural Development Agency (ARDA). Information about the beneficiaries of these projects was also obtained.

The data about organic producers, certified organizations, and individuals was collected provided by Biological Farming Association Elkana and Caucascert, organic certification provider organization. Moreover, the data about the existing financial institutions in target regions was gleaned from the National Bank of Georgia (NBG).

2.2.2 FIELD RESEARCH

During the main value chain study stage, the online interviews were conducted with the representatives of selected OA product value chains. The questionnaires were developed for each actor of value chains.

Table 2: List of interviews conducted

VALUE CHAIN	VALUE CHAIN ACTOR	NUMBER OF INTERVIEWS	MALE	FEMALE
Fruits (apple, pear, plum)	Primary Production - Farmer	7	6	1
Vegetables (tomato, cucumber)	Primary Production - Farmer	10	7	3
Beekeeping	Primary Production - Farmer	9	5	4
Non-Timber Forest Products	Collectors	6	4	2
	Cooperatives	2	2	-
	Processing enterprises	1	1	-
All Value Chains	Input Suppliers - Nursery	2	2	-
All Value Chains	Input Suppliers - Suppliers of fertilizers and pesticides	1	1	-
All Value Chains	Input Supplier - Suppliers of machinery and equipment	1	1	-
All Value Chains	Input Supplier - Laboratories for Soil Analysis	1	1	-
All Value Chains	Certification Agency	1	1	-
All Value Chains	Vocational educational institutions (VET Institutions)	1	1	-

Age range of interviewees was from 26 to 73, with approximately half of them being more than 55. There were a very few interviewed farmers below the age of 35. All Interviewed farmers were perceived as vulnerable, due to their lack of access to finance, current poor living conditions, lack of academic knowledge and attended trainings as well as low-income levels.

For detailed information about conducted interviews see Annex 1 (3. OA VCA). The value chain selection process took place in January and February. Detailed value chain studies were conducted from the end of February to May. All activities were carried out in close collaboration and with support of Elkana.

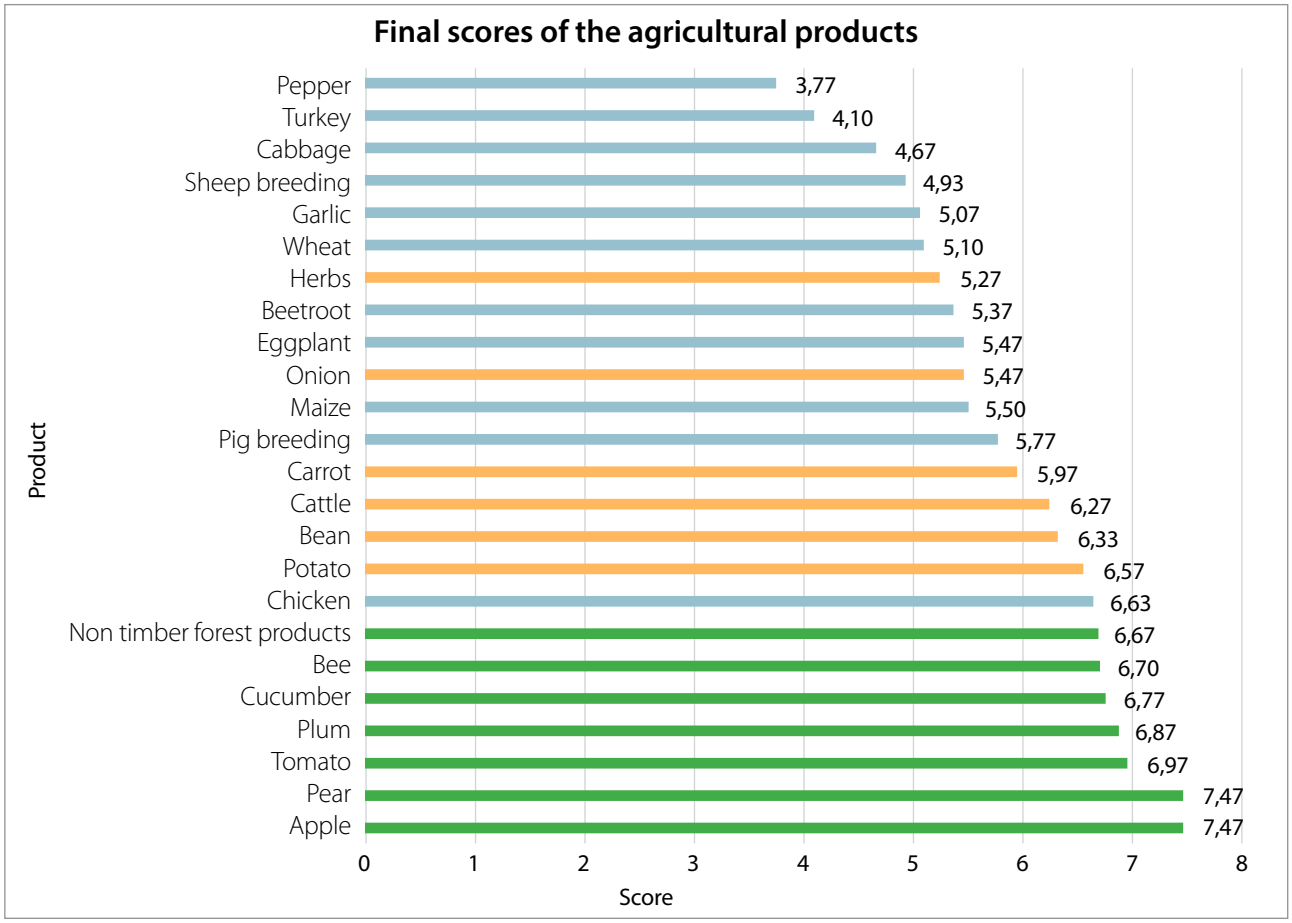
2.3 RESEARCH LIMITATIONS

The given study has several limitations:

- There is incomplete statistical information on the municipality and community level in Georgia.
- There is no complete database of farmers by location and agricultural product.
- Due to COVID- 19, the Government of Georgia announced the state of emergency during March-May 2020, therefore the research team was unable to conduct face to face in-depth interviews, as planned. Instead, the phone interviews were conducted. However, this did not have a negative impact on the research process due to value chain participants' high motivation and willingness to provide information about their activities.

3. SELECTION OF VALUE CHAINS

Based on the selection criteria, agricultural VCs with potential for organic production and income generation in target municipalities were selected. Final scores of the agricultural products are given on the graph below (for the detailed description of selection OA value chains see Annex 5 - Selection of Value Chains).



- Products marked in green were selected as priority and detailed value chain analysis will be conducted
- Products marked in orange are highly concentrated in target areas, demanded in local markets and interventions in these areas can be sought by the OART project.

Based on the scores, PMC Research has selected the following products for the detailed VC Analysis:

Table 4: The selected agricultural products for the VC analysis

THE SELECTED AGRICULTURAL PRODUCTS FOR THE VC ANALYSIS	DESCRIPTION
Fruit Growing (apple, pear, plum)	Due to climate conditions, fruit growers in Tianeti Municipality do not use any chemical substances against pests and diseases. Fruit can be proceeded to produce pectin (natural thickening and gelling agent), which is a niche product and can be used for export. Acquiring a bio-certificate can still be time-consuming but should not be resource-intensive. Demonstrative gardens can be organized for Tianeti fruit-growers and other interested parties to deepen their knowledge in this regard. Fruit are among the products most demanded in local (Georgian) market, having high export potential in EU, and development of fruit value chains could improve economic situation for women and vulnerable groups.

Vegetables (Tomato, cucumber)	Due to climate conditions, Tianeti farmers produce cucumbers and tomatoes with distinguished taste and quality. The only problem is lack of heat, which can be fixed by constructing simple greenhouses. These products are one of the most concentrated and most demanded ones in local (Georgian) market. Furthermore, there are a lot of products that can be produced from tomatoes (juice, concentrates). These products have export potential in many countries. Other vegetables that undergo similar processes, may also be considered alongside tomato and cucumber in this regard.
Beekeeping	Geographical location and a large variety of plants in Tianeti gives beekeepers (and producing various products such as honey, royal jelly, honeycomb, propolis, etc.) an advantage compared to other regions. Additionally, having bees in the area is beneficial for other directions in agriculture as well. Honey is one of the most demanded products in local (Georgian) market.
Non-Timber Forest Products	This direction has the highest export potential. There are already several producers who export the products to various countries, so there is an experience to learn from. Furthermore, certification process is rather easy compared to other directions. There are still a lot of unused resources in Tianeti forests and due to geographic location, a high variety of wild berries and medicine plants.

One can see from the chart that several products were not chosen, however, their scores are close to the selected products. Some of the products are highly concentrated in target areas and are most demanded in local markets. These are cattle breeding, chicken, beans, potato, onion, herbs, and carrot production:

Cattle breeding – cattle and its proceeded products, such as meat and dairy can be a very interesting and profitable direction. Particularly, a specialty from Tianeti – Dambal Khacho (technology of its making has become an intangible cultural heritage item of Georgia), which is considered a delicacy and is far more expensive compared to other local dairy products. However, acquiring bio-certificate is rather difficult compared to other agricultural products. Due to current regulations, there is no export potential to the EU countries. Therefore, cattle breeding was not selected as a priority value chain analysis at this stage of the project. However, OART team can identify and conduct small-scale targeted interventions to support cattle breeding.

Beans, potato – Tianeti is an exceptionally good location for cultivating these cultures. Due to climate conditions, the quality of beans and potatoes is very high. What is more, converting to organic production should be relatively simple, as there is no need for using any chemical substances against pests and diseases. . However, current productivity is rather low for these cultures due to low temperature and irrigation system. Beans and potato were not selected for detailed value chain analysis at this stage of the project. However, similar to cattle breeding, small-scale interventions with the view to benefiting a large number of people can be considered by OART.

Onion, herbs, carrot – Onion, herbs, and carrots represent one of the most concentrated agricultural products in Tianeti Municipality. Compared to Georgia, current productivity in the municipality is higher for these products, and together with selected agricultural products, organic onion, herbs, and carrot are one of the most demanded commodities in local (Georgian) markets. Therefore, under the given project, the interventions can also be made in these directions.

4. FRUITS (APPLE, PEAR, PLUM) VALUE CHAIN ANALYSIS

4.1 GRID MAP – FRUIT VALUE CHAIN ACTORS

The following diagram shows fruit value chain in target regions.

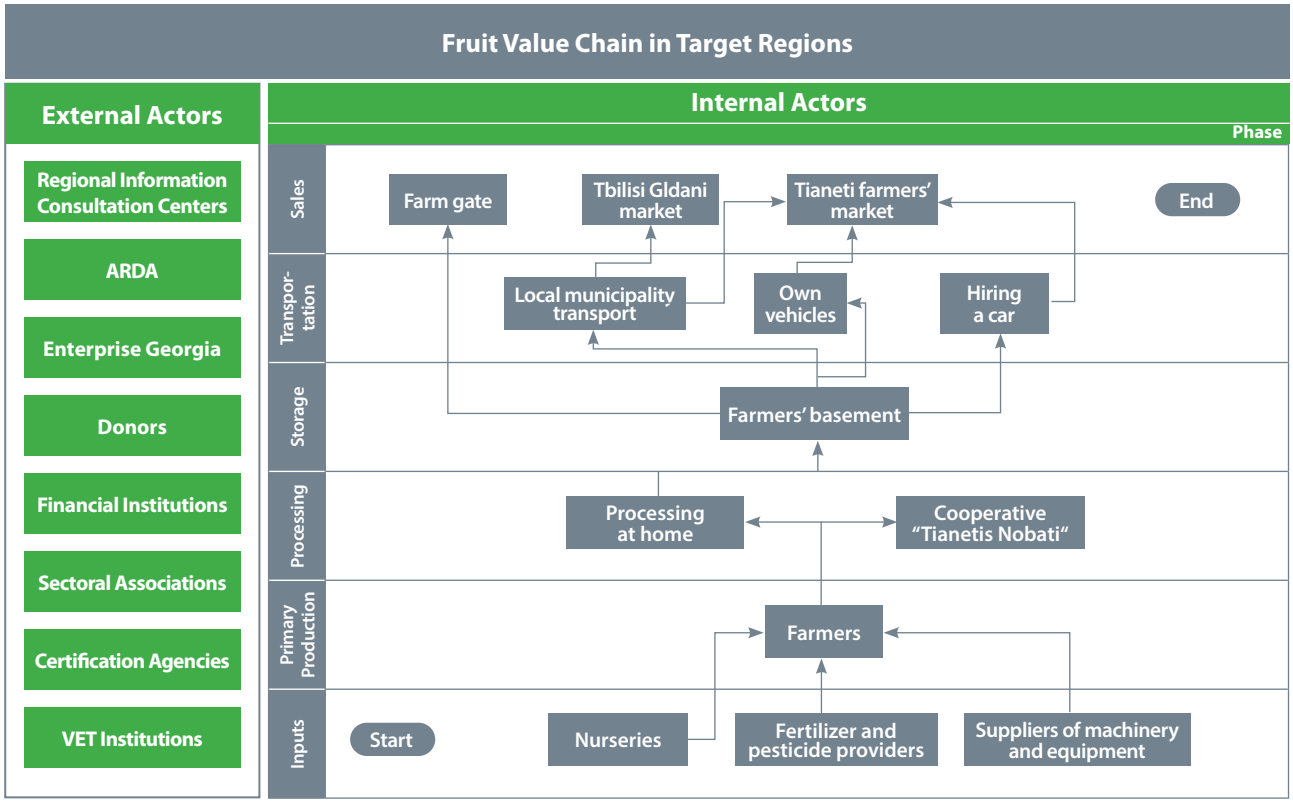


Diagram 1: Fruit Value Chain in target regions *Source: Field research*

4.1.1 INPUT SUPPLIERS

4.1.1.1 Nurseries

Georgia does not have a unified database that lists all nurseries in the country. Most of them are not registered. Even so, there are still some ways to trace some of them by using the following sources: The National Statistics Office of Georgia's 2014 Agricultural Census and Business Register, and ARDA.

Nurseries according to the National Statistics Office of Georgia's 2014 Agricultural Census

According to the National Statistics Office of Georgia's 2014 Agricultural Census, there are 1281 agricultural holdings having nurseries in Georgia. Out of these 1281, just 20 agricultural holdings are from Mtskheta-Mtianeti, while only 1 of these 20 operates in Tianeti Municipality[2].

Nurseries according to the National Statistics Office of Georgia's Business Register

According to the statistics of the National Statistics Office of Georgia's Business Register, as of March 2020, there are only 44 active registered enterprises under the economic activity "Plant propagation",[3] which comprises of production of saplings and seedbeds[4] (Business Register does not contain information about the seedlings the nursery provides). Out of these 44, only 2 operate in Mtskheta-Mtianeti region.

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[2] The census does not give the possibility to identify the name of the nursery

[3] Includes saplings and seedbeds

[4] The huge difference between the number of nurseries according to the National Statistics Office of Georgia's business register and according to the National Statistics Office of Georgia's 2014 Agricultural Census is due to most of the farmers in Georgia are not registered as a business enterprise

Both nurseries are in Mtskheta Municipality. Among them one "Geo-Nergi" is in the community of Mukhrani (the distance between Mukhrani and Tianeti Municipality is about 70 km), however, the nursery only has vine seedlings, not apple, plum or pear. Another one is in the community of Tsilkani (the distance between Tsilkani and Tianeti Municipality is about 60 km)[5].

According to the Business Register, there is no nursery in Tianeti Municipality or in Lower Pshavi area.

Number of nurseries according to the Agricultural and Rural Development Agency (ARDA)

According to ARDA, there are 63 nurseries[6] in Georgia, with none of them operating in target regions, not even in Mtskheta-Mtianeti region. Out of these 64, only 16 are producing fruits (25%), with the majority of them producing apples. The geographical distribution of fruit nurseries is also worth pointing out. 11 of the 16 nurseries are situated in Shida Kartli region, the municipality of Gori being particularly dominant, with 9 out of these 11 nurseries are situated there. 4 out of 16 nurseries are located in Kakheti region and one in Tbilisi (the detailed information about the number of nurseries by regions and municipalities are given in Table 5 below).

Table 5: Number of fruit nurseries by regions and municipalities of Georgia as of May 2020

		Number of fruit nurseries	Apple (number of nurseries having seedlings of apple)	Pear (number of nurseries having seedlings of pear)	Plum (number of nurseries having seedlings of plum)	Distance between Tianeti Municipality and this area
Georgia		16	12	7	10	
Shida Kartli	Gori	9	9	5	6	110 km
	Kareli	2	2	1	2	131 km
Kakheti	Gurjaani	1				91km
	Lagodekhi	2	1	1		131km
	Kvareli	1			1	90 km
Tbilisi	Tbilisi	1	1		1	80 km

Source: ARDA

During 2015-2019, under ARDA's program "Plant the Future" only 2 beneficiaries applied for financing nurseries, both were financed. One of them is a nursery for hazelnuts and another is a nursery for raspberry. None of them is from target areas, or from Mtskheta-Mtianeti region.

According to the "Mtskheta-Mtianeti Regional Development Strategy, 2015-2021", the lack of developed nurseries and excessive prices of saplings are major obstacles that are hindering the development of fruit production in the region. According to the strategy, there is one active fruit nursery in the region, in the municipality of Mtskheta (in Jighaura), however, there is no evidence that its activities have had a significantly positive impact on the region.

[5] The data does not give the possibility to identify which seedlings the nursery provides

[6] Source: ARDA, http://arda.gov.ge/projects/read/plant_future/51:child

Under the given research, the challenges related to the nurseries identified by the interviewed female and male farmers in Tianeti Municipality are the following:

- The non-existence of local nurseries
- Low quality of seedlings in local markets
- High price of the seedlings in local markets.

The interviewed fruit producer farmers, neither males nor females, have any information about the nursery gardens in the municipality, according to them, such nursery in the municipality does not exist. The farmers do not have even information about the existence of the nursery in Jighaura.

Some of them make plant propagation themselves, others use local Tianeti market or go to Kakheti or Tbilisi to buy seedlings. The seedlings farmers bought in those areas are mainly Antonovka, Turashauli and Banana. The price differs, its range is 5-8 GEL[7]. Based on the interviewed female and male farmers' information, the seedlings sold in Tianeti market are not produced locally (in Tianeti Municipality) but the sellers buy them in other regions of Georgia, in general in Kakheti and Shida Kartli.

Most of the farmers who bought the seedlings in Tianeti Market are not satisfied with the quality. From their point of view, the price of seedlings is too high and not in line with the quality. For most of the interviewed farmers, one of the challenges to increase their fruit business is the price of seedlings, that is too high for them. As some of the farmers stated, in the past, they were planning to increase the land area of their gardens, however they changed their minds because of the prices. One of the interviewed male farmers claimed: "I was going to arrange a plum garden; however, the seedlings were too expensive for me, the price was 8 GEL for each seedling in Shida Kartli region".

In the frame of the research, two male-owned nurseries in the municipality were identified. One nursery is located in Borough Tianeti, the owner of the nursery is 84 years old. The nursery has been in existence during the last 10 years. It is an open field area of 0.1-0.15 hectare. The average number of seedlings produced in the nursery is 200 each year, the maximum amount the farmer produced was 500 seedlings but that was years ago. For the nursery, the farmer only uses fertilizers like animal and chicken manure and does not use any chemicals. The nursery is not certified[8]. The owner of the nursery is not going to increase his business because of the problems related to health. Moreover, there is the low demand for seedlings in the municipality (this is what he thinks, but from the point of farmers, the demand for seedlings exits). The maximum amount the nursery can produce is 500 seedlings per year.

According to the owner of the nursery, the demand for his seedlings in the municipality is very low, mostly due to the fact that farmers are not informed about the presence of his nursery. Since he does not do anything in order for the farmers to be notified about its nursery, the demand for his seedlings has not changed during last 10 years. As the owner of the nursery stated, mainly the farmers in target areas buy seedlings in Gori and Kaspi municipalities.

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[7] In 2019 1EUR=3.15 GEL. During 2020 in January 1EUR=3.2 GEL, in February 1EUR=3.11 GEL, in March 1EUR=3.36 GEL, in April 1EUR=3.45 GEL

[8] The certification of nurseries is done by the Agricultural Research Center of the Ministry of Environmental Protection and Agriculture of Georgia.
The process of voluntary certification of planting materials in Georgia has been underway since 2017 and is being implemented by the Agricultural Research Center of the Ministry of Environmental Protection and Agriculture of Georgia. Firstly, the nursery should obtain a qualified nursery status, then it will be possible to get engaged in the certification process.

The price of each seedling in the nursery is 7 GEL. The types of fruit varieties in nurseries are given in Table 6 below:

Table 6: Fruit (apple, pear, plum) varieties the nursery owns in borough of Tianeti

Fruit	Variety
Apple	Winter banana, banana
	Tsarsky
	Antonovka
	Iveria (Malusdomestica'iveria')
Pear	"Aleksandrovka"
	Gulabi
	Borbala
Plum	Black plum (Shavi Kliavi)

Source: Interview with the owner of nursery

According to the owner of the nursery, all the varieties of fruit he produces are productive and adjusted to existing climate conditions. However, Antonovka was pointed out to be the best in terms of its adaptability to existing climate conditions and can be stored very long.

Another nursery is located in the village of Tegeraanebi (Tianeti Municipality), it is an open-field nursery, its area is 0.2 hectare. The owner started functioning the nursery three years ago. Apart from fruits (apple, pear, plum seedlings), the nursery has other seedlings, like vine. The nursery is in the starting point now and is going to expand its business in the following years. Currently, the owner of the nursery is doing the identification of seedlings, observes how different fruit varieties will be adjusted to existing climate conditions. This year the nursery will already have approximately 1000 fruit seedlings. The price the nursery is going to have on its seedling will be between 5-10 GEL. From the owner, the farmers also can get advice towards fruit growing.

From the perspective of the owner of the nursery, the existing varieties of fruit in Tianeti Municipality like Antonovka, Banana, etc., are not productive and they have to be replaced with new productive varieties. That is the reason why he started producing new varieties of fruits which are modern, more productive, have good characteristics and are also well known in the European Union. These varieties will have more potential and will be more productive for Georgian farmers.

According to the owner, there is interest in its nursery from the farmers in Tianeti Municipality, they call them and inquire about the seedlings that they are interested in buying. However, he has not sold its seedlings yet, as he still observes how they will be adjusted to the climate conditions of Tianeti. During the following years, the nursery is going to expand, the owner plans to increase its area from 0.2 hectare to 1 hectare. He stated that in case of expansion, he will be able to produce up to 100 000 seedlings (including vine) per year. To expand, the owner needs additional finance in order to install modern irrigation system, to arrange greenhouse structures, and other necessary equipment for the nursery. Moreover, the owner is willing to develop online platform, where he will be able to sell seedlings.

Table 7: Fruit (apple, pear, plum) varieties the nursery owns in Borough Tianeti

Fruit	Variety
Apple	Gala: Royal Gala, Gala Venus, Gala Galaxy
	Pink Lady, Malus domestica 'Cripps Pink'
	Ariwa
	Red Jona Prince

Pear	Concorde
	Josephine
	Khechechuri
	"Patardzala"
	Conference
Plum	Black Amber
	Angelina
	President
	Chumlaki red

Source: Interview with the owner of nursery

4.1.1.2 Suppliers of fertilizers and pesticides

Fruit gardens require to be sprayed by anti-fungal biopreparations (like phitocatena and biocatena), with biopreparations against pests (like Tuiringen and Lipidin). Moreover, feeding with biofertilizers (like manure, Organica) is required. Soil fertilizing and correct care is one of the important factors to increase yield. A properly selected and implemented care system increases the orchard's productivity by 20-25%; it improves fruit quality and enhances resistance to pests and diseases[9].

The fact that most organic fertilizer producers and suppliers are offering organic products to their customers along with non-organic products, makes it nearly impossible to identify every organic fertilizer supplier in Georgia. Statistical classification of economic activities also does not draw a distinction between organic and non-organic producers and traders of fertilizers. It is also likely that the popularization of organic fertilizers will not create a huge amount of new companies exclusively producing or trading with the organic fertilizers, but rather it will result in already existing companies expanding their product variety from non-organic to organic fertilizers. Because of this, it is important to analyze not only organic, but also non-organic fertilizer suppliers in Georgia.

Production of fertilizers and agrochemical products

According to the Business Register of National Statistics Office of Georgia, as of March 2020, there are only 8 companies in Georgia producing mineral fertilizers[10], and only 5 companies producing pesticides or other agrochemical products[11], none of them operating in Mtskheta-Mtianeti region.

Wholesale and retail trade of fertilizers and agrochemical products

According to the Business Register of National Statistics Office of Georgia, as of March 2020, there are 227 companies that operate in the wholesale trade of mineral fertilizers and agrochemical products[12] in Georgia. It is worth pointing out that there is a strong upward trend in the number of these companies over time, with its quantity more than doubling from 2012 to 2020. Even so, out of these 227, only 3 companies operate in Mtskheta-Mtianeti region (a share of 1.3%) and none in Tianeti Municipality and Lower Pshavi.

Retail suppliers of fertilizers in Georgia are harder to identify, as National Statistics Office of Georgia's methodology combines fertilizer retailers with flower, seed, domestic animal, and domestic animal feed retailers[13]. However, in many cases the above-listed product can be found in the same retail store, so we can still draw some conclusions from the analysis of this category. As of March 2020, there are

[9] Source: Elkana, https://elkana.org.ge/uploads/page/217/pdf/eng/publication/Fruit.pdf

[10] Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 20.15.1

[11] Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 20.20.0

[12] Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 46.75.1

[13] Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 47.76.0

586 companies falling in the above-mentioned category of retail trade. Contrary to the wholesale trading companies, their quantity has been more stable over time, with no significant change since 2015. Only 8 out of these companies operate in Mtskheta-Mtianeti (which is 1.3% of the total 586). Once again, there is no retail fertilizer supplier operating in Tianeti Municipality and Lower Pshavi.

Table 8: Number of companies in trade of fertilizers and agrochemical products

Number of companies in trade of fertilizers and agrochemical products	Georgia	Mtskheta-Mtianeti	Tianeti	Lower Pshavi
Retail trade	586	8	0	0
Wholesale trade	227	3	0	0

Source: National Statistics Office of Georgia

In Tianeti Municipality or in Lower Pshavi area, there are no organized shops where pesticides and fertilizers are sold for fruit growing. From the perspectives of the most farmers, there is no necessity such shops to be there, as mainly farmers do not use any pesticides and fertilizers in their farms. This happens mainly because they do not have knowledge how to use pesticides or fertilizers in a productive way.

The results of the interviews with the farmers revealed that a very few of them use pesticides for fruit garden, however, they even were not able to name the pesticides. Such farmers buy pesticides in Tbilisi. One of them claimed, that in the past in Tianeti Municipality, there was a shop selling fertilizers, however it was closed years ago. It is noteworthy that among those interviewed farmers who use pesticides, none of them are female. Knowledge of pesticide usage, attitude, and practices by gender perspective have not been documented in Georgia yet, however, the data from developing countries show that women's exposures to pesticides are significantly higher than it is recognized. Along with these findings poisonings and other pesticide-related injuries are greatly underestimated for women.[14]

In general, fruit producers in Tianeti do not use any pesticides or fertilizers for their fruit gardens. This fact significantly lowers the risks of serious potential health effects to which women may be more vulnerable, e.g. the exposure of women to the pesticides through agricultural work can affect their children, either in utero or through breast milk. This can have negative outcomes ranging from intrauterine growth retardation to neurological effects and potential implications for later health and productivity[15]. As the current assessment shows, neither female nor male farmers have knowledge how to look after their fruit gardens. They neither have information that fertilizers and pesticides can be both organic and nonorganic. Some of the interviewed farmers claimed they use manure as a fertilizer in their fruit gardens and it was believed to be helpful to increase yields. The current assessment also demonstrated that if we look at the knowledge of pesticide usage, men are more advanced in this regard to compare with women, that is in line with the developing countries' experience that women farmers often receive less training and instruction than male workers for working with agrochemicals.[16]

To sum up, the farmers in Tianeti Municipality do not have access to fertilizers and pesticides at local levels (both organic and nonorganic). Moreover, they do not have knowledge how to care for their fruit gardens, what pesticides, and fertilizers they have to use, and when to apply them.

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[14] Leslie London, et.al (2002) Pesticide Use and Women's Health. Available at the following link: https://www.environment.gov.za/sites/default/files/docs/pesticides_usage_health_consequencesfor_women_0.pdf Last time visited on May 5, 2020

[15] FAO (2014). Gender in Agriculture Closing the Knowledge Gap. Available at the following link: http://www.fao.org/3/i8815en/I8815EN.pdf Last time visited on May 5, 2020

[16] Same

4.1.1.3 Availability of machinery and equipment

For fruit production, a number of agrotechnical procedures have to be conducted both before planting and during harvesting process.

The machinery and equipment required for fruit growing is given in Table 9 below.

Table 9: Machinery and equipment needed for fruit growing

	Activity	Type of equipment/machinery
1	Plowing	Tractor, plow
2	Cultivating	Cultivator
3	Pruning	Pruning equipment, like pruning saws, lopping shears
4	Fertilizing	Compact spreader machine
5	Spraying the chemicals	Mordanting machine
6	Irrigating	Irrigation system
7	Harvesting	Fruit picker tool
8	Saving trees against prolonged winter frosts and late winter frosts and hail	Freezing protection systems
9	Saving trees against hail	Hail protective shades

According to the "Mtskheta-Mtianeti Regional Development Strategy, 2015-2021", one of the hindering factors of fruit production in Mtskheta-Mtianeti is non-existence of the appropriate machinery. Moreover, according to the "Midterm Development Plan of Tianeti Municipality", the lack of knowledge among the Tianeti population prevents them from realizing the importance of agrotechnology.

Suppliers of machinery and equipment according to the National Statistics Office of Georgia's Business Register

Based on the information from the National Statistics Office of Georgia's Business Register, as of March 2020, there are 2 private companies nationwide which are involved in manufacturing of agricultural machinery[17], with none of those in Mtskheta-Mtianeti. Other forms of more common activities are the wholesale trading with the agricultural machinery or renting and leasing of the machinery. 95 companies operate in the wholesale trade of agricultural machinery and equipment[18] and 48 companies operate in renting and leasing of agricultural machinery and equipment[19] in Georgia. Out of these, only one renting and leasing company, "LTD Titani" operates in Mtskheta-Mtianeti, namely, in the village Mukhrani, which is part of Mtskheta Municipality.

Table 10: Suppliers of machinery

Suppliers of machinery	Georgia	Mtskheta-Mtianeti	Tianeti	Lower Pshavi
Manufacturing	2	0	0	0
Wholesale Trade	95	0	0	0
Renting and Leasing	48	1	0	0

Source: GeoStat

[17] Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 28.30.0

[18] Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 46.61.0

[19] Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 77.31.0

One of the most prominent suppliers of machinery in Georgia is state-owned company LTD Meqanizatori, which operates under "Agricultural Logistics & Services LTD". It has service centers and dislocation centers for the machinery and equipment in nearly all regions of the country. Out of 55 dislocation centers countrywide, one is in Dusheti Municipality and one is in Tianeti Municipality. It is noteworthy that nearly all agrotechnical services needed for fruit production is performed by the Agricultural Logistics & Services LTD. Using machinery for plowing the land plot costs GEL 120 - 200 for a 1-hectare land plot and cultivating would cost GEL 60 - 100.

Apart from LTD Meqanizatori, in the frame of the research, one cooperative "Imedi" providing machinery and equipment was identified in target area. The cooperative was established in 2014 and is situated in Borough Tianeti. The cooperative has all necessary equipment for fruit gardens, like a tractor, plow, cultivator and mordanting machine.

The prices of cooperative are given in the table below:

Table 11: Prices on the services of cooperative "Imedi"

	Activity	Number of hours required (1 ha)	Price (GEL per 1 ha)
1	**Plowing**	3	150
2	**Cultivating**	2	100
3	**Fertilizing**	1	50
4	**Spraying the chemicals**	1	50

Source: Conducted interview with cooperative "Imedi"

However, according to the representative of the cooperative, the prices also depend on the prices of fuel. If the price of fuel changes significantly, the cooperative also adjusts its prices. According to the supplier of equipment, the farmers in Tianeti Municipality mainly do not conduct any necessary works in their fruit gardens and therefore, they hire their machinery very rarely for fruit growing.

According to the interviews conducted with fruit producer female and male farmers in target regions, most of the farmers do not have any machinery and equipment for fruit growing. Very few farmers use their own tractors and none of them are female. None of the interviewed female and male farmers use the service of Meqanizatori or cooperative "Imedi"; most of them do not even have information that such possibility exists.

The main challenges farmers stated are prolonged winter frosts, late spring frosts and hail. They do not have any freezing protection systems or hail protective shades implemented.

Most of the interviewed male farmers claimed that having mini tractors would make their work more productive (farmers need mini tractors for cultivating the land), while female farmers did not have such willingness. This once again confirms the difference in roles women and man play and responsibilities they have in fruit value chain activities. When female and male farmers do not have equal access to capital and property, women tend to participate in the activities where physical product transformation involves simple, relatively low-cost equipment, or no-cost equipment (such as knives and bowls, etc.). This is also stipulated by the fact that farming machinery purchase costs are high, and credits/ loans in Georgia require collateral which due to land ownership, etc. is not in favor of women. Typically, household members with economic decision-making power and access to credits and loans purchase laborsaving tools and machines. Those household members are men, even though during the interviews almost all the farmers highlighted that they were making decisions on any type of activity together with the household. It is also worth mentioning that women, if provided with increased access to machinery and tools, can reduce the need and amount of labor on their farms, that gives them time for other responsibilities

or leisure. It appeared that in Tianeti, there are no disabled farmers, nor the cases of people with disability (PWD) involving in farming were observed, which can be stipulated by no access to the different capital assets, including machineries that determines an individual's, i.e. PWD's ability to productively engage in farming.

4.1.1.4 Laboratories for soil analysis

According to ARDA's program "Plant the Future" there are three laboratories where farmers can apply to carry out soil analysis[20], however, none of the laboratories is in Mtskheta-Mtianeti region.

Table 12: Laboratories in Georgia

	Name of the Laboratory	Address (Region, municipality)
1	Soil and food diagnostic center "Anaseuli"	Samegrelo-Zemo Svaneti, Ozurgeti
2	Multitest – a chemical laboratory of food and fossils testing	Tbilisi
3	Public and University Laboratory Centre of the Agrarian University of Georgia	Tbilisi

Source: ARDA

According to the ARDA and University Laboratory Centre of the Agrarian University of Georgia, the following features have to be examined during the soil analysis:

Table 13: Price of soil analysis according to the University Laboratory Centre of the Agrarian University of Georgia

Features to be analyzed	Price according to the University Laboratory Centre of the Agrarian University of Georgia
1. Mechanical content	37 GEL
2. Humus	25 GEL
3. Nitrogen	40 GEL
4. Phosphorus	35 GEL
5.Potassium	34 GEL
6. Complex of cations	45 GEL
7. Ph level	12 GEL
8. Carbonates	11 GEL
9. EC-salinity	7 GEL
10. Preparation of recommendation	50 GEL
Total Cost	296 GEL

Source: The University Laboratory Centre of the Agrarian University of Georgia

In the frame of the project "Plant the future", it is necessary the laboratory representative to take a sample on site. Apart from Tbilisi, the Public and University Laboratory Centre of the Agrarian University of Georgia have their representatives in Ambrolauri and Gori (however it only happens during the COVID-19 period. After the virus stops, the representatives will not be presented in these municipalities, they will only be in Tbilisi). Together with the costs of soil analysis given in the above table, the farmers must cover the costs of transportation of laboratory staff.

[20] http://arda.gov.ge/projects/read/plant_future/20:child

Apart from the project "Plant the future" in general, if needed, the farmers can visit the Public and University Laboratory Centre of the Agrarian University of Georgia themselves or the employees of laboratory can take samples on site and make laboratory analysis. If farmers prefer to make soil analysis on site together with the cost of soil analysis, they have to cover transportation costs of the laboratory staff. The laboratory does make analysis of pests and diseases.

According to the research, in target areas, farmers (neither male, nor female) never have carried out soil laboratory analysis. They do not realize the importance of this activity, thinking this could be additional costs for their businesses. They do not know that by carrying out the soil analysis, the needs of soil can be determined, and the productivity of their fruit could be increased.

4.1.1.5 Access to services of agronomy and access to knowledge/information

Mainly, in Georgia the farmers have access to services of agronomy and necessary information; they also possess knowledge through the information and consultation centers, suppliers of fertilizers and pesticides.

Regional Information Consultation Centers operate under the Ministry of Environment and Agriculture of Georgia within the ministry's department of their respective municipality. The centers provide information and advice to the farmers and cooperatives on various issues related to agriculture; monitor implementation of various projects in the respective municipality; act as main actors in regional agricultural data collection and represent more general interests of the Ministry of Environment and Agriculture of Georgia. The following areas of the centers' responsibilities are relevant for the fruit products in interest within the scope of the report:[21]

- Cultivation of agricultural crops - popularization of modern agrotechnical methods of care and promotion of implementation of these practices
- Collecting and processing information on seed and planting materials available on the market, consulting interested parties according to their specific needs
- Providing information to interested parties on the availability of mechanization in municipalities, as well as their rational use
- Collecting information on plant protection products available on the market and offering valid methods for their use to interested parties
- Providing consultations to interested parties on preparatory technical measures and other organizational issues related to harvesting
- Providing recommendations to the interested parties on the storage conditions and terms of the harvest
- Within the scope of its competence, promoting the development of agricultural cooperatives
- Promoting bio-production
- Promoting the dissemination of international experience in the production and sale of agricultural products and food

Information consultation centers have agronomists, however, most of the interviewed farmers never applied to them, even they have never heard about them. Few farmers apply to information consultation centers to get information about government programs.

Apart from information consultation centers, in other municipalities of Georgia, where there are shops of fertilizers and pesticides located, farmers can receive a service of agronomists free of change . Farmers do not have such opportunities in target areas.

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[21] Core competencies of Regional Information Consultation Centers: https://mepa.gov.ge/Ge/Page/RegionalInformationConsultationCenters

Farmers do not use the support of agronomists; they think in the municipality such specialist does not exist, as they have never heard about that and applying to an agronomist in Tbilisi or other regions will cost much. The current assessment demonstrates that female farmers tend to be more willing to get consultations from an agronomist, while male farmers are more reluctant to do so. This once again affirms female farmers' lack of knowledge and practice, which was mentioned above.

In the frame of the research, it was identified that in target regions, farmers (both female and male) do not have information and awareness of modern ways of fruit growing. Moreover, there is a limited access to information and knowledge for them. Farmers do not have knowledge in soil management, water management, cropping system management, pest management, etc. If we look at information and knowledge possession from a gender perspective, the research partially supports the findings of the World Bank research, according to which women farmers have less access to agricultural information and extension services. Rather, they receive information on farming techniques through their husbands or informal sources; they do not either have a chance to participate in any trainings. The situation is even more drastic when it goes to PWDs. They have even less access to information, as there are no tailored extension and agricultural information services available to meet the specific needs of PWDs.

4.1.1.6 Labor force

Mainly, fruit producer farmers are engaged in farming with their family members and do not see the need to hire labor. According to the interviewed farmers, the knowledge of their family members in fruit growing is not enough. In general, they think that in the municipality, there is a lack of knowledge in fruit growing among population (not only fruit growing, but also in other fields of agriculture). The research demonstrated that ageing of farmers is the typical phenomenon for Tianeti. Young people are not actively engaged in fruit growing and in general in agriculture.

Even though the respondents highlight that in general, most of the activities like pruning, harvesting, sorting are shared with all groups (women, men, and youth) equally, production is still organized in a gender-specific way. This tradition of gender roles in households is based on deeply rooted stereotypes. Women are perceived as physically weak and men as strong. It is also claimed that women and men are fit for/better at different tasks. e.g. mainly men are involved while plowing in Tianeti whereas the majority of women are selling the products. More specifically, as the assessment shows, much of women's work in fruit value chain takes place in the context of family farming, typically ranges across harvesting, packaging, and processing of dry fruit products.

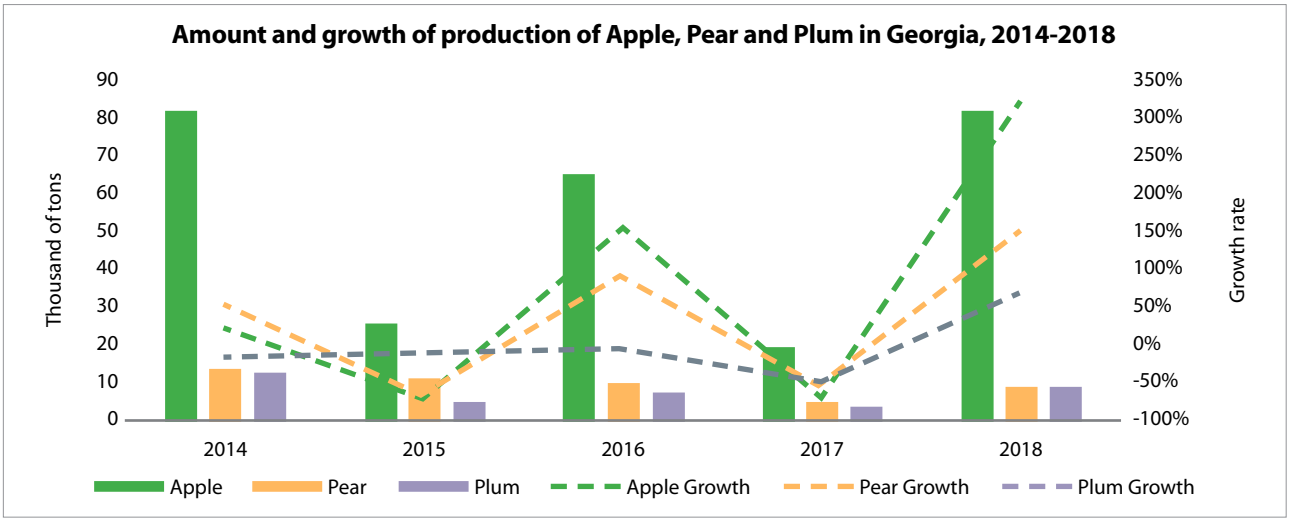
Some farmers in the process of pruning and harvesting use the help of neighbors, but in general, this is unpaid work. One of the interviewed farmers, who used the unpaid help of neighbors in the process of pruning, is unsatisfied with the knowledge and experience of his neighbors.

4.1.2 PRIMARY PRODUCTION

4.1.2.1 Fruit production in Georgia by conventional methods

According to the National Statistics Office of Georgia's Survey of Agricultural Holdings, in Georgia, production of apple, pear and plum amounted to 101.6 thousand tons in 2018.[22] Out of these 3, apple dominated in 2018, with the volume of 82.7 thousand tons, with its volume being more than 4 times the amount of the combined volume of pear (9.4 thousand tons) and plum (9.5 thousand tons) production in 2018. It is worth noting that along with having the largest volume of production over the period of 2014-2018, apple production has also been the most volatile between the three, having peaks biannually, in 2014, 2016 and 2018, while production in 2015 and 2017 were more than three times lower compared to the volume in 2018. As for the pear production volume, it has been stable over the 2014-2018 period, with a slight downward trend, while plum production volume showed no significant trend.

[22] Among this the distribution of organic and non-organic fruit is not known



Source: National Statistics Office of Georgia

4.1.2.2 Organic fruit production in Georgia

Based on Caucascert[23], that is the only agency which issues certificates proving the organic nature of the product, there are 105 entrepreneurs with active certificates. Out of them, only 5 are producing fruits.

In Georgia, the market of certified organic production being dominated by wineries and beekeeping farms. Out of 105 entrepreneurs, only 4 of them are situated in Mtskheta-Mtianeti. However, none of those 4 entrepreneurs are producing fruits.

Members of Elkana, though some of them are without a certificate of proof, apply methods of organic farming. From the members of Elkana, in Georgia 148 members are involved in production of fruits or berries, just 16 are situated in Mtskheta-Mtianeti region.

4.1.2.3 Fruit production in target regions by conventional methods

Land used for fruit growing

According to statistics provided by the information-consultation center in Tianeti Municipality, in 2019, 256 hectares of agricultural land was used for cultivating apples in Tianeti Municipality. For pear and plum, this figure was 91 and 92 hectares respectively, which is about 2.8 times less than the land used for cultivating apples. While in Lower Pshavi, the land used for fruit is insignificant. According to the interviewed farmers, the land used for cultivating apples, pear, and plum did not change significantly for the last three years. From the interview it was also emerged that the area of the land plots, where fruits are mainly planted, do not exceed 1 hectare.

Unfortunately, the land-related statistics for Tianeti Municipality, that include data on land and agriculture ownership disaggregated by gender and age, is not available. However, national statistics can allow the assumptions to Tianeti Municipality, according to which legitimated agricultural land is owned by three times more men, than women.[24] This is also validated by the current research according to which in all the cases the agriculture land was owned by men.

[23] Caucascert - http://caucascert.ge/files/RegGe060420.pdf

[24] Kaushal Joshi, Hema Swaminathan, et al. (2019). Women's Asset Ownership: Evidence from Georgia; Mongolia; and Cavite, Philippines. Available at the following link: https://www.adb.org/sites/default/files/publication/487506/ewp-571-womens-asset-ownership-georgia-mongolia-philippines.pdf Last visited on May 4

Quantities produced

The leading fruit in Tianeti Municipality in terms of the volume of production is apple – nearly 2 thousand tons of apple was produced in 2019. As for the other two fruits, 457 tons of pear and 307 tons of plum were produced in 2019 in Tianeti Municipality. According to the interviewed farmers, the volume of apple, pear, and plum produced during 2017-2018 was less, compared to 2019.

Productivity of fruit

When the fruits (apple, pear, and plum) were analyzed in terms of productivity, which is the quantity of fruit produced per hectare, in 2019, apple was leading once again, with the productivity of 7.8 tons per hectare, while this figure for pear and plum production was 5 and 3.3 tons per hectare, respectively.

According to the farmers, the productivity of fruit is volatile year by year and their fruit gardens are characterized by low productivity in recent years. It was also stated that during 2017-2018, the productivity of fruits was even lower compared to 2019.

The productivity of these three products in Tianeti Municipality is significantly lower compared to the average productivity. In general, the average productivity of apple is 35-40 tons per hectare, pear – 18-25 tons per hectare, plum – 15-17 tons per hectare.[25]

The summary of all three characteristics in Tianeti Municipality in 2019 can be found in Table 14 below.

Table 14: Fruit in Tianeti Municipality, 2019

	Hectares	Tons	Productivity (ton/ha)
Apple	256	1997	7.8
Pear	91	457	5
Plum	92	307	3.3

Source: Information-consultation center in Tianeti and interviews with farmers

The low productivity of fruit gardens in Tianeti municipality is mainly because of having old orchards and poor practices of fruit growing (like plowing, pruning, harvesting, sorting, grading, packing, etc.). Moreover, the farmers relate the issue of the low productivity of fruits to the hail that occurred some years ago resulted in damaging fruit trees.

Fruit varieties

In Tianeti Municipality the most common fruit varieties are given in Table 15 below:

Table 15: Fruit varieties in Tianeti Municipality[26]

Fruit	Variety	Description
Apple	Turashauli	Local variety. The tree is larger than average, is high-yielding, storable and environmentally friendly variety. The fruit is light greenish-yellow in color, with dark red stripes, rounded. Harvested in the second half of October, stored until spring.
	Winter banana, banana	American variety. The tree is of medium size, high-yielding, storable. The fruit is yellow, rounded, medium or large size, has a characteristic aroma, is characterized by the best taste. Harvested in September-October, stored until April-May. Recommended for industrial fruit growing zone.
	Tsarsky	

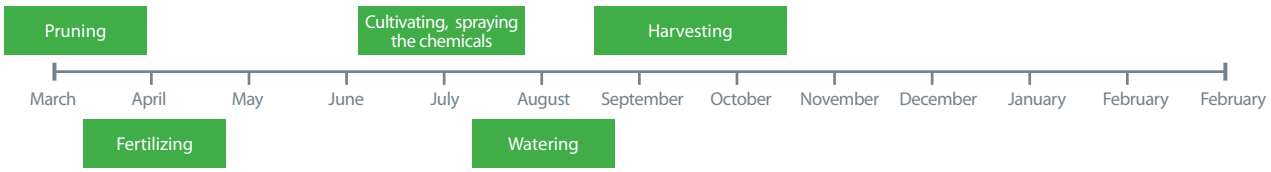
[25] Source: https://agrokavkaz.ge/

[26] Sources: http://catalog.elkana.org.ge/index.php?pageid=26&postid=3636
https://gfa.org.ge/wp-content/uploads/2018/10/მოსავლის-აღების-შემდგომი-დამუშავების-მეთოდები-და-სამაცივრო-შენახვის-კრიტერიუმები.pdf

	Winter gold Parmain	European variety. The tree is larger than average and by 12-15th year is high-yielding, storable. The fruit is of medium size, rounded or sometimes elongated, symmetrically developed. It is an autumn-winter variety, though it depends on a region.
	Antonovka	Russian variety. The tree is of large size, high-yielding, storable and transportable. The fruit is of medium thickness, elongated, tall, narrowed at the sum and the surface of the fruit is slightly sloping. Long shelf life and good adaptability to harsh environmental conditions (low temperature) make it of wide industrial value. Supposedly European variety. The tree is of large size, storable. The fruit is large, flat, rounded, more narrowed at the bottom, with a metatarsal fruit, five-lobed, symmetrically developed. The shape and thickness of the fruit vary greatly depending on the age of the tree and the environmental conditions. It is recommended to harvest the Antonovka late - in October.
	Sinap	Local variety. The tree of large size, high-yielding, late in fruiting, storable. The fruit is green in color, flattened, medium-sized, harvested in the second half of October, stored until April-May.
Pear	Kekhura	Local variety. The tree is of large size, high-yielding, late in fruiting, storable. The fruit is red, rounded, large, average tasted. Harvested in late October, well stored until May-June. There are several clones - including the clone - "Achabetura".
	Josephine	European variety. The tree is of medium size, high-yielding, late in fruiting, storable and transportable. The fruit is medium-sized or thin, often develops asymmetrically. The variety is not of industrial importance in Georgia.
	Gulabi	Local variety. The tree is of large size, high-yielding, late in fruiting, not transportable. The fruit is of medium size. Has a yellowish-lemon delicate skin. Harvested in early August.
	Borbala	Local variety. The tree is of large size, high-yielding, storable for 15-20 days, has a medium flowering period. The fruit is green, rarely yellow, thick, less rough; The entire surface of the fruit is covered with frequent grayish streaks and has rhombic shape. Harvested in late August, or early September.
Plum	Black plum (Shavi Kliavi)	Local variety. The tree grows in 3-4 years, it is characterized by medium yielding. The fruit is egg-shaped, the skiny is dark purple, covered with a tinge. The pulp is juicy, characterized by a distinctive taste, the turmeric is large, the pulp is well removed. Harvested in late August- early September.
	Prune Péche (Alibukhari)	Local variety. The tree is of average size, high-yielding with medium flowering period. Fruit is of elongated, ovate shape, quite large with dense, yellow skin with white subcutaneous spots. The surface of the fruit is followed by a longitudinal groove. Harvested in the first half of September.
	Chanchuri	Local variety. The tree is of medium size, high-yielding, late in fruiting. The skin of the fruit is thin and dense, the pulp - yellowish, juicy, has a specific flavor. Harvested in early August.

Methods for fruit growing

The process of growing fruit in target regions is given is graph below:



Source: Conducted interviews with farmers

The farmers in target regions lack knowledge in fruit growing. Plowing the soil is not done regularly, some of them have never done this before. Almost all interviewed farmers never use fertilizers or pesticides to improve the soil structure. Fruit trees are not pruned regularly because of their lack of knowledge and expertise on how and when to do it. The mechanization level is very low and most of the farmers do everything manually as they do not have appropriate machinery and equipment.

For the farmers in target areas, the main competitors in the fruit market are fruit producers from Shida Kartli region, mainly from Gori municipality. As the interviewed farmers stated, unlike the farmers in Shida Kartli region, they do not use any pesticides and fertilizers for fruit production, therefore their product is healthier. However, consumers do not have this information and still, they prefer buying fruit produced in Shida Kartli region because of a very small price difference. In most cases fruit produced in Shida Kartli is GEL 0.05-0.10 (for a kilo) cheaper.

The farmers plan to increase their fruit gardens, renew old orchards, substitute old varieties of their fruit with new internationally recognized varieties. Some of them have the plan to start or increase processing of fruit. However, the main constraint to fulfill their plans is lack of finance.

The research demonstrated that farmers involved in fruit growing are not as diverse as expected. More specifically, youth and PWDs are not engaged in farming in Tianeti, even though both groups do have the potential to participate through labor contribution and decision making. For example, for PWDs to be actively involved in fruit farming, like others, they need certain assets, including land, financial capital, machinery, tools and equipment, as well as networks to be able to carry out special activities at certain value chain. In the same vein, youth if provided with necessary skills, knowledge, and resources, do have the potential to be actively engaged in the fruit value chain. The research demonstrated that ageing of farmers is the typical phenomenon for Tianeti, similarly to the other parts of Georgia. Youth is abandoning agriculture, and often migrate to urban areas in search of employment, as average nominal monthly salary of an employed person in rural and urban areas differs significantly. During 2010-2018, the average nominal monthly salary in Tbilisi was on average 35% higher compared to the salary in Mtskheta-Mtianeti region[27]. This notwithstanding, agriculture is less prestigious among young people. The share of students applying for agricultural programs is less than 0.8% of total students, which is quite small compared to other professions.[28]

Distribution of production and income of farmers from fruit growing

The farmers in target region consume approximately 32% of their fruit production at home, while they give 6% of their production as a present to their relatives and neighbors. The rest 62% is sold.

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[27] Source: National Statistics Office of Georgia

[28] Kharaishvili, E., Chavleishvili, M., et al. (2017). Problems of Youth Employment in Agricultural Sector of Georgia and Causes of Migration. http://eprints.tsu.ge/1609/1/Problems%20of%20Youth%20Employment%20in%20Agricultural%20Sector%20of%20Georgia%20and%20Causes%20of%20Migration.pdf

The average monthly income of fruit growers in target regions is 630 GEL (this is the total amount of income per month), with a yearly income is 7600 GEL on average (ranges from 4000-12000 GEL yearly). The share of income from fruit selling accounts about 20-30% of fruit producers' total yearly income (on average 1520 GEL).

4.1.2.4 Organic fruit production in target regions

As mentioned in the part 4.1.2.2, organic fruit production in Georgia is based on Caucascert[29], however, none of the entrepreneurs in target regions has the certificate proving the organic nature of the product.

From the members of Elkana, in Georgia, 148 members are involved in production of fruits or berries, just 16 are situated in Mtskheta-Mtianeti region, while 6 out of these 16 are operating in Tianeti Municipality. There are no members of Elkana in Lower-Pshavi region. However, as it was identified based on the research, all of these 6 members are involved in producing berries, not apple, pear, or plum.

Looking at the practices of fruit growing in target regions, it could be noted that even the farmers do not have the knowledge and do not follow the rules of organic farming. Most of the fruits produced in target regions could be mentioned as organic, due to the fact that farmers do not use any chemicals.

4.1.3 STORAGE

In Georgia during 2016-2019, 33 storage enterprises were financed by ARDA, from there 13 are for storing fruits and vegetables.[30] According to the research conducted by PMCG in 2019, it was identified that storage enterprises in Georgia are not able to fully use their capacity, because of the low level and quality of production in Georgia.

Table 16: Number of storage enterprises in Georgia by region and municipality, as of March 2020

Region	Municipality	Number of storage enterprises
Shida Kartli	Gori	4
	Kareli	3
Kakheti	Sagarejo	1
	Sighnaghi	3
Mtskheta-Mtianeti	Mtskheta	2

Source: ARDA

There are no storage enterprises of fruit in target regions that will allow the fruits to be stored in accordance with the appropriate standards. Both the female and male farmers stated working on this as one of the challenges they faced. However, even if they were available, based on other developing countries' experience, they would often be out of reach for women, as the cost is high. Currently, the farmers in target regions save their fruits at homes in wooden boxes in cellars.

The farmers in target areas do not have knowledge about the storing conditions of fruit. After picking fruits in autumn, they try to sell their products, especially pear and plum as soon as possible. In case of apple, they can store and then harvest till the end of December (most of the farmers sell apple till the end of December, while they do not store pear or plum and sell it as soon as possible because of the fruits' perishability). Based on their past experiences, they think cellars are the best place to store the fruits. Therefore, they store their products at homes in wooden boxes in cellars and try to check

[29] Caucascert - http://caucascert.ge/files/RegGe060420.pdf

[30] Source: ARDA

frequently to discover the rotten fruit on time. This is mainly done by women. Sometimes if farmers do not manage to discover such product, it causes other fruit to become rotten. In most cases, the loss of apple while storing is about 2-3%.

The development of storage enterprises in target regions would allow farmers to store their products and sell off season when the prices of fruit are high. However, currently, due to the low level of production in target regions, the existence of storage enterprises may not be efficient.

4.1.4 PROCESSING

Together with storage enterprises, processing sector is not developed in target areas either. There is only one cooperative that mainly works on processing of non-timber forest products; however, they also process fruit.[31]

Some of the fruit producer farmers process fruit themselves and make dried fruit (mostly done by female members of household), Jam or Vodka, mainly for their own consumption. However, some of them also process fruit for selling purposes. They do not follow any quality standard. For making dried fruit, farmers put the fruit on the sun. For making Vodka, they just use a copper boiler.

Other farmers who are willing to process fruit to make Vodka, do not have the special equipment for processing, like Vodka distillation equipment. Some of the farmers are planning to buy fruit dryer machines in the future. Mainly, they think to produce dried plum.

However, it has to be noted, that the farmers do not have knowledge how to process fruit in accordance with quality standards. Also, the farmers do not have information about the costs of fruit processing. One of the interviewed farmers stated: "Fruit pressing will be profitable; however, it requires special knowledge which I do not have".

4.1.5 PACKAGING

According to the Food and Agriculture Organization of the United Nations (FAO), the main goal of packaging is preservation and encouragement to purchase the product. With proper packaging, it is possible to extend the shelf life of local food products, which will allow for distribution, offer a wider choice of available foods, and make it possible to redistribute food resources equally.

According to the FAO, wooden containers are good protectors (produced with all necessary measures taken, with the international standards of phytosanitary measurement - ISPM-15, to ensure integrity of the product to be carried) of liquid and solid foods due to its good characteristics, strength and firmness. However, if it does not add to the quality of the product, wood can be substituted for a cheaper alternatives like plastic or glass, which is a good choice because glass can withstand high temperatures, does not get into reaction with food and is easily recyclable. This has a drawback of being relatively heavy which, as a result, increases transportation costs.

Packaging is more important when the product is exported, due to the fact, that it has to meet certain standards of quality and preservation. Different products require different types of packaging to ensure that above-mentioned standards are met.

Below are the three main packaging companies operating in Georgia:

"Georgian Cardboard" - a company founded in 2009 in Tbilisi that uses modern machinery and high-quality raw materials. They produce sheets and boxes of corrugated cardboard of any configuration suited to clients' needs including such service as putting information on the packaging (such as logo, address, product name, etc.).

[31] The cooperative is concentrated on NTFP production

JSC "Mina" - glass container factory produces 2.3 million tons of products per year and is the fourth largest in Europe and in the world (it has offices in Russia, Turkey, Ukraine, Georgia). In Georgia, the company is located in Mtskheta-Mtianeti region, Mtskheta Municipality. The group offers glass containers of different sizes, colors, and designs for the food, beverage, pharmaceutical, and cosmetic sectors. In Georgia, they produce bottles and jars of different sizes.

"Legi Group" has been operating in the Georgian market for more than 10 years. It has its own production in Tbilisi and in Shida Kartli region, Gori Municipality. The company is equipped with modern machinery. "Legi Group" produces corrugated cardboard, wooden boxes, portable boxes, archival boxes, auxiliary packaging materials and paper.

In target regions, simple packaging materials are used by farmers for storing and transporting fruit products. They use wooden boxes to store their fruit in cellars. Wooden boxes and 50kg bags for fruit transportation are also used. Moreover, while selling the product, the farmers use small bags.

4.1.6 TRANSPORTATION

The farmers in target regions mainly use local municipality transportation for transporting their products, however, sometimes they hire cars. The volume of fruit that farmers carry ranges between 100-300 kg fruit per travel for each type of transportation.

When selling products in Tianeti, the market farmers mainly use local municipality transport between their villages and Tianeti. The cost of such kind of transport is mainly 1 GEL (one way). The travel change is acceptable for farmers, however when farmers require to transport high volume of production, they mainly are not able to use local municipality transportation due to the nonexistence of enough space.

Sometime, together with fruit, the farmers sell other agricultural products in the markets (in total more than 300 kgs). In those cases, due to the high volume of production, they are not able to manage to transport their products through local municipality transport. Therefore, they hire cars that costs on average 100 GEL (a day). The travel cost for farmers is high, however, using the car is more comfortable, compared to the local municipality transport. This is because they can take their product by car from home and at the end of the day, they are able to return home by that car.

Even though it was not mentioned by the female respondents explicitly, generally, not having access to transport services excludes women from key downstream activities along the supply chain. For example, the World Bank research has noted that for instance, buses that run only during peak hours, coincide with women's household responsibilities or transportation, that exposes women to a high likelihood of harassment, reduces user rates.

When selling products in Tbilisi, the Gldani market, the farmers also mainly use local municipality transportation, that costs 5 GEL (one way). The cost of transportation is acceptable for farmers.

4.1.7 SALES

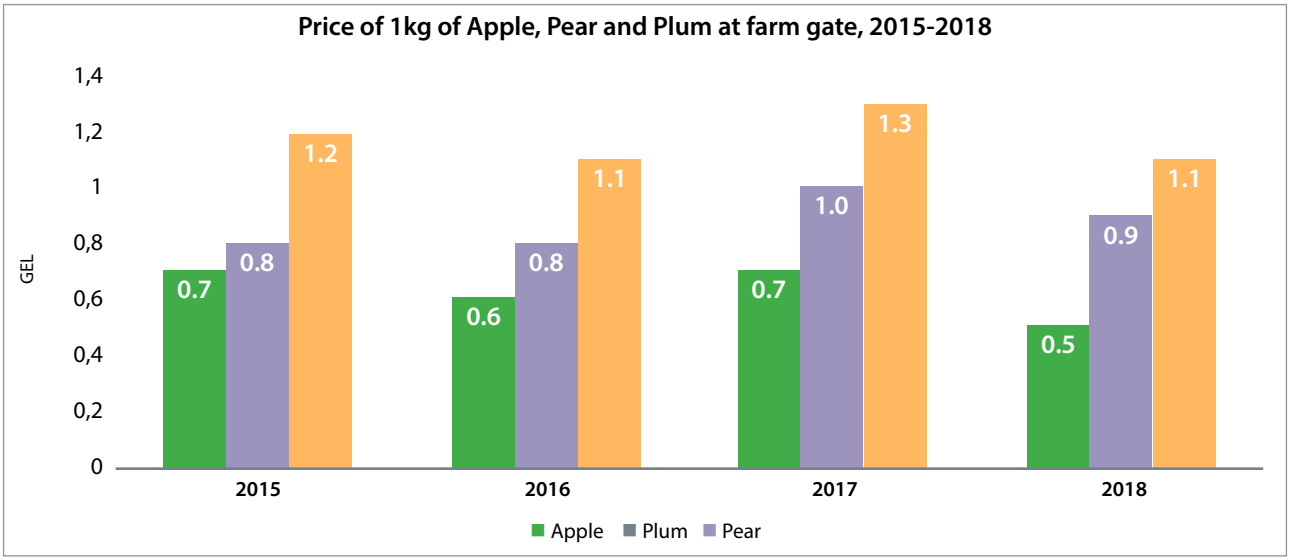
4.1.7.1 Prices of fruits in Georgia

The statistics for different prices for fruits were obtained and analyzed. The National Statistics Office of Georgia collects data of the prices at the farm gate directly from farmers. Additionally, National Statistics Office of Georgia collected retail prices for calculating the CPI index, in the supermarket chains, markets, and street markets in 6 major cities of Georgia (Tbilisi, Kutaisi, Batumi, Gori, Telavi, Zugdidi). Moreover, under the given research, desk and field research were conducted at the end of February. Furthermore, fruit prices in major supermarket chains Carrefour and Goodwill were collected.

Prices at farm gate

According to the National Statistics Office of Georgia, a relatively stable situation can be observed in the prices of apple, pear and plum at farm gates in Georgia over the period 2015-2018, with a slight

rise of price of all 3 fruits in 2017, and a fall in 2018. The average prices at farm gates for 1 kilogram of each fruit in 2018, expressed in GEL was 0.47 for apple, 1.11 for pear, and 0.90 for plum. The average price for the period over 2015-2018 was 0.62 for apple, 1.17 for pear, and 0.88 for plum.



Source: National Statistics Office of Georgia

Prices at supermarkets and markets in the 6 major cities of Georgia[32]

The analysis of the fruit prices based on Consumer Price Index of Georgia, reveals that in 2018, the average retail price of apple is 4.6 times higher than the price at the gate; the same figure is 2.92 for pear, and 2.18 for plum.

Among the three products, pear is clearly the most expensive, with the average price over the period 2015-2019 amounting to 3.19 GEL/kg, while during that period the average price of apple amounted to 2.22 GEL/kg, and the average price of plum during 2017-2019 amounted to 2.16 GEL/kg.[33]

The average price of pear in 2019 being 64% and 58.8% more than the average prices of apple and plum, respectively. Plum and apple have relatively the same prices, hovering around 2 GEL/kg, apple being more expensive in 2017 -2018, and plum overtaking in 2019.

The average prices of the three fruits in the years between 2015 and 2019, expressed in GEL are as follows:

Table 17: Prices at supermarkets and markets in the 6 major cities of Georgia

Prices (GEL)	2015	2016	2017	2018	2019
Apple	2.01	2.39	2.33	2.16	2.22
Pear	3.12	2.69	3.25	3.24	3.65
Plum[34]	...	...	2.13	1.96	2.39

Source: National Statistics Office of Georgia

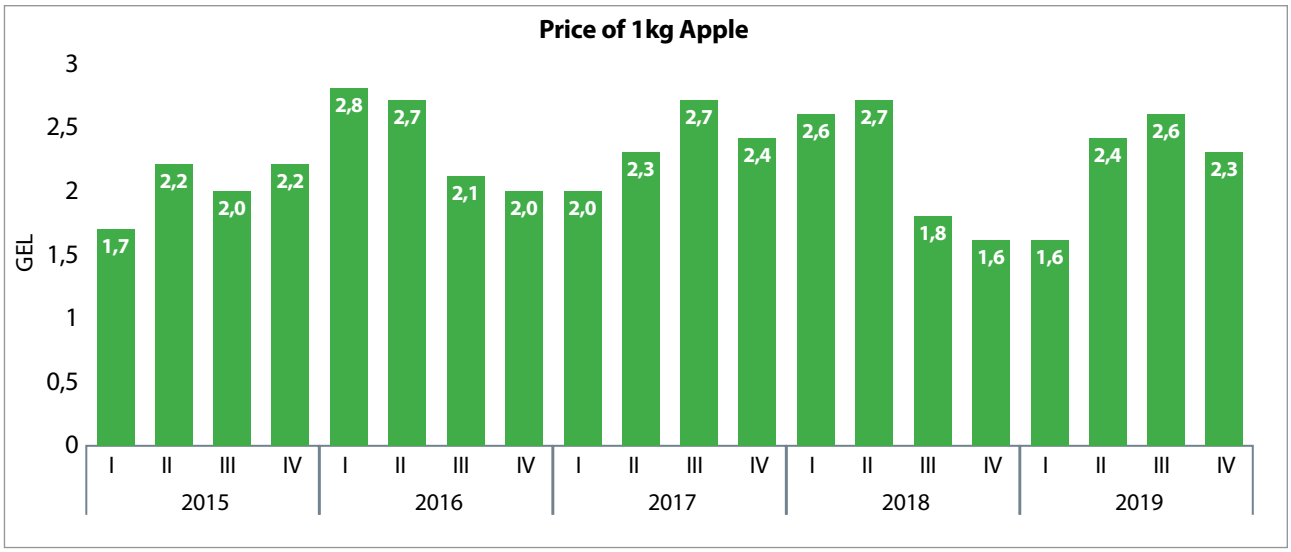
The price of apple fluctuates significantly due to seasonality, however there is no clear pattern. The highest average prices are generally observed in QII, while the average prices are nearly the same over the period of 2015-2019 for other 3 quarters. There are sizable fluctuations in the prices over the years

[32] Source: National Statistics Office of Georgia

[33] GeoStat does not have the data of plum prices during 2015-2016

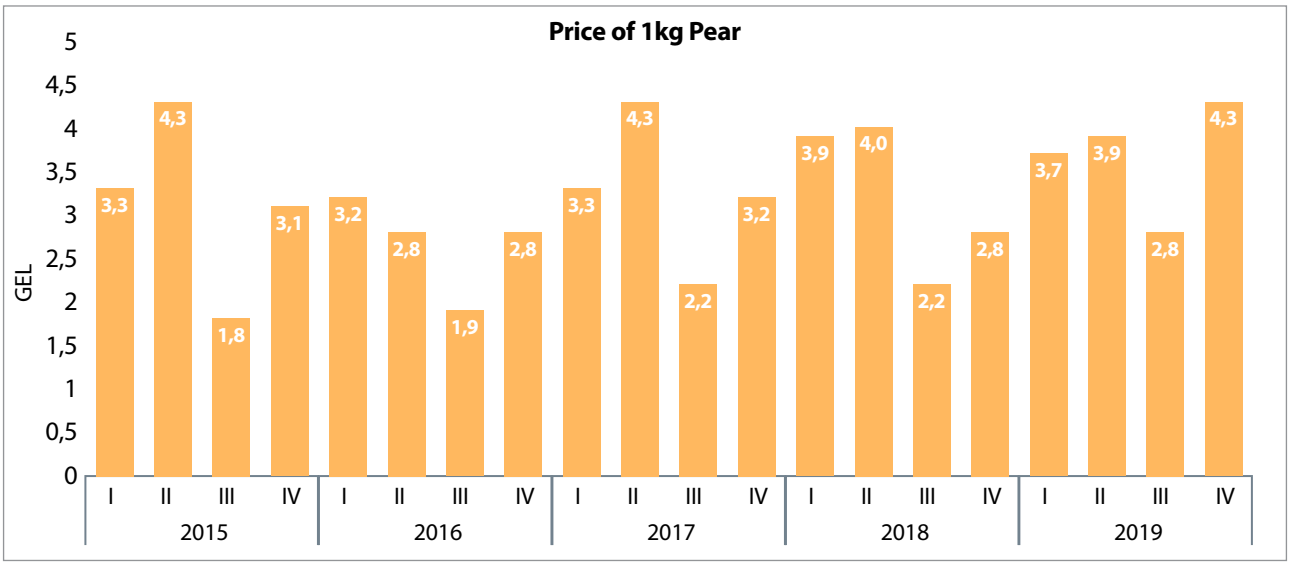
[34] According to National Statistics Office of Georgia, plum was not included in the consumer basket before 2017

in the same quarters. For instance, in QI of 2016, the average price was 2.8 GEL, which was the highest among other quarters, however, in 2019 the price in QI was the lowest in the year (1.6 GEL). This huge variability can be explained by different supplies of apples in different years.



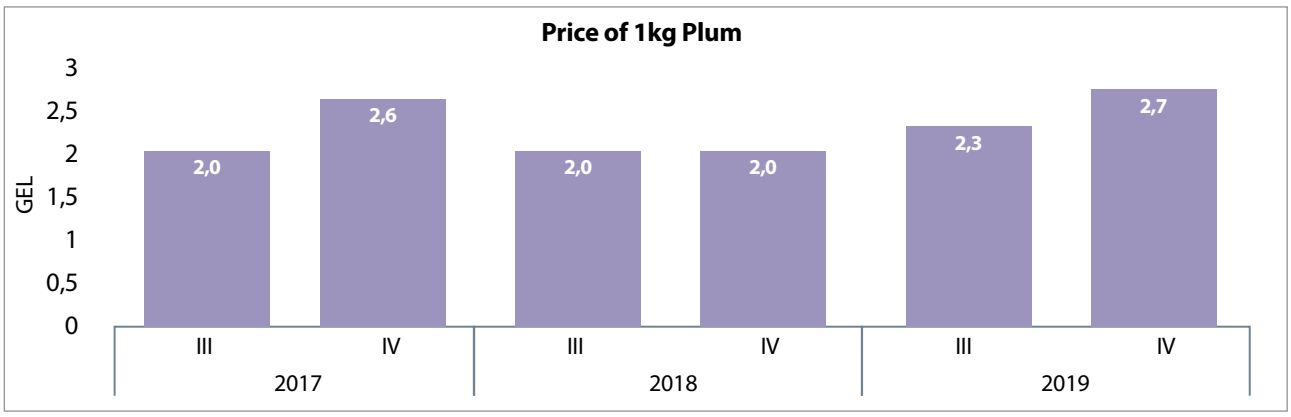
Source: National Statistics Office of Georgia

As for the quarterly prices of pear, there is a consistent pattern of the lowest prices in QIII of each year, with the prices being the highest in QII on average, however, not much higher than other two quarters prices. This pattern can be explained by the fact that pear harvesting period is in autumn, thus, raising the supply in QIII which is contributing to the lower prices.



Source: National Statistics Office of Georgia

As there is limited data on the prices of plum, it is much harder to make inferences about the dynamics of the prices. According to National Statistics Office of Georgia, sufficient information for generalizing the observations was only available in quarters III and IV in 2017, 2018, 2019. This mean that not many of the major supermarkets and markets sell plum in QI and QII. Still, the prices plum in QIII is no more than the prices in QIV in each year of the three-year period, which is resulted by the harvesting season in QIII.



Source: National Statistics Office of Georgia

Prices in major supermarkets in Tbilisi [35]

Based on the desk research, the prices for apple, pear, plum, and their products (both imported and locally produced) in Carrefour and Goodwill were identified.

Apple

5 varieties of apple were found in the two hypermarkets, with the prices ranging from 3.65 GEL/kg for locally produced "Aidarid" to 4.80 GEL/kg for imported "Start". Three other varieties were all locally produced: "Antonovka" – 4.35 GEL/kg; "Golden" – 4.25 GEL/kg and "Gran Smith" 4.6 GEL.

Both, local and imported apple juices are available in the two hypermarkets. The average price of imported juice was 4.11 GEL/liter in Carrefour and 3.66 in Goodwill, while the price of a liter for locally produced apple juice was 3.70 GEL in Carrefour and 4.23 in Goodwill.[36] As for other apple products, in Goodwill, the price of dried apple was 49.7 GEL/kg, and for locally produced apple jam, it was 65.4 GEL/kg. Imported apple vinegar costs 9.57 GEL/liter, while locally produced vinegar costs 4.95 GEL/liter.

Pear

3 varieties of pear were found in the two hypermarkets, and their average prices in GEL per 1 kg were as follows: "Aleksandrouli" – 6.5; "Conference"- 7.45 and 6.2 for the imported variety "Nashi". As for pear lemonades, the average price of locally produced lemonade was 1.8 GEL/liter.

Plum

Plum in its non-processed form was not found in the two hypermarkets, perhaps because of seasonality. Dried Plum was available at both stores, with the average price of locally produced dried plum being 25.7 GEL/kg, while imported dried plum was priced at 60.7 GEL/kg in Goodwill. Locally produced plum compote and plum juice per liter were priced at 4.95 and 4.30 GEL respectively, while their imported versions were priced at 3.95 GEL/liter for compote and 13.27 GEL/liter for juice.

It can be observed that for all three fruits, the prices obtained in large supermarket stores are significantly higher than those according to Consumer Price Index.

Prices of organic products in Georgia

Despite the fact that organic products are not highly popular for the mass public in Georgia yet, there are several grocery stores and shops that have occupied the niche market of selling exclusively organic products. Based on the desk research, the prices of some organic fruits and their products were obtained in the end of February from the selected organic shops[37].

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[35] Source: PMC Research Center. Data was obtained in March 2020 in Tbilisi

[36] The average prices are based on 4-5 products

[37] Selected organic shops include: Sunflower Health Food Store; Biofarm Pona; Georgita; Tserti; Soflidan.ge

A detailed list of all organic products can be found in the Table 11:

Table 18: Prices of organic products in Georgia

Product	Store	Unit	Price (GEL per unit)	Imported or Local
Apple Aidarid	Sunflower Health	1kg	5	Local
Apple Antonovka	Sunflower Health	1kg	10	Local
Dried apple	Sunflower Health	1kg	35	Local
Dried apple	Soflidan.ge (Biofarm Pona)	1kg	35	Local
Apple vinegar	Goodwill	1 liter	23.7	Imported
Apple vinegar	Georgita	1 liter	18.8	Imported
Apple vinegar	Sunflower Health	1 liter	10	Local
Apple vinegar	Soflidan.ge (Elkana)	1 liter	14.5	Local
Apple juice	Sunflower Health	1 liter	8	Local
Apple Jam	Tserti	1kg	27.5	Local
Apple purée	Georgita	1kg	17	Imported
Dried pear	Soflidan.ge (Biofarm Pona)	1kgg	35	Local
Dried pear	Sunflower Health	1kg	37.5	Local
Pear jam	Tserti	1kg	27.5	Local
Pear and quince compote	Sunflower Health	1 liter	16	Local
Dried plum	Soflidan.ge (Biofarm Pona)	1kg	35	Local
Dried plum	Sunflower Health	1kg	37.5	Local
Plum jam	Tserti	1kg	27.5	Local

Source: Desk research

Comparison of organic and non-organic prices in Georgia

The comparison of the above prices for organic products to the prices of their non-organic counterparts on the basis of the prices collected in February 2020 reveal several patterns. Firstly, obviously there was a higher price for organic products observed, but the magnitude of the price distinction was significantly different for each product. However, in most cases the prices were at least double for the organic counterpart of the product.

Apple

According to the prices collected in February 2020, the biggest price difference was observed between organic and non-organic apple jam (both locally produced), as the former was 288% more expensive than the latter. Organic and non-organic "Aidarid" showed the least price difference, with the organic one being just 36% more expensive than non-organic one, while the price difference for "Antonovka" was 129%. The price difference of locally produced apple vinegar on average was 147%, while it was 120% for imported apple vinegar. Finally, the price of organic apple juice was on average twice higher than the price for the non-organic juice.

Pear

There were no matching organic and non-organic products for pear.

Plum

According to the prices collected in February 2020, differences between in the prices of organic and non-organic plum products were less drastic than that for apple products. The highest price difference was observed between organic and non-organic local plum jam, with the organic counterpart being 272% more expensive. However, the difference was less when it was compared to imported non-organic jam, with just 55% higher price. As for the dried plum prices, locally produced organic dried plums outpriced non-organic ones by 62%, while imported non-organic dried plum in fact was 40% more expensive than locally produced organic dried plum, which makes it an only exception in the sample.

Rules in supermarkets in Georgia

Based on desk research[38] and the interviews conducted with major supermarket chains, the following trends were revealed:

- Major supermarkets do not have exclusive suppliers of fresh products and are open to any supplier who wants to deliver fresh products. They state that they want to contribute to local producers' development.
- There is an entrance fee in most of the supermarkets, which is either annual or one-time.
- There are marketing costs – free products for customers to taste, product placement on specific shelves, etc.
- The quality of products and production location are tested before the contract is signed and then randomly, on occasion. If the product quality degrades, the supermarkets can terminate the contracts with suppliers.
- Supermarkets prefer that the suppliers are stable. In most cases, suppliers have to carry transportation costs and deliver their products to different branches at different locations.
- In most cases, the products are consigned by the supermarkets, which means that the supplier receives the payment according to sold products. In a few cases, the products are paid for in advance. In either case, expired products are not paid for.
- Supermarkets tend to prefer suppliers that deliver the products regularly, however, some of them are open to possibilities that the suppliers can only deliver products seasonally, in small quantities.

4.1.7.2 Sales of fruit in target regions

Most of the fruit produced in Tianeti Municipality is sold locally in Tianeti market. Other main sale channels are selling fruit to consumers at Gldani market in Tbilisi, collectors, and consumers at farm gate. Mainly farmers prefer not to sell fruit to collectors as the price offered by them is very low. In general, fruit farmers are not under contract to deliver their entire crop to food processors, distributing companies or individual buyers.

- Farm gate – selling fruit to collectors

As identified, based on the research, some of the farmers in Tianeti Municipality sell their products through the intermediaries - collectors. Collectors go to the villages and collect fruit (apple, pear, and plum) from farmers, the price of 1 kilo of fruit is on average 0.2 GEL (ranges between 0.15-0.3 GEL). According to the interviewed farmers, there is no difference between the prices of the three products. From the information interviewed farmers provided, these intermediaries sell their products to the fruit processing enterprises in Dusheti Municipality.

[38] http://zrda.georgianeo.ge/index.php/ka/news-room-ka/market-research-sectoral-studies/item/download/246_8085d-00d5a860d6a8ad001eb56e3197d

For most of the farmers, this kind of selling method is not acceptable due to the low price the collectors pay. It has to be noted that the prices collectors offer to farmers in Tianeti Municipality are significantly lower compared to the average prices at the farm gate for these three products in Georgia during the period over 2015-2018 (according to the GeoStat the average price for the period over 2015-2018 was 0.62 for apple, 1.17 for pear, and 0.88 for plum).

- Farm gate – selling fruit to consumers

Very few farmers (insignificant) in Tianeti Municipality sell part of their fruit to consumers at farm gate. Consumers from Tbilisi, Kakheti and Shida Kartli go to farmers' places to buy fruit. Mainly in such cases, these are regular buyers, who have the information that for fruit production, the farmers do not use any fertilizers or pesticides. These kinds of consumers buy fruit for their own consumption. The price of 1 kilo fruit in this case is between 2-3 GEL for each product.

In this case the prices consumers pay to farmers in Tianeti Municipality are significantly higher compared to the average prices at farm gate for these three products in Georgia during the period over 2015-2018 (according to the GeoStat, the average price for the period over 2015-2018 was 0.62 for apple, 1.17 for pear, and 0.88 for plum).

Some of the interviewed farmers sell Vodka at farm gate to consumers. The price of Vodka is about 5 GEL locally (in Tianeti municipality).

- Local Tianeti market – selling to consumers

Mainly farmers sell their production at local market in Tianeti. The prices on average is 1.2 (ranges between 1-1.5 GEL).

Together with primary products, the farmers sometimes sell processed fruit in Tianeti market. The price of 1-kilogram dried fruit is about 5 GEL there. It must be noted that according to the data collected at the end of February, the price of dried fruit sold in Sunflower and Soflidan.ge was between 35-37.5 GEL. Such price differences could be explained by the following factors: these selling channels are associated with high quality among consumers, moreover, they have good marketing strategies and favorable locations. The customers of the soflidan.ge and Sunflower are mostly high-income families. Even though the farmers in target areas do not use any pesticides and their fruit is natural, consumers do not have this information, as farmers do not conduct any marketing. Moreover, the farmers from Tianeti Municipality only sell their products in markets like Gldani[39] or Tianeti market, where the buyers are low-income families.

- Tbilisi Gldani market – selling to consumers

  Transport – municipal transportation

Some farmers sell fruit in Tbilisi Gldani market, as the price of fruit is higher compared to Tianeti market. The price of fruit on average is 1.6 GEL.

Table 19: The prices of primary fruit according to the sale channels in target regions

	Farm gate to collectors[40]	Farm gate to direct consumers	Local Tianeti market	Tbilisi Gldani market
Average Price (GEL)	0.2	2.5	1.2	1.6
Price range (GEL)	0.15-0.3	2-3	1-1.5	1-3

Source: Field research

[39] Gldani market – is located in the Gldani-Nadzaladevi, that is an administrative district in Tbilisi

[40] The volume of fruit selling to collectors is insignificant, as farmers mainly do not sell fruit in such way, because of low price offered by the collectors

Considering that the fruit produced by farmers are produced in almost organic way, the prices on the products are significantly lower even compared to the non-organic fruits in supermarkets and online shops (like e.g. soplidan.ge) in Georgia.

4.1.7.3 Foreign trade – export and import

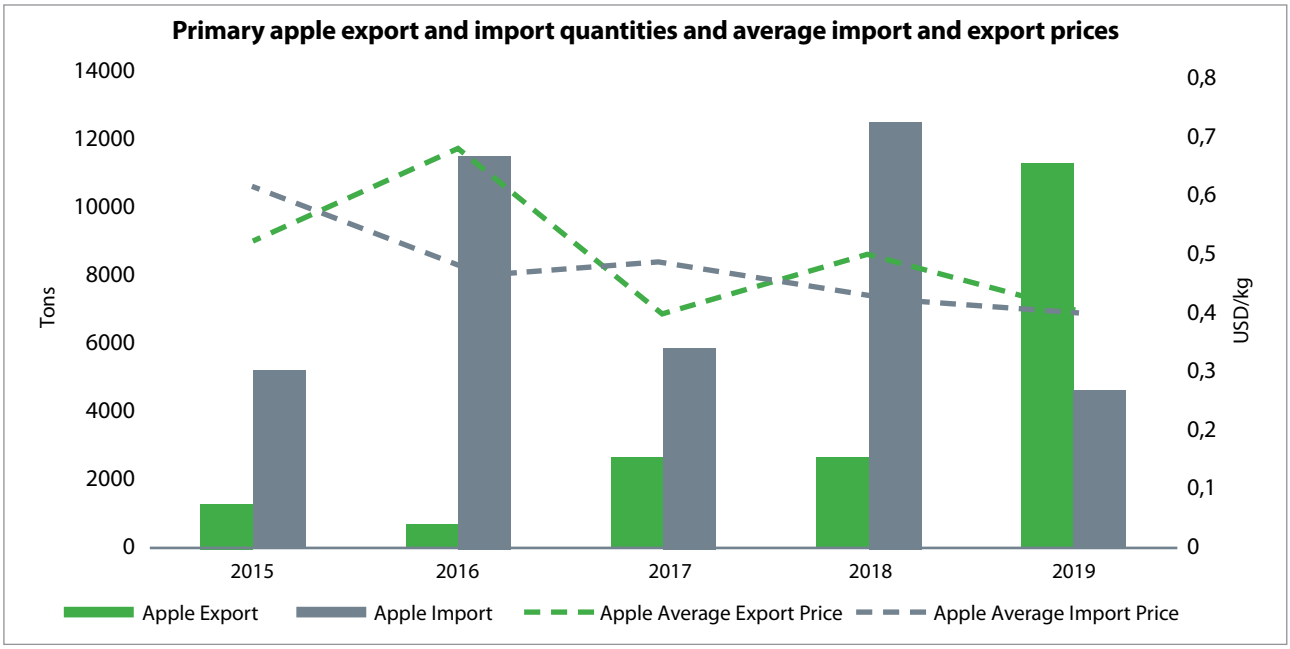
Apple products export and import

According to the National Statistics Office of Georgia, exports of all apple products in 2019 amounted to 12,548 tons, which is approximately 3 times more than exports in 2018. Still, a major part of these exports was primary apple exports (91%). Apple juice exports amounted to 901 tons in 2019 (7% of all exports), while exports of dried apple amounted to only 215 tons (2%). As for the imports of apple products, again primary apple dominated, with 4703 tons out of total 5479 tons (85%) in 2019. Apple juice imports amounted to 774 tons (15%), while the amounts of dried apple import, as well as apple puree import were negligible.

It is worth noting that 2019 was the first year in the period of 2015-2019 when the trade balance for apple products was positive, mostly due to a more than fourfold increase in the amount of primary apple compared to 2018.

Apple dominated in the volume of both, import and export between the three fruits, with its share in total import volume in terms of USD dollars being 74% of imports, while this figure was 94% for export volume.

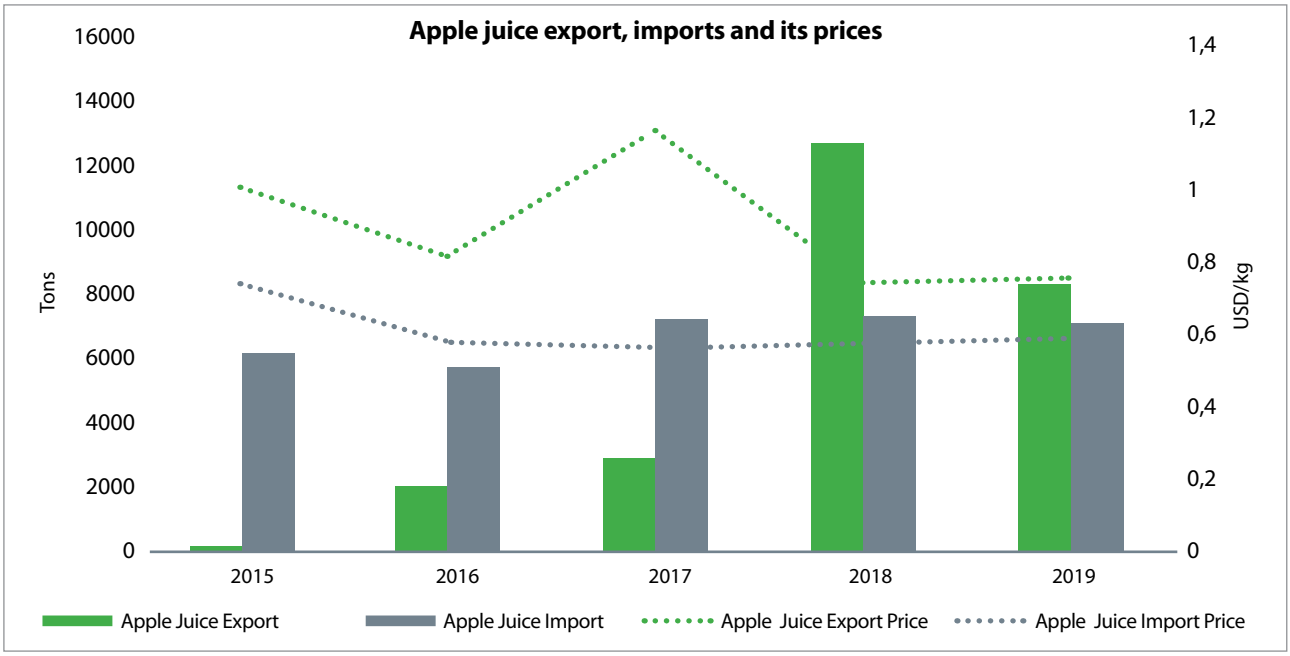
As for the prices, both, export and import prices have been more or less stable, with a slight downward trend over the period of 2015-2019.



Source: National Statistics Office of Georgia

The volume of exported apple juice has been rising tremendously, with the highest 1,379 tons exported in 2018. Quantity of imports on the other hand, has been stable, hovering around 600-800 tons per year.

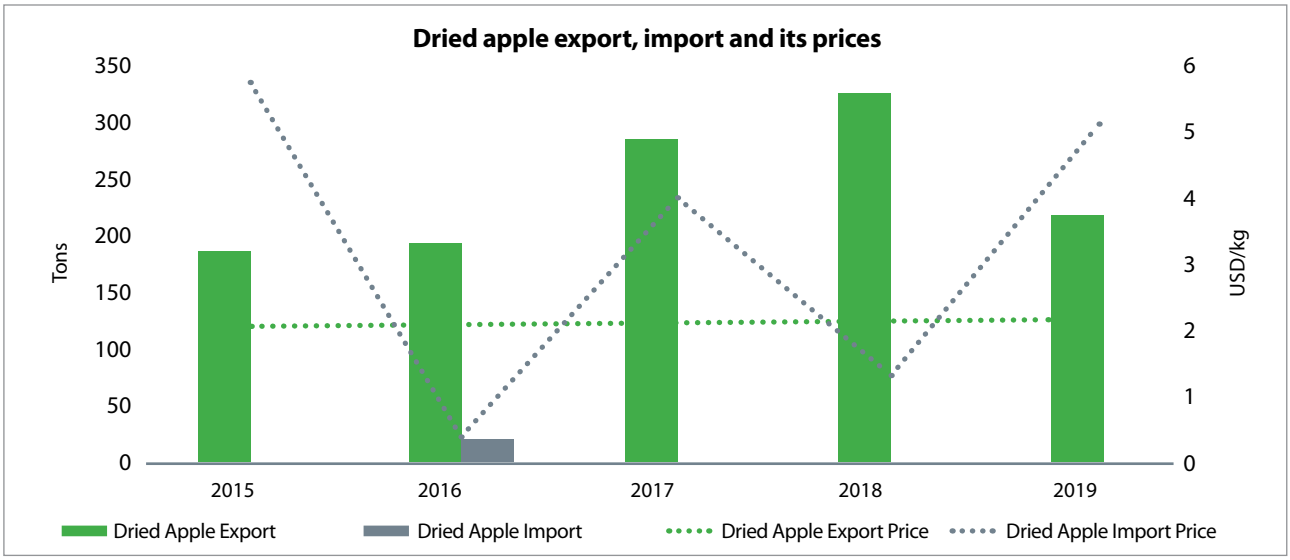
The pattern of notably higher export price compared to the import price deserves attention. The main driver of the difference is the distinction of import and export markets. Approximately 93.7% of exports were to Germany over the period of 2015-2019, with the average price of 0.86 USD/kg. On the other hand, 68.4% of imports were from Ukraine with the average price of 0.59 USD/kg over the period. This observation explains the difference between average import and export prices of apple juice.



Source: National Statistics Office of Georgia

Georgia has been a net exporter of dried apple in the period of 2015-2019, with a slight upward sloping trend and stable export price of 2.1 USD/kg on average.

As for import, there is practically no import of dried apple in Georgia, except in 2016, when 20 tons of dried apple were imported from Ukraine. Thus, the import price figures can be misleading.



Source: National Statistics Office of Georgia

Export of apple and apple products by countries: Top 5 partners during 2015-2019

In terms of primary apple, Russia is by far the most prominent export partner, Georgia exporting 72.3% of all its apple exports to this country over the period of 2015-2019. As for apple juice and dried apple, Germany dominates and is practically the only export partner, as Georgia exported 99% and 93.7% of all its exports of apple juice and dried apple to this country (for more information see Annex 10 – Export by Countries).

Table 20: Export of apple by countries (sum amounts during 2015-2019)

	Primary Apple		Apple Juice		Dried Apple	
	Value (1000USD)	Tons	Value (1000USD)	Tons	Value (1000USD)	Tons
Armenia	846.9	989.9	13	22.1	0	0
Azerbaijan	228.1	1012.3	29	42.7	0	0
Germany	27.4	13.4	2281.2	2645.2	2477.9	1178.4
Kazakhstan	274.1	403.7	18.4	18.6	0	0
Russia	5783.7	13939.8	36.1	48.3	20.6	20.3

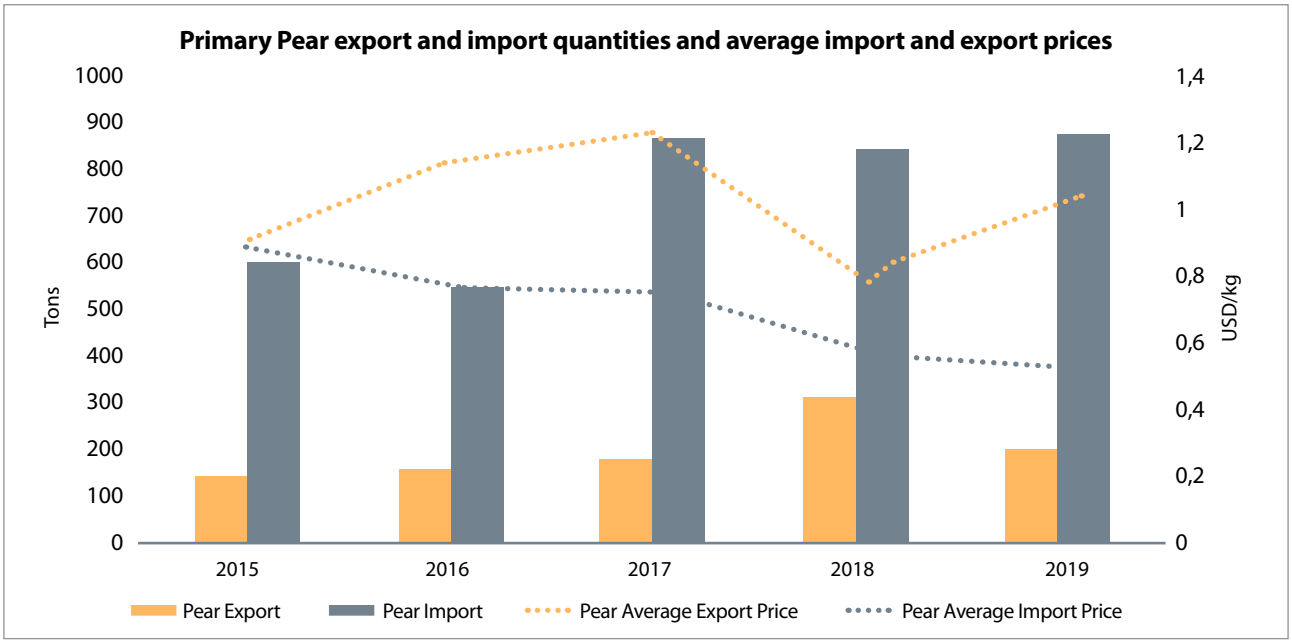
Source: National Statistics Office of Georgia

Pear products export and import

According to the National Statistics Office of Georgia, exports of all pear products in 2019 amounted to 202 tons and have been somewhat stable over the period of 2015-2019. A major part of these exports is primary pear exports (98%), while amounts of exports of dried pear and canned pear were negligible.

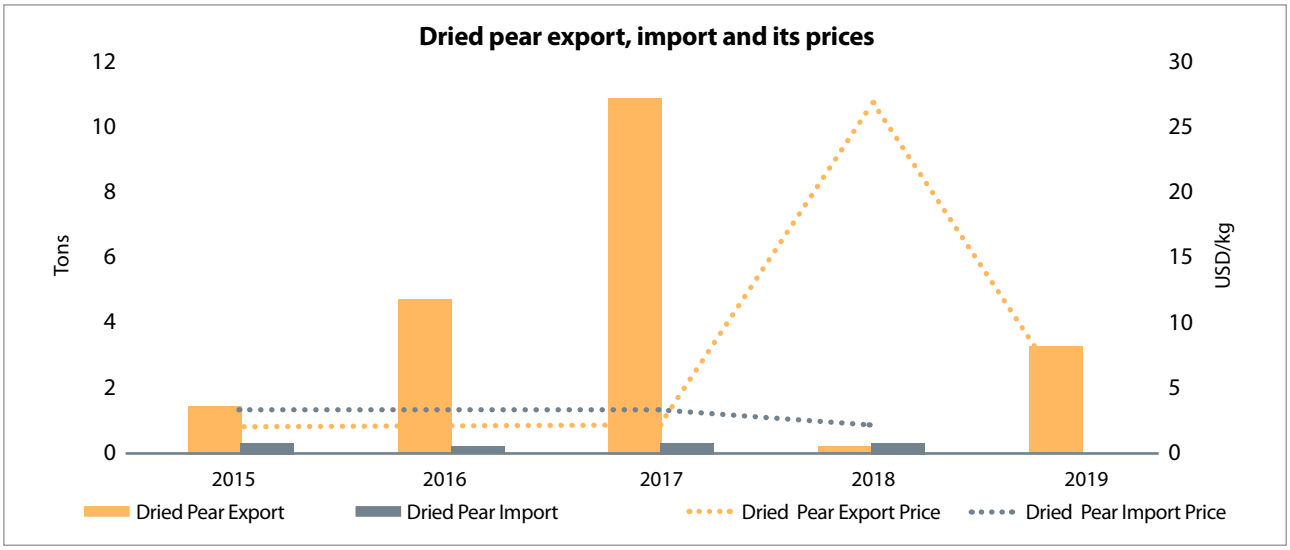
As for the imports of pear products, again primary pear dominated, with 873 tons out of total 877 tons (99%) in 2019. The trade balance has been significantly negative during all years of the period between 2015 and 2019.

The average price of exported pear has been higher than the price of imported pear in each period, which could indicate at superior quality of Georgian pear.



Source: National Statistics Office of Georgia

Dried pear export from Georgia is still negligible and the price analysis is not conclusive. There are just 3 countries where dried pear is being exported to, the main partner being Germany, which is also responsible for the relatively higher export of 10.8 tons in 2017. The amounts of dried pear import, as well as canned pear import were negligible. As for the spike in average price of exports in 2018, Russia purchased a small amount of dried pear in 2018 with abnormally high price and this is the main explanation of it.



Source: National Statistics Office of Georgia

Export of pear and pear products by countries: Top 4 partners during 2015-2019

The main export partners in terms of primary pear are three of Georgia's neighbor countries, with Armenia dominating. As mentioned before, exports of dried pear and canned pear are negligible, with one exception of Germany in terms of dried pear (for more information see Annex 10 – Export by Countries).

Table 21: Export of pear by countries (sum amounts during 2015-2019)

	Primary Pear		Dried Pear		Canned Pear	
	Value (1000USD)	Tons	Value (1000USD)	Tons	Value (1000USD)	Tons
Armenia	466.1	306.6	0.0	0.0	0.0	0.0
Azerbaijan	261.1	288.2	0.0	0.0	0.0	0.0
Germany	0.0	0.0	40.5	19.8	0.0	0.0
Russia	251.6	381.6	3.3	0.1	6.0	3.6

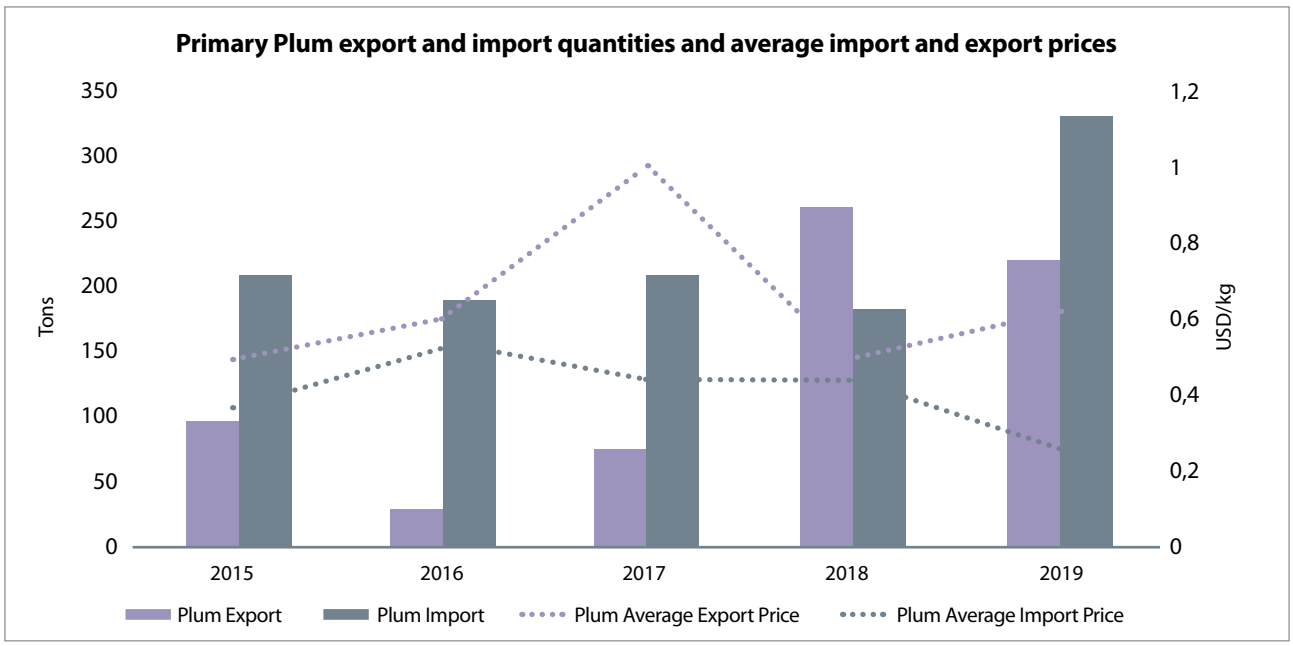
Source: National Statistics Office of Georgia

Plum Product export and import

According to the National Statistics Office of Georgia, exports of all plum products in 2019 amounted to 222 tons and have been somewhat stable over the period of 2015-2017. Exports increased sharply in 2018 and 2019. A major part of these exports is primary plum exports (99%), while amounts of exports of dried plum and processed plum were negligible.

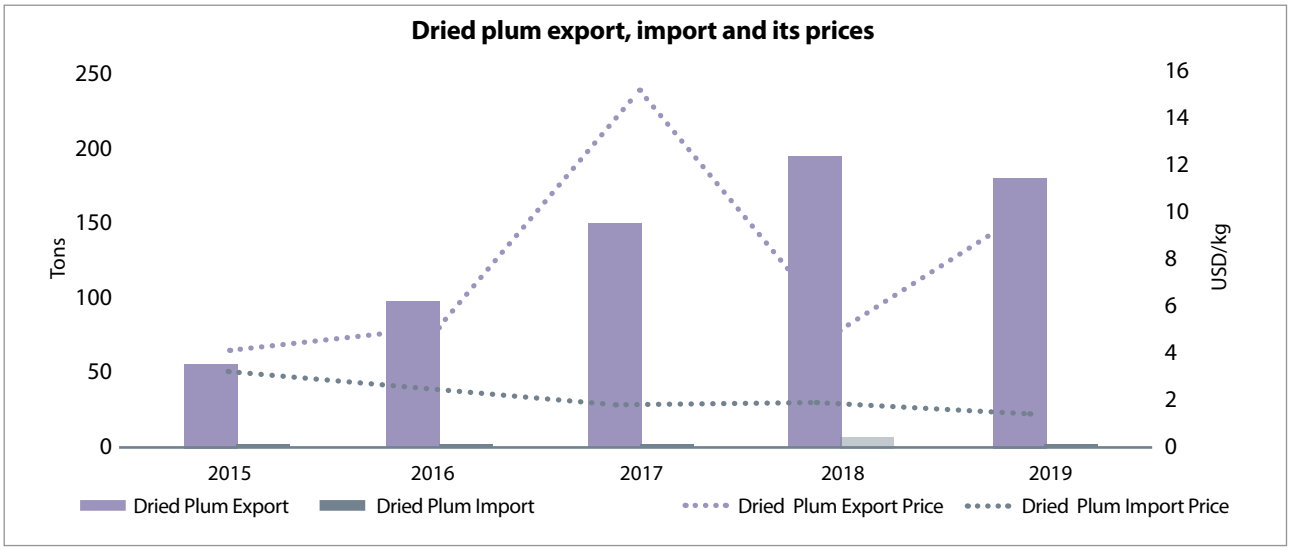
As for the imports of plum products, again primary plum dominated, with 328 tons out of total 508 tons (65%) in 2019. The imports of dried plums also had a significant part, with 178 tons and a share of 35%. As for processed plums, its import amount was negligible. The trade balance has been significantly negative during all years of the period between 2015 and 2019, except 2018, where the gap was less significant.

The average price of exported plum has been higher than the price of imported pear in each period, which could indicate the superior quality of Georgian plum.



Source: National Statistics Office of Georgia

As mentioned above, the quantity of dried plum exports is negligible. There was the unusual spike in the average price of exports in 2017, Russia purchased a small amount of dried plum in 2017 with extraordinarily high price. Even when excluding this spike, the price of imports is lower than the price of exports in each period, however, a significant amount of dried plum is imported. This quantity seems to be growing over time. The main import partner country is Uzbekistan.



Export of plum and dried plum by countries: Top 3 partners during 2015-2019

In terms of primary plum, Russia dominates, with 65.9% of all plum exports going to this country in the period of 2015-2019, while in terms of dried plum, Germany is on top, with 53.4% of all dried plum exports, followed by Russia with 35.9% of all dried plum exports (for more information see Annex 10 – Export by Countries).

Table 22: Export of plum by countries (sum amounts during 2015-2019)

	Primary Plum		Dried Plum	
	Value (1000USD)	Tons	Value (1000USD)	Tons
Germany	0	0	27.9	6.1
Russia	263.1	487.2	18.7	1.7
Belarus	50.5	40.4	0	0

Source: National Statistics Office of Georgia

Exports of Organic Fruit Products

Based on Caucascert's export statistics, there were no certified organic fruit products from Georgia which were going on export during the period of 2013-2019.

4.2 EXTERNAL STAKEHOLDER ANALYSIS

This section Includes the analysis of value chain financing and value chain technical assistance (skills development).

4.2.1 STATE AUTHORITIES

In the assistance of rural development, two government entities stand out: ARDA and "Regional Information Consultation Centers"[41], both under the Ministry of Environment Protection and Agriculture of Georgia (MEPA) and "Enterprise Georgia" under the Ministry of Economy and Sustainable Development of Georgia.

Agricultural and Rural Development Agency (ARDA)

ARDA is an agency which operates under the Ministry of Environment and Agriculture of Georgia. Main objective of the agency is to promote the development of agriculture in Georgia. Its key functions include planning and management of projects initiated by the Ministry of Environment and Agriculture as well as management of subordinate agricultural companies.

ARDA's projects[42] provide support for nearly every part of the supply chain of fruits, except transportations, sales, and exports. The detailed list[43] of those projects that assist fruit value chain is displayed in table 23.

Table 23: Government programs supporting the actors of fruit value chain

	Plant the Future	Program of Agro-production Promotion: Primary Production[44]	Program of Agro-production Promotion: Processing and preserving	Co-financing of Agro processing and storage enterprises	Preferential Agro-credit Project: Fixed Assets	Preferential Agro-credit Project: Agro-leasing	Preferential Agrocredit Project: Produce in Georgia	Agro-insurance	Stimulating agriculture Landowners	Agro-diesel support program	State program of technical assistance
Input Supply – Nursery											
Input Supply - Fertilizers and pesticides											
Input Supply - Machinery & Equipment											
Primary Production											
Storage											
Processing											

[41] This is discussed in chapter 4.1.1.5 Access to services of agronomy and access to knowledge/information

[42] ARDA has added some of the programs currently like stimulating agriculture landownership, agrofuel support program, etc. and is also going to modify some of its programs in the future due to the COVID-19

[43] The detailed description of each project is provided in Annex 12

[44] Receiving Applications under the Program of Agro-production Promotion have been suspended for all purposes from January 9, 2020. The program only includes apple, not pear or plum

Packaging											
Transportation (Distribution)											
Sales (Retailers)											
Export											

Source: ARDA

Beneficiaries of the projects of ARDA

According to the data of implemented projects by ARDA over the period 2013-2019, a total of 17 beneficiaries in Tianeti Municipality got the support. However, the program was "Preferential Agrocredit Project" for each of the 17 beneficiaries. The number of beneficiaries is negligible number compared to the total amount financed in Georgia under this project (9303). Out of these 17 beneficiaries, one beneficiary used the loan to develop a fruit garden and another one to develop a fruit processing facility[45].

Enterprise Georgia

Enterprise Georgia is functioning under the Ministry of Economy and Sustainable Development of Georgia, focusing on stimulating domestic production and entrepreneurship. Among other programs implemented by Enterprise Georgia, "Micro and Small Business Support" is most adjusted to rural SMEs[46]. In this program, the agency is disbursing grants of up to GEL 20 000[47] to promote micro and small enterprise development outside the capital. The grant is conditional on 20% co-financing by the beneficiary. Special priorities are given to rural initiatives, initiatives by women, and persons under 35 years of age. Since 2015, there have been four waves of the program. It has to be noted that the program does not finance primary agricultural production, however, it finances the processing.

It must be mentioned that the program together with financial support includes technical assistance to help the beneficiaries develop basic entrepreneurial skills. Trainings include business plan writing before financing and business management training after being financed. However, it is not obligatory for beneficiaries to attend the trainings.

Beneficiaries of the project of Enterprise Georgia

According to the data of Enterprise Georgia, from 2015 under the program "Micro and Small Business Support" in total 103 beneficiaries were financed in Tianeti Municipality. Out of 103 beneficiaries, 57 beneficiaries obtained support for agriculture and food processing. The number of beneficiaries who received assistance in Lower Pshavi is 9, from where 7 beneficiaries got support for agriculture and food processing.

Most of the interviewed farmers in target regions do not have extensive information about the government programs (programs of ARDA and Enterprise Georgia). In general, they heard that such programs exist, however do not know how to apply, what kind of financial support they can get. Some of the farmers recently applied the program of Enterprise Georgia "Micro and Small Business Support"

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[45] It was not possible to identify beneficiaries in Lower Pshavi region explicitly using the statistics provided by ARDA. In Dusheti municipality, 1 enterprise, which is "LTD Iberia Fruits", was co-financed in 2015 within the project "Co-financing of Agro processing and storage enterprises" and in 2019 within the project "Program of Agro-production Promotion: Processing and preserving". The company operates processing and storage plant of berries.
Within "Preferential Agrocredit Project", 37 beneficiaries received preferred loan in Dusheti municipality over the period of 2013-2019, out of which 5 was concerned with developing a fruit garden, two was concerned with processing fruits, two was concerned with developing a vegetable garden and three was concerned with developing beekeeping

[46] Enterprise Georgia is going to modify all its programs. However, yet, it is not known what will be changed.

[47] According to the Enterprise Georgia in the future 20000 GEL will be increased to 30000 GEL.

to open guesthouse, however, none of them were financed. The farmers do not know the reason for rejection of their grant applications, but they think it is because of low quality business plans they prepared. One of the fruit producer farmers was willing to get finance from ARDA's program "Plant the Future", however after he got to know the rules of the program, he changed his mind. The program demands to carry out the soil analysis before applying and for the farmer, this rule was unacceptable. The farmer stated: "I have half a hectare, where I have water and electricity, I heard a state program provided funding for blackberries, but I had to carry out the analysis of land and had to pay some money for this. This amount was so unacceptable for me. The government has to finance this too". The cost of soil analysis was 296 GEL.

Some farmers also stated that it was difficult for them to find out the procedures of the programs, the required documentation, etc. Most of the farmers are above 40 years old, they generally do not use the internet, do not have information where to get detailed information about the programs and their requirements.

For the farmers among the programs ARDA proposes, Agro insurance is very important one. They see the importance to ensure their fruit production, mainly from risks related to hail. According to the farmers, hail in the region does not occur too often but when it happens, it damages trees heavily and has negative consequences on their fruit production for many years. Currently, the farmers consider the cost of insurance to be very high. Considering their current income, they think they cannot cover the expenses of the insurance.

4.2.2 DONOR ORGANIZATIONS

It is crucial to note that currently Tianeti Municipality and Lower Pshavi Community are not considered as target regions by most international donors and organizations. Currently, Tianeti Municipality and Lower Pshavi are only targeted by several organizations. Austrian Development Cooperation finances the project "Organic Agriculture and Rural Tourism Development in Mtskheta-Mtianeti Region", which is implemented by Elkana in Tianeti Municipality and Lower Pshavi area. People in Need (PIN) implements project "Sustainable Development of Aragvi Community" that covers Lower Pshavi area, but not Tianeti Municipality. The PIN project targets tourism sector.

It has to be noted that, large scale projects such as the USAID "ZRDA activity in Georgia" and ENPARD (European Neighborhood Program for Agriculture and Rural Development) do not have ongoing projects in Mtskheta-Mtianeti region. "The USAID Agriculture Program" partially includes Mtskheta-Mtianeti region because of its coverage of the entire country, one of the target value chains in this program is apple (For detailed information about donor's programs see Annex 13 – Donor Programs).

None of the interviewed fruit producer farmers has ever been supported by any donor organization. They do not have any information on donors' programs in target regions and even not in Georgia.

4.2.3 FINANCIAL INSTITUTIONS (COMMERCIAL BANKS, MICROFINANCE ORGANIZATIONS, INSURANCE COMPANIES) AND NATIONAL BANK OF GEORGIA

There are two commercial banks in Tianeti Municipality: Liberty and Credo, while none is in Lower Pshavi. The microfinance organizations are not located in target areas. ATMs of Liberty Bank (2) Credo (1) and Bank of Georgia (2) are located also in Tianeti[48], none is in Lower Pshavi.

Access to finance is a challenge for small farmers in the fruit sector, they are not able to increase the land area, to buy samplings, machinery, or equipment. Some of the interviewed farmers have consumer loans taken from commercial banks, but for household purposes. The farmers never tried to obtain loans for their fruit businesses. They even do not know about the existence of such loans.

[48] Source: National Bank of Georgia (NBG)

For most of the farmers, bank loans are considered as a large burden often associated with high risks. For this reason, they avoid having any connection with financial institutions. From their point of view, the interest rates on loans are too high and due to instability of their income, they cannot take such risks. They are afraid that if loans are taken, they will not be able to cover credit payments.

The level of financial literacy is very low among fruit farmers, that somehow explains the farmers' negative perceptions towards financial institutions. They do not have information that different kinds of loans are available; they are neither able to differentiate business and consumer loans.

4.2.4 SECTORAL ASSOCIATIONS

In Georgia, there are several sectoral associations in which fruit producing farmers can be involved. Some of them includes:

- Biological Farming Association Elkana
- Georgian Association of Organic Producers
- Association of Supporting Greenhousing
- Georgian Farmers Association

In general, in Georgia and also in target regions specifically fruit (apple, pear, plum) producer farmers' associations do not exist. None of the interviewed fruit producer farmers in target regions is a member of any association. What is more, they have not heard any information about the associations and thus, are unable to analyze its importance.

4.2.5 CERTIFICATION AGENCIES

There are several organic certification agencies that operate in Georgia:

- ECOCERT[49]
- EUROCERT[50]
- CAUCASCERT

Currently in Georgia, CAUCASCERT Ltd is the most popular one among the certification agencies. CAUCASCERT Ltd is the first Georgian local company, which offers its customers certification of organic products. The certificate of CAUCASCERT is legally recognized in Georgia, the European Union, and Switzerland.

The company can certify the following categories of the bio fruit products:

- Unprocessed fruit products
- Processed fruit products
- Vegetative propagating material and seeds for cultivation[51]

The fruit certificate is issued at the first harvest after 36 months the application is submitted.

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[49] https://www.ecocert.com/en/offices; Office responsible for Georgia is situated in Belgrade, Serbia

[50] https://www.eurocert.ge/; Office is situated in Tbilisi

[51] Source: CAUCASCERT, http://caucascert.ge/en/about-us

Organic Certification Costs

Below are the costs associated with annual obligatory inspection costs for fruit land plots:
Table 24: Organic certification costs

Area (Hectares)	Time needed for Inspecting and reporting (hours)	Inspecting cost (GEL) (hourly fee – GEL 325)
0-2	2	650
2-10	3	975
11-50	4	1300
50-150	5	1625
150+	6	1950
Daily rate for inspector		70
Travelling fee for inspector (per 100 km)		95
Take a sample and send it to the lab		160
VAT		+18%

Source: CAUCASCERT

According to the organic certification standard, CAUCASCERT additionally conducts random annual inspections to 10% of the certificate holders. Costs of this random inspections have to be covered in addition to the annual obligatory inspection costs by the certificate holder. According to CAUCASCERT experts, annual certification costs for a fruit farmer with land plot of no more than 2 hectares are approximately GEL 1500-1800 (For detailed information about the pricing of Caucascert see Annex 14 - pricing policy of Caucascert).

The interviewed farmers in target areas do not have any information about the certification possibilities of their products. They are not aware of the processes and costs related to certification. The farmers are less willing to start producing in an organic way because they do not analyze the benefits of organic production.

4.2.6 VOCATIONAL EDUCATIONAL INSTITUTIONS (VET INSTITUTIONS)

There is a state VET college in the Mtskheta-Mtianeti region – Ilia Tsinamdzgvrishvili Community College, which is the first vocational education Institution founded in Georgia, with 138 years of history. Their main building with sample plots and various agricultural technical equipment is situated in village Tsinamdzgvriantkari. They also have branches in Tianeti, Dusheti and Stepantsminda.

The Dusheti branch of the college is just a building at the moment; they have not started providing educational courses yet. For their agricultural and tourism programs, the college expects to have the students from the villages that are far from the college building location and they are trying to arrange transportation of the students.

In Tianeti branch of the college, there are the following modular (the whole course is taught in the college, including practical component) and dual (40% of the course is arranged in actual working environment) programs, with duration of 9 – 36 months:

- Fruit growing - dual
- Beekeeping - modular
- IT Specialist – modular
- Accounting – modular
- Dairy production technologies – dual
- Forestry – modular

There are approximately 10 students in each group. Educational fees for both types of programs are fully financed by the state. Admissions are conducted twice a year – in spring and autumn. To be enrolled on a vocational program, the students have to overcome a minimal barrier on the state exam and then submit necessary documents to the college.

The duration of the existing fruit growing dual program is 9-36 months. The Tsinamdzgvrishvili College also plans to implement Fruit and Vegetable Processing VET program in Tianeti branch and to introduce shorter professional training programs for the directions listed above.

In main Tsinamdzgvriantkari branch, the college offers a wider variety of the programs[52], in addition to the ones listed above:

- Viticulture and Winemaking
- Cultural Heritage Guide of Georgia
- Electricity
- Sewing Specialist
- Hair Stylist
- Tractor Driver
- Horticulture
- Wood Artistic Processing
- Hotel Service

The college also has a dorm where accommodation can be provided for students who do not live nearby.

In target regions, fruit farmers do not have any connection with VET college, never heard about them. They do not have any academic or vocational education in agricultural fields. Apart from formal education, they have never attended any trainings in this field. However, they have willingness to get knowledge in fruit growing. The fruit farmers in target regions lack knowledge in both agriculture and entrepreneurship.

Skills in agriculture

The farmers in target regions do not analyze that like other agricultural products fruit growing also needs care. They do not have knowledge to improve the production system to yield more food. For example, one of the interviewed farmers stated: "Fruit trees should never be watered, they do not need this". In general, the farmers in target regions do what they know from their ancestors.

There is a lack of knowledge at almost every process of fruit production:

- Soil management
- Water management
- Cropping system management
- Fertilization
- Planting
- Crop maintenance
- Protection management
- Harvesting
- Storage

[52] https://www.tmk.edu.ge/pdf/%E1%83%99%E1%83%90%E1%83%A2%E1%83%90%E1%83%9A%E1%83%9D%E1%83%92%E1%83%98.pdf

The farmers have never had any training. However, all of them are willing to learn how to take care of trees, as they analyze there is much they do not know. Additionally, all the farmers claimed they would attend the trainings if location was suitable for them.

Entrepreneurship skills

Apart from the existing problem related to knowledge of fruit growing, the farmers lack knowledge in entrepreneurship. They do not keep records, never carry out financial planning, do not observe costs or revenues. They think as they are involved in the farming only with their family members and do not hire employees since they assume there is no necessity to do financial planning. However, in their opinion, in the future if their business expands, they will need knowledge in this regard.

Currently, the fruit farmers also do not carry out any marketing activities to sell their products. They do not have knowledge how to do that.

4.3 PROFITABILITY ANALYSIS

4.3.1 PROFITABILITY ANALYSIS – EXISTING SITUATION IN TARGET AREAS

Fruit sector value chain in target areas is underdeveloped, there is no storage and underdeveloped fruit processing enterprises. Moreover, even input suppliers, like nurseries, suppliers of pesticides and fertilizers, suppliers of equipment do not exist. If such suppliers are available, there is no connection among them and fruit farmers.

Farmers in target areas do not have any costs related to fruit production, apart from transportation. Mainly, they do not use any fertilizers or pesticides. Moreover, in general, they do not plow the soil or prune the trees, even if they do, it is done with the help of the family members.

In fruit value chain of target regions mainly there are only two participants: farmer and consumer. The whole value created in fruit sector stays with the farmer. Created value differs according to selling methods farmers choose selling fruit at the local market in Tianeti and selling fruit at the Gldani market in Tbilisi. Selling fruit to collectors is not common in Tianeti, as the prices offered by the collectors are not acceptable for them. Among selling methods, profit is the highest when the farmers sell fruit at Tbilisi Gldani market, with the profit margin 1.56 GEL. The profit farmer gets for each selling methods is very low, due to two factors: the low productivity of fruit gardens and the low-price consumers pay.

The table below shows the profitability analysis of fruit gardens for the farmers in target areas for 1 hectare, the costs only include transportation as generally farmers currently do not have any other costs related to fruit production.

Profitability analysis – Apple

Table 25: Profitability analysis of apple

	Farmers selling fruit at local market in Tianeti (transportation: hiring a car)	Farmers selling fruit at local market in Tianeti (transportation: Local transport)	Farmers selling fruit at local market in Tbilisi (transportation: Local transport)	Farmer who sells fruit at farm gate to collectors[53]
Productivity per ha (kg)	7800	7800	7800	7800
Average Price (GEL)	1.2	1.2	1.6	0.2
Total cost (GEL)	2600	52	312	0
Revenues (GEL)	9360	9360	12480	1560
Profit (GEL)	6760	9308	12168	1560
Prime Cost (GEL/kg)	0.3	0.01	0.04	0
Profit Margin (GEL/kg)	0.9	1.19	1.56	0.2
Profit Margin (%)	72%	99%	98%	100%

[53] The volume of fruit selling to collectors is insignificant, as farmers mainly do not sell fruit in such way, because of low price offered by the collectors

Profitability analysis – Pear

Table 26: Profitability analysis of pear

	Farmers selling fruit at local market in Tianeti (transportation: hiring a car)	Farmers selling fruit at local market in Tianeti (transportation: Local transport)	Farmers selling fruit at local market in Tbilisi (transportation: Local transport)	Farmer who sells fruit at farm gate to collectors
Productivity per ha (kg)	5000	5000	5000	5000
Average Price (GEL)	1.2	1.2	1.6	0.2
Total cost (GEL)	1670	33	200	0
Revenues (GEL)	6000	6000	8000	1000
Profit (GEL)	4330	5967	7800	1000
Prime Cost (GEL/kg)	0.3	0.007	0.04	0
Profit Margin (GEL/kg)	0.9	1.19	1.56	0.2
Profit Margin (%)	72%	99%	98%	100%

Profitability analysis – Plum

Table 27: Profitability analysis of plum

	Farmers selling fruit at local market in Tianeti (transportation: hiring a car)	Farmers selling fruit at local market in Tianeti (transportation: Local transport)	Farmers selling fruit at local market in Tbilisi (transportation: Local transport)	Farmer who sells fruit at farm gate to collectors
Productivity per ha (kg)	3300	3300	3300	3300
Average Price (GEL)	1.2	1.2	1.6	0.2
Total cost (GEL)	1100	22	132	0
Revenues (GEL)	3960	3960	5280	660
Profit (GEL)	2860	3938	5148	660
Prime Cost (GEL/kg)	0.3	0.01	0.04	0
Profit Margin (GEL/kg)	0.9	1.19	1.56	0.2
Profit Margin (%)	72%	99%	98%	100%

According to the present situation, the farmers profits are the highest when they sell their fruit in Tbilisi Gldani market. However, currently, the farmers' profit is not maximized, the profit will be much higher if the farmers start conducting all necessary activities for their fruit gardens and increase fruit productivity. As already mentioned, nowadays the productivity of fruit in Tianeti Municipality is very low.

4.3.2 PROFITABILITY ANALYSIS – POTENTIAL COSTS AND EARNINGS FOR ORGANIC PRODUCTION OF FRUIT[54]

This chapter analyzes the potential costs and earnings for the farmers if they start producing fruit by applying organic method.

To produce fruit by using organic method, and assure at least average productivity, several processes shall be completed. The dates and associated costs (per 1 hectare) of these processes are given in Table 28 below[55]:

Table 28: Costs of producing apple, pear and plum by applying organic methods

Process	Month	Unit	Unit Price (GEL)	Total Cost (GEL)
Plowing a land plot (by tractor)	X-XI	1	150	150
Pruning	XI, II, III	1	950	950
Taking out pruned trees	III-IV	1	100	100
Purchasing fertilizer and fertilizing the land plot	II, IV, IX	3	200	600
Cultivation (by tractor)	III-VII	3	100	300
Numbering	VI	1	800	800
Watering	V, VI, VII, VIII	7	80	560
Harvesting	VIII-IX	1	800	800
Transportation	VIII-IX	1	200	200
Unforeseen costs (+10%)				446
Certification costs				1800
Total costs				6706

Source: Field and desk research

In the table below, the profitability of apple, pear, and plum is given in case the farmers in target areas start producing them in accordance with the given guidelines. The average productivity for conventional producing as assumed was 35 tons per hectare for apple, for pear 20 tons per hectare and for plum 15 tons per hectare. 20% loss in productivity is assumed if farmers start producing in organic way.

Table 29: Profitability analysis of apple, pear, and plum by applying organic methods

	Apple	Pear	Plum
Productivity per ha (kg)	28000	16000	12000
Average Price (GEL)	1	1	1
Total cost (GEL)	6706	6706	6706
Revenues (GEL)	28000	16000	12000
Profit (GEL)	21294	9294	5294
Prime Cost (GEL/kg)	0.24	0.42	0.56
Profit Margin (GEL/kg)	0.76	0.58	0.44
Profit Margin (%)	76%	58%	44%

[54] Alternative scenario – when farmer conducts all the necessary activities like plowing, pruning, cultivation, using organic fertilizers and pesticides

[55] The stages are based on documents developed by Georgian Farmers Association (for Cucumber and for tomato) and the costs are derived based on the latter documents and Elkana expert calculations.

4.4 SWOT ANALYSIS

Analysis of fruit sector in target areas identified the strengths, weaknesses, opportunities, and threats. The results are presented in Table 27 below:

Table 30: SWOT analysis

Strengths	Weaknesses
- Favorable climate and soil conditions - Healthy product - Relatively low risk of fruit diseases and pests - Low level of use of chemical products for fruits - Geographical closeness to Tbilisi - Available water resources	- Low productivity - Old orchards - Lack of access to high quality seedlings (No certified nursery) - Low quality of seedlings in local markets - High prices of seedlings in local markets - Lack of specialists in fruit growing - Absence of organized suppliers of fertilizers and pesticides - Lack of technology (non-existence of the appropriate equipment and machinery) - Lack of insurance due to high prices - Underdeveloped processing sector - non-existence of storage and processing enterprises - Lack of knowledge about modern fruit growing methods among diverse groups (women, men, youth, PWDs) - Lack of knowledge in food processing among diverse groups (women, men, youth, PWDs) - Lack of awareness and willingness to convert to organic production among diverse groups (women, men, youth, PWDs) - Low awareness about government programs among diverse groups (women, men, youth, PWDs) - Low awareness about donor programs - Lack of knowledge in entrepreneurship among diverse groups (women, men, youth, PWDs) - Absence of information about the importance of associations or cooperatives - Lack of access to finance due to high interest rates at financial institutions - Low level of youth involvement - Exclusion of PWDs - Low level of women's access to output markets - Gendered division of roles - Women's PWDs and youth's limited access to formal credit services - Unpaid or low payed labor for women - Women's and PWDs limited access to mobility and means of transportation

Opportunities	Threats
- Renewal of orchards (Replacing old trees with new ones) - Development of storage and processing sector - Good entry point for low-skilled rural youth - Increase youth, PWD involvement - Increase women involvement at all stages In-crease of demand on organic fruit among Geor-gian population - Existence of certification agency - Relatively easy process of conversion to organic farming - Government support programs - Development of rural tourism - Existence of ELKANA project	- Prolonged winter frosts, late spring frosts and hail - Ageing population due to internal and external migration - Unstable economic situation - Hindered social norms and stereotypes

4.5 RECOMMENDATIONS

In this section, we summarize conclusions turned into recommendations as possible solutions to the issues encountered during value chain analysis of fruit production in the targeted area. This is based on the concerns of stakeholders, as well as our observations.

1. Support farmers to renovate old orchards

Conclusion:

Mainly, the farmers in the target regions have old orchards, that represents one of the reasons of the low productivity of fruit gardens. Most of the farmers are willing to renovate their fruit gardens, however, are unable to do due to a lack of finance and skills.

Recommendation:

It would be beneficial, the project to support farmers renovating their fruit gardens, that could be done by providing farmers with appropriate knowledge and finance:

- Providing consultations and knowledge - Elkana could provide the farmers with expert knowledge giving them advice and information which varieties of seedlings they have to use, how to plant and care for the seedlings, where to buy, etc.
- Co-financing price of seedlings and providing consultations and knowledge - together with expert knowledge, Elkana could help farmers with finance, by co-financing part of the cost of the seedlings (as mainly price of the seedlings is the main constraint for farmers to renovate their orchards).
- Technical assistance in ARDA's projects - Elkana can help farmers to get finance from ARDA's program "Plant the Future" to renovate their fruit gardens and Elkana can provide them with expert knowledge.

The administrative units, where producing fruit is more favorable due to climate conditions, are given in Annex 11 – Climate conditions. However, it has to be noted that the productivity does not only depend on climate conditions, but it also depends on the factors like soil, etc. that needs further research (like soil analysis).

2. Development of suppliers of fertilizers and pesticides

Conclusion:

In target regions, there are no organized shops where pesticides and fertilizers are sold for fruit growing, which creates difficulty for farmers to have access to necessary inputs. Together with a lack of access to fertilizers and pesticides, there is a lack of knowledge among farmers which fertilizers and pesticides they need to use and how to use them productively.

Recommendation:

Support the development of suppliers of fertilizers and pesticides in target areas could improve farmers' access to fertilizers and pesticides; this will also develop their expertise and raise their awareness of the care needed for their fruit gardens. This could have beneficial effect on fruit sector (and not only fruit sector) in target regions. Elkana could support opening a shop in the target regions where the farmers will be able to get consultations as well as receive pesticides and fertilizers. The business model of supplier that can have positive effect on the municipality is described below, however, before such supplier is financed by Elkana, the business plan has to be assessed to be profitable too.

The business model of supplier will be better to include product as well as the service that is provided. The supplier has to promote organic farming in the municipality and be able to provide farmers with fertilizers and pesticides as well as expert knowledge. The fertilizers and pesticides should include organic pesticides. Fertilizers required for fruit growing are anti-fungal biopreparations like phitocatena

and biocatena, biopreparations against pests like Tuiringen and Lipidin, also biofertilizers like manure, Organica, etc.

It would be important for the suppliers to have knowledge in agronomy, especially in organic farming as well as being familiar with the local conditions. Together with supplying fertilizers and pesticides, it would be crucial the supplier to be able to provide farmers with consultations. It will be better if the consultations that the supplier provides are available via phone on on-site.

All farmers from the villages of Tianeti Municipality should have access to products and services of the supplier. The place where the suppliers of pesticides and fertilizers can be developed could be Borough Tianeti as mainly local municipality transport provides transportation from the villages of Tianeti Municipality to borough of Tianeti.

However, supporting the establishment of such shop in the municipality will enable the farmers to use supplier's services and products. With the help of Elkana, it would be important farmers to get knowledge about the importance of soil fertilization, spraying against fungal diseases and pests of their products. Otherwise, maybe the supplier will not be able to continue functioning in the municipality in the long run, as the demand on its products and services will be low.

The supplier of pesticides and fertilizers will need a strong marketing strategy in order the farmers to get information about its existence and to be persuaded that the supplier's products and services would be beneficial for them. To spread the information about the supplier, it would be better if information about it is printed on papers and placed in the centers of the villages, as currently this is the most common practice of spreading information in Tianeti Municipality. Moreover, the spreading of information could be done with the help of the information-consultation center and the representatives of the local governments in the villages.

3. Support development of certified fruit nurseries

Conclusion:

The farmers in target regions do not have access to seedlings due to the lack of seedlings provided by the local nurseries and a lack of information about the existence of these nurseries in the municipality. Moreover, for the farmers the price of seedlings is too high, and the quality of seedlings sold in Tianeti market is not satisfactory.

Recommendation:

The development of local fruit nurseries in the target regions could have a positive effect on fruit sector advancement. That could increase the access to good quality seedlings for farmers. It would be important the nursery to produce productive varieties of fruit.[56] However, before financing by Elkana, the profitability of such nursery has to be assessed (by assessing its business plan).

The nursery located in village Tegeraanebi could have a positive effect on the municipality due to the modern varieties the nursery produces and the owner's acceptance of innovations. It could be beneficial if Elkana collaborates with this nursery and provides it with financial resources to expand.

Together with financial support, Elkana could help the nursery by informing the farmers about it. The nursery will require effective marketing strategy for the farmers to be informed about its existence and to be persuaded that the nursery provides good quality seedlings. To spread the information about the nursery, it would be better if information about it is printed on papers and placed in the centers of the villages, as currently this is the most common practice of spreading information in Tianeti Municipality. Moreover, the spreading of information could be done with the help of the information-consultation centers and the representatives of the local governments in the villages.

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[56] There is no data giving which varieties of fruits are exported or manufactured in Georgia, however according to the desk research conducted Sinap (apple), Panta (pear), Alibukhari, Chanchuri (plum) are exported from Georgia

Moreover, Elkana may support this nursery to develop online platform for selling the seedlings, and if agreed with the owner of the nursery, afterwards the platform can also be used for selling the products of local fruit producer farmers.

4. Increase farmers' access to agricultural machinery and equipment

Conclusion:

According to the interviews conducted with fruit producer female and male farmers in target regions, most of them do not have any machinery and equipment for fruit growing. Apart from not having machinery and equipment, there is a lack of knowledge among the farmers about the necessity of plowing, cultivating, fertilizing, etc. their land.

There are suppliers of machinery in the Tianeti Municipality like Meqanizatori and cooperative Imedi. However, most of the farmers do not apply to them, due to several reasons: firstly, there is a lack of information about their services (the farmers are not aware that such possibility exists), secondly, the farmers do not see the importance of using machinery for their fruit gardens and thirdly, the farmers are less reluctant to pay money in such services (this is related to the second reason). Some farmers (mainly not for the purpose of fruit growing), who apply to the suppliers of machinery, find it difficult to get their services, as they often have to wait long. According to the farmers, having mini tractors would make their work more productive and will help them increase the productivity of the fruit gardens.

Recommendation:

Elkana could support farmers to increase their knowledge and access to agricultural machinery.

- Providing consultations and develop knowledge - Elkana can increase knowledge among farmers about the importance of using appropriate machinery for fruit growing by training component.
- Financing suppliers of agricultural machinery - apart from boosting knowledge, Elkana can support farmers to increase their access to machinery. One possibility can be to finance a project by grant component to create another supplier of agricultural machinery in the target regions. In this case, according to the interviewed farmers, it will be better such project to be financed in or near Borough Tianeti.
- Financing individual farmers or farmer groups – the farmers in target regions mainly require mini tractors for their fruit gardens. Elkana could consider providing fruit producer farmers with mini-tractors individually or with the agreement that the farmers to be united and e.g. 4-5 fruit producer farmers in the same village to use the machinery provided by Elkana.

5. Promote development of processing sector in the target region

Conclusion:

The processing sector in the target regions is not developed. Some fruit farmers produce dried fruit or Vodka themselves, but mainly for own consumption. According to the interviewed farmers, they are willing to start processing their fruit products, however, they do not have knowledge and special equipment for processing.

Recommendation:

Elkana can support the development of processing in the target regions by providing farmers with knowledge and special equipment. The equipment farmers require are mostly fruit drying machines and Vodka distillation equipment. Together with equipment, the farmers will need knowledge for processing in accordance with quality standards.

Another possibility can be Elkana to support opening a fruit processing enterprise. However, it has to be considered, that farmers are less willing to sell their fruit to such enterprises or collectors due to a low price they offer (0.15-0.3 GEL). Therefore, the functioning of enterprise depends on the model it applies.

In case of plum and pear, the farmers will be more willing to sell them to enterprise, due to perishability of these products. During 2019, the volume of pear produced amounted to 457 tons, plum – 307 tons, apple – 1997 tons. According to the interviewed farmers, they sell on average 62% of their fruit production, so in case of pear - 283 tons, in case of plum 190 tons and in case of apple – 1240 tons[57]. These are the maximum amount the enterprise can get from the farmers in Tianeti Municipality[58].

One model to establish enterprise can be fruit producer farmers to be united like a cooperative and start functioning together.

However, before deciding to develop enterprise in target regions, feasibility study is recommended to be conducted, this will enable to analyze different business models.

6. Increase entrepreneurship skills including management and financial literacy skills among farmers

Conclusion:

There is a lack of entrepreneurship skills among farmers, including management skills and financial literacy.

The level of financial literacy is very low among them, due to this reason, the farmers have negative perceptions towards financial institutions. They do not plan their finances, do not produce any bookkeeping and financial reporting. There is a lack of knowledge among them to understand financial issues. They cannot differ family money from business money.

Apart from financial literacy, there is a scarcity of skills among the farmers to market their products, they do not know how to sell and advertise. They are not able to analyze the market needs either.

Recommendation:

Elkana can support farmers to increase their skills in entrepreneurship by providing relevant practical training programs in the fields of entrepreneurship. One of the possibilities could be to use the training program developed by National Bank of Georgia for SMEs[59] and agrobusinesses[60]. This will ensure that women, youth, PWDs are actively involved in those trainings.

7. Supporting VET college to increase farmers knowledge in fruit growing

Conclusion:

In target regions, the farmers do not have information and awareness in modern fruit growing, organic farming and fruit processing. They do not have knowledge in soil management, water management, cropping system management, pest management, etc. Moreover, together with a lack of skills and knowledge among the farmers, there is a limited access to information and knowledge for them.

Recommendation:

To increase access to information and knowledge for farmers and for the project results to be sustainable, it is important to involve other actors in Tianeti and Lower Pshavi, who will maintain the provision of the activities after the project has reached its end. For this purpose, it is advisable to establish partnerships with information-consultation centers and Ilia Tsinamdzgvrishvili VET College, which has branches in Dusheti and Tianeti.

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[57] It has to be taken into account that the current research was qualitative, not quantitative, therefore we cannot say that the calculated numbers are representative

[58] It has to be taken into account that the research conducted is qualitative, the calculated numbers may not to be representative, this issue requires additional quantitative research

[59] https://www.nbg.gov.ge/index.php?m=706&lng=eng

[60] https://www.nbg.gov.ge/index.php?m=749&lng=geo

Elkana can support Ilia Tsinamdzgvrishvili VET College and in partnership with the college develop professional training programs[61]: short term programs and dual programs. The main purpose of such programs is to provide specific knowledge to recipients of all ages (life-long learning) in a specified narrow field. To support development of fruit sector, the programs that can be developed are the following (not limited to):

- Modern fruit growing methods
- Organic fruit growing methods
- Planning, managing and operating nurseries
- Planning, managing and operating fertilizer and pesticide stores
- Planning, managing and operating machinery and equipment businesses
- Fruit processing

In order to develop professional training programs, working group should be created in partnership with VET college. Working group can be composed of educational experts (on college's part) and agriculture/vegetable growing experts (on Elkana's part). Developing a curriculum and application process for the program to get approved by the authorities is rather straightforward.

The development of professional training programs can be cost-saving activity in many ways for Elkana, as Ilia Tsinamdzgvrishvili College is state-owned and the funding for students' education, administrative purposes and students' special educational needs can be acquired from the state budget.

Together with the development of short-term dual program, it will be necessary the farmers to be informed actively about this program and encourage their involvement in this program.

8. Raise farmers' awareness and knowledge about organic fruit growing and technologies,

Conclusion:

As identified by the conducted research, the farmers in target regions do not have knowledge in organic fruit growing and technologies.

Recommendation:

Elkana could support increasing farmers' awareness and knowledge about organic fruit growing and technologies, by providing relevant practical trainings with the farmers in target regions. Elkana has to ensure women, youth, PWDs are actively involved in those trainings.

9. Promote conversion to organic methods and taking organic certification

Conclusion:

The price of organic production significantly exceeds the price of non-organic production in Georgia and in the EU. Moreover, in Georgia among consumers, the importance of organic food is increasing and in the future the demand on organic production is expected to grow.

The farmers in target regions produce fruit mainly in organic way as they do not use any chemicals, however, they lack knowledge on how to follow standards of organic production. Moreover, they will not be able to cover the costs of certification.

Recommendation:

Support farmers to convert to organic farming and be certified in organic fruit growing and fruit processing, through fully or partially subsidizing occurred costs for certification. The certified farmers can be the ones who will be supported by Elkana to start fruit processing.

[61] https://www.mes.gov.ge/content.php?id=9133&lang=geo

10. Increase awareness about the importance of organic fruit among the Georgian population and Increase awareness of Georgian consumers about the quality of fruit in target regions

Conclusion:

In the frame of the research, through the interviews with the representatives of supermarkets and café/restaurants, it was identified that in Georgia, among the population, there is a lack of awareness about the importance of consuming organic products including fruit. Moreover, among the Georgian population, there is a lack of knowledge about the quality of produced fruit in target regions.

Recommendation:

Elkana could support to increase awareness about the importance of organic products including fruit and the quality of fruit produced in target regions among the Georgian population by providing relevant marketing campaign. The campaign is better to be conducted mainly in Tbilisi.

11. Increase farmers awareness about government and donor programs and support them taking participations in those programs

Conclusion:

Most of the interviewed farmers in target regions do not have extensive information about the government programs (programs of ARDA and Enterprise Georgia). In general, they heard about the existence of such programs, though do not know how to apply, what kind of financial support they can get. Moreover, as most of the government programs require business plans, for the farmers developing business plans represent a challenge.

Recommendation:

Due to the fact that the farmers in target region need complex support beginning from renovating their old orchards ending in developing processing, the government programs, mainly programs of ARDA and Elkana project, could complement each other.

Elkana can support farmers to get extensive information about the government programs. The farmers could be assisted with application to such programs, development of business plans and necessary documentations. Moreover, as most of the government programs require beneficiary's co-financing, that represents a challenge for the farmers, Elkana may help the farmers by financing their part in those projects.

12. Support farmers to diversify sales channels

Conclusion:

The main selling channels for fruit farmers in target regions are selling fruit in Tianeti market, Tbilisi Gldani market or the farm gate. The prices in these channels are lower compared to the fruit prices in Tbilisi supermarkets, online shops or shops selling organic products.

Recommendation:

Elkana can support fruit producer farmers to connect with high value-added markets, like supermarkets, online shops, and organic shops in Tbilisi (the detailed information about these supermarkets are given in chapter 4.1.7). This can be done by helping farmers to connect with supermarkets, one of the supermarkets can be Carrefour, that was interested to be involved in the given project and supports farmers from Tianeti Municipality. Elkana can continue communicating with Carrefour and agree on the conditions the supermarket has.

Moreover, Elkana can support farmers by providing them with coaching and mentoring, to increase their awareness of the requirements of high-priced markets and teach them how to satisfy these requirements.

13. Support farmers involvement in relevant associations

Conclusion:

None of the interviewed farmers is a member of any associations and does not realize the benefits they could get from membership of some agriculture associations.

Recommendation/Possible solution:

Encourage farmers to consider the membership of the relevant agriculture associations, e.g. Elkana by increasing their awareness of the benefits such associations can provide.

14. Training opportunities for women, youth and PWDs

Conclusion:

The assessment demonstrated that if we look at the knowledge of modern farming practices, including farm management, financial literacy, marketing, men are more advanced in this regard to compare to women. This result is in line with the findings of the World Bank research, according to which women and girl farmers have less access to agricultural information and extension services. Rather, they receive information on farming techniques through their husbands, brothers or informal sources and not have a chance to participate in any trainings. The situation is even more drastic when it goes to PWDs. They have even less access to the information, as there are no tailored extension and agricultural information services available to meet the specific needs of PWDs. Also, the current assessment demonstrates that women and girl farmers tend to be more willing to get consultations from an agronomist, while male farmers are more reluctant to do so. This once again affirms female farmers' lack of knowledge and practice, which was mentioned above.

Recommendation:

Ensure women, youth, PWDs are actively involved in capacity building opportunities (trainings, mentorships, etc.) on modern fruit farming practices tailored exclusively to their diverse needs, including fruit farm management, financial literacy, marketing, etc., so that a lack of knowledge of women, youth, PWDs does not limit their contribution to agricultural production. The training time, location, and accessibility also need to be considered. If one group (e.g. women, girls, PWDs) must be at home during a specific time when others are available or vice versa, the training either should be arranged on appropriate time when all groups are available or be scheduled as separate trainings. Having same group trainings separately may create conditions where each group (women, youth, PWDs) feels more confident in participating and expressing their needs. Adapting the trainings, in terms of contents, methods and materials, to the level of knowledge and previous experience of potentially interested members of diverse groups, will also be an effective way to attract vulnerable groups. Ensure that the training materials show neither a stereotypical representation nor underrepresentation of vulnerable groups; there is fair portrayal of women, men, youth, PWDs in materials, so as to contribute to the lack of positive role models for the groups who are underrepresented in the field.

15. Grant support schemes for women, youth, and PWDs

Conclusion:

The research demonstrates that the labor force in fruit value chain is not as diverse as expected. More specifically, youth and PWDs are not engaged in fruit farming in Tianeti, even though both groups do have the potential to participate through labor contribution and decision making. For example, for PWDs to be actively involved in fruit farming, they need certain assets, including land, financial capital, machinery, tools and equipment, as well as networks to be able to carry out certain activities at certain value chain; the certain stage is also required, however, given the type of disability, this is not available

for them. In the same vein, we see much of women's and girls' work in fruit value chain taking place in the context of family farming, typically ranging across harvesting, packaging, and processing of dry fruit products.

Recommendation:

Provide targeted grant support schemes for women, youth PWDs to establish or improve their own farming; ensure they are eligible and get support on putting together a grant application. This could include the schemes as diverse as technical support, in-kind grants, twining grants, etc.

16. Access to high-quality inputs, equipment, technology for fruits for women, youth, and PWDs

Conclusion:

Typically, those household members with economic decision-making power and access to credits and loans who purchase laborsaving tools and machines are men, even though during the interviews almost all the farmers highlighted that they are making decisions on any type of activity together with the household. It is also worth mentioning that women and girls, if provided with increased access to machinery and tools, can reduce the need and amount of labor on their farms, which gives them time for other responsibilities or leisure. It appeared that in Tianeti there are no disabled farmers, nor the cases of people with disability (PWD) involving in farming were observed, which can be stipulated by no access to the different capital assets, including machineries that determines an individual's, i.e. PWD's ability to productively engage in farming. The current assessment confirmed that post-harvest operations, e.g. packaging, which is time consuming and repetitive are mostly carried out by women in Tianeti.

Recommendation/Possible solution:

Ensure women, youth, and PWDs have access to high-quality inputs, equipment, technology for fruits and have knowledge, how to use them to achieve high-quality product.

17. Access to credit for women, youth, and PWDs

Conclusion:

While land-related statistics for Tianeti Municipality, which includes data on land and agriculture ownership disaggregated by gender and age is not available, in all the cases under the current research the agriculture land was owned by men. When female and male farmers do not have equal access to capital, women and girls tend to participate in the activities where physical product transformation involves simple, relatively low-cost equipment, or no-cost equipment (such as knives and bowls, etc.). The example of this can be the case of dry fruit production, which according to the current assessment is associated with women and girls. This notwithstanding, it appeared that in Tianeti there are no disabled farmers, nor the cases of people with disability (PWD) involving in farming were observed, which can be stipulated by no access to the different capital assets, including machineries that determines an individual's, i.e. PWD's ability to productively engage in farming.

Recommendation:

Support access to credit, land for women, youth, and PWDs, by providing support schemes in partnership with financial institutions, that would open up economic opportunities for them and support the growth of women, youth and PWD-owned farming.

5. VEGETABLE (TOMATO, CUCUMBER) VALUE CHAIN ANALYSIS

5.1 GRID MAP – VEGETABLE VALUE CHAIN ACTORS

The following diagram shows vegetable value chain in target regions.

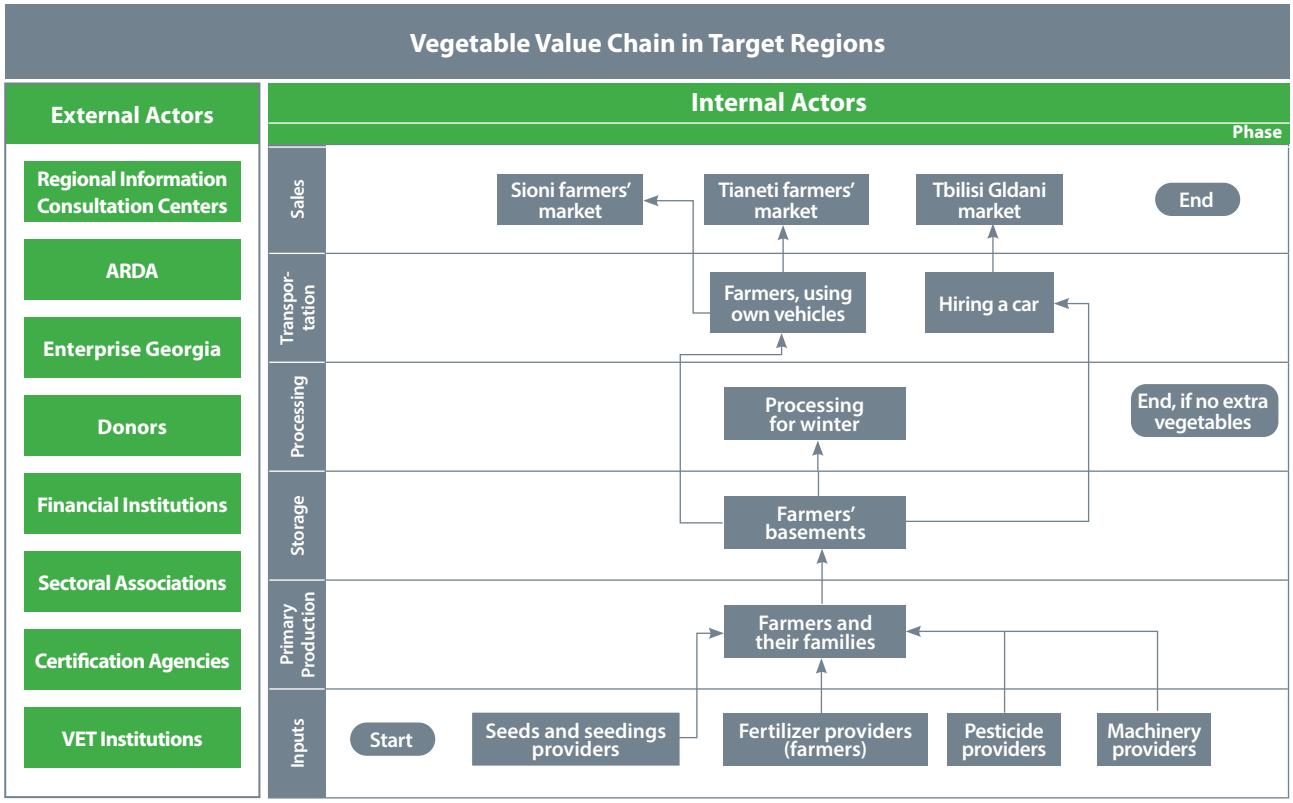

Diagram 2: Vegetable Value Chain in target regions *Source: Field research*

5.1.1 INPUT SUPPLIERS

5.1.1.1 Nurseries

Georgia does not have a unified database that lists all nurseries in the country, and neither is there any information about what is produced in the nurseries. Most of them are not registered. Even so, there are still some ways to trace some of them by using the following sources: National Statistics Office of Georgia's 2014 Agricultural Census and Business Register and ARDA.

Nurseries according to the National Statistics Office of Georgia's Business Register

According to the statistics of the National Statistics Office of Georgia's Business Register, as of March 2020, there are only 44 active registered enterprises under economic activity "Plant propagation"[62], which comprises of production of saplings and seedbeds[63] (Business Register does not have information about the seedlings the nursery provides). Out of these 44, only 2 are operating in Mtskheta-Mtianeti region, in Mtskheta Municipality and in Tsilkani community, but none of them produces vegetable seedlings.

According to the Business Register, there is no nursery in Tianeti Municipality or in Lower Pshavi area.

62 Includes saplings and seedbeds

63 The huge difference between the number of nurseries according to the National Statistics Office of Georgia's business register and according to the National Statistics Office of Georgia's 2014 Agricultural Census is due to most of the farmers in Georgia are not registered as a business enterprise

Nurseries according to the National Statistics Office of Georgia's 2014 Agricultural Census

The National Statistics Office of Georgia does not distinguish between fruit and vegetable nurseries and has a unified register. Therefore, statistical information about nurseries is discussed in chapter 4 – Fruit Value Chain Analysis.

According to the interview results, there are several nurseries producing vegetables in Tianeti Municipality, but they are in the process of development and at present, they do not produce seedlings for tomato and cucumber. There is a veterinary shop in Tianeti, which offers a low variety of vegetable seeds. Therefore, female, and male farmers in Tianeti have to buy their seedlings in Tianeti farmers' market. The seedlings are brought by sellers from Kakheti and Shida Kartli Region. Prices vary according to the quality of seeds and seedlings, but for good quality seeds/seedlings the prices are the following:

- 1 tomato seed – GEL 0.25
- 1 cucumber seed – GEL 0.20
- 1 tomato seedling – GEL 0.5 – 0.6

According to the interview results, the farmers, both female and male, who buy lesser quality seedlings, later have to replace at least 50-70% of them, because they do not grow properly.

5.1.1.2 Suppliers of fertilizers and pesticides

For vegetable growing to be productive, green fertilizers and green anise shall be used. Frequently mulching with hay, mowed grass, straw, etc. and fertilizing the land with bio humus, compost, liquid herbal fertilizers and other microbiological and organic fertilizers is essential to achieve high productivity. Bio-insecticides, biofungicides and biostimulators such as Kuproxate, Agrocatena, Biocatena, Stimufungi and Organica also help farmers to harvest more products[64].

The fact that most organic fertilizer producers and suppliers are offering organic products to their customers along with non-organic products, makes it nearly impossible to identify every organic fertilizer supplier in Georgia. Statistical classification of economic activities also does not draw a distinction between organic and non-organic producers and traders of fertilizers. It is also likely that the popularization of organic fertilizers will not create a huge amount of new companies exclusively producing or trading with the organic fertilizers, but rather it will result in already existing companies expanding their product variety from non-organic to organic fertilizers. Because of this, it is important to analyze not only organic, but also non-organic fertilizer suppliers in Georgia.

Production of fertilizers and agrochemical products

According to the Business Register of National Statistics Office of Georgia, as of March 2020, there are only 8 companies in Georgia producing mineral fertilizers[65], and only 5 companies producing pesticides or other agrochemical products[66], with none of them operating in Mtskheta-Mtianeti region.

Wholesale and retail trade of fertilizers and agrochemical products

According to the Business Register of the National Statistics Office of Georgia, as of March 2020, there are 227 companies which operate in the wholesale trade of mineral fertilizers and agrochemical products[67] in Georgia. It is worth pointing out that there is a strong upward trend in the number of these companies over time, with its quantity more than doubling from 2012 to 2020. Even so, out of these 227, only 3 companies operate in Mtskheta-Mtianeti region (a share of 1.3%) and none in Tianeti Municipality and Lower Pshavi.

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64 https://elkana.org.ge/uploads/page/217/pdf/geo/publication/mebostneoba.pdf, p. 23-24

65 Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 20.15.1

66 Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 20.20.0

67 Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 46.75.1

Retail suppliers of fertilizers in Georgia are harder to identify, as the National Statistics Office of Georgia's methodology combines fertilizer retailers with flower, seed, domestic animal, and domestic animal feed retailers[68]. However, in many cases the above-listed products can be found in the same retail store, so we can still draw some conclusions from the analysis of this category. As of March 2020, there are 586 companies falling in the aforementioned category of retail trade. Contrary to wholesale trading companies, their quantity has been more stable over time, with no significant change since 2015. Only 8 out of these companies operate in Mtskheta-Mtianeti (which is 1.3% of the total 586). Once again, there is no retail fertilizer supplier operating in Tianeti Municipality and Lower Pshavi.

Table 31: Number of companies in trade of fertilizers and agrochemical products

Number of companies in trade of fertilizers and agrochemical products	Georgia	Mtskheta-Mtianeti	Tianeti	Lower Pshavi
Retail trade	586	8	0	0
Wholesale trade	227	3	0	0

In Target areas, there are no organized shops selling fertilizers or pesticides for crop growing. However, in Tianeti Municipality, there is a veterinary shop which offers a low variety of pesticides to its customers. In target areas in most cases, when the farmers have to purchase pesticides, they go to "Samto Kimia" (a place near metro Didube) in Tbilisi and purchase necessary substances there.

In general, in target areas, the vegetable female and male farmers do not use fertilizers or pesticides to produce vegetables. In a few cases, they only use fertilizers of their own making (cattle and chicken manure). This significantly lowers the risks of serious potential health effects to which women may be more vulnerable, e.g the exposure of women to the pesticides through agricultural work can affect their children, either in utero or through breast milk, with negative outcomes ranging from intrauterine growth retardation to neurological effects. This may lead to the potential implications for later health and productivity[69].

Due to the fact that neither female nor male farmers have extensive knowledge in vegetable diseases/pests and defense mechanisms against them, they often cannot manage to select an appropriate product and approximately half of the time the substances do not achieve their purpose. However, the current research also demonstrated that the female farmers tend to be more willing to get information in more targeted and organized way, i.e. through internet, TV show Farm, while the male farmers are more reluctant to do so, they mostly rely on informal channels, i.e. relatives, neighbors, etc.

5.1.1.3 Availability of machinery and equipment

For vegetable production, a number of agrotechnical procedures have to be conducted both before planting and during growing process. The machinery and equipment required for vegetable growing is given in Table 32 below.

Table 32: Machinery and equipment for vegetable growing

	Activity	Type of equipment/machinery
1	Plowing	Tractor, plow
2	Cultivating	Cultivator
4	Fertilizing	Compact spreader machine

[68] Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 47.76.0

[69] FAO (2014). Gender in Agriculture Closing the Knowledge Gap. Available at the following link: http://www.fao.org/3/i8815en/I8815EN.pdf Last time visited on May 5, 2020

5	Spraying the chemicals	Mordanting machine
6	Irrigating	Irrigation system
7	Saving vegetables against prolonged winter frosts and late winter frosts and hail	Freezing protection systems
8	Saving vegetables against hail	Hail protective shades

According to the "Mtskheta-Mtianeti Regional Development Strategy, 2015-2021", one of the hindering factors of vegetable production in Mtskheta-Mtianeti is non-existence of the appropriate machinery. Moreover, according to the "Midterm development plan of Tianeti Municipality" the lack of knowledge among the Tianeti population make them unaware of the importance of agrotechnology.

Suppliers of machinery and equipment according to the National Statistics Office of Georgia's Business Register

Based on the information from the National Statistics Office of Georgia's Business Register, as of March 2020, there are 2 private companies nationwide which are involved in manufacturing of agricultural machinery[70], with none of those in Mtskheta-Mtianeti. Other forms of more common activities are the wholesale trading with the agricultural machinery or renting and leasing of the machinery. 95 companies operate in the wholesale trade of agricultural machinery and equipment[71] and 48 companies operate in renting and leasing of agricultural machinery and equipment[72] in Georgia. Out of these, only one renting and leasing company, "LTD Titani" operates in Mtskheta-Mtianeti, namely, in the village Mukhrani, which is part of Mtskheta Municipality.

Table 33: Suppliers of machinery

Suppliers of machinery	Georgia	Mtskheta-Mtianeti	Tianeti	Lower Pshavi
Manufacturing	2	0	0	0
Wholesale Trade	95	0	0	0
Renting and Leasing	48	1	0	0

Source: National Statistics Office of Georgia

One of the most prominent suppliers of machinery in Georgia is a state-owned company LTD Meqanizatori, which operates under "Agricultural Logistics & Services LTD"[73]. It has the service centers and dislocation centers for the machinery and equipment in nearly all regions of the country. Out of 55 dislocation centers countrywide, one is in Dusheti Municipality and one is in Tianeti Municipality. It is noteworthy that nearly all agrotechnical services needed for vegetable production is performed by the Agricultural Logistics & Services LTD.

According to the interviews conducted with the vegetable female and male farmers in Lower Pshavi and Tianeti, they do not use machinery for their vegetables, sometimes if they do, they borrow it from their neighbor for free. Some farmers use their own tractors. None of the interviewed farmers uses the service of LTD Meqanizatori. According to the farmers, even they do not use machinery for vegetable growing, in the municipality, there is a problem related to access to machinery, as there is a lack of such suppliers. Sometimes, they need to wait for long for the machinery to be available for them.

[70] Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 28.30.0

[71] Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 46.61.0

[72] Corresponding code in "Classification of Economic Activities (NACE Rev.2) (2016) – 77.31.0

[73] http://www.alsc.ge/

There is also machinery cooperative "IMEDI". The interview conducted with this cooperative confirmed the farmers' claim that they do not use machinery for vegetable growing processes. Gender-specific differences were not observed, however, we can assume that women will have difficulty to access them. This is because typically those household members with economic decision-making power and access to credits and loans who purchase laborsaving tools and machines are men. It appeared that in Tianeti, there were no disabled farmers, nor the cases of people with disability (PWD) involving in farming were observed. This can be stipulated by no access to the different capital assets, including machineries that determine an individual's, i.e. PWD's ability to productively engage in farming. The increasing number of machineries and new technologies under vegetable farming would encourage women to take part in activities which in the past were done by men, as well as it would minimize their workload. Using machinery for plowing the land plot would cost GEL 200 for a hectare and cultivating would cost GEL 100. For spraying the vegetables with herbicides, fertilizers or pesticides, the price is GEL per 1 hectare (for each).

5.1.1.4 Laboratories for Soil Analysis

According to ARDA's program "Plant the Future", there are three laboratories where farmers can carry out soil analysis (for more information about the laboratories see Fruit value chain)[74]. For the soil analysis of vegetable, the following features have to be examined:

Table 34: Features to be analyzed and corresponding prices

Features to be analyzed	Price according to the University Laboratory Centre of the Agrarian University of Georgia
1. Mechanical content	37 GEL
2. Humus	25 GEL
3. Nitrogen	40 GEL
4. Phosphorus	35 GEL
5.Potassium	34 GEL
6. Complex of cations	45 GEL
7. Ph level	12 GEL
8. Carbonates	11 GEL
9. EC -salinity	7 GEL
10. Preparation of recommendation	50 GEL
Total Cost	296 GEL

Source: The University Laboratory Centre of the Agrarian University of Georgia

In general, if needed, the farmers can visit the Public and University Laboratory Centre of the Agrarian University of Georgia themselves or the employees of laboratory can take samples on site and make laboratory analysis. If the farmers prefer to make soil analysis on site together with the cost of soil analysis, they have to cover the transportation costs of the laboratory staff. The laboratory does make analysis of pests and diseases.

The interviewed female and male farmers claimed they have never carried out soil laboratory analysis. Most of them do not analyze why they have to do soil analysis, thinking this could be additional costs for them. Differences among the female and male farmers behavior were not observed in this regard.

[74] http://arda.gov.ge/projects/read/plant_future/20:child

5.1.1.5 Access to services of agronomy and access to knowledge/Information

Mainly, the farmers in Georgia have access to services of agronomy, necessary information and knowledge through the information and consultation centers as well as from suppliers of fertilizers and pesticides.

Regional Information Consultation Centers

Regional Information Consultation Centers operate under the Ministry of Environment and Agriculture of Georgia, within the Ministry's department of their respective municipality. The centers provide information and advice to the farmers and cooperatives on various issues related to agriculture; monitor implementation of various projects in the respective municipality; act as main actors in regional agricultural data collection. They represent more general interests of the Ministry of Environment and Agriculture of Georgia. The following areas of the centers' responsibilities are relevant for the fruit products in interest within the scope of the report:[75]

- Cultivating agricultural crops - popularization of modern agrotechnical methods of care and promotion of implementation of these practices
- Collecting and processing information on seed and planting materials available on the market, consulting interested parties according to their specific needs
- Providing information to interested parties on the availability of mechanization in municipalities, as well as their rational use
- Collecting information on plant protection products available on the market and offering valid methods for their use to interested parties
- Providing consultations to interested parties on preparatory technical measures and other organizational issues related to harvesting
- Providing recommendations to the interested parties on the storage conditions and terms of the harvest
- Within the scope of its competence, promoting the development of agricultural cooperatives
- Promoting bio-production
- Promoting the dissemination of international experience in the production and sale of agricultural products and food

Information-consultation centers have agronomists, however, the interviewed farmers never applied to them for any kind of information. They have not heard about them either.

In other municipalities of Georgia, where shops of fertilizers and pesticides are located, the farmers can take service of agronomists free of charge. Farmers do not have such opportunity in target areas. They do not use the support of agronomists; they think in the municipality, such specialist does not exist, as they have never heard about that and applying to agronomist in Tbilisi or other regions will cost much. The current assessment demonstrates that the female farmers tend to be more willing to get consultations from an agronomist, while the male farmers are more reluctant to do so, which once again affirms female farmers lack of knowledge and practice, as mentioned above.

In the frame of the research, it was identified that in target regions, the farmers (both female and male) do not have information and knowledge in modern vegetable growing. They do not have knowledge in soil management, water management, cropping system management, pest management, etc. If we look at information and knowledge possession from gender perspective, the research in part supports the findings of the World Bank research, according to which women farmers have less access to agri-

[75] Core competencies of Regional Information Consultation Centers: https://mepa.gov.ge/Ge/Page/RegionalInformationConsultationCenters

cultural information and extension services. Rather, they receive information on farming techniques through their husbands or informal sources, what is more, they do not have a chance to participate in any trainings. The situation is even more drastic when it goes to PWDs. They have even less access to the information, as there are no tailored extension and agricultural information services available to meet the specific needs of PWDs.

5.1.1.5 Labor force

The research demonstrated that the labor force was not as diverse as expected. More specifically, youth and PWDs are not engaged in farming in Tianeti, even though both groups do have the potential to participate through labor contribution and decision making. For example, for PWDs to be actively involved in vegetable farming, they need certain assets, including land, financial capital, machinery, tools, and equipment, as well as networks to be able to carry out certain activities. Given the type of disability, PWDs are also required to have a certain stage, which is not available for them. In the same vein, youth if provided with necessary skills, knowledge, and resources, they do have the potential to be actively engaged in the vegetable value chain, as it provides entry point for low-skilled rural youth. The research demonstrated that the aging of the farmers is the typical phenomenon for Tianeti, similar to the other parts of Georgia.

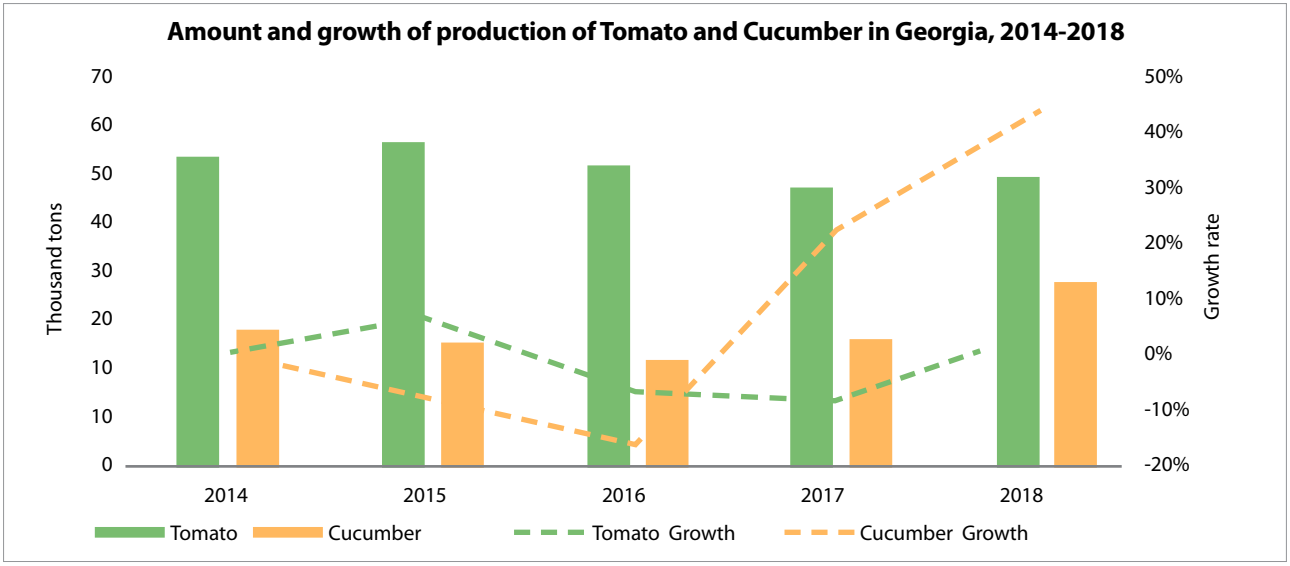
Mainly, the vegetable producer farmers are engaged in farming with their family members and do not need to hire any labor. This is due to the fact that they produce vegetables in small quantities and situation can change as the produced quantities increase.

Even though the respondents highlight that in general, most of the activities like plowing, cultivating, harvesting, sorting are shared with all groups (women, men, youth) equally, the production is still organized in a gender-specific way. This tradition of gender roles in households, is based on deeply rooted stereotypes. Women are perceived as physically weak and men as strong; it is claimed that women and men are fit for/better at different tasks. e.g. while in plowing mainly men are involved in Tianeti, the women are in majority in selling of the products. More specifically, as the assessment shows much of women's work in vegetable value chain takes place in the context of family farming, typically ranges across harvesting and processing of vegetable products.

5.1.2 PRIMARY PRODUCTION

5.1.2.1 Vegetable production in Georgia by conventional methods

According to the National Statistics Office of Georgia's Survey of Agricultural Holdings, in Georgia, the production of vegetables amounted to 119.1 thousand tons in 2018. Out of this, tomato and cucumber amounted to more than 2/3 of total production, with tomato produced 51.7 and cucumber - 33 thousand tons. As observable from the chart below, the highest production of tomato was in 2015, with 58.1 thousand tons, and for cucumber – in 2018. As for the lowest production, for cucumber it was in 2016 and for tomato – 2017, with 18.7 and 49.9 thousand tons produced, respectively. Cucumber production was gradually declining until 2016 and then began rising since than with 43% increase in 2018. As for tomato production, there is no significant trend and it is more stable, with maximum change of -8% in 2017.



Source: National Statistics Office of Georgia

5.1.2.2 Vegetable production in Georgia by organic methods

Based on Caucascert, which is the only agency in Georgia issuing certificates proving the organic nature of the product, there are 105 farmers with active certificates, with only 4 of them being situated in Mtskheta-Mtianeti. However, none of those 4 farmers are cultivating vegetables. In fact, nationwide there are only 4 farms cultivating vegetables.

Members of Elkana, though without a certificate of proof, can be considered as organic farmers. Out of Elkana's 104 members in Georgia which are involved in production of vegetables, just 9 are situated in Mtskheta-Mtianeti region, while only 1 out of these 9 s is operating in Tianeti Municipality and 3 of them in Dusheti Municipality. The other 5 are situated in Mtskheta Municipality.

5.1.2.3 Vegetable production in target regions by conventional methods

Land used for vegetable growing

According to statistics provided by Information-consultation center in Tianeti Municipality, in 2019, 34.5 hectares of agricultural land were used for cultivating tomato in Tianeti Municipality. For cucumber, this figure was 35.5 hectares, while in Lower Pshavi the land used for vegetables is insignificant. Unfortunately, the land-related statistics for Tianeti Municipality, that include data on land and agriculture ownership disaggregated by gender and age is not available, however, the national statistics can allow the assumptions to Tianeti Municipality, according to which legitimated agricultural land is owned by three times more men, than women.[76] This is also validated by the current research according to which in all the cases the agriculture land was owned by men.

There is a scarcity of arable land in Tianeti Municipality and Lower Pshavi. Many farmers mentioned the land registration problems during focus group meeting, specifically they have problem of registering land plots to their names, which hinders them from cultivating these areas. As beans and potatoes are more profitable and less perishable, the majority of interviewed farmers grow vegetables such as cucumber and tomato only in their gardens near their houses.

[76] Kaushal Joshi, Hema Swaminathan, et al. (2019). Women's Asset Ownership: Evidence from Georgia; Mongolia; and Cavite, Philippines. Available at the following link: https://www.adb.org/sites/default/files/publication/487506/ewp-571-womens-asset-ownership-georgia-mongolia-philippines.pdf Last visited on May 4, 2020

Quantities produced

706.5 tons of tomato and 682 tons of cucumber were produced in Tianeti Municipality in 2019. In terms of productivity, which is quantity of fruit produced per hectare, tomato and cucumber are relatively similar, amounting to 20.5 and 19.2, respectively. Quantities produced in Lower Pshavi are insignificant.

Productivity of vegetable production

The productivity in Tianeti seems to be much lower than the average productivities of 50 ton/ha for tomato and 40 ton/ha for cucumber. The reason behind this is the fact that in Tianeti, the farmers only produce small quantities of tomato and cucumber in their gardens and do not carry out the necessary activities to increase productivity, such as cultivating the land properly and using fertilizers and defense mechanisms against pesticides.

The summary of characteristics in Tianeti Municipality in 2019 is given in Table 35 below.

Table 35: Vegetable in Tianeti Municipality, 2019

	Hectares	Tons	Productivity (ton/ha)
Tomato	34.5	706.5	20.5
Cucumber	35.5	682	19.2

Source: Information-Consultation Center in Tianeti

Vegetable Varieties

According to the conducted interviews with the female and male farmers, in Tianeti and Dusheti (lower Pshavi) Municipalities the most common vegetable varieties are given in Table 36 below:

Table 36: Vegetable varieties in Tianeti Municipality

Vegetable	Variety	Description
Tomato	Pink Tomato (from Choporta)	Its main features include a resistance to temperature changes and viral diseases, a special taste of fruits and highly branched stem. The fruit is round, with a smooth surface. Consumed as a salad as well as in canning.
	Lenor F1	Its main features include its medium time vegetation duration and uniform thick fruits, weight of 150-190 gr. The fruits are not characterized by green spots around the stalk. For open ground production.
Cucumber	Gherkin (Crispina F1)	Its main features include resistance to air dryness and various viruses. The fruit is of high quality and the best taste. It is parthenocarpic, designed for zones with different climatic conditions. For open ground production.
	Kirby Cucumber (Ajax F1)	Its main features include high tolerance to various viruses, and resistance to temperature changes as well as insufficient moisture, early picking dates and stable high yields. The fruits are homogeneous and of green color with the good taste. For open ground production.

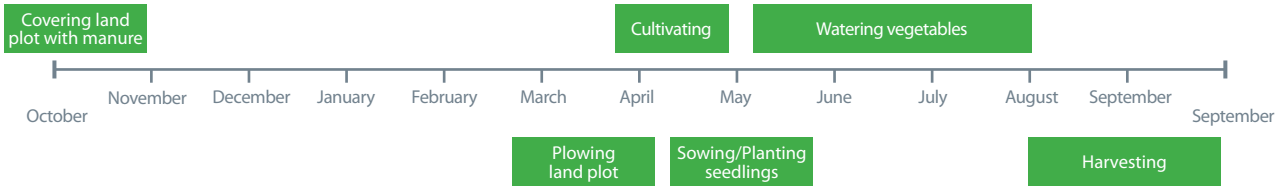
Source: Interviews with farmers, desk research

Methods for vegetable growing

The primary purpose of growing vegetables is to have healthy food for their families. Hence, the sizes of the gardens are proportional to family sizes. Families of 2 have 20-30 plants of each tomato and cucumber, while bigger families have larger quantities of plants, up to 100-150. The fact that the vegetables are grown for family use is also the reason behind the fact that the farmers do not know how

many kilograms of each vegetable they produce each year. However, they claim that the quantities are quite volatile and depend on the quality of seeds/seedlings, weather and other conditions. The farmers do not use hired labor force in any activities. They are individual producers, none of the farmers are members of any vegetable production-related cooperatives. Only one of the interviewed farmers was a member of a cooperative in Lower Pshavi, however, the cooperative is producing only dairy products and has not started functioning yet.

The process of growing vegetables starts in October and ends in September.



Due to a geographical location, the temperatures are lower than in other regions of Georgia. This means that vegetable growing process in open ground starts in April. The majority of farmers manually prepare land with shovels or use portable power tools (cordless drills, commonly referred as "Hand Tractors"), which some of the farmers own and lend to their neighbors for free. Portable power tools are also available for rental. The land is previously (in October-November) covered with manure, which is produced in the farms, using cattle droppings. During shoveling process, the manure is mixed with the land and the land gets fertilized. The next step is to use hoe for cultivation, to mellow the land for seedlings/seeds.

Alternative process was observed for only few farmers among the interviewees. These farmers are relatively big producers. They need to use machinery for land plowing and fertilization. One of the farmers uses a tractor, which he owns. Another one has to hire a tractor, which costs GEL 50 for plowing and GEL 50 for cultivation. Afterwards, before planting the seedlings, he cultivates the plowed land with cultivator tool, which is attached to the tractor. As the research demonstrated, women are not involved at this stage and cultivation is done solely by men.

The next step is sowing the seeds or planting the seedlings. In most cases, the farmers use seedlings for tomatoes and seeds obtained from the previous year's harvest for cucumbers. This has to happen in the first half of May, according to the traditional knowledge that the Tianeti farmers inherit from their ancestors and is done mostly by women. Sometimes, in reality, the planting/sowing happens a bit earlier or later, depending on the weather.

The next step is to water the vegetables regularly. This is relatively easy job for the Tianeti farmers, due to the fact that their gardens are next to their houses and they have readily available water on tap. For those few, whose vegetable gardens are far from their houses, they have a river nearby from which they can retrieve water. The frequency of watering the vegetables depends on the rain in most cases.

The farmers claim that there are very few diseases and pests that threaten vegetables in Tianeti, due to the lower temperatures observed in Tianeti. However, the majority of the farmers have had cases when they had to use a variety of chemical substances to protect the vegetables. The farmers are not very knowledgeable about these substances, they just ask the shop assistants or other farmers what to use and are mostly dependent on luck – the substances they purchase and use work about only half of the time. However, they have one organic traditional method against diseases – they are using the vegetables' own leaves or milk, mixed with water to spray the vegetables to protect them. However, less and less farmers are using this method, as they consider chemical substances more reliable.

The harvesting period depends on the altitude – the higher the vegetable garden is situated, the later the vegetables ripen. In the lowest regions, vegetables are ready for harvesting in late July, whereas in the highest and coldest regions , sometimes even in September. The majority of works related to harvesting, thinning, and managing the vegetables fall on women.

Most often the vegetables are not collected altogether at the same time. The farmers collect a few, the ripest vegetables at a time, using them for food for their families. When all the vegetables are ready for harvest, the farmers collect them with the help of family members. Sometimes a few neighbors provide assistance (for free).

None of the interviewed farmers used any hired labor for any agricultural activities. The division of tasks was mainly equal between men and women, with the exception of using a tractor, which was used by only one male farmer. Men try to do all the heavy labor themselves (shoveling mainly), while women take care of processing the vegetables.

Distribution of production and income of farmers from vegetable growing

Distribution of harvested vegetables among household consumption and sales in target region is either 100% household consumption or, in few cases of farmers with larger production, 80% of sales and 20% of household consumption.

The average monthly income of vegetable growers in target regions who sell is 330 GEL, with yearly income of approximately GEL 4000. The farmers have difficulty naming the costs and income, as they do not carry out any kind of bookkeeping or budgeting.

5.1.2.3 Vegetable production in target regions by organic methods

As mentioned in the part about organic vegetable production in Georgia, there are no organic certificate holders that produce vegetables in target regions.

However, as observed through interviews, the farmers in target regions use almost no chemicals during vegetable production process, therefore, they can be perceived as organic farmers but without certification. It is worth noting that, if decided, these farmers can very easily switch to fully organic production and acquire certificates.

5.1.3 STORAGE

Due to the low level of production in target regions, the existence of storage enterprises may not be efficient. In Georgia during 2016-2019, 33 storage enterprises were financed, from there 7 are for storing fruit and vegetables (they are located in Shida Kartli (3), Kakheti (3) and Kvemo Kartli(1)). According to the research conducted by PMCG in 2019, it was identified that storage enterprises were not able to fully use the capacity, because of the low level and quality of production in Georgia.

Table 37: Number of storage enterprises in Georgia by region and municipality, as of March 2020

Region	Municipality	Number of storage enterprises
Shida Kartli	Gori	1
	Kareli	2
Kakheti	Sagarejo	1
	Sighnaghi	2
Kvemo Kartli	Bolnisi	1

Source: ARDA

In target regions, there are no storage units where farmers could store large amounts of vegetables, if produced. Currently, the collected vegetables are stored in wooden boxes in cool dry places (mostly in farmers' basements). The farmers in target areas do not have knowledge about the storing conditions. However, as already mentioned, due to low temperatures, the vegetables are not easily perished in Tianeti and can last for several weeks, even months. During this period, the farmers use the vegetables in fresh meals or sell them in farmers' markets.

The farmers who produce large quantities of vegetables do not have storage facilities, therefore they have to sell the vegetables immediately after harvesting. Hence, they harvest vegetables gradually, and sell them straightaway.

5.1.4 PROCESSING

As mentioned above, the current assessment confirmed that post-harvest operations, i.e. processing, which is time consuming and repetitive, are mostly carried out by women in Tianeti. Production is mainly for home consumption and there are no opportunities for selling. The female family members make tomato sauce and canned tomatoes for winter. For this reason, they thermally process tomatoes in their home kitchen conditions, add spices, and store them in hermetically sealed glass jars. The female family members make pickles from raw (green) tomatoes and gherkin cucumbers - they thermally process the vegetables, add vinegar and other ingredients, and store them in hermetically sealed glass jars. These products are not made according to any standards; they are neither labeled nor produced in lab-approved safe conditions, so the farmers are unable to sell them. Thus, post-harvest equipment, better storage facilities and other new and improved technologies still need to be explored and promoted in the interest of the women farmers.

5.1.5 PACKAGING

The farmers mostly use wooden boxes to store and transport their vegetables. None of them possesses or has ever used packaging materials for vegetables or any other cultures of their production, therefore, they do not have any knowledge about the materials, their costs and required standards. However, there are observations that packaged vegetables cost more in supermarkets due to the perceived higher quality and the time saved by the customers for weighing the products. Therefore, if the target market is supermarkets, it can be profitable to raise awareness about these factors among the farmers in target region.

5.1.6 TRANSPORTATION

Among the interviewed farmers, there are very few farmers who periodically sell their products, depending on the harvested quantities, while in the case of all interviewed female farmers, vegetables are consumed within the household, and there is limited market-orientation among the female farmers. The selling points are Gldani, Tianeti and Sioni farmers' markets. On all markets, the main selling days are Saturday or Sunday. Some farmers have their own cars, which they use for transporting vegetables, some farmers use bigger cars of their neighbors and pay up to GEL 10 per day for transportation. Farmers who sell on Tianeti and Sioni farmers' markets, live close to the marketplaces and therefore the costs of transportation are very low, about GEL 5 per both trips to and from the marketplace. Even though it was not mentioned by the female respondents explicitly, generally, not having access to the transport services excludes women from key downstream activities along the supply chain. Thus, if women provided with improved transportation and other infrastructure, as well as training and increased access to competitive lines of credit/loans, they could advance in vegetable production, handling, and marketing better.

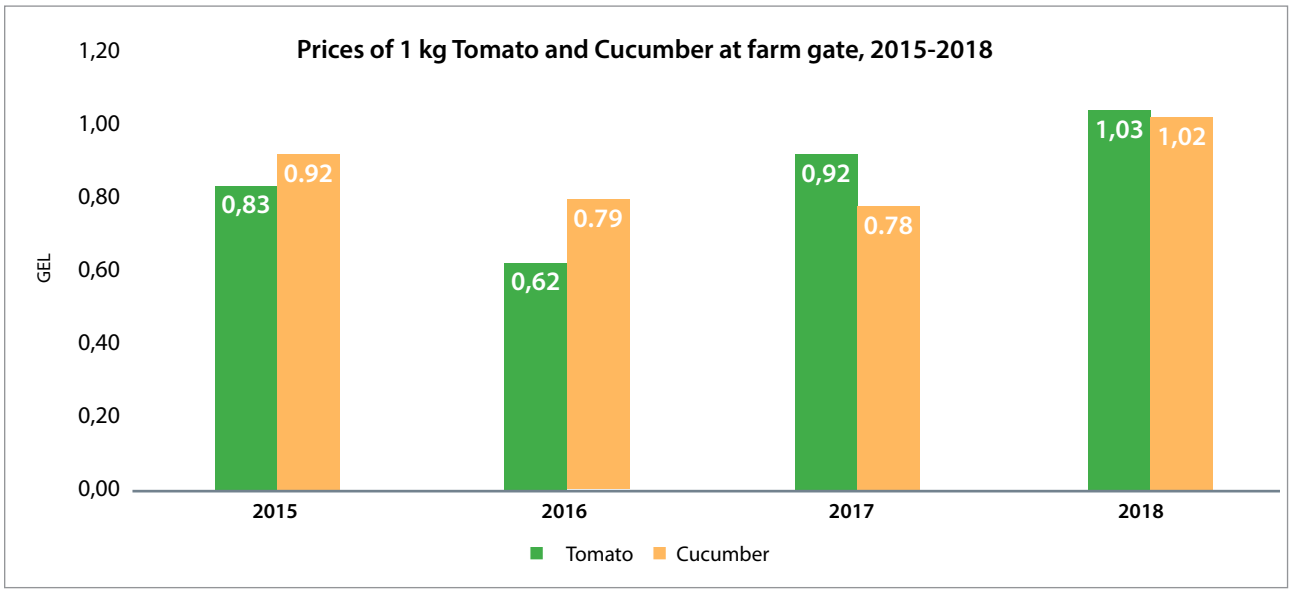
5.1.7 SALES

5.1.7.1 Prices of vegetables in Georgia

The statistics for different prices for vegetables were collected and analyzed. The National Statistics Office of Georgia collects data of the prices at the farm gate directly from the farmers. Additionally, the National Statistics Office of Georgia collects retail prices for calculating the CPI index, in the supermarket chains, markets and street markets in 6 major cities of Georgia (Tbilisi, Kutaisi, Batumi, Gori, Telavi, Zugdidi). Moreover, the desk and field research studies were conducted at the end of February and vegetable prices in major supermarket chains Carrefour and Goodwill were collected.

Prices at farm gate

According to the National Statistics Office of Georgia, the farm gate price range in 2015-2018 was 0.62 – 1.03 GEL, and cucumber price range was 0.79 - 1.02 GEL. Both prices peaked in 2018. Average price for this period was 0.85 GEL for tomato and 0.88 for cucumber.



Source: National Statistics Office of Georgia

Prices at supermarkets and markets in the 6 major cities of Georgia[77]

The analysis of tomato and cucumber prices based on Consumer Price Index of Georgia, reveals that retail prices of tomatoes in 2018 were 2.5 times higher than prices at the farm gate, while retail prices of cucumbers were 2.6 times higher.

It is worth noting that in the period of 2015-2019, tomato was proved to be more expensive with an average price of 2.6 GEL/kg. Average price of cucumber in this period was 2.3 GEL/kg. Moreover, the latest statistics of 2019 showed that average price of tomatoes was 15.6% higher than average price of cucumber.

The average prices of tomatoes and cucumbers in the years between 2015 and 2019, expressed in GEL are as follows:

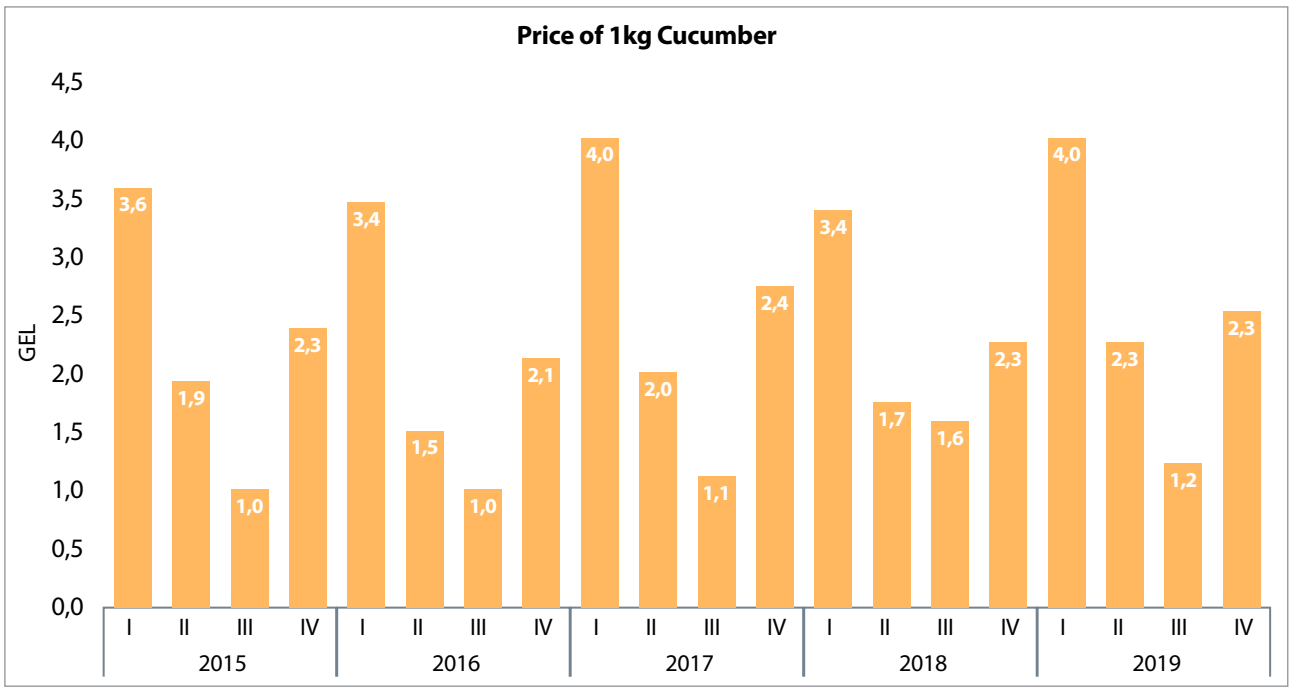
Table 38: Prices of cucumbers and tomatoes at supermarkets and markets in the 6 major cities of Georgia

Prices (GEL)	2015	2016	2017	2018	2019
Tomato	2.64	2.22	2.71	2.62	2.89
Cucumber	2.19	1.99	2.46	2.22	2.5

Source: National Statistics Office of Georgia

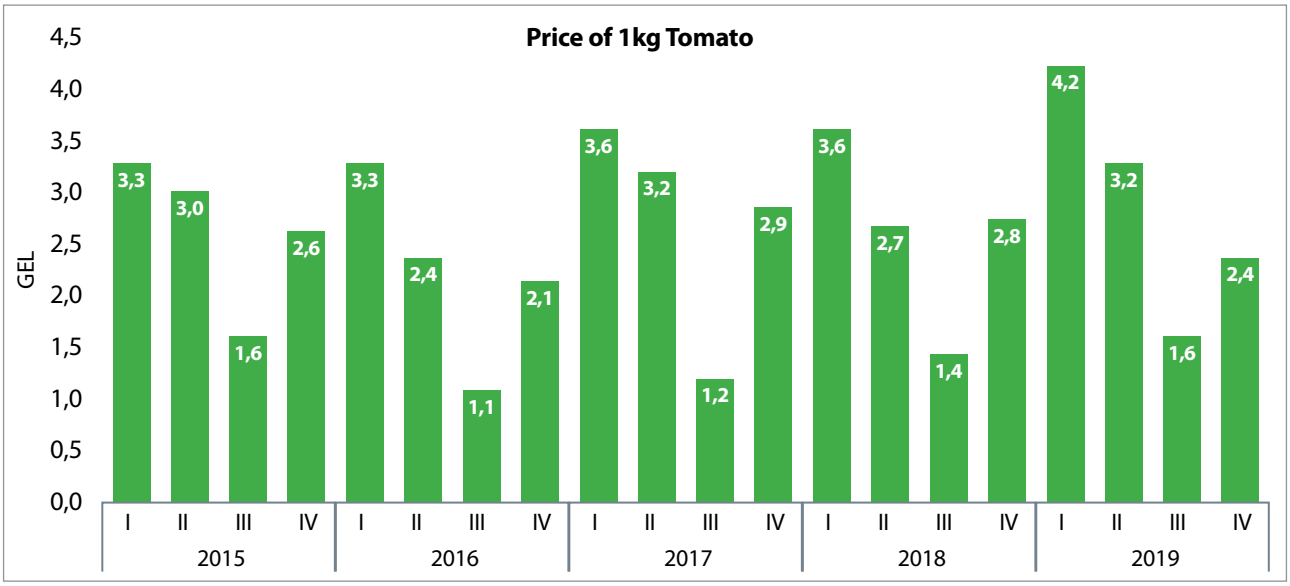
There are significant fluctuations in average prices of cucumbers due to seasonality. It is worth noting that average prices of cucumber generally follow the pattern of decreasing from QI to QIII, and then increasing in QIV. First quarters of each year in the period of 2016-2019 are characterized with the highest average prices of the year. Average price of cucumbers in first quarters (2015-2019) is 3.68 GEL/kg, while figures for QII, QIII and QIV are 1.88, 1.18 and 2.38 GEL/kg, respectively.

[77] Source: National Statistics Office of Georgia



Source: National Statistics Office of Georgia

It is important to note that the average prices of tomatoes in 2015-2019 follow the same consistent pattern as cucumbers; the average prices gradually decrease from QI to QIII and then increase in QIV. Moreover, there is another similarity with fluctuations of the average price of tomatoes, which is a clear pattern of QI characterized with the highest average price of the year, while QIII representing the lowest average price.



Source: National Statistics Office of Georgia

Prices in major supermarkets in Tbilisi [78]

As a result of desk research[79] the prices of tomato, cucumber, and their products were identified in Georgia's largest supermarkets - Carrefour and Goodwill. It is worth mentioning that the desk research was conducted in February, when the prices were relatively high, according to data from the National Statistics Office of Georgia.

Tomato

There are 3 kinds of locally grown tomatoes in Georgian supermarkets. Below price ranges for 1 kilogram are given:

- "Georgian tomato" – the cheapest kind of tomato, with price range of GEL 4.30 – 4.45
- "Pink tomato" – observed in Goodwill only, costs GEL 8.45
- Cherry tomatoes – price ranging from 5.95 to 10.40, depending on the producer

List of tomato products with prices in GEL is given in the table below:

Tale 39: Prices of tomato products in supermarkets

Product	Carrefour			Goodwill	
	Organic (Imported)	Nonorganic (Local)	Nonorganic (Imported)	Nonorganic (Local)	Nonorganic (Imported)
Tomato juice 1 L					8.36
Tomato Sauce 1 L				12.00	
Adjika (hot and spicy pepper/ tomato spread) 1 KG				15.16	12.00
Tomato paste 1 L	25.89		9.88		7.04
Ketchup sauce 1 L			7.60	9.20	9.82
Pickled cherry 1 KG		4.50		5.75	
Pickled tomatoes 1 KG				5.63	5.35
Canned tomatoes 1 KG	6.25				6.55

Source: PMC Research Center. Data was obtained in March 2020

Cucumber

Cucumber's product range is rather smaller than tomato's – there are only 3 kinds of cucumbers: "Georgian garden cucumber", "Kirby cucumber" and "Netherlands cucumber", with price range GEL 2.55 – 8.45 and the only processed cucumber product is pickled cucumbers (gherkins), with price range of GEL 2.18 – 4.85, varying with weight.

Tale 40: Prices of cucumber products in supermarkets

Product	Carrefour		Goodwill	
	Non-organic (Local)	Non-organic (Imported)	Non-organic (Local)	Non-organic (Imported)
Georgian Cucumber 1 KG	5.45	6.35	2.55	
Kirby Cucumber 1 KG			6.55	
Netherlands Cucumber 1 KG			8.45	
Pickled Cucumber 1 KG	4.36	6.52	9.70	8.18

Source: PMC Research Center. Data was obtained in February 2020

[78] Source: PMC Research Center. Data was obtained in March 2020 in Tbilisi

[79] Source: PMC Research Center. Data was obtained in March 2020 in Tbilisi

Prices of organic products in Georgia

The prices of organic cucumber and tomatoes were obtained from several grocery stores and shops in Tbilisi, Georgia that have occupied the niche market of selling exclusively organic products. The prices were collected at the end of February[80].

A detailed list of all organic products can be found in the table below:

Tale 41: Prices of organic products in grocery stores and shops in Georgia, Tbilisi

Product	Store	Unit	Price (GEL per unit)	Imported or Local
Pickled Cucumbers	Georgita[81]	1 KG	35.14	Organic, Imported
Tomato Paste	Carrefour	1 KG	27.5	Organic, Imported
Tomato Paste	Carrefour	1 KG	24.29	Organic, Imported
Canned Whole Tomatoes	Carrefour	1 KG	6.25	Organic, Imported
Adjika with tomatoes	Sunflower Health Food Store	1 L	28	Organic, Local
Tomato Ketchup	Sunflower Health Food Store	1 L	8	Organic, Local
Tomato Paste	Sunflower Health Food Store	1 L	11	Organic, Local
Tomato	Sunflower Health Food Store	1 KG	5	Organic, Local
Tomato Sauce	Georgita	1 KG	36.67	Organic, Imported
Tomato Ketchup	Georgita	1 KG	23.79	Organic, Imported
Semi-dried Tomato	Georgita	1 KG	62.78	Organic, Imported
Tomato	Farmers George and Ines[82]	1 KG	4	Organic, Local
Tomato	Samkura[83]	1 KG	3.5	Organic, Local

Source: PMC Research Center. Data was obtained in February 2020

Comparison of organic and non-organic prices in Georgia

The comparison of the above prices for organic products to the prices of their non-organic counterparts on the basis of the prices collected in February 2020 reveals several patterns. Firstly, it has to be noted that all the prices were collected during the period of February-March. While normally for fresh vegetables the prices are less than the prices obtained in February (due to increased supply) during other quarters, the decline in the prices of organic vegetables is quite insignificant. Secondly, prices of imported organic tomato and cucumber products are approximately 2-3 times higher than those of local non-organic ones.

Rules in supermarkets in Georgia

Based on the desk research[84] and the interviews conducted with major supermarket chains, the following trends were revealed:

- Major supermarkets do not have exclusive suppliers of fresh products and are open to any supplier who wants to deliver fresh products. They state that they would love to contribute to local producers' development.
- There is an entrance fee in most of the supermarkets, which is either annual, or one-time.

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80 Selected organic shops include: Sunflower Health Food Store; Biofarm Pona; Georgita; Tserti; Soflidan.ge

81 https://www.georgita.ge/

82 https://agrokavkaz.ge/agromarket/iqhideba-organuli-tsesith-moqhvanili-pomidori.html

83 https://www.facebook.com/biosamkura/

84 http://zrda.georgianeo.ge/index.php/ka/news-room-ka/market-research-sectoral-studies/item/download/246_8085d-00d5a860d6a8ad001eb56e3197d

- There are marketing costs – free products for customers to taste, product placement on specific shelves, etc.
- The quality of products and production location are tested before the contract is signed and then randomly, on occasion. If the product quality degrades, the supermarkets can terminate the contracts with suppliers.
- Supermarkets prefer that the suppliers are stable. In most cases, suppliers have to carry transportation costs and deliver their products to different branches at different locations.
- In most cases, the products are consigned by the supermarkets, which means that the supplier receives the payment according to sold products. In a few cases, the products are paid for in advance. In either case, expired products are not paid for.
- Supermarkets tend to prefer suppliers that deliver the products regularly, however, some of them are open to possibilities that the suppliers can only deliver products seasonally, in small quantities.

On the contrary, in farmers' markets, there are no such rules. Main trend is that producers sell their products to re-sellers, who then sell the vegetables in the farmers' markets, with a markup. The transportation is carried out either by the farmers, who bring their products to the farmers' markets and sell them to re-sellers for a bulk price, or by the collectors who pick up products at the farm's gate and transport them to farmers' markets.

5.1.7.2 Sales of vegetables in target regions

Most of vegetables produced in Tianeti Municipality are sold locally or in Tbilisi, Gldani farmer's market. Mainly farmers prefer not to sell to collectors as the price offered by them is very low. In general, farmers are not under contract to deliver their entire crop to food processors, distributing companies or individual buyers.

The farmer who sells his production in Sioni, is not a regular seller. The quantity for sale depends on the productivity of harvested vegetables – if there is an extra amount of vegetables produced other than what is necessary for the family, he brings the vegetables to Sunday farmers' market with his mother who is the salesperson. Given the fact that Sioni visitors value the taste and healthiness of the product, they pay more for the locally grown vegetables than for those brought from Kvemo Kartli or Kakheti. Cucumber is sold for GEL 1.5 – 2 and tomato is sold for GEL 2 – 3, depending on the prices of competitors at the time. However, the quantity sold is very small – about 10-15 KG of each tomato and cucumber, therefore, the revenue and profit are insignificant.

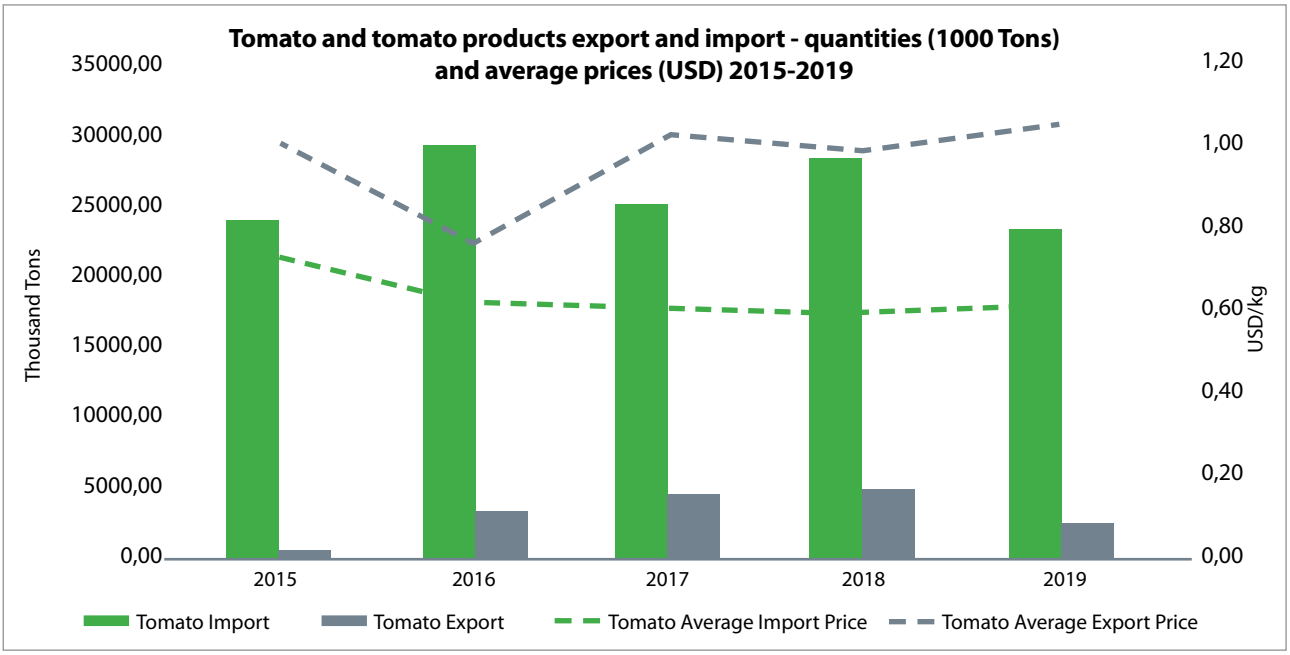
The farmer who sells his product in Tianeti farmers' market has approximately 200 KGs of each cucumber and tomato to sell every year. Different from Sioni, which is a touristic destination, the prices of vegetables are not as high as in Tianeti – both vegetables are sold for GEL 1 - 1.5. Therefore, this farmer's yearly profit from selling cucumber and tomato is approximately GEL 400-600, which as he states is not a big part of his annual income.

The farmer who sells his product in Gldani farmers' market, sells about 800-1000 KGs of each tomato and cucumber, and generates up to GEL 2000 from each culture. Both, tomato, and cucumber are sold for GEL 1.5 – 2.5, depending on the period of the year.

5.1.7.3 Foreign Trade – Export and Import

Tomato products export and import

According to the National Statistic Office of Georgia, during 2015-2019, 128.7 million tons of tomato and its products were imported to Georgia, costing USD 81.1 million. 15.4 million tons of tomato and its products were exported, costing USD 14.8 million. Average import and export prices are USD 0.6 and USD 0.96, respectively, however, as observable, trade balance is negative.



Source: National Statistics Office of Georgia

To observe the distribution of tomato products' export, fresh tomatoes amount to 93% of exports, while the remaining 7% is divided almost equally among canned/pickled tomatoes, tomato juice. Ketchup and other sauces and frozen tomatoes.

Table 42: Exported tomato products

Exported products	SUM Q	%Q	SUM P	%P
Pickled/canned tomatoes	330.01	2%	328.43	2%
Fresh tomatoes	14351.97	93%	13651.17	92%
Tomato Juice	84.82	1%	74.63	1%
Ketchup and other tomato sauces	518.93	3%	698.75	5%
Frozen tomatoes	105.75	1%	48.10	0%
Dried tomatoes	0.00	0%	0.05	0%
SUM	15391.49		14801.13	

Source: National Statistics Office of Georgia

Concerning import, quantities of fresh tomatoes amount to 71% of total import of tomato products, while pickled/canned tomatoes amount to 16% and Ketchup and other sauces amount to 13%.

Table 43: Imported tomato products

Imported products	SUM Q	%Q	SUM P	%P
Pickled/canned tomatoes	19 991.9	16%	24 831.2	31%
Fresh tomatoes	91 318.2	71%	38 890.1	48%
Tomato Juice	630.4	0%	469.5	1%
Ketchup and other tomato sauces	16 741.8	13%	16 868.9	21%
Frozen tomatoes	0.5	0%	1.2	0%
Dried tomatoes	1.1	0%	7.2	0%
SUM	128 683.8		81 068.2	

Source: National Statistics Office of Georgia

Export of tomato and tomato products by countries: Top 5 partners during 2015-2019

In terms of fresh tomatoes, Russia is by far the most prominent export partner over the period of 2015-2019. For tomato juice-Ukraine, pickled tomatoes-Azerbaijan and for ketchup and other tomato sauces -also Russia (for more information see Annex 10 – Export by Countries).

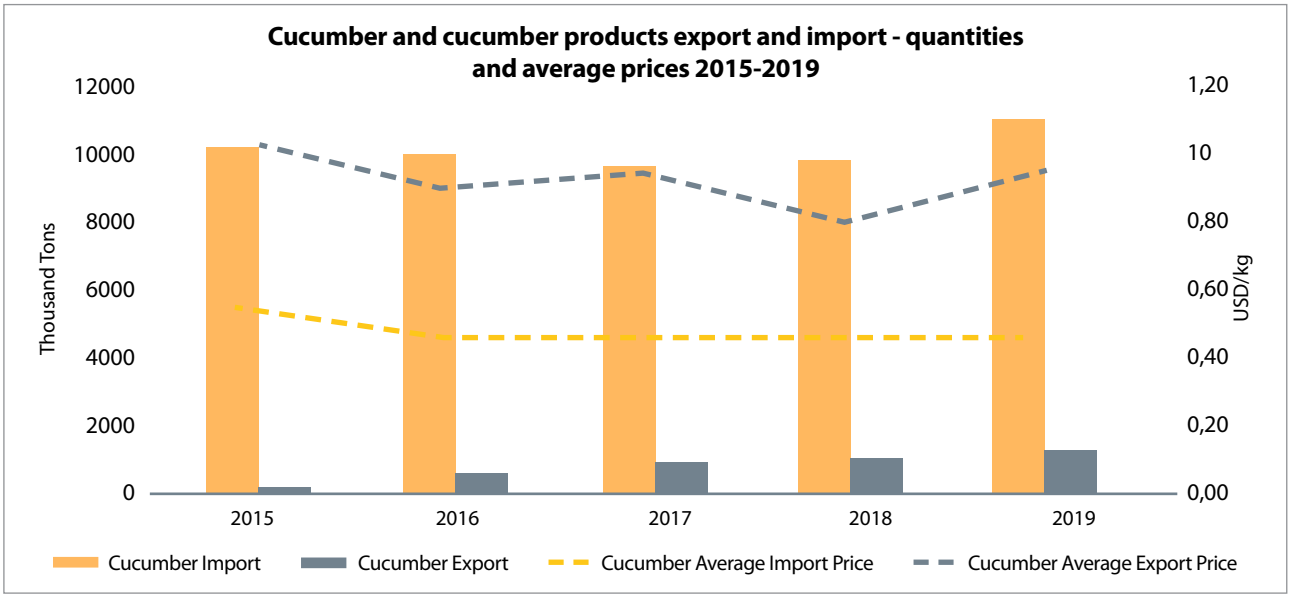
Table 44: Export of tomato by countries (sum amounts during 2015-2019)

	Fresh Tomatoes		Tomato Juice		Ketchup and other tomato sauces		Pickled Tomatoes	
	Value (1000USD)	Tons	Value (1000USD)	Tons	Value (1000USD)	Tons	Value (1000USD)	Tons
Armenia	390.2	873.8	0.0	0.0	102.4	81.2	13.8	7.7
Azerbaijan	178.9	492.2	17.1	22.3	137.9	141	262.2	237.6
Russia	11634.5	10381	1.1	1.5	197.9	141.1	0.0	0.0
Ukraine	572.6	711.7	21.8	26.3	8.7	6.4	0.0	0.0
USA	0.0	0.0	5.7	4.8	112.8	76.1	7.3	8.9

Source: National Statistics Office of Georgia

Cucumber products export and import

According to the National Statistic Office of Georgia, during 2015-2019, 50.5 million tons of cucumber and its products were imported to Georgia, costing USD 23.9 million; 3.8 million tons of cucumber and its products were exported, costing USD 3.4 million. The average import and export prices are USD 0.5 and USD 0.9, respectively, however, as it can be observed, the trade balance is negative.



Source: National Statistics Office of Georgia

Fresh cucumber amounts to 97% of exports of cucumber products, and pickled cucumber and gherkin amount to the remaining 3%.

Table 45: Exported cucumber products

Exported products	SUM Q	%Q	SUM P	%P
Fresh cucumber and gherkin	3655.84	97%	3304.40	97%
Pickled cucumber and gherkin	111.19	3%	87.93	3%
SUM	3767.03		3392.33	

Source: National Statistics Office of Georgia

Fresh cucumber amounts to 83% of imports, while pickled cucumber and gherkin amount to the remaining 17%.

Table 46: Imported cucumber products

Imported products	SUM Q	%Q	SUM P	%P
Fresh cucumber and gherkin	41 903.8	83%	17 361.3	73%
Canned cucumber and gherkin	14.4	0%	9.8	0%
Pickled cucumber and gherkin	8 548.8	17%	6 572.7	27%
SUM	50 467.0		23 943.8	

Source: National Statistics Office of Georgia

Export of cucumber and cucumber products by countries: Top 4 partners during 2015-2019

In terms of fresh cucumber, Russia is by far the most prominent export partner over the period of 2015-2019, while for pickled cucumber and gherkin - Azerbaijan (for more information see Annex 10 – Export by Countries).

Table 47: Export of cucumber by countries (sum amounts during 2015-2019)

	Fresh Cucumber and gherkin		Pickled Cucumber and gherkin	
	Value (1000USD)	Tons	Value (1000USD)	Tons
Azerbaijan	0.0	0.0	38.8	64.3
Russia	3270.6	3609.5	0.0	0.0
Ukraine	10.9	18.7	0.0	0.0
USA	0.0	0.0	24	28

Source: National Statistics Office of Georgia

Exports of Organic Vegetable Products

Based on Caucascert's export statistics, there were no certified organic vegetable products from Georgia which were going on export during the period of 2013-2019.

5.2 EXTERNAL STAKEHOLDER ANALYSIS

5.2.1 STATE AUTHORITIES

In the assistance of rural development, two government entities stand out: ARDA, and "Regional Information Consultation Centers"[85], both under the Ministry of Environment Protection and Agriculture of Georgia (MEPA) and "Enterprise Georgia" under the Ministry of Economy and Sustainable Development of Georgia.

Rural and Agricultural Development Agency (ARDA)

The non-profit (non-commercial) legal entity ARDA is an agency which operates under the Ministry of Environment and Agriculture of Georgia. Main objective of the agency is to promote the development of agriculture in Georgia. Its key functions include planning and management of projects initiated by the Ministry of Environment and Agriculture as well as the management of subordinate agricultural companies.

ARDA's projects provide support for nearly every part of the supply chain of vegetables, except for suppliers of fertilizers and pesticides. The detailed coverage of the programs can be found in the table below.

Table 48: Government programs supporting the actors of fruit value chain

	Co-financing Agricultural Machinery	Program of Agro-production Promotion: Primary production	Program of Agro-production Promotion: Processing and preserving	Co-financing of Agro processing and storage enterprises	Preferential Agrocredit Project: Fixed Assets	Preferential Agrocredit Project: Agroleasing	Preferential Agrocredit Project: Produce in Georgia	Agroinsurance	Stimulating agriculture Landowners	Agro-diesel support program	State program of technical assistance
Input Supply – Nursery											
Input Supply - Fertilizers and pesticides											
Input Supply - Machinery & Equipment											
Primary Production											
Storage											
Processing											
Transportation (Distribution)											
Sales (Retailers)											
Export											

Source: ARDA

[85] This is discussed in chapter 4.1.1.5 Access to services of agronomy and access to knowledge/information

Beneficiaries of the projects of ARDA

According to the data of implemented projects by ARDA over the period 2013-2019, a total of 17 beneficiaries in Tianeti and Dusheti municipalities got the support, however, the program was "Preferential Agrocredit Project" for each of the 17 beneficiaries. The number of beneficiaries is negligible number compared to the total amount financed in Georgia under this project (9303). Out of these 17 beneficiaries, only 3 were in vegetable growing field representatives. 2 were limited liability companies and the 3rd one was a sole proprietor. 1 of the beneficiaries was financed to purchase working capital and the other 2 were financed to purchase long term assets. The whole sum was GEL 10534.

Enterprise Georgia

Enterprise Georgia is functioning under the Ministry of Economy and Sustainable Development of Georgia, focusing on stimulating domestic production and entrepreneurship. Among other programs implemented by Enterprise Georgia, "Micro and Small Business Support" is most adjusted to rural SMEs[86]. In this program, the agency is disbursing grants of up to GEL 20 000[87] to promote micro and small enterprise development outside the capital. The grant is conditional on 20% co-financing by the beneficiary. Special priorities are given to rural initiatives, and initiatives by women, and persons under 35 years of age. Since 2015, there have been four waves of the program. It has to be noted that the program does not finance primary agricultural production, however it finances the processing.

It must be mentioned that the program together with financial support includes technical assistance to help the beneficiaries develop basic entrepreneurial skills. Trainings include business plan writing before financing and business management training after being financed. However, it is not obligatory for beneficiaries to attend the trainings.

Beneficiaries of the project of Enterprise Georgia

According to the data of Enterprise Georgia, from 2015, under the program "Micro and Small Business Support" a total 103 beneficiaries were financed in Tianeti Municipality. From there, 57 beneficiaries got support for agriculture and food processing. While 9 beneficiaries got support in Lower Pshavi community, from where 7 beneficiaries got support for agriculture and food processing.

Most of the interviewed farmers are aware that there are some government programs in the framework of which they can get access to necessary funding or assets. However, they do not have in-depth knowledge about the details of any programs. Another significant observation is that the farmers' attitude towards the programs is quite negative for the following reasons:

- Farmers believe that even if they apply for the government programs, they will not get funded because they are not qualified for writing business plans and projects; they do not believe in fair dealing from the agency's side either
- Farmers think that their current circumstances (lack of arable land and cold climate) make the agricultural opportunities unlikely to succeed
- Farmers do not have funds for co-financing which is required in some of the programs and they are against taking credits from financial institutions
- Farmers consider the project application procedures to be rather confusing and bureaucratic

Only one farmer had applied for Enterprise Georgia program and received funding for hay pressing machine 3 years ago.

None of the farmers uses insurance for vegetables due to the low quantity of plants.

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[86] Enterprise Georgia is going to modify all its programs. However, yet, it is not known what will be changed

[87] According to the Enterprise Georgia in the future 20000 GEL will be increased to 30000 GEL

5.2.2 DONOR ORGANIZATIONS

It is crucial to note that currently Tianeti Municipality and Lower Pshavi Community are not considered as target regions by most international donors and organizations. At present, both areas are only targeted by Austrian Development Cooperation and Biological Farming Association ELKANA; in addition, Lower Pshavi is targeted by People in Need, however, only in direction of tourism development.

It has to be noted that, massive projects such as the USAID "ZRDA activity in Georgia" and ENPARD (European Neighborhood Program for Agriculture and Rural Development) do not have ongoing projects in Mtskheta-Mtianeti region. "The USAID Agriculture Program" partially includes Mtskheta-Mtianeti region because of its coverage of the entire country, one of the target value chains in this program is apple. (For detailed information about donors' programs see Annex 13 – Donor Programs).

Among the interviewed farmers, none of them have ever been supported by any donor organization. They even do not have any information on donors' programs in Georgia.

5.2.3 FINANCIAL INSTITUTIONS

In Tianeti Municipality, there are two commercial banks: Liberty and Credo, while none is in Lower Pshavi. The microfinance organizations are not located in target areas. ATMs of Liberty Bank (2) Credo (1) and Bank of Georgia (2) are located also in Tianeti[88], none is in Lower Pshavi.

Access to finance is a challenge for small farmers in the vegetable sector. Along with the scarcity of arable land, this is one of the main obstacles for them standing in the face of increasing their production. None of the interviewed farmers have ever had any loans from commercial banks or micro financing organizations. Most of the interviewed farmers are afraid to take bank loans and to have any connections with financial institutions. From their point of view, the interest rates on loans are too high.

5.2.4 SECTORAL ASSOCIATIONS

In Georgia, there are several sectoral associations in vegetable producing field:

- Biological Association Elkana
- Georgian Association of Organic Producers
- Association of Supporting Greenhousing
- Georgian Farmers Association

None of the interviewed farmers appeared to be the members of or even aware of these associations, except for Elkana.

5.2.5 CERTIFICATION AGENCIES

There are several organic certification agencies that operate in Georgia:

- ECOCERT[89]
- EUROCERT[90]
- CAUCASCERT

Georgian farmers and companies can also apply for certification in various international certification agencies. CAUCASCERT Ltd is the most popular one among the certification agencies.

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88 Source: National Bank of Georgia (NBG)

89 https://www.ecocert.com/en/offices; Office responsible for Georgia is situated in Belgrade, Serbia

90 https://www.eurocert.ge/; Office is situated in Tbilisi

CAUCASCERT Ltd facilitates the development of organic agriculture, protection of the rights of organic products' consumers' and growth of the organic market in Georgia. Besides, it facilitates exportation of Georgian organic products to the European Union and Switzerland. CAUCASCERT participates in development of national and private standards, training of qualified organic inspectors and contributes to increasing public awareness of importance of organic agriculture.[91]

None of the interviewed farmers were the members of or even aware of certification agencies, processes, or costs. They consider the vegetables they produce rather healthy, because the purpose of the production is to feed their families. Because the production is not for profit, they are not planning to acquire organic or any other kind of certificates in the foreseeable future.

Organic Certification Costs

Below are the costs associated with annual obligatory inspection costs for vegetable land plots:

Table 49: Organic certification costs

Area (Hectares)	Time needed for Inspecting and reporting (hours)	Inspecting cost (GEL) (hourly fee – GEL 325)
0-2	2	650
2-10	3	975
11-50	4	1300
50-150	5	1625
150+	6	1950
Daily rate for inspector		70
Travelling fee for inspector (per 100 km)		95
Take a sample and send it to the lab		160
VAT		+18%

Source: CAUCASCERT

According to the organic certification standard, CAUCASCERT additionally conducts random annual inspections to 10% of the certificate holders. Costs of these random inspections have to be covered in addition to the annual obligatory inspection costs by the certificate holder. According to CAUCASCERT experts, annual certification costs for a vegetable farmer with a land plot of no more than 2 hectares are approximately GEL 1500-1800 (For detailed information about the pricing of Caucascert see Annex 14 - pricing policy of Caucascert).

Organic certification cost for vegetable production is further discussed in chapter 7.

5.2.6 VOCATIONAL EDUCATIONAL INSTITUTIONS

There is a state VET college in the Mtskheta-Mtianeti region – Ilia Tsinamdzgvrishvili Community College, which is the first vocational education Institution founded in Georgia, with 138 years of history. Their main building with sample plots and various agricultural technical equipment is situated in village Tsinamdzgvriantkari, and they also have branches in Tianeti, Dusheti and Stepantsminda.

The Dusheti branch of the college is just a building at the moment – they have not started providing educational courses yet. For their agricultural and tourism programs, the college expects to have the students from villages that are far from the college building location and they are trying to arrange transportation of the students.

[91] Source: Caucascert,

In Tianeti branch of the college, the following modular (the whole course is taught in the college, including practical component) and dual (40% of the course is arranged in actual working environment) programs, with duration of 9 – 36 months:

- Fruit growing - dual
- Beekeeping - modular
- IT Specialist – modular
- Accounting – modular
- Dairy production technologies – dual
- Forestry – modular

There are approximately 10 students in each group. Educational fees for both types of programs are fully financed by the state. Admissions are conducted twice a year – in spring and autumn. To be enrolled to a vocational program, the students have to overcome a minimal barrier on the state exam and then submit necessary documents to the college.

The Tsinamdzgvrishvili College also plans to implement Fruit and Vegetable Processing VET program in Tianeti branch and to introduce shorter professional training programs for the directions listed above.

In main Tsinamdzgvriantkari branch, the college offers a wider variety of programs[92], in addition to the ones listed above:

- Viticulture and Winemaking
- Cultural Heritage Guide of Georgia
- Electricity
- Sewing Specialist
- Hair Stylist
- Tractor Driver
- Horticulture
- Wood Artistic Processing
- Hotel Service

The College also has a dorm where accommodation can be provided for students who do not live nearby.

Despite having years of experience, none of the interviewed farmers have an academic or vocational education in agricultural field. They have "traditional" knowledge, which means that they have learnt the agricultural production methods from their ancestors. Neither have they attended any trainings in this regard, despite their willingness, they claim that the trainings are not locally provided. It was also reported that the farmers do not have financial resources to attend the trainings in Tbilisi or at other locations, neither are they aware of schedules of such trainings. The farmers in Tianeti and Lower Pshavi lack skills in:

- Entrepreneurship
- Modern vegetable production
- Processing
- Marketing and sales

[92] https://www.tmk.edu.ge/pdf/%E1%83%99%E1%83%90%E1%83%A2%E1%83%90%E1%83%9A%E1%83%9D%E1%83%92%E1%83%98.pdf

5.3 PROFITABILITY ANALYSIS

5.3.1 COSTS AND EARNINGS FOR TIANETI AND LOWER PSHAVI MUNICIPALITY FARMERS – CURRENT SITUATION

According to the results of conducted interviews among Tianeti and Lower Pshavi farmers, most of the vegetable production is for non-commercial use.

It is apparent from the field research, that the female and male farmers have almost no costs apart from their own alternative labor cost. Deriving from the interview results that the majority of the farmers have periodic jobs as craftsmen, the alternative labor cost can be assumed to be insignificant. In most cases, the cucumber farmers obtain seeds themselves from last year's production. In case of tomato, the answers were divided between obtaining their own seeds like in case of cucumber or buying seedlings in the Tianeti farmers' market.

The basic costs and earnings for the farmers are summarized in the table below:

Table 50: Costs and earnings of farmers

Purpose	Costs/Earnings
Cost of seedlings	GEL 2-3 for 20 tomato seedlings, cucumber seedlings are not used by farmers
Cost of seeds	Tomato and cucumber seeds are obtained from last year's harvest, for free
Plowing	Conducted by farmers and their family members, for free
Cultivation	Conducted by farmers and their family members, for free
Fertilizing	Manure obtained by farmers for free
Defense against diseases and pests	Non-recurring expense, not specified, can be negligible
Watering	GEL 1.704 monthly fee per household member for customers without counters
Harvesting	Conducted by farmers and their family members, for free
Transportation costs	GEL 5-10 per a trip to farmers market
Sales	Cucumber as well as tomato costs GEL 1 – 1.5 in Tianeti farmers' market, cucumber costs GEL 1.5 – 2 and tomato costs GEL 2 – 3 in Sioni farmers' market; tomato and cucumber cost GEL 1.5-2.5 in Gldani farmers' market

Source: Field research

5.3.2 POTENTIAL COSTS AND EARNINGS FOR ORGANIC PRODUCTION OF VEGETABLES

In order to produce vegetables, in particular, tomato and cucumber using organic method, and to assure at least average productivity, several processes shall be completed. The dates and associated costs (per 1 hectare) are given in the table below[93]:

Table 51: Costs of producing vegetable by applying organic methods

Process	Month	Costs for tomato (GEL)	Costs for cucumber (GEL)
Plowing	III-IV	150	150
Harrowing	IV-V	150	150
Cultivation	IV-V	150	150
Making traces for seedlings	X-XII or III-IV	110	110

[93] The stages are based on documents developed by Georgian Farmers Association (for Cucumber and for tomato) and the costs are derived based on the latter documents and Elkana expert calculations

Purchasing nitrogen fertilizer and fertilizing the land plot	V-VII	600	600
Purchasing seedlings[94]	III-IV	1400	1120
Planting the seedlings	V	950	650
Watering[95]	V-VIII	290	450
Harvesting	VII-X	3250	1800
Unforeseen costs (+10%)		675	518
SUM		7425	5698
Harvest		Approx. 40 tons	Approx.32 tons

Source: Field and desk research

Organic certification costs

As already mentioned in Chapter 5, organic certification is conducted by CAUCASCERT. Below are the costs associated with annual obligatory inspection costs for vegetable land plots:

Table 52: Organic certification costs

Area (Hectares)	Time needed for Inspecting and reporting	Inspecting (hourly fee – GEL 325)
0-2	2	650
2-10	3	975
11-50	4	1300
50-150	5	1625
150+	6	1950
Daily rate for inspector		70
Travelling fee for inspector (per 100 km)		95
VAT		+18%

Source: CAUCASCERT

According to the organic certification standard, CAUCASCERT additionally conducts random annual inspections to 10% of the certificate holders. Costs of this random inspections have to be covered in addition to the annual obligatory inspection costs by the certificate holder. According to CAUCASCERT experts, annual certification costs for a vegetable farmer with a land plot of no more than 2 hectares are approximately GEL 1500-1800.

The organic certificate is issued for harvest of vegetables received by the culture sown after 24 months of first application date, that is, if a farmer applies for a certificate in January 2021, the first certified organic harvest will be the one harvested in summer 2023.

Based on the above-mentioned facts, for 1 hectare of tomato cultivated by organic methods and certified accordingly, annual costs will be approximately GEL 9075 and for cucumber – GEL 7350. If assumed that average productivity is 40 tons for tomato and 32 tons for cucumber, and using prices by National Statistics Office of Georgia (non-organic, as there are no organic vegetable prices collected at the moment), the following revenue can be generated:

[94] 2.5 plants per square meter, + additional 3000 seedlings due to losses

[95] Maximum possible number of watering needed, 15x for cucumber, 7x for tomato

Table 53: Expected revenue generated by farmers

Selling point	Tomato (Thousand GEL)	Cucumber (Thousand GEL)
At farm's gate[96]	40x1.03=41.2	32x1.02=32.64
Tianeti farmers' market[97]	40x1.25=50	32x1.25=40
Sioni farmers' market[98]	40x2.5=100	32x1.75=56
Gldani farmers' market[99]	40x2=80	32*2=64
Supermarkets[100] **(GeoStat)**	40x1.6=64	32x1.19=38.08

Based on the data above, from a typical farmer's (living in Tianeti, harvesting 1 hectare of tomato or cucumber with organic methods, assuming no alternative labor costs) point of view, 3 scenarios can be discussed[101]:

Farmer sells their production at farm's gate:

Table 54: Profitability analysis

Farm's gate	Tomato (GEL)	Cucumber (GEL)
Costs of production	7425	5698
Transportation costs	0	0
Organic Certification costs	1650	1650
Price per KG	1.03	1.02
Revenue	40x1.03=41.2	32x1.02=32.64
Profit	41200-7425-1650=32135	32640-5698-1650=25292

Farmer sells their production at Tianeti farmers' market

Table 55: Profitability analysis

Tianeti farmers' market	Tomato (GEL)	Cucumber (GEL)
Costs of production	7425	5698
Organic Certification costs	1650	1650
Price per KG	1.25	1.25
Revenue	40x1.25=50	32x1.25=40
Profit [102]	50000-7425-1650=40 925	40000-5698-1650=32 652

96 2018 price

97 Average price according to farmers

98 Average price according to farmers

99 Average price according to farmers

100 2019 Q3 prices

101 Sioni farmers' market is neglected because it is very small for selling large quantities of vegetables and supermarkets are neglected because they have their own markup and because there are no realistic examples in Tianeti of such cases.

102 Transportation costs have to be subtracted from profit

Farmer sells their production at Gldani farmers' market

Table 56: Profitability analysis

Gldani farmers' market	Tomato (GEL)	Cucumber (GEL)
Costs of production	7425	5698
Organic Certification costs	1650	1650
Price per KG	2	2
Revenue	40x2=80	32*2=64
Profit [103]	80000-7425-1650=70 925	64000-5698-1650=56 652

In scenarios 2 and 3, transportation costs and selling and marketing expenses shall be taken into consideration. However, it can be easily concluded that all scenarios are rather profitable. If a farmer has an organic production certificate (already included in the costs), it can be assumed that the selling price can be even higher.

[103] Transportation costs have to be subtracted from profit

5.4 SWOT ANALYSIS

As assessed by the farmers, PMC Research and using the Strategy for Regional Development of Mtskheta-Mtianeti for 2015-2021, the SWOT table for vegetables in Lower Pshavi and Tianeti municipalities is the following:

Table 57: SWOT analysis

Strengths	Weaknesses
- Relatively low risk of vegetable diseases and pests - High quality of vegetables - Traditional vegetable growing methods - Low level of use of chemical products for vegetables - Locally produced manure - Geographical closeness to Tbilisi - Available water resources - Potential to create jobs and employment, especially for poor farmers	- Low productivity due to unfavorable climate conditions - Fragmented land plots - Scarcity of arable land - Lack of knowledge about modern (highly productive) vegetable growing methods among farmers - Lack of knowledgeable agriculture specialists in the region - Land registration difficulties - Lack of local supplies against disease/pests - Lack of awareness and willingness to convert to organic production - Lack of awareness about donor programs - Low level of economic development - Lack of functioning irrigation system - Low level of youth involvement - Exclusion of PWDs - Low level of women's access to output markets - gendered division of roles - Women's. PWDs and youth limited access to formal credit services - Low waged employment opportunity - Unpaid or low payed labor for women - Women's limited access to large markets - Women's and PWDs limited access to mobility and means of transportation
Opportunities	**Threats**
- Relatively easy process of conversion to organic farming - Steady increase of demand on organic products - Potentially increased demand due to increased quantities of tourists - Government programs (ARDA) - Good entry point for low-skilled rural youth - Increase youth, PWD involvement - Increase women involvement at all stages	- Aging population due to internal and external migration - Loss of harvest due to natural disasters and no insurance mechanisms used by farmers Spread of diseases and pests - Lack of access to financial resources - Farmers' attitude towards agricultural opportunities

5.5 RECOMMENDATIONS

In this section, we summarize conclusions turned into recommendations as possible solutions to the issues encountered during value chain analysis of vegetable production in the targeted area, based on concerns of stakeholders, as well as our observations.

1. Support farmers to carry out preliminary activities before starting vegetable production

Conclusion:

For vegetable production, some parts of Tianeti and Lower Pshavi municipalities have the climate conditions that are very feasible for productive vegetable growing (the table is given in annex 11). However, it needs to be noted that the location alone is not the guarantee of high productivity and the farmers need to pursue thorough procedures to achieve it.

The arable land is scarce in both municipalities and the farmers prefer growing less perishable and more profitable (in their perception) vegetables, such as potatoes, beans, etc. Cultures such as tomato and cucumber are only grown on very small land plots, in order for the farmers to have fresh food at home.

Productivity in Tianeti in production of tomato and cucumber is rather low. The reasons behind this fact are the following:

- The farmers do not follow the procedures that can lead to high productivity. They do not perform soil analysis and do not fertilize the land with the necessary substances.
- Water resources are available, but the irrigation system is not properly functioning, therefore, farmers are dependent on the weather conditions.

Recommendation:

The availability of arable land and favorable climate conditions should also be taken into consideration in the process of planning in this direction.

Soil samples analysis needs to be conducted in different villages in order to determine how to cultivate and fertilize them correctly; proper vegetable cultures shall be selected[104] to avoid land depletion.

For development purposes of irrigation sources, the cost-benefit analysis of several scenarios such as water well, water channel from the river, or drip irrigation systems should be conducted in a broader perspective, from a village's point of view.

2. Support development of nurseries

Conclusion:

There are several nurseries in Tianeti, but they do not produce vegetable seedlings at this point. The farmers are dependent on sellers from Kakheti region to provide them with seedlings. Often, the seedlings are not of acceptable quality, and the farmers have to replace at least half of them. Therefore, at this point, many farmers prefer to cultivate tomato and cucumber from seeds. This process leads to the late harvest.

Recommendation:

Elkana can support farmers by developing a nursery. The nurseries in Tianeti and Lower Pshavi should be situated in a greenhouse building to ensure that the seedlings will be available in a timely manner, when needed by farmers (in May). To ensure the availability of all farmers, the nurseries should be situated in or close to townlet Tianeti and Shuapkho. If funding is available for several nurseries, the other locations should be determined based on the number of farmers producing vegetables in the villages.

[104] https://elkana.org.ge/uploads/page/217/pdf/geo/publication/mebostneoba.pdf page 22

It is rather important for the nursery owners/managers to have good knowledge of producing vegetables and be able to offer advice to the farmers accordingly. This can be achieved by providing trainings for nursery owners/managers. More information on this matter is given in Recommendation 5.

Awareness-raising activities about the existence of the nursery should be carried out among farmers in Tianeti Municipality and Lower Pshavi. To spread the information about the nurseries and available seedlings, it will be better if information is printed on papers and placed in the centers of the villages, as this is the most common practice of spreading information at present in Tianeti Municipality. Moreover, the spreading of information could be done with the help of the information-consultation center and the representatives of the local governments in the villages.

3. Increase farmers' access to agricultural machinery and equipment

Conclusion:

There are several suppliers of machinery and equipment needed for vegetable production in the region, state-owned as well as private companies or individuals who own the machinery. However, most of the farmers do not use the machinery as they only cultivate small land plots for cucumbers and tomatoes. According to the farmers in the municipality, there is a problem related to access to machinery, as there is a lack of such suppliers and sometimes, they need to wait for long for the machinery to be available for them.

Recommendation/Possible solution:

Elkana could support the farmers to gain access to agricultural machinery and equipment by financing a project that provides such machinery to the population. For vegetable growing, tractors for larger land plots and hand tractors for smaller land plots are needed to plow and cultivate. Machinery and equipment should be available for the farmers in a timely manner. For this purpose, the supplier financed by Elkana will be better to be situated in or close to townlet Tianeti and Shuapkho. If funding is available for several locations, the others should be determined based on the number of farmers producing vegetables in the villages.

Another activity carried out by Elkana could be financing individual farmers or farmer groups – at present, farmers in target regions mainly require mini tractors for their vegetable land plots. Elkana could consider providing vegetable-producing farmers with mini-tractors individually or with the agreement that the farmers to be united and e.g. 4-5 vegetable farmers in the same village to use the machinery provided by Elkana.

Awareness-raising activities should be carried out among farmers in Tianeti and Lower Pshavi municipalities. To spread the information about the machinery and equipment, it will be better if information about it is printed on papers and placed in the centers of the villages, as currently this is the most common practice of spreading information in Tianeti Municipality. Moreover, the spreading of information could be done with the help of the information-consultation center and the representatives of local governments in the villages.

4. Support development suppliers of fertilizers and pesticides

Conclusion:

Vegetable farmers in Tianeti and Lower Pshavi only use the manure of their own production as fertilizers. This can be perceived as organic method, but on the other hand, a land needs more fertilizers to become productive (discusses in the chapter of suppliers of pesticides and fertilizers). The farmers do not have knowledge about these factors. Concerning pesticides, farmers mostly ask for advice in the veterinary shops where they buy these products, and sometimes the pesticides do not work, as they only orally describe the condition and veterinary shops do not have experienced agronomists who could assist the farmers in selecting specific treatments.

Recommendation/Possible solution:

Elkana could support the development of suppliers of fertilizers and pesticides at target regions, by financing a project which includes opening a shop, selling fertilizers and pesticides in target regions. Such project could improve the farmers access to fertilizers and pesticides and enhance their knowledge about vegetable growing. This could have beneficial effect on vegetable sector in Tianeti Municipality and Lower Pshavi. The business model of supplier that has a positive effect on the municipality is described below, however, before such supplier is financed by Elkana, the business plan has to be assessed to be profitable too.

The additional positive effect will be the promotion of organic farming in the municipalities. For this purpose, it is important for the suppliers to have knowledge in agronomy especially in organic farming and the local conditions. Together with supplying fertilizers and pesticides, it is crucial that the supplier is able to provide the farmers with consultations. It will be optimal if the consultations are provided on the phone as well as on-site. To ensure the availability for all farmers from the villages of Tianeti municipality and Lower Pshavi to have access to products and services of the supplier, the place where the suppliers of pesticides and fertilizers can be developed could be townlet Tianeti and Shuapkho.

With the support, the establishment of such supplier in the municipality where farmers can access suppliers' services and products, would become important to obtain knowledge about the importance of soil fertilization, spraying against fungal diseases and pests of their products.

Otherwise maybe the supplier will not be able to continue functioning in the municipality in the long run, as the demand on its products and services will be low.

The supplier of pesticides and fertilizers will need strong marketing strategy for the farmers to get information about its existence and be persuaded of beneficial effect of supplier's products and services for them. To spread the information about the supplier, it will be better if information about it will is on papers and placed in the centers of the villages, as currently this is the most common practice of spreading information in Tianeti municipality. Moreover, the spreading of information could be done with the help of the information-consultation center and the representatives of the local governments in the villages.

5. Increase entrepreneurship skills including management and financial literacy skills among farmers

Conclusion:

There is a lack of entrepreneurship skills among farmers. They are not able to differ family money from business money. They do not plan their finances and do not make any records either. The level of financial literacy is very low among them. Most of the farmers do not know what their annual income is and have difficulty identifying expenses. Additionally, their perception of credits is rather negative. Apart from financial literacy, there is a scarcity of skills among farmers to market their products they do not know how to sell, how to advertise and they are not able to analyze market needs.

Recommendation:

Farmers need to develop their skills in entrepreneurship, management, and finances. For this reason, the relevant practical training programs need to be provided for them. One of the possibilities could be to use the training program developed by National Bank of Georgia for SMEs[105] and agro-businesses.[106]

[105] https://www.nbg.gov.ge/index.php?m=706&lng=eng

[106] https://www.nbg.gov.ge/index.php?m=749&lng=geo

6. Supporting VET college to increase farmers knowledge in vegetable growing

Conclusion:

The farmers in target regions lack knowledge in modern vegetable growing methods. They follow the advice they get from their ancestors. They do not have knowledge of soil management, water management, cropping system management, pest management, etc. Moreover, along with a lack of skills and knowledge, there is a limited access to information and knowledge for the farmers. They are interested in undertaking trainings if it leads to increased productivity.

Recommendation:

To develop the farmers' skills, Elkana can collaborate with VET college. That also makes project results to be sustainable. The main activity that can be carried out in partnership with the Ilia Tsinamdzgvrishvili VET College is to develop professional training programs.[107] The main purpose of such programs is to provide specific knowledge to recipients of all ages (life-long learning) in a specified narrow field, to support and promote vegetable productions. The programs that can be developed are the following (not limited to):

- Modern vegetable growing methods
- Organic vegetable growing methods
- Planning, managing and operating nurseries
- Planning, managing and operating fertilizer and pesticide stores
- Planning, managing and operating machinery and equipment businesses
- Vegetable processing

In order to develop professional training programs, a working group should be created in partnership with VET college. The working group should be composed of educational experts (on college's part) and agriculture/vegetable growing experts (on Elkana's part). Developing a curriculum and application process for the program to get approved by the authorities is rather straightforward. This can be cost-saving activity in many ways, as Ilia Tsinamdzgvrishvili College is state-owned and the funding for students' education, administrative purposes and for students' special educational needs can be acquired from the state budget.

If short-term professional training programs are developed, it will be necessary to spread information about them. Marketing strategy should be decided based on target group for the program.

7. Raise farmers' awareness and knowledge about organic vegetable growing methods

Conclusion:

As identified by the conducted research, the farmers in target regions do not have knowledge in organic vegetable growing methods.

Recommendation:

Elkana could support increasing farmers' awareness and knowledge about organic vegetable growing methods, by providing relevant practical trainings with farmers in target regions. Elkana must ensure women, youth, PWDs are actively involved in those trainings.

[107] https://www.mes.gov.ge/content.php?id=9133&lang=geo

8. Raise farmers' awareness and support them in applying to government and donor programs

Conclusion:

The farmers have rather brief knowledge when it comes to supporting programs carried out by the government and/or other donors. Even the farmers who have this information, hesitate to apply for these projects because they consider the process very bureaucratic and difficult. The farmers who have applied, have never received any grants.

Recommendation:

The farmers' awareness of various government and donor programs shall be raised, and it is advisable to provide brief trainings for the interested farmers about how to fill in the applications, where and how to acquire necessary documents if necessary. Moreover, Elkana can support farmers to raise their awareness and develop skills on how to apply for credits in financial institutions for the co-financing needed in some donor or government projects.

9. Support development of storage facilities in the target region

Conclusion:

There are no storage facilities in Tianeti or Lower Pshavi. None of the interviewed farmers have come across any problems due to this factor so far, because they produce in small quantities, or gradually harvest and sell the vegetables.

Recommendation:

It can be said that currently in the municipality there is no necessity of storage enterprises to be there for vegetables, due to the low level of production. Therefore, storage units will become a necessity only if the quantities of produced vegetables increase.

In the future, the construction of storage facilities shall be planned considering the farmers' production possibility frontiers. The storage units shall be located close to the land plots where the vegetables are harvested in order to minimize transportation costs for farmers. For features and equipment needs of storage units, the purpose shall be determined first. The two most common examples are a dry cool place with proper ventilation and a refrigerating device (of several kinds). The decision about which type of storage units need to be constructed in the villages has to be made according to the farmers' needs. However, it shall be taken into consideration that during the period of October – May, fresh vegetables are more expensive than during other periods. Therefore, the storage unit with a refrigerating device can be more profitable alternative.

10. Promote conversion to organic methods and taking organic certification

Conclusion:

None of the vegetable farmers in Tianeti or Lower Pshavi are certified, organic farmers. However, their methods of production are very close to fully organic methods, therefore, they will not have to put a lot of effort in conversion process. However, they lack knowledge of complying with standards of organic production, moreover they will not be able to cover the costs of certification.

In general, the prices of organic vegetables significantly exceed the prices of non-organic products. Moreover, the importance of organic food is increasing among consumers in Georgia, and in the future, the demand on organic production is expected to grow.

Organic certification involves annual costs and can be used to increase income, via setting a higher price for organic vegetables or processed products than that of vegetables grown by conventional methods.

Recommendation:

Farmers' production possibility frontiers shall be assessed and analyzed in respect of profitability to determine whether organic certification is feasible and beneficial. This activity can be conducted from a farmer's perspective as well as from a broader perspective (village, cooperative or several farmers together). Based on the current situation, becoming certified may not be profitable. However, after the productivity of the farmers increases and they start thinking to sell their products in more profitable markets (like supermarkets) or export conversion to organic farming, it will be profitable for them. Elkana can co-finance the cost of certification to farmers who will be interested to be certified.

11. Promote development of processing sector in the target region

Conclusion:

Currently, processed vegetables are only made for household consumption and not for sale, because there are certain requirements that need to be followed during processing for vegetables to be sold. These requirements cannot be followed in home conditions.

The possible competitive advantages that vegetable processing factory in Tianeti can have is the distinguished taste qualities of vegetables and the possibility of organic production. This will enable setting higher prices and aiming at the specific target customer base.

Recommendation:

Prospects of vegetable processing shall be analyzed considering country-wide situation. Several scenarios shall be constructed, for various sizes of the projected factory. Costs of constructing processing factories or units shall be determined for each scenario. Also, a business plan shall be constructed with prospective products that can be produced from vegetables, accompanied with quantities and projected prices. Currently functioning vegetable processing factories should be considered as competitors while conducting the analysis.

Before the analysis is conducted, Elkana can support the development of processing in the target regions by providing support to individual producers or several producers together to establish small processing units where all the processing guidelines can be followed.

12. Support farmers to diversify sales channels

Conclusion:

Currently, only few farmers manage to produce enough vegetables (tomato and cucumber) to have excess for sale. The extra vegetables are sold in Sioni, Tianeti or Gldani farmers' markets. However, if the produced quantities increase, there will be surplus supply, which will negatively prices. Vegetables will be left unsold in current target markets.

The main selling channels for vegetable farmers in target regions are Sioni, Tianeti, Tbilisi/Gldani or farm gate. The prices in these channels are lower compared to the vegetable prices in Tbilisi supermarkets, online shops or shops selling organic products.

Recommendation:

Farmers will need new sales channels in case their production increases. They will need assistance to establish sustainable connections with collectors and/or markets and supermarkets, to carry out negotiations with them and develop contracts with favorable conditions for them. They need to realize differences between the sales channels. For example, collectors who buy product at the farm's gate, will pay less than supermarkets. There are also transportation issues, for example, most supermarkets require the product to be delivered at different locations periodically, while most collectors pick up the product from where farmers keep it. Elkana can support farmers by providing them with coaching and

mentoring, to increase their awareness of the requirements of high-priced markets and teach them how to satisfy these requirements.

Export possibility can be also analyzed in case of increased production. For this purpose, Export Development Association[108] can be involved in the process and provide advice for the farmers.

13. Increase awareness of the importance of organic vegetables among the Georgian population and increase awareness of Georgian consumers about the quality of vegetable in target regions

Conclusion:

In the frame of the research, through the interviews with the representatives of supermarkets and café/restaurants, it was identified that in Georgia, among the population, there is a lack of awareness of the importance of consuming organic products including vegetables. Moreover, among the Georgian population, there is a lack of knowledge about the quality of produced vegetables in target regions.

Recommendation:

Elkana could support increasing awareness of the importance of organic products including vegetables and about the quality of vegetables produced in target regions among local consumers by providing relevant marketing campaign. The campaign is better be conducted mainly in Tbilisi.

14. Support farmers involvement in relevant associations

Conclusion:

None of the interviewed farmers are members of any associations and do not realize the benefits they could get from the membership of some agriculture associations.

Recommendation/Possible solution:

Encourage farmers to become members of relevant agriculture associations, e.g. Elkana could support to increase their awareness of the benefits associations can provide.

15. Training opportunities for women, youth and PWDs

Conclusion:

Due to the fact that neither female nor male farmers have extensive knowledge in vegetable diseases/pests and defense mechanisms against them, they often do not manage to select an appropriate product and approximately half of the time the substances do not achieve their purpose. However, the current research also demonstrated that the women and girl farmers tend to be more willing to get information in more targeted and organized way, i.e. through internet, TV show farm, while the male farmers are more reluctant to do so and they mostly rely on informal channels, i.e. relatives, neighbors, etc.

Recommendation:

Ensure women, youth, PWDs, are actively involved in trainings on modern vegetable farming practices, including post-harvesting processes and storage vegetable management, financial literacy, marketing, etc., so that a lack of knowledge of women, youth, PWDs, does not limit their contribution to agricultural production. The training time, location, and accessibility also need to be considered. If one group (e.g. women, girls, PWDs) is at home during a specific time when others are available or vice versa, the training either should be arranged on appropriate time when all groups are available or separate trainings should be scheduled. Having the same group trainings separately may create conditions where each group (women, youth, PWDs) are more confident in participating and expressing their needs. Adapting the trainings, in terms of contents, methods and materials, to the level of knowledge

[108] https://www.eda.org.ge/

and previous experience of potentially interested members of diverse groups, will also be an effective way to attract vulnerable groups. Ensure that the training materials show neither a stereotypical representation nor underrepresentation of vulnerable groups. Also, there is a fair portrayal of women, men, youth, PWDs in materials, so as to contribute to the lack of positive role models for the groups who are underrepresented in the field.

16. Access to high-quality inputs, equipment, technology for vegetables for women, youth and PWDs

Conclusion:

Gender-specific differences were not observed, however, we can assume that women will have difficulty accessing them. This is because typically, men are those household members with economic decision-making power and access to credits and loans who can purchase laborsaving tools and machines. It appeared that in Tianeti there are no disabled farmers, nor the cases of people with disability (PWD) involving in farming were observed, which can be stipulated by no access to the different capital assets, including machineries that determine an individual's, i.e. PWD's ability to productively engage in farming. The current assessment confirmed that post-harvest operations, e.g. processing, which is time consuming and repetitive are mostly carried out by women in Tianeti; production is mainly for home consumption and there are no opportunities for selling. Thus, post-harvest equipment, better storage facilities, other new and improved techs still need to be explored and promoted in the interest of the women farmers. The increasing number of machineries and new technologies under vegetable farming would encourage women to take part in activities which in the past were done by men, as well as minimizing their workload.

Recommendation:

Ensure women, youth and PWDs have access to high-quality inputs, equipment, technology for vegetables and boost knowledge on how to use them to achieve high quality product.

17. Grant support schemes for women, youth, and PWDs

Conclusion:

The research demonstrated that the labor force is not as diverse as expected. More specifically youth and PWDs are not engaged in farming in Tianeti, even though both groups do have the potential to participate through labor contribution and decision making. For example, for PWDs to be actively involved in vegetable farming, they need certain assets, including land, financial capital, machinery, tools and equipment, as well as networks to be able to carry out certain activities. PWDs are also required to have access to certain stage and given the type of disability, this is not available for them. In the same vein, youth if provided with necessary skills, knowledge, and resources, do have the potential to be actively engaged in the vegetable value chain, as it provides entry point for low-skilled rural youth. The research demonstrated that the ageing of the farmers is the typical phenomenon for Tianeti, similarly to the other parts of Georgia.

Recommendation:

Provide targeted grant support schemes for women, youth, PWDs to establish or improve their own farming; ensure they are eligible to get support on putting together a grant application.

18. Transport and collection arrangements for female farmers

Conclusion:

Among the interviewed farmers, there are only 2 male farmers who periodically sell their products, depending on the harvested quantities, while in the case of all interviewed female farmers, vegetables are consumed within the household and there is limited market-orientation among the female

farmers. Even though it was not mentioned by the female respondents explicitly, generally, not having access to transport services excludes women from key downstream activities along the supply chain. Thus, if women provided with improved transportation and other infrastructure, as well as training and increased access to competitive lines of credit/loans, they could advance in vegetable production, handling, and marketing better.

Recommendation:

Improve transport and collection arrangements for female farmers to the best advantage of them to have access to the local markets and networks.

19. Access to credit for women, youth and PWDs

Conclusion:

The land-related statistics for Tianeti Municipality, that include data on land and agriculture ownership disaggregated by gender and age, is not available, however, national statistics can allow the assumptions to Tianeti Municipality, according to which legitimated agricultural land is owned by three times more men, than women. When female and male farmers do not have equal access to capital, women and girls tend to participate in the activities where physical product transformation involves simple, relatively low-cost equipment, or no-cost, i.e. the majority of works related to thinning and managing the vegetables fall on women. This notwithstanding, it appeared that in Tianeti, there are no disabled farmers, nor the cases of people with disability (PWD) involving in farming were observed, which can be stipulated by no access to the different capital assets, including machineries that determine an individual's, i.e. PWD's ability to productively engage in farming.

Recommendation:

Support access to credit and land for women, youth, and PWDs, by providing support schemes in partnership with financial institutions, that would open up economic opportunities for them and support the growth of women, youth and PWD-owned farming.

6. BEEKEEPING VALUE CHAIN ANALYSIS

6.1 GRID MAP – BEEKEEPING VALUE CHAIN ACTORS

The following diagram shows beekeeping value chain in target regions.

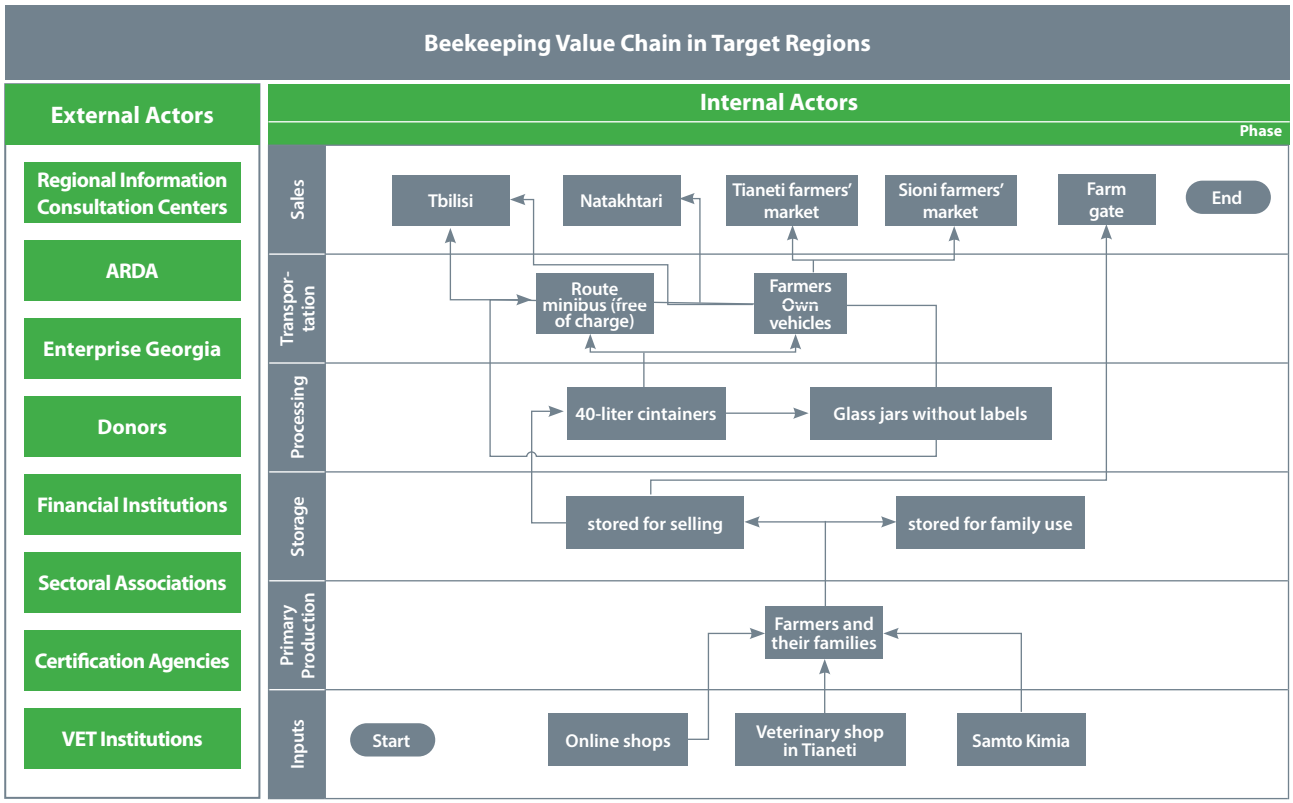


Diagram 3: Beekeeping Value Chain in target regions *Source: Field research*

6.1.1 INPUT SUPPLIERS

6.1.1.1 Veterinary shops

The National Statistics Office of Georgia does not account for beekeeping equipment suppliers and bee colony sellers; therefore, we could not provide statistical information on this matter.

According to the interview results, there is a veterinary shop in Tianeti, which sells small equipment such as smokers, bee veils, protective clothing and gloves, uncapping knives and others as well as prevention and suppression supplies for treating diseases. Larger equipment such as automatic honey extractor, beehive body materials or beehive bodies and bee colonies can be purchased in in "Samto Kimia" shops in Didube district, in Tbilisi. The fact that in Tianeti Municipality beekeeping is organized in traditional manner, without adaptation of modern technologies, hinders changes in gender roles, decreasing women participation and empowerment among beekeepers. There are also a few online shops[109] offering a wide variety of products for beekeeping – beehive bodies, equipment, prevention, and suppression supplies for treating diseases, etc.

[109] https://www.facebook.com/pages/category/Agricultural-Cooperative/%E1%83%9B%E1%83%94%E1%83%A4%E1%83%A3%E1%83%A2%E1%83%99%E1%83%A0%E1%83%94%E1%83%9D%E1%83%91%E1%83%98%E1%83%A1-%E1%83%AF%E1%83%92%E1%83%A3%E1%83%A4%E1%83%98-%E1%83%A4%E1%83%A3%E1%83%A2%E1%83%99%E1%83%90%E1%83%A0%E1%83%90-%E1%83%98%E1%83%9B%E1%83%9E%E1%83%94%E1%83%A0%E1%83%95%E1%83%94%E1%83%A2%E1%83%98-761869843925842/http://georgianbee.ge/gcat?id=1

All of the interviewed farmers have inherited their bee colonies and beehive bodies as well as the main equipment from their ancestors. The necessary equipment they need are purchased mainly in Tianeti veterinary shop or "Samto Kimia" shops. The farmers cannot purchase modern automatic equipment due to financial difficulties they face, therefore their annual purchases are bee veils, protective gloves and frames for honeycombs, as well as prevention and suppression supplies for treating diseases.

6.1.1.2 Access to Services of Agronomy and Access to Knowledge/Information

Mainly, farmers in Georgia have access to services of agronomy and necessary information and knowledge through the information and consultation centers as well as through the suppliers of fertilizers and pesticides.

Regional Information Consultation Centers

Regional Information Consultation Centers operate under the Ministry of Environment and Agriculture of Georgia, within the Ministry's department of their respective municipality. The centers provide information and advice to the farmers and cooperatives on various issues related to agriculture; monitor implementation of various projects in the respective municipality; act as main actors in regional agricultural data collection and represent more general interests of the Ministry of Environment and Agriculture of Georgia. The following areas of the centers' responsibilities are relevant for the fruit products in interest within the scope of the report:[110]

- Cultivating of agricultural crops - popularization of modern agrotechnical methods of care and promotion of implementation of these practices
- Collecting and processing information on seed and planting materials available on the market, consulting interested parties according to their specific needs
- Providing information to interested parties on the availability of mechanization in municipalities, as well as their rational use
- Collecting information on plant protection products available on the market and offering valid methods for their use to interested parties
- Providing consultations to interested parties on preparatory technical measures and other organizational issues related to harvesting
- Providing recommendations to the interested parties on the storage conditions and terms of the harvest
- Within the scope of its competence, promoting the development of agricultural cooperatives
- Promoting bio-production
- Promoting the dissemination of international experience in the production and sale of agricultural products and food

Information-consultation centers have agronomists; however, the interviewed farmers have never applied to them for any kind of information and have not heard about them. The farmers do not use the support of agronomists as they already have knowledge and experience or have relatives/friends who can advise them on various issues. The current assessment demonstrates that female farmers tend to be more willing to get consultations from an agronomist, while the male farmers are more reluctant to do so, which once again affirms the female farmers' lack of knowledge and practice, which was mentioned above.

[110] Core competencies of Regional Information Consultation Centers: https://mepa.gov.ge/Ge/Page/RegionalInformationConsultationCenters

Books and guidelines about beekeeping are sold in bookstores as well as in veterinary and "Samto Kimia" shops. However, the interviewed beekeepers in Tianeti have not purchased them, they mainly have old books purchased by their ancestors, or borrowed from their relatives and neighbors. There are many materials about beekeeping available online for free of charge in Georgian as well as in other languages, however, only a few younger farmers have access to such materials and they seldom use it, rather they prefer to obtain the advice from their experienced and knowledgeable acquaintances.

6.1.1.3 Labor force

The research demonstrated that labor force is not as diverse as expected. More specifically, youth and PWDs are not engaged in farming in Tianeti, even though both groups do have the potential to participate through labor contribution and decision making. For example, for PWDs to be actively involved in beekeeping, they need certain assets, including financial capital, beehives, bee colonies, tools and equipment, as well as networks to be able to carry out certain activities. They also require the certain stage but given the type of disability, this is not available for them. In the same vein, youth if provided with necessary skills, knowledge and resources, do have the potential to be actively engaged in the beekeeping value chain, as it provides entry point for low-skilled rural youth. The research demonstrated that the of the farmers is the typical phenomenon for Tianeti, similar to the other parts of Georgia.

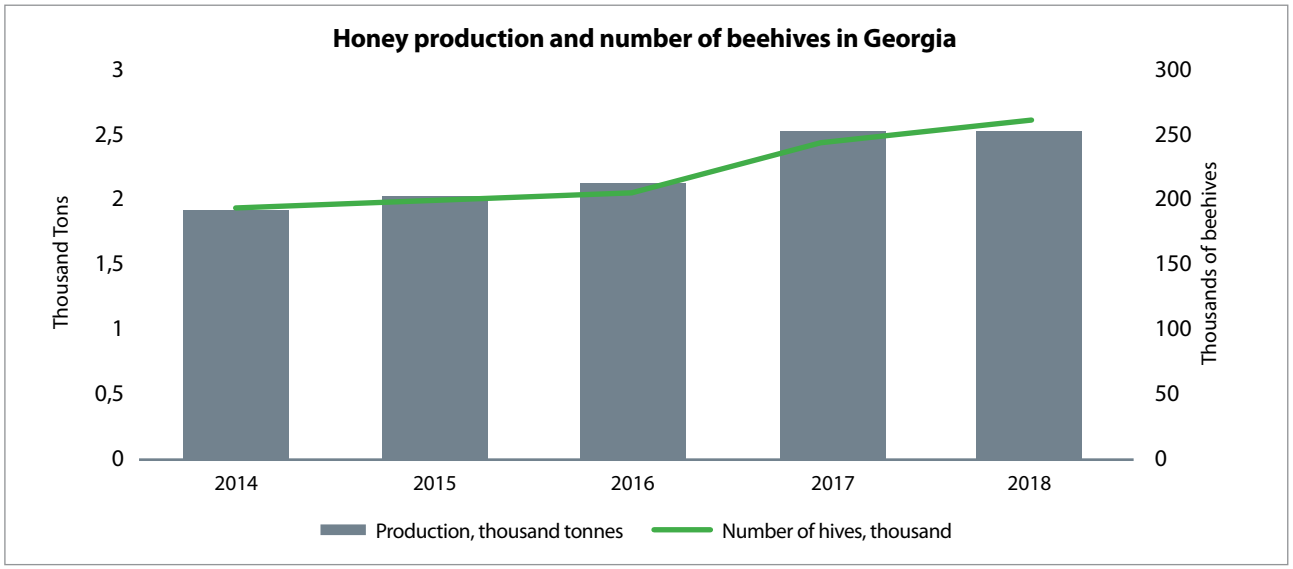
Mainly, the farmers are engaged in beekeeping with their family members and do not need to hire any labor. This is due to the fact that they do not own a large number of beehives/bee colonies and do not have need to hire any labor. This situation can change if the sizes of beekeeping farms increase.

6.1.2 PRIMARY PRODUCTION

In Georgia, as well as in target regions, the main beekeeping product that is produced is honey. Therefore, the statistics is only available for honey.

6.1.2.1 Honey production in Georgia by conventional methods

According to the National Statistics Office of Georgia's Survey of Agricultural Holdings, in Georgia, production of honey[111] amounted to 2.5 thousand ton in 2018, with the overall positive trend over the period of 2014-2019. The same trend is visible for the number of beehives, which stood at 257.8 thousand beehives in 2019.



Source: National Statistics Office of Georgia

[111] The underlying data does not provide information about other bee products except honey

Productivity

The productivity of honey production is measured by annual yield per beehive, which was 9.7 kg/per beehive in 2018. According to the profitability study of honey production in Saudi Arabia[112], the mean annual yield was 6.6 kg/hive, which is lower than Georgian yield figure. However, the range of yield per beehive can be enormous, starting from as little as 4.5kg/hive all the way up to 90kg/hive.[113] It mostly depends on the health of bees, the weather conditions, proximity to honey-producing flowers and other characteristics. Overall, Georgian productivity can be said to have a long way to go in order to catch up with some of the most productive countries.[114] As for the world average, according to GeoStat, in 2018 the average annual yield was 22.2 kg/beehive, which is significantly higher than the corresponding figure in Georgia.

Table 58: Average annual Yield

	2014	2015	2016	2017	2018
Yield, kg per hive	9.96	10.15	10.23	10.39	9.70

Source: National Statistics Office of Georgia

6.1.2.2 Honey production in Georgia by organic methods

Based on Caucascert[115], which is the only agency that issues certificates proving the organic nature of the product, there are 106 farmers with active certificates, with only 4 of them being situated in Mtskheta-Mtianeti but none of those 4 farmers are beekeepers. In fact, nationwide, there are 24 bee-keeping farms, all of them situated in Adjara.

Members of Elkana, though without a certificate of proof, apply methods of organic farming. Out of Elkana's 52 members in Georgia which are involved in beekeeping, just 6 are situated in Mtskhe-ta-Mtianeti region, while only 1 out of these 6 is operating in Tianeti Municipality. There are no mem-bers of Elkana in Lower-Pshavi region.

6.1.2.3 Honey production in target regions

According to statistics provided by Information-consultation centers in the target regions, there are there are 3720 and 435 beehives in Tianeti Municipality and Lower Pshavi, respectively. There is no other statistics available for beekeeping in Tianeti and Lower Pshavi.

Methods for honey production

Many of Tianeti inhabitants pursue beekeeping since it is considered a traditional activity in Tianeti. From the interviewed female and male farmers, the shortest-term beekeepers were those of 2-3 years of experience (it is worth mentioning that they inherited bee colonies and beehives from their male grandparents. The most experienced farmer had 28 years of experience. Consequently, the farmers were found to be older, and the males exhibit more years of experience on average compared to the females).

Since beekeeping is a traditional field, the knowledge that the farmers have is also traditional. Almost none of the farmers are aware of modern beekeeping techniques, as they learned from their grand-parents and the old books about beekeeping. However, several interviewees mentioned that they had rather experienced relatives, whom they were turning to for advice, when they first started practicing beekeeping.

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[112] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5478371/

[113] https://wildflowermeadows.com/2019/04/how-much-honey-can-a-beehive-produce/

[114] According to FAO, the annual yield in Taiwan in 2018 was 82.3 kg/beehive, 71kg/beehive in Myanmar and 56.2 kg/beehive in Canada. http://www.fao.org/faostat/en/#data/QL

[115] Caucascert (as of May 6th)- http://caucascert.ge/files/Register_060520Ge.pdf

To get a better grasp of gender and age differences at the production level, the research looked at who decided on beekeeping. It turned out that women never participated significantly in making key decisions regarding beekeeping enterprise, while it is common that men reserved the right of making the most of the decisions regarding beekeeping at the household level. There are 7 bee products that can normally be taken out from the beehive[116]:

- Honey - complex substance made when the nectar and sweet deposits from plants and trees are gathered, modified and stored in the honeycomb by honeybees as a food source for the colony
- Royal jelly - Royal jelly is a honeybee secretion that is used in the nutrition of larvae, as well as adult queens. The worker nurse bee secretes royal jelly from its' hypopharynx glands. This is fed to the larvae of queen, worker, and drone bees. The product is perishable, producers must have immediate access to proper cold storage (e.g., a household refrigerator or freezer) in which the royal jelly is stored until it is sold or conveyed to a collection center. To aid the royal jelly shelf life, sometimes honey or beeswax are added
- Propolis - created from resins, balsams, and tree saps. Because of its' high medicinal qualities, propolis is consumed by humans as a health supplement in various ways and it is also used in some cosmetics
- Beeswax - worker bees at a young age will secrete beeswax from a series of glands on their abdomens. They use this beeswax to form the walls and caps of the honeycomb. Many people harvest beeswax for various purposes like candles, lip balms, creams, etc.
- Bee venom - also known as apitoxin, bee venom is a colorless, clear liquid containing proteins that can lead to localized inflammation or in extreme cases, severe allergic reaction. Bee venom has been used as an alternative medicine in apitherapy for some time for its' benefits to health and to treat some illnesses
- Pollen - bees collect pollen in their pollen basket and carry it back to the hive. Excess pollen can be collected from the hives. It is often used as a health supplement
- Bee bread - pollen collected by bees and packed into bee brood cells mixed with bee digestive fluids and nectar. The bees then seal these cells with honey and stored in the hive for later consumption

Out of these 7 products, the farmers in Tianeti and Lower Pshavi only harvest honey in large quantities, the other products are perceived to be necessary by bee colonies for development and the farmers do not want to prevent this process. Most of the farmers also extract propolis and beeswax in small quantities. Honey is sold as well as used at home and given to relatives and/or neighbors as a gift. Propolis is only used at home, and beeswax is used at home or sometimes donated to church shops or exchanged for a few frames used in beehives (which costs about GEL 1-1.5, so it is neglected when discussing profitability in chapter 7).

Small families of farmers have up to 10 bee colonies, while bigger families of the more experienced farmers have up to 25 bee colonies. The number of beehives, bee colonies, amount of harvested honey in liters and the derived productivity of beekeepers are given below:

[116] T. Ghoghoberidze, G. Madzgarashvili, M. Peikrishvili, T. Nafetvaridze, L. Baliashvili, A. Kordzakhia, S. Kvezereli; Beekeeping; 2017, Copyright to UNDP Georgia; p.7. https://saveourbees.com.au/bee-products/

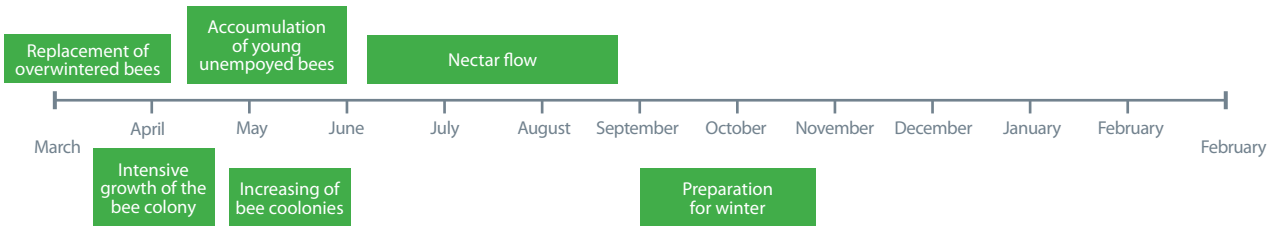
Table 59: The number of beehives, bee colonies, amount of harvested honey in liters and the derived productivity of beekeepers

ID	Bee colonies	Beehives	Harvested honey (L)	Productivity (L/beehive)
#8	4	10	120	10
#2	6	6	40	7
#3	10	20	200	10
#6	13	15	130	9
#4	14	14	50	4
#7	15	30	200	7
#1	17	17	120	7
#5	22	50	500	10
#9	25	50	500	10

Source: Field wok

Based on the summarized data given in the table, it can be concluded that in Tianeti and Lower Pshavi, the average productivity is 7-10 liters of honey per beehive, while the average productivity is considered to be 12-15 KG per beehive, which is 8.33 – 10.33 liters (conversion rate is 1.44 KG honey is 1 liter) in the eastern regions of Georgia.[117] The slightly lower than average productivity in Tianeti and Lower Pshavi can be explained by the fact that in mountainous regions, the winter period for bees continues for a bit longer period of time. Therefore, about 14 liters of honey should be left in the beehive[118] for them to be enough for the whole time before nectar flow starts again. The interviewed farmers leave 8 full frames of honeycombs filled with honey in the beehive for winter and set out salty water for bees.

Post-winter activities of beekeeping start in April in Tianeti and Lower Pshavi. Intensive growth of bee colonies and accumulation of young unemployed bees happen in the period of April-June, as a result of which, bee colonies increase and are ready to generate nectar for honey. The nectar flow period starts in June and continues until the end of August. At the beginning of September, farmers extract honey, propolis and beeswax and start to prepare bee colonies for winter. The annual process is depicted in the diagram below:



Most of the male interviewed farmers have quite good knowledge of the main steps of the process, the tools they need to use and the preventive methods against bee diseases. The female interviewees had difficulty coming up with exact answers, saying that their husbands or fathers-in-law are the ones fully involved in beekeeping and therefore they did not know the processes, diseases, or any other factors. This in part supports the findings of the World Bank research, according to which women farmers generally have less access to agricultural information and extension services. Rather, they receive information on farming techniques through their husbands or informal sources and do not have a chance to participate in any trainings. The only disease that interviewees name is Acarine disease - caused by the tracheal mite, treated by VARAKOM medicine. The beehives need to be opened and treated with

[117] T. Ghoghoberidze, G. Madzgarashvili, M. Peikrishvili, T. Nafetvaridze, L. Baliashvili, A. Kordzakhia, S. Kvezereli; Beekeeping; 2017, Copyright to UNDP Georgia; p.37

[118] http://www.gurianews.com/article/karmidamo-chemi/chveni-rchevebi/41431

the medicine twice a week, during spring, before the bees start intensive growth period and during winter preparations after bees are done extracting honey.

The female and male farmers are also aware of honeydew, a sweet liquid excreted by aphids, leafhoppers and some scale insects that are collected by bees, especially in the absence of a good source of nectar[119] and mad honey. It is made from the nectar, so it contains pollen of Rhododendron species and other plants in the family Ericaceae consisting of grayanotoxins[120]. Both are types of honey that are not useful and can be dangerous for bees as well as humans, therefore, they need special treatment. However, the farmers claim that none of them represents a problem in Tianeti and Lower Pshavi, as there are always good sources of nectar.

Distribution of production and income of farmers from beekeeping

Distribution of extracted honey among household consumption and sales in target region are rather volatile. On average, for household and as gift for relatives, approximately 30 liters of honey is consumed. The rest is sold. This constitutes to the range of 60-80% of extracted honey.

The average monthly income of beekeepers in target regions are GEL 590, with yearly income GEL 7100 (ranges of GEL 3700-12000 annually). The share of income from selling honey accounts to about 27-30% of honey producers' total annual income.

6.1.3 HONEY EXTRACTION AND STORAGE

Honey is extracted in August-September. For this reason, the farmers use fume blowers to remove bees from frames and then put the frames with honeycombs in a special sealed container. This is done to ensure that bees do not follow them to the place where they extract the honey. Honey extraction from honeycombs has to happen in a closed dry room to avoid bees from hindering the process and this is always done by women. It was observed by the research that the females are not involved in cleaning of the apiary, transporting, construction, repair of beehives, and watering of bees. Most of the farmers have old equipment so they have to do manual extraction, because the automatic extractor among farmers is very expensive and they do not have available finances to purchase such equipment. As in the case of other value chains, in beekeeping when female and male farmers do not have equal access to capital and property, the women tend to participate in the activities where physical product transformation involves simple, relatively low-cost equipment, or no-cost equipment (such extracting honey, packaging, etc.). It is also worth mentioning that women, if provided with increased access to technologies and tools, can reduce the need and amount of labor, which gives them time for other responsibilities or leisure.

Extracted honey is stored in hermetically sealed 40-liter containers and kept in cool dry places, in farmers' basements. Honey does not need special conditions for storing. With time, it crystalizes and becomes thicker, but maintains most of the useful qualities.

The amount of honey used in farmers' families and gifted to their relatives varies highly according to family sizes and a number of relatives the farmers' have.

6.1.4 TRANSPORTATION

Farmers who sell their extracted honey at farms' gate or in shops in Tianeti or Lower Pshavi, do not need to use transportation.

Farmers who sell their honey in Tianeti or Sioni farmers' markets, use their own vehicles for transportation. Due to the fact that they live close to farmers' markets, necessary fuel for transportation (2 ways) costs up to GEL 5. In most cases, honey is transported in large 40-liter containers.

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[119] https://www.betterbee.com/glossary/

[120] Consumption of the plant or any of its secondary products, including mad honey, can cause a rare poisonous reaction called grayanotoxin poisoning, mad honey disease, honey intoxication, or rhododendron poisoning

One farmer sends honey to Natakhtari (a village in Mtskheta Municipality) and her in-laws sell it there. This farmer does not have transportation costs because her daughter-in-law is from Natakhtari and she often goes there for other reasons and takes honey with her, free of charge.

Another farmer practices similar scheme for selling honey, but in Tbilisi – his daughter lives there and when he goes to visit her, he brings honey with him, therefore he does not have transportation costs either. One more farmer sells honey to customers in Tbilisi and she has found an original way – she brings honey stored in different size glass jars to minibus of route Lower Pshavi – Tbilisi and minibus driver transports the honey for free.

6.1.5 PACKAGING

All of the interviewed farmers use glass jars for packaging, without any labels or instructions. In most organized marketplaces such as supermarkets, etc. there are requirements that honey jars should be hermetically closed and properly labelled, therefore, if the target market is the latter, the packaging issues should be taken into account.

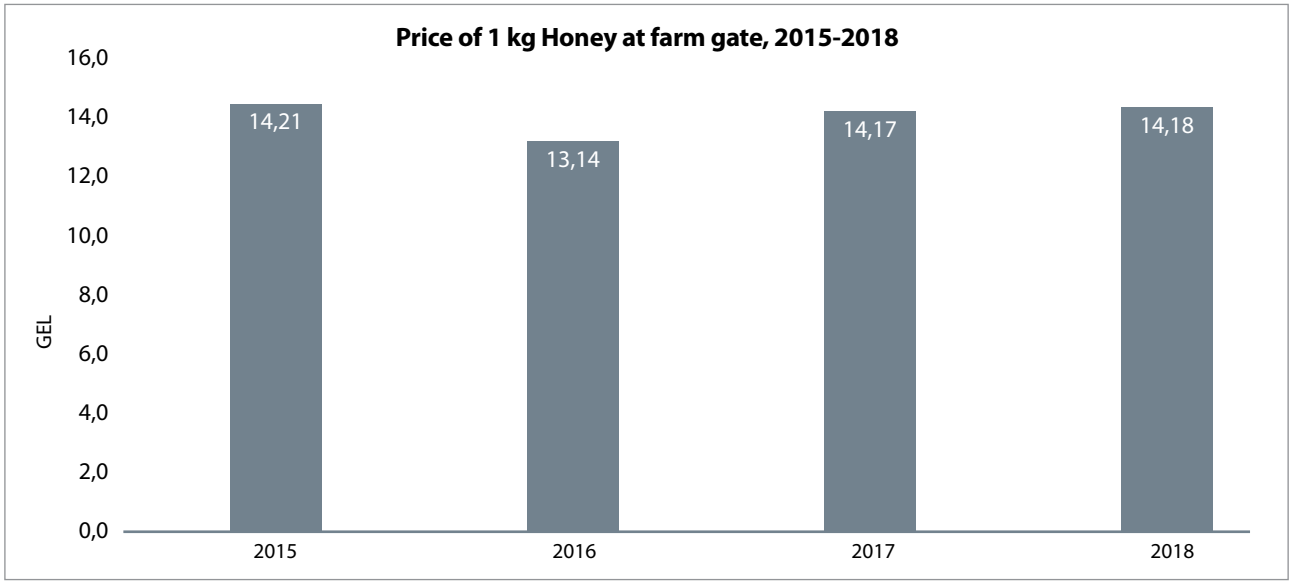
6.1.6 SALES

6.1.6.1 Price of honey in Georgia

The statistics for different prices for honey were obtained and analyzed. The National Statistics Office of Georgia collects data of the prices at the farm gate directly from farmers. Additionally, the National Statistics Office of Georgia collects retail prices for calculating the CPI index, in the supermarket chains, markets, and street markets in 6 major cities of Georgia (Tbilisi, Kutaisi, Batumi, Gori, Telavi, Zugdidi). Moreover, under the given research, desk and field research studies were conducted at the end of February and honey prices in major supermarket chains Carrefour and Goodwill were collected.

Price at farm gate

Statistics from the National Statistics Office of Georgia, show that prices have been relatively stable for the period of 2015-2019, with a noteworthy 7.5% decrease in the price occurring from 2014 to 2015.



Source: National Statistics Office of Georgia

Price at supermarkets and markets in the 6 major cities of Georgia[121]

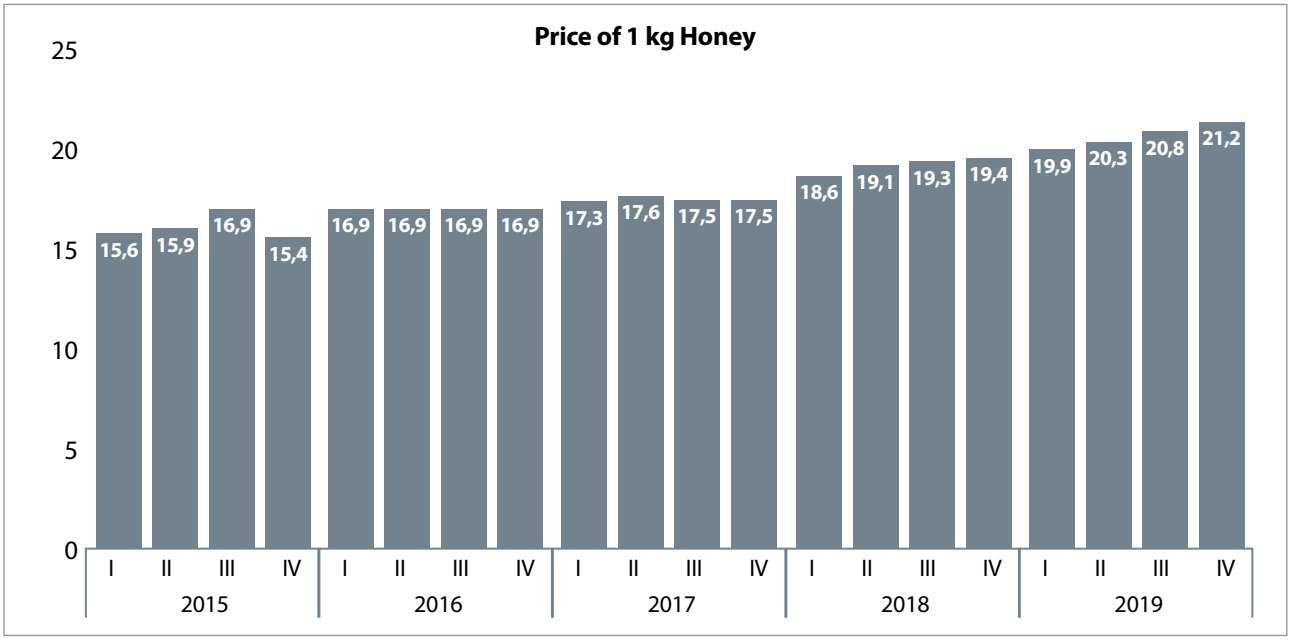
The analysis of the honey prices based on Consumer Price Index of Georgia reveals that the average price in supermarkets and markets in 2018 was about 34% higher than the price at the farm gate. The average prices of honey in period 2015-2019 expressed in GEL per kg were as follows:

Table 60: Prices of honey at supermarkets and markets in the 6 major cities of Georgia

Price (GEL)	2015	2016	2017	2018	2019
Honey	15.37	16.9	17.48	19.09	20.54

Source: National Statistics Office of Georgia

It is important to note that average prices of honey are not characterized by seasonality and therefore it is hard to identify tendencies of price fluctuations over the year. However, it can be noticed that prices have gradually increased from 2015 to 2019. The QI of 2019 recorded a growth of 28% compared to QI of 2015, while QIV of 2019 compared to QIV of 2015 recorded even higher growth of 38%.



Source: National Statistics Office of Georgia

Price in major supermarkets[122]

The prices of honey in major supermarkets in Tbilisi are higher than both, prices at the farm gate and the prices according to CPI, with the exception of local honey price in Carrefour being 20.7 GEL/kg. This is consistent with the price according to the CPI. The price is higher for special varieties of honey. For instance, chestnut honey costs 40.4 GEL/kg, while spring honey costs 28.8 GEL/kg in Goodwill; alpine honey costs 31.5 GEL/kg and 37.8 GEL/kg in Carrefour and Goodwill, respectively. The price is higher for imported honey as well, with the price of 38 GEL/kg in Goodwill.

Prices of Organic Products in Georgia

There is a lack of certified organic honey on the Georgian market. However, the conducted desk research at the end of February from the selected organic shops made it possible to identify the price of organic

[121] Source: National Statistics Office of Georgia

[122] Source: PMC Research Center. Data was obtained in Tbilisi, March 2020

honey. For instance, Sunflower Health Food Store has 6 different varieties of honey, with the price ranging from 25-28 GEL/kg. Barbale's honey costs 24 GEL/kg, while the price stands at a higher 30 GEL/kg for the chestnut honey. Overall, there is not a huge price difference between the non-organic and organic honey, which could be an indication of the high trust of non-organic honey on the Georgian market.

6.1.6.2 Sales of honey in target regions

All the interviewed farmers sell some amount of honey. The interview results are summarized in the table below:

Table 61: Sales of honey in target regions

ID	Amount sold (L)	Price (GEL)	Revenue from selling honey	Selling point
#2	37	20	740	Dusheti, farm gate
#4	40	20	800	Sioni farmers' market
#6	50	20	1000	Tianeti, farm gate
#8	80	25	2000	Tbilisi, her daughter sells from home
#3	100	15	1500	Natakhtari, Daughter-in-law brings it there
#5	100	20	2000	Tianeti farmers market, farm gate
#1	108	18	1944	Tbilisi, sends to customers with minibus
#7	170	20	3400	Sioni farmers' market, farm gate
#9	200	20	4000	Tianeti farmers market, shop, farm gate

Source: Field research

The farmers who sell their extracted honey in Tianeti or Lower Pshavi, mostly sell at the farm gate – customers from Tianeti or other parts of Georgia come to their houses and take honey with glass jars, the size of which depends on the amount of honey purchased – from 0.5 to 3 liters mainly.

The farmers who sell their honey in Tianeti or Sioni farmers' markets, pour honey in 0.5- and 1-liter glass jars to bring to the farmers' market. They do not use any kind of labeling.

One farmer sends honey to Natakhtari (a village in Mtskheta Municipality) and her in-laws sell it there. Honey is transported in large 40-liter containers and then poured into glass jars when sold.

Another farmer practices the similar scheme for selling honey, but in Tbilisi – his daughter lives there and when he goes to visit her, he brings honey with him, which then his daughter sells to customers who visit her at home. Honey is transported in large 40-liter containers and then poured into glass jars when sold. One more farmer sells honey to customers in Tbilisi and she has found an original way – she brings honey stored in different size glass jars to minibus of route Lower Pshavi – Tbilisi.

There is a grocery shop next to one of the farmer's house and she brings some honey there to sell in 0.5- and 1-liter glass jars.

Several farmers complained that despite the fact that they extract a large amount of honey, they cannot sell the amount they want to, because they cannot find customers and they did not manage to find any collectors.

If we look at sales in Tianeti Municipality from diversity perspective, we will see that according to the current research, the main decisions on negotiations of honey price and sale proceedings in almost all the cases are made again by men.

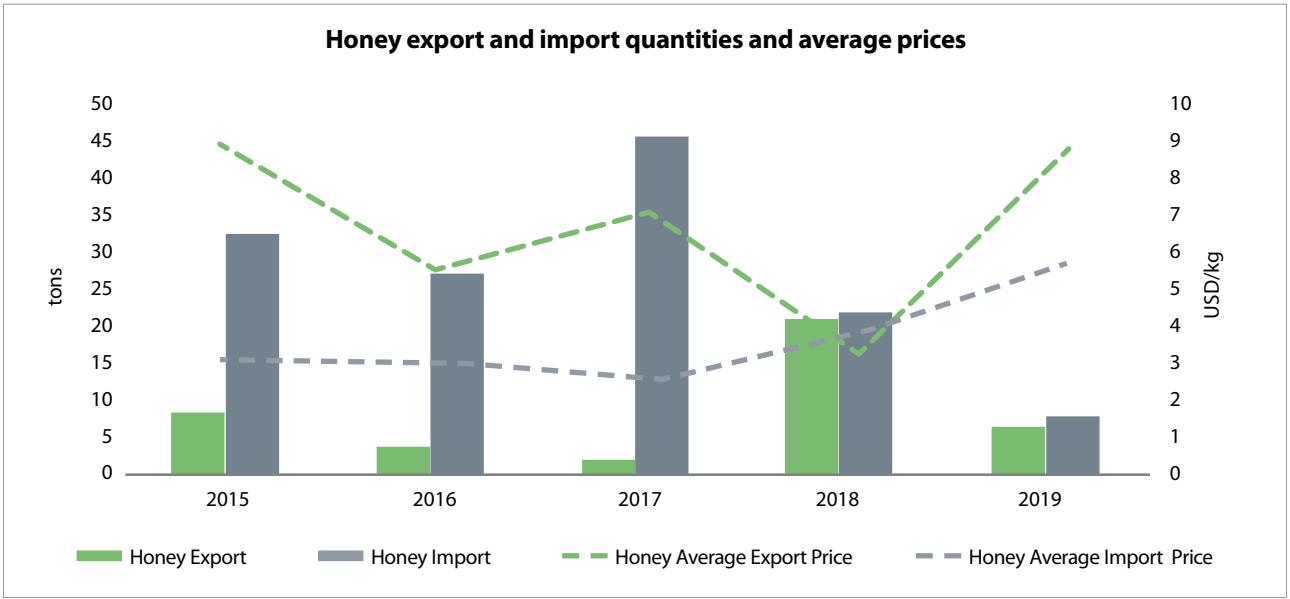
Similarly, to other value chains, the research on beekeeping demonstrated that the labor force is not as diverse as expected. More specifically, youth and PWDs are not engaged in beekeeping in Tianeti, even though both groups do have the potential to participate through labor contribution and deci-

sion making, as beekeeping is relatively light work and storage and proceeding can be done by people with certain types of disabilities. In the same vein, youth if provided with necessary skills, knowledge and resources, do have the potential to be actively engaged in beekeeping value chain, as it provides an entry point for low-skilled rural youth.

6.1.6.3 Foreign trade – export and import

When analyzing the import and export of honey in Georgia, one should keep in mind that trade turnover of honey did not exceed 2% of production in the period of 2015-2019, resulting in a Self-Sufficiency Ratio of 98%-100% in each of these years, which means that Georgia produces just enough honey to satisfy its needs.

Georgian exporters sell their honey with about 2-3 times higher average price than Georgian importers buy it. An exception to this pattern was 2018, when the average price of exported honey was, in fact, lower than the average import price. The highest average price (8.82 USD/kg) in the period of 2015-2019 for exported honey was observed in 2015 and 2019. The higher export price compared to the import price of honey could indicate the higher quality of Georgian honey, compared to the imported honey.



Source: National Statistics Office of Georgia

Export of honey by countries: Top 5 partners during 2015-2019

The analysis of the countries which are honey export destinations reveals that top partner is Azerbaijan, followed by Saudi Arabia, United Arab Emirates, Iran and China over the period of 2015-2019 (for more information see Annex 10 – Export by Countries).

Table 62: Export of honey by countries (sum amounts during 2015-2019)

	Honey	
	Value (1000USD)	**Tons**
Azerbaijan	40.5	17.7
Saudi Arabia	27.1	2.8
UAE	22.5	2.7
Iran	22.3	2.5
China	21.2	3.2

Source: National Statistics Office of Georgia

Exports of Organic Products

According to Caucascert, export of organic honey from Georgia has not started yet.

6.2 EXTERNAL STAKEHOLDER ANALYSIS

6.2.1 STATE AUTHORITIES

In the assistance of rural development, two government entities stand out: ARDA, and "Regional Information Consultation Centers"[123], both under the Ministry of Environment Protection and Agriculture of Georgia (MEPA) and "Enterprise Georgia" under the Ministry of Economy and Sustainable Development of Georgia.

Agricultural and Rural Development Agency (ARDA)

ARDA is an agency which operates under the Ministry of Environment and Agriculture of Georgia. Main objective of the agency is to promote the development of agriculture in Georgia. Its key functions include planning and management of projects initiated by the Ministry of Environment and Agriculture as well as management of subordinate agricultural companies.

ARDA's projects provide support for nearly every part of the supply chain of beekeeping, except transportations, sales and export. The detailed list[124] of those projects that assist beekeeping value chain is displayed in Table 63.

Table 63: Government programs supporting the actors of fruit value chain

	Supporting Development of Agricultural Cooperatives	Program of Agro-production Promotion: primary production	Program of Agro-a Promotion: Processing and preserving	Co-financing of Agro-processing and storage enterprises	Preferential Agrocredit Project: Fixed Assets	Preferential Agrocredit Project: Agro-leasing	Preferential Agrocredit Project: Produce in Georgia	Agro-insurance
Input Supply - Machinery & Equipment								
Primary Production								
Storage								
Processing								
Transportation (Distribution)								
Sales (Retailers)								
Export								

Source: ARDA

Beneficiaries of the projects of ARDA

According to the data of implemented projects by ARDA over the period 2013-2019, a total of 17 beneficiaries in Tianeti Municipality got the support, however, none of these beneficiaries were concerned with beekeeping.[125]

[123] This is discussed in chapter 4.1.1.5 Access to services of agronomy and access to knowledge/information

[124] The detailed description of each project is provided in Annex 12

[125] It was not possible to identify beneficiaries in Lower Pshavi region explicitly using the statistics provided by ARDA. In Dusheti municipality, within "Preferential Agrocredit Project", 3 beneficiaries that were concerned with beekeeping received preferred loan in Dusheti municipality over the period of 2013-2019

An extra attention should be devoted to "State Program for Support of Beekeeping Agricultural Cooperatives", which is a subprogram of more general program "Supporting Development of Agricultural Cooperatives". Out of 204 beneficiary cooperatives over the period 2016-2017, just 12 were located in Mtskheta-Mtianeti, out of which just 1 cooperative "Dzelkva" was situated in Tianeti Municipality[126].

Enterprise Georgia

Enterprise Georgia is functioning under the Ministry of Economy and Sustainable Development of Georgia, focusing on stimulating domestic production and entrepreneurship. Among other programs implemented by Enterprise Georgia, "Micro and Small Business Support" is most adjusted to rural SMEs[127]. In this program, the agency is disbursing grants of up to GEL 20 000[128] to promote micro and small enterprise development outside the capital. The grant is conditional on 20% co-financing by the beneficiary. Special priorities are given to rural initiatives, initiatives by women, and persons under 35 years of age. Since 2015, there have been four waves of the program. It has to be noted that the program does not finance primary agricultural production, however, it finances the processing.

It must be mentioned that the program together with financial support includes technical assistance to help the beneficiaries to develop basic entrepreneurial skills. Trainings include business plan writing before financing and business management training after being financed. However, it is not obligatory for beneficiaries to attend the trainings.

Beneficiaries of the project of Enterprise Georgia

According to the data of Enterprise Georgia, from 2015 under the program "Micro and Small Business Support", total 103 beneficiaries were financed in Tianeti Municipality. From there 57 beneficiaries got support for agriculture and food processing. While 9 beneficiaries got support in Lower Pshavi community, from where 7 beneficiaries got support for agriculture and food processing.

The Interviewed farmers in beekeeping field are mostly aware of the existing government programs, however, 6 of them have never tried to participate in one of the programs. 2 farmers from Lower Pshavi have received a government grant in the field of dairy production. One farmer in Tianeti has applied for different programs several times but he has never won it. The reasons have not been explained to him.

6.2.2 DONOR ORGANIZATIONS

Tianeti Municipality and Lower Pshavi Community are not targeted by most of the international donor organizations. As a result, the potential of beekeeping in the region is not fully exploited. ELKANA project "Organic Agriculture and Rural Tourism Development in Mtskheta-Mtianeti region" with the financial contribution of "Austrian Development Cooperation" is one of the few projects currently targeting the region.

Projects such as ENPARD (European Neighborhood Program for Agriculture and Rural Development) and the USAID "ZRDA activity in Georgia" do not currently support Mtskheta-Mtianeti region, even though "Zrda activity" does bee products considered as its target products. Another big project "The USAID Agriculture program" includes Mtskheta-Mtianeti region because of its coverage of the entire country, however, it does not have bee products as its target (For detailed information about donors' programs see Annex 13 – Donor Programs).

None of the interviewed farmers have ever been the beneficiaries of any donor programs and do not have information about ongoing projects in Georgia.

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[126] It was not possible to identify beneficiaries in Lower Pshavi region explicitly using the statistics provided by ARDA. In Dusheti municipality, within "State Program for Support of Beekeeping Agricultural Cooperatives", there were three beneficiaries concerned with beekeeping over the period of 2016-2017

[127] Enterprise Georgia is going to modify all its programs. However, yet, it is not known what will be changed.

[128] According to the Enterprise Georgia in the future 20000 GEL will be increased to 30000 GEL

6.2.3 FINANCIAL INSTITUTIONS

In Tianeti Municipality there are two commercial banks: Liberty and Credo, while none is in Lower Pshavi. The microfinance organizations are not located in target areas. ATMs of Liberty Bank (2) Credo (1) and Bank of Georgia (2) are located also in Tianeti[129], none is in Lower Pshavi.

Among the interviewees, there were 2 beekeepers who had taken out small consumer loans, but not for beekeeping reasons. One of the farmers had taken out a loan for purchasing furniture for her house and she was paying it back from her salary as a schoolteacher. Another farmer had taken out a loan for purchasing food for his pig, which he was paying back from his pension.

6.2.4 SECTORAL ASSOCIATIONS

In Georgia, there are several sectoral associations in beekeeping field:

- Association of Professional Beekeepers of Georgia[130]
- Georgian Apifarmers' Association[131]
- Biological Association Elkana
- Georgian Association of Organic Producers
- Georgian Farmers Association

There are also regional associations of beekeepers in different regions of Georgia, but not in target region. Georgia is also a member of APImondia, which is international beekeeper's association. Georgian bee farmers often participate in international bee product exhibitions. None of the interviewed farmers were the members of or even aware of these associations apart from Elkana. Some of the interviewed farmers analyze the importance of uniting together under associations or cooperatives.

6.2.5 CERTIFICATION AGENCIES

There are several organic certification agencies that operate in Georgia:

- ECOCERT[132]
- EUROCERT[133]
- CAUCASCERT

Georgian farmers and companies can also apply for certification in various international certification agencies. CAUCASCERT Ltd is the most popular one among the certification agencies.

CAUCASCERT Ltd facilitates the development of organic agriculture, protection of the rights of consumers' who go for organic products' and the growth of organic market in Georgia. Besides, it facilitates the exportation of Georgian organic products to the European Union and Switzerland. CAUCASCERT participates in the development of national and private standards, training of qualified organic inspectors and contributes to increasing public awareness of the importance of organic agriculture[134].

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[129] Source: National Bank of Georgia (NBG)

[130] https://www.facebook.com/pages/category/Community-Organization/%E1%83%A1%E1%83%90%E1%83%A5%E1%83%90%E1%83%A0%E1%83%97%E1%83%95%E1%83%94%E1%83%9A%E1%83%9D%E1%83%A1-%E1%83%9E%E1%83%A0%E1%83%9D%E1%83%A4%E1%83%94%E1%83%A1%E1%83%98%E1%83%9D%E1%83%9C%E1%83%90%E1%83%9A-%E1%83%9B%E1%83%94%E1%83%A4%E1%83%A3%E1%83%A2%E1%83%99%E1%83%A0%E1%83%94%E1%83%97%E1%83%90-%E1%83%90%E1%83%A1%E1%83%9D%E1%83%AA%E1%83%98%E1%83%90%E1%83%AA%E1%83%98%E1%83%90-717388588455917/

[131] https://www.facebook.com/apifarmer.org.ge/

[132] https://www.ecocert.com/en/offices; Office responsible for Georgia is situated in Belgrade, Serbia

[133] https://www.eurocert.ge/; Office is situated in Tbilisi

[134] Source: Caucascert

None of the interviewed farmers were members of or even aware of certification agencies, processes or costs. They are not planning to acquire organic or any other kind of certificates in the foreseeable future, due to a lack of economies of scale – they think that they have few bee colonies and the certification costs will not be covered by revenue.

Organic certification costs

Below are the costs associated with annual obligatory inspection costs for honey production (For detailed information about the pricing of Caucascert see Annex 14 - pricing policy of Caucascert):

Table 64: Organic certification costs

Beehives	Time needed for Inspecting and reporting (hours)	Inspecting cost (GEL) (hourly fee – GEL 325)
0-50	2	650
51-100	3	975
101-250	4	1300
251-400	5	1625
400+	6	1950
Daily rate for inspector		70
Travelling fee for inspector (per 100 km)		95
Take a sample and send it to the lab		160
VAT		+18%

Source: CAUCASCERT

According to the organic certification standard, CAUCASCERT additionally conducts random annual inspections to 10% of the certificate holders. Costs of these random inspections have to be covered in addition to the annual obligatory inspection costs by the certificate holder.

6.2.6 VOCATIONAL EDUCATIONAL INSTITUTIONS

There is a state VET college in the Mtskheta-Mtianeti region – Ilia Tsinamdzgvrishvili Community College, which is the first vocational education Institution founded in Georgia, with 138 years of history. Their main building with sample plots and various agricultural technical equipment is situated in village Tsinamdzgvriantkari. They also have branches in Tianeti, Dusheti and Stepantsminda.

The Dusheti branch of the College is just a building at the moment – they have not started providing educational courses yet. For their agricultural and tourism programs, the college expects to have students from villages that are far from the College building location and they are trying to arrange transportation of the students.

In Tianeti branch of the college, there are the following modular (the whole course is taught in the college, including practical component) and dual (40% of the course is arranged in actual working environment) programs, with duration of 9 – 36 months:

- Fruit growing - dual
- Beekeeping - modular
- IT Specialist – modular
- Accounting – modular
- Dairy production technologies – dual
- Forestry – modular

There are approximately 10 students in each group. Educational fees for both types of programs are fully financed by the state. Admissions are conducted twice a year – in spring and autumn. To be enrolled on a vocational program, the students have to overcome a minimal barrier on the state exam and then submit necessary documents to the college.

In main Tsinamdzgvriantkari branch, the college offers a wider variety of programs[135], in addition to the ones listed above:

- Viticulture and Winemaking
- Cultural Heritage Guide of Georgia
- Electricity
- Sewing Specialist
- Hair Stylist
- Tractor Driver
- Horticulture
- Wood Artistic Processing
- Hotel Service

The college also has a dorm where accommodation can be provided for students who do not live nearby.

Despite having years of experience, none of the interviewed farmers have an academic or vocational education in beekeeping or agricultural field. They have "traditional" knowledge, which means that they have learned beekeeping methods from their ancestors. Neither have they attended any trainings in this regard (except one farmer in Lower Pshavi). Despite their willingness, they claim that the trainings are not locally provided. They do not have financial resources to attend trainings in Tbilisi or any other locations, neither are they aware of schedules of such trainings. The beekeepers in Tianeti and Lower Pshavi lack skills in:

- Entrepreneurship
- Modern beekeeping methods
- Marketing
- Sales

[135] https://www.tmk.edu.ge/pdf/%E1%83%99%E1%83%90%E1%83%A2%E1%83%90%E1%83%9A%E1%83%9D%E1%83%92%E1%83%98.pdf

6.3 PROFITABILITY ANALYSIS

6.3.1 COSTS AND EARNINGS FOR TIANETI AND LOWER PSHAVI MUNICIPALITY FARMERS – CURRENT SITUATION

Only 5 out of 9 the interviewed farmers were able to specify costs associated with beekeeping procedures. The results are given in the table below.

Table 65: Costs associated with beekeeping procedures

ID	Beehives	Costs per beehive (GEL)	Harvested honey	Productivity (L/ beehive)	Amount sold (L)	Price (GEL)	Revenue from selling honey	Profit (GEL)	Profit per Liter
#6	15	70	130	9	50	20	1000	-50	-1
#7	30	70	200	7	170	20	3400	1300	8
#2	6	40	40	7	37	20	740	500	14
#9	50	30	500	10	200	20	4000	2500	13
#3	20	20	200	10	100	15	1500	1100	11
#4	14	0	50	4	40	20	800	800	20
#8	10	0	120	12	80	25	2000	2000	25
#5	50	0	500	10	100	20	2000	2000	20
#1	17	0	120	7	108	18	1944	1944	18

Source: Field research

From the table, it is apparent that there is almost no logical correlation between:

- Costs and extracted honey
- Costs and number of beehives
- Costs and productivity

One reason behind this is the fact that the beekeeping farmers in target regions do not carry out any kind of bookkeeping for their activities. For this reason, it was very difficult for them to declare annual costs for any procedures. Due to this, the remaining 4 farmers claimed that they had no costs at all, even though they purchase frames for honeycombs and supplies that are used against diseases.

The average selling price of honey is GEL 20 per 1 liter. Transportation costs are non-existent (in most cases) or very low and can be neglected, therefore, the profit varies from GEL 8 to 14 per 1 liter of honey sold, among the farmers who managed to calculate approximate annual costs.

6.3.2 POTENTIAL COSTS AND EARNINGS FOR ORGANIC PRODUCTION OF HONEY

The costs of arranging a 100-beehive farm are the following[136]:

Table 66: The costs of arranging a 100-beehive

Equipment	Units	Unit Price (GEL)	Sum (GEL)
Beehive bodies	100	190	19000
Substitute beehive body parts	-	-	3298
Necessary equipment [137]	-	-	10520

[136] T. Ghoghoberidze, G. Madzgarashvili, M. Peikrishvili, T. Nafetvaridze, L. Baliashvili, A. Kordzakhia, S. Kvezereli; Beekeeping; 2017, Copyright to UNDP Georgia; p.250

[137] Honeycomb frames, smoker, bee veil, honey extractor, storage container, uncapping knife, etc. for detailed list please see the link, p. 257

Supplies against diseases	-	-	1000
Special Building for storing equipment and honey extraction	-	-	2000
Total			**35818**

Source: Field research

The sum of 35818 is the initial outlay of arranging a farm. During the following years (year 2 - onwards), there will be the need for working capital (annual variable costs), such as inspecting beehives, feeding bee colonies, treatment against diseases, deriving/purchasing new bee colonies, extracting honey and beeswax, etc.[138]

Table 67: Expenses

Expense[139]	GEL
Annual beehive Inspections	115
Feeding of bee colonies	1400
Treatment against diseases	1000
Increasing bee colonies (including beehive bodies)	2000
Extracting honey and beeswax	230
Honeycomb frames	1020
Small equipment	300
Other expenses (~5%)	300
Total	**6365**

Source: Field research

If productivity is assumed to be 10 liters per beehive and selling price is GEL 20, then the following scenario will take place:

Table 68: Profitability analysis

Initial Outlay	GEL 35818
Annual variable costs	GEL 6365
Annual extracted honey	100 x 10 = 1000 Liters
Annual Revenue	1000 x 20 = GEL 20000
Annual Profit	20000 – 6365 = 13623
Time for breaking even	3 years [140]

[138] Interest expenses in case of commercial loan, labour costs and alternative costs are neglected for simplicity.

[139] for detailed list please see the link, p. 263

[140] Profit of GEL 5051 at the end of the year, assuming no discount rate

Organic certification costs

As already mentioned in Chapter 6, organic certification is conducted by CAUCASCERT. The costs associated with annual obligatory inspection costs for beekeeping are below:

Table 69: Organic certification costs

Number of beehives	Time needed for Inspecting and reporting	Inspecting (hourly fee – GEL 325)
0-50	2	650
51-100	3	975
101-250	4	1300
251-400	5	1625
400+	6	1950
Daily rate for inspector		70
Travelling fee for inspector (per 100 km)		95
VAT		+18%

Source: Caucascert

According to the organic certification standard, CAUCASCERT additionally conducts random annual inspections to 10% of the certificate holders. Costs of this random inspections have to be covered in addition to the annual obligatory inspection costs by the certificate holder.

An organic certificate is issued 1 year after the first application date, with a condition that honeycombs will be fully replaced by organic honeycombs. That is, if a farmer applies for a certificate in January 2021, the first certified organic harvest will be the one harvested in summer 2022.

According to CAUCASCERT experts, annual certification costs for a farm of 100 beehives are approximately GEL 1500-1800. In case of a beekeeping, if the farmer decides to convert to organic production, the annual costs (average of GEL 1650) should be added to the working capital. If productivity is assumed to be unchanged at 10 liters per beehive and selling price is still GEL 20, then the following scenario will take place:

Table 70: Profitability analysis

Initial Outlay	GEL 35818
Annual variable costs	6365 + 1650 = 8015
Annual extracted honey	100 x 10 = 1000 Liters
Annual Revenue	1000 x 20 = GEL 20000
Annual Profit	20000 – 8015 = 11985
Time for breaking even	3 years[141]

Source: Field research

It is visible, that even in this case, 3 years are needed to break even.

[141] Profit of GEL 5051 at the end of the year, assuming no discount rate

6.4 SWOT ANALYSIS

As assessed by the farmers, PMC Research and using the Strategy for Regional Development of Mtskheta-Mtianeti for 2015-2021, the SWOT table for beekeeping in Lower Pshavi and Tianeti Municipalities is the following:

Table 71: SWOT analysis

Strengths	Weaknesses
- Relatively low risk of bee diseases - Low risk of bees collecting honeydew - Low risk of bees collecting mad honey, due to absence - High quality of honey - Traditional beekeeping methods - Low level of using chemical products - No need for taking bees to the mountains during the nectar flow period - Geographical closeness to Tbilisi (for sales) - High demand for honey - High price of honey	- Lack of knowledge about modern (highly productive) beekeeping methods among farmers - High prices of beekeeping equipment - Lack of awareness and willingness to convert to organic production - Lack of awareness about donor programs - Low level of economic development - Difficulty to sell honey due to lack of marketing skills - Low level of youth engagement - Exclusion of PWDs - Low level of women's access to output markets - Gendered division of roles - Women's, PWDs and youth limited access to formal credit services - Unpaid or low - paid labor for women - Women's limited access to large markets - Women's limited access to decision-making
Opportunities	**Threats**
- Relatively easy process of conversion to organic farming - Potential to create jobs and employment, especially for poor farmers - Steady increase of demand on organic products - Potentially increased demand due to increased quantities of tourists - Good entry point for low-skilled rural youth - Skills development programs for youth, PWDs and women	- Ageing population due to internal and external migration - Loss/death of bees due to mice and other rodents - No insurance mechanisms used by farmers - Lack of access to financial resources - Farmers' attitude towards agricultural opportunities - Hindered social norms and stereotypes

6.5 RECOMMENDATIONS

In this section, we summarize conclusions turned into recommendations as possible solutions to the issues encountered during value chain analysis of honey production in the targeted area. The conclusions are based on concerns of stakeholders, as well as our observations.

1. Promotion of extracting other beekeeping products than honey

Conclusion:

The productivity of honey extraction in Tianeti and Lower Pshavi is in line with the average productivity in Eastern Georgia. However, beekeepers do not extract any other bee products from beehives expect honey.

Recommendation:

It is advisable to raise awareness of other bee products among beekeepers in target regions :

- Royal jelly
- Propolis
- Beeswax
- Bee venom
- Pollen

All of these products can be collected from beehives and be used for additional income generation by beekeepers. Beekeepers shall be provided with trainings in order to start extracting the above-mentioned products. Trainings should include information about extraction methods, storage requirements and selling channels.

2. Supporting input suppliers to promote availability of resources

Conclusion:

There are several veterinary shops in Tianeti, but they sell only a few tools and equipment for the beekeeping industry. Therefore, the farmers have to bring equipment from Tbilisi. Tbilisi is close to Tianeti (80 km) and Lower Pshavi (100 km), but a lack of accessibility to inputs still persists – the farmers have to wait until it's necessary for them to go to Tbilisi on other business to collect the inputs. In other words, the fact that the main equipment is not sold in Tianeti, makes the inputs not readily available.

Recommendation:

Elkana can support beekeepers by supporting the veterinary shops in Tianeti and Lower Pshavi to have the inputs readily available. The shops should be situated in or close to townlet Tianeti and Shuapkho. They should be selling all the necessary equipment as well as treatment supplies for beekeeping purposes. If funding is available for several veterinary shops, the other locations should be determined based on the number of beekeepers in the villages. However, before deciding to support/develop veterinary shops in target regions, feasibility study is recommended to be conducted that will analyze different business models.

It is rather important for the veterinary shop owners/managers to have good knowledge of beekeeping and offer advice to the farmers accordingly. This can be achieved by providing trainings for veterinary shop owners/managers.

To spread information about the veterinary shops and available equipment, it will be better if information about it is printed on papers and placed in the centers of the villages, as currently, this is the most common practice of spreading information in Tianeti Municipality. Moreover, the spreading of information could be done with the help of the information-consultation center and the representatives of the local governments in the villages.

The additional positive effect will be the promotion of organic beekeeping in the municipalities. For this purpose, it is important for the suppliers to have knowledge in agronomy, especially in organic beekeeping as well as the local conditions. Together with supplying equipment and treatment supplies, it is crucial that the supplier is able to provide beekeepers with consultations. It will be optimal if the consultations are provided on the phone as well as on-site.

3. Increase farmers awareness about government and donor programs and support them taking participations in those programs

Conclusion:

Most of the interviewed farmers in target regions do not have extensive information about the government programs (programs of ARDA and Enterprise Georgia). In general, they heard about the existence of such programs, however, they do not know how to apply and what kind of financial support they can get. Moreover, as most of the government programs require business plans, for the farmers developing business plans represent a challenge.

Recommendation:

The farmers' awareness of various government and donor programs shall be raised. It is advisable to provide brief trainings for the interested farmers about how to fill in the applications, where and how to acquire necessary documents and if necessary, how to apply for credits in financial institutions for the co-financing needed in some donor or government projects.

4. Increase entrepreneurship skills including management and financial literacy skills among farmers

Conclusion:

There is a lack of entrepreneurship skills among the farmers. They are not able to differ family money from business money. They do not plan their finances, do not make any records. The level of financial literacy is very low among them. Most of the farmers do not know what their annual income is and have difficulty identifying expenses. Additionally, their perception towards credits is rather negative.

Recommendation:

The farmers need to develop their skills in entrepreneurship, management and finances. For this reason, relevant practical training programs need to be provided for them. One of the possibilities could be to use the training program developed by the National Bank of Georgia for SMEs[142] and agrobusinesses[143].

5. Raise farmers' awareness and knowledge about organic beekeeping methods

Conclusion:

As identified by the conducted research, the farmers in target regions do not have knowledge in organic beekeeping methods.

Recommendation:

Elkana could support to increase farmers' awareness and knowledge of organic beekeeping methods, by providing relevant practical trainings with the farmers in target regions. Elkana must ensure women, youth, PWDs are actively involved in those trainings.

[142] https://www.nbg.gov.ge/index.php?m=706&lng=eng

[143] https://www.nbg.gov.ge/index.php?m=749&lng=geo

6. Supporting VET college to increase farmers knowledge in beekeeping

Conclusion:

In target regions, the farmers lack knowledge in modern beekeeping methods. They follow the advice they get from their ancestors. They are interested in undertaking trainings if it leads to increased productivity.

Recommendation:

For the project results to be sustainable, it is important to involve other actors in Tianeti and Lower Pshavi, who will maintain the provision of the activities after the project has reached its end. For this purpose, it is advisable to establish partnerships with information-consultation centers and Ilia Tsinamdzgvrishvili VET College, which has branches in Dusheti and Tianeti.

The main activity that can be carried out in partnership with the Ilia Tsinamdzgvrishvili VET College is to develop professional training programs[144]. The main purpose of such programs is to provide specific knowledge to recipients of all ages (life-long learning) in a specified narrow field. To support and promote vegetable productions, the programs that can be developed are the following (not limited to):

- Modern beekeeping methods
- Organic beekeeping methods
- Planning, managing and operating veterinary shops
- Planning, managing and operating beekeeping farms

In order to develop professional training programs, working group should be created in partnership with VET college. Working group should be composed of educational experts (on college's part) and agriculture/beekeeping experts (on Elkana's part). Developing a curriculum and application process for the program to get approved by the authorities is rather straightforward. This can be cost-saving activity in many ways, as Ilia Tsinamdzgvrishvili College is state-owned and the funding for students' education, administrative purposes and for students' special educational needs can be acquired from the state budget.

7. Considering building storage facilities

Conclusion:

After extraction, honey is stored in large 40-liter containers, which are hermetically sealed. The containers are stored in cool dry places. Containers do not take up much space and can be stored in honey extraction room as well as in beekeepers' basements. Storage facilities can become a necessity in case the size of beekeeping farms increases.

Recommendation:

Construction of storage facilities shall be planned while developing budgets and business plans for beekeeping farms. Other bee products such as royal jelly, propolis, etc. require special storage conditions, which should be also considered while developing business plans. Such storage facilities should be located close to beehives in order to avoid spoiling of products.

8. Promote packaging of honey

Conclusion:

Beekeepers in Tianeti and Lower Pshavi use simple glass jars for selling honey. The volume of the jar depends on the amount of honey the customer wants to buy. The farmers either pour honey in the

[144] https://www.mes.gov.ge/content.php?id=9133&lang=geo

glass jars of different sizes at home to bring to farmers' markets or bring large honey containers and pour honey in jars when customers make a purchase. None of the farmers use any kind of labels, which is compulsory in organized indoor marketplaces. Packaging and labeling are associated with different costs, such as packaging and labeling materials, laboratory testing of honey quality and ingredients, etc.

Recommendation:

Awareness about the importance of packaging and labeling honey and other bee products is rather important in case the farmers want to increase their sales. The farmers will require assistance in understanding the requirements, collecting necessary materials, organizing packaging and labeling activities.

9. Promote conversion to organic beekeeping methods and taking organic certification

Conclusion:

None of beekeepers in Tianeti or Lower Pshavi hold organic certificates. However, their methods of production are very close to fully organic methods, therefore, they will not have to put a lot of effort in conversion process. The process of obtaining a certificate lasts for only 12 months after application, if the materials used in beekeeping are replaced with organic ones. Organic certification involves annual costs and can be used to increase income via setting a higher price for honey or other bee products.

Recommendation:

Beekeepers' production possibility frontiers shall be assessed and analyzed in respect of profitability to determine whether organic certification is feasible and beneficial. This activity can be conducted from a beekeepers' perspective as well as from a broader perspective (village, cooperative, or several beekeepers together). Elkana can co-finance the cost of certification to farmers who will be interested to be certified.

10. Support farmers to diversify sales channels

Conclusion:

Currently, only few farmers manage to sell the amount of honey that they intend to. Several farmers mentioned during interviews that they are willing, but unable to establish connections with honey collectors.

Recommendation:

Beekeepers need to establish sales channels. They need to be assisted in establishing sustainable connections with collectors and/or markets and supermarkets, to carry out negotiations with them and develop contracts with favorable conditions for them. They need to realize the differences between the sales channels. For example, collectors who buy in bulk, pay less than retail price. There are also transportation issues, for example, the most supermarkets require the product to be delivered at different locations periodically, while most collectors pick up the product from where beekeepers keep it. Elkana can support farmers by providing them with coaching and mentoring, increasing their awareness about the requirements of high-priced markets and teaching them how to satisfy these requirements.

Elkana can assist beekeepers in establishing connections with honey collectors and other sales representatives, such as supermarkets, hypermarkets, etc. Moreover, Elkana can provide assistance with negotiating favorable conditions for them. Export possibility can be also analyzed in case of increased production. For this purpose, Export Development Association[145] can be involved in the process and provide advice for the farmers.

[145] https://www.eda.org.ge/

11. Increase awareness about the importance of organic honey among the Georgian population and Increase awareness of the Georgian consumers about the quality of honey in target regions

Conclusion:

In the frame of the research, through the interviews with the representatives of supermarkets and café/restaurants, it was identified that in Georgia, among the population, there is a lack of awareness about the importance of consuming organic products including honey. Moreover, among the Georgian population, there is a lack of knowledge about the quality of honey produced in target regions.

Recommendation:

Elkana could support to increase awareness about the importance of organic products including honey and boost the quality of honey produced in target regions among local consumers by providing relevant marketing campaign. The campaign is better to be conducted mainly in Tbilisi.

12. Support farmers involvement in relevant associations

Conclusion:

None of the interviewed farmers are members of any associations; do not realize the benefits they could get from the membership of some agriculture associations either.

Recommendation:

Encourage farmers to consider the membership of relevant agriculture associations, e.g. Elkana by increasing their awareness of the benefits such associations can provide.

13. Entrepreneurship opportunities for women, youth, and PWDs

Conclusion:

The current research showed that beekeeping is considered a male-dominated in Tianeti Municipality, while women are taking up supporting roles. Women in most of the cases have no ownership and control over assets, neither decision-making capacity. It is always men, either husband or son, who are in charge of doing so. More precisely, it turned out that women never participated significantly in making key decisions regarding beekeeping enterprise, while it is common that men reserved the right of making the most of the decisions regarding beekeeping at the household level. This notwithstanding, youth and PWDs are not engaged in beekeeping in Tianeti, even though both groups do have the potential to participate through labor contribution and decision making. Beekeeping is relatively light work and storage, and proceeding can also be done by people with certain types of disabilities.

Recommendation:

Through grant support schemes, provide women, youth, and PWDs with entrepreneurship opportunities, more specifically, the opportunities for development and advancement of women and youth-led beekeeping businesses and ensure that they get support on putting together a grant application.

14. Access to credit for women, youth, and PWDs

Conclusion:

As in the case of other value chains, in beekeeping, when female and male farmers do not have equal access to capital, women tend to participate in the activities where physical product transformation involves simple, relatively low-cost equipment, or no-cost equipment (such extracting honey, packaging, etc.). It is also worth mentioning that women, if provided with increased access to technologies and tools, can reduce the need and amount of labor, which gives them time for other responsibilities or leisure.

Recommendation:

Support access to credit, land for women, youth, and PWDs, by providing support schemes in partnership with financial institutions. These schemes would open up economic opportunities for them and support the growth of women, youth and PWD-owned beekeeping business.

15. Access to high-quality inputs, equipment, technology for beekeeping for women, youth, and PWDs

Conclusion:

The fact that in Tianeti Municipality beekeeping is organized in traditional manner without adaptation of modern technologies, hinders changes in gender roles, decreases women's and girls' participation and weakens empowerment among beekeepers.

Recommendation:

Ensure women, youth, and PWDs have access to high-quality inputs, equipment and technology for vegetables; ensure they have knowledge how to use them to achieve high quality product.

16. Training opportunities for women, youth and PWDs

Conclusion:

Consequently, the farmers were found to be older, and males exhibit more years of experience on average compared to females. Most of the male interviewed farmers have quite good knowledge of the main steps of the processes, the tools they need to use and the preventive methods against bee diseases. The female interviewees had difficulty coming up with exact answers, saying that their husbands or fathers-in-law were the ones fully involved in beekeeping and therefore they did not know the processes, diseases or any other factors. This in part supports the findings of the World Bank research, according to which women farmers generally have less access to agricultural information and extension services. Rather, they receive information on farming techniques through their husbands or informal sources and do not have a chance to participate in any trainings.

Recommendation:

Provide tailored trainings for women, youth, PWDs to hone their skills in beekeeping, including different management techniques like catching and attractant methods, swarm control methods, extracting, packaging, labeling, etc. The training time, location, and accessibility also needs to be considered. If one group (e.g. women, girls, PWDs) must be at home during a specific time when others are available or vice versa, the training either should be scheduled on the time when all groups are available or trainings on different days and times should be provided. Having same group trainings separately may create conditions where each group (women, youth, PWDs) are more confident in participating and expressing their needs. Adapting the trainings, in terms of contents, methods and materials, to the level of knowledge and previous experience of potentially interested members of diverse groups, will also be an effective way to attract vulnerable groups. Ensure that the training materials show neither a stereotypical representation nor underrepresentation of vulnerable groups, and that there is a fair portrayal of women, men, youth, PWDs in materials, so as to contribute to the lack of positive role models for the groups who are underrepresented in the field.

17. Sales and collection arrangements for female farmers

Conclusion:

If we look at sales and transportations in Tianeti Municipality from diversity perspective, we will see that according to the current research, the main decisions on who negotiates honey sale price and who keeps honey sales processes, in almost all the cases are done again by men.

Recommendation:

Improve sales and collection arrangements for the female farmers to the best advantage of them to have access to the local markets and networks.

18. Access to credit for women, youth, and PWDs

Conclusion:

The land-related statistics for Tianeti Municipality, that include data on land and agriculture ownership disaggregated by gender and age is not available, however, national statistics can allow the assumptions to Tianeti Municipality. According to statistics, legitimated agricultural land is owned by three times more men, than women. When the female and male farmers do not have equal access to capital, women and girls tend to participate in the activities where physical product transformation involves simple, relatively low-cost equipment. This notwithstanding, it appeared that in Tianeti, there are no disabled farmers, nor the cases of people with disability (PWD) involving in farming were observed, which can be stipulated by no access to the different capital assets, including machineries that determine an individual's, i.e. PWD's ability to productively engage in farming.

Recommendation:

Support access to credit, land for women, youth, and PWDs, by providing support schemes in partnership with financial institutions. These schemes would open up economic opportunities for them and support the growth of women, youth and PWD-owned beekeeping enterprise.

7. NON-TIMBER FOREST PRODUCTS' VALUE CHAIN ANALYSIS

7.1 GRID MAP – NTFP VALUE CHAIN ACTORS

The following diagram shows NTFP value chain in target regions.

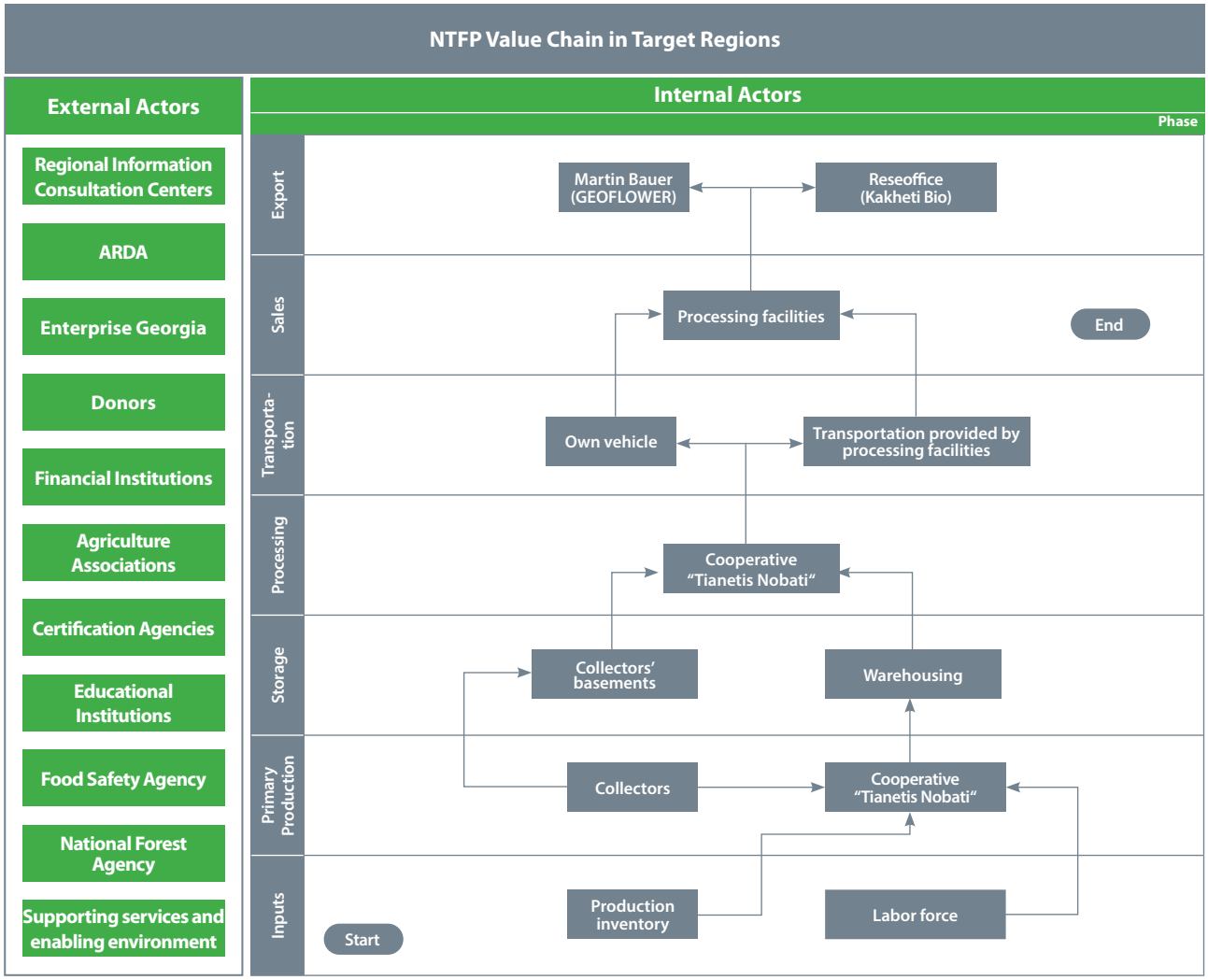

Diagram 4: NTFP Value Chain in target regions *Source: Field research*

7.1.1 INPUT SUPPLIERS

Within targeted area, NTFP sector value chain main actors comprise of: Individual households or so-called Collectors living in different villages of Tianeti Municipality and Lower Pshavi that are involved in collecting of NTFPs; collection centers, or so-called cooperatives, that collect NTFPs from local population; and medium and large scale processing facilities that purchase large quantities of NTFPs, including medical herbs, from different regions of Georgia and sell 99% of them on export. .

Different inputs for different value chain actors have been identified. Based on conducted interviews, there are minor input supplies for Collectors. Firstly, they name wild collection skills as important know-how for productive work. Besides, in some cases, they mention the importance of having hand tools for more effective collection of several forest products; and finally, most of them underline the importance of having special vehicles to go far ahead to the forests for wild collection and bring the products to the cooperative, thereafter. This is of particular importance for women and PWDs, as improved techniques for harvesting would save time as well as provide opportunities for economic

empowerment, as no access to these assets hinders their participation in the sector more proactively. Unfortunately, women have less opportunities to compare to men to increase output and less access to credit, technology and training, thus they are at a disadvantaged position at this level of upgrading.

With regards to the Cooperatives, these inputs have been acknowledged as an initial step of their value chain: *production inventory* – crucially important having proper and durable inventory for simple processing of NTFPs. Lack of necessary inventory leads to longer production processes, which in turn results in lower capacities. For instance, "Tianetis Nobati" having small single drying oven procrastinates fresh plums for 48 hours, as such amount of time is necessary for drying only 200kg fruits. *Packaging materials* are also inputs for cooperatives. Although they mostly use simple bags for stuffing final products, they still need to have clea n and proper materials. In some cases, plastic containers would have been very convenient not to damage products during transportation. Besides, it is very important to note that "Tianetis Nobati' have their small capacity vacuum packing machine. Having proper packaging materials and inventory can yield long lasting products, i.e. products with higher added value.

Natural resources, mainly electricity, water, and gas, are also important inputs, out of which electricity is the costliest (drying, cooling).

We can finalize this section with citing input supplies for processing facilities. Mostly, the same components and principle, as for the Cooperatives, but with much bigger scales of production machinery and packaging materials. In regards human resources, the processing facilities complain about a lack of collectors, as human resources in the villages aim to collect NTFPs. According to them, the reason is that either people, especially youth, tend to migrate from villages to urban areas, or they are lazy and need to be somehow stimulated. With regards to the market information, time to time they conduct export market research, but mostly such information is backed by the long-term agreements signed with international clients.

Access to information/kwowledge - although regional information consultation centers of Ministry of Environment and Agriculture of Georgia have the representatives particular in Tianeti Municipality, the most of the collectors have never requested information from such center, nor attended any kind of training or educational sessions. Besides, while most of such collectors expressed eagerness to upgrade their skills and increase awareness about NTPF industry, some collectors frankly admitted that such training would be aimless and only time-consuming. During the interviews, when asked about competent person in NTFP industry in targeted area, most of them named the male director of "Tianetis Nobati" cooperative of being such. According to them, such person can be trustworthy and knowledgeable source for required information in agriculture in the targeted region.

With regards to the cooperative and its members, they have experience of regular training sessions on different subjects in NTFP industry within the EU supported ENPARD program. Training locations were in Natakhtari, an office of RCDA (Rural Communities Development Agency), as well as in Mtskheta ('Gvinis Sakhli'). The trainings have been conducted by local, as well as international consultants in NTFP sector and most of the respondents described such sessions as 'interesting' and 'useful'.

Labor force - NFFP collectors never hire external labor force and are engaged in wild collection process only with their family members. According to them, awareness and know-how of wild product picking process trace back to their ancestors and there is no specific need for getting additional knowledge in this matter.

Neither the cooperative nor its members hire labor for production, however, the members appear both to be collectors of NTFPs. As the members are also involved in fruit processing in the facility and are being paid at daily basis by the cooperative. As mentioned, the cooperatives have up to 13 members of which 8 is women. It is very important to mark well-built relations, devotion and respect between the collectors and the cooperative directors. Based on the interviews, both sides expressed eagerness and readiness for stable cooperation as a long-term gain, rather than with untrustworthy

clients as a short-term pain (for example, 2 out of 6 collectors told the same story how they refused the offers directly from the processing facilities for cooperation, even if bargained at better terms). In terms of human resource development, based on our perception during the interviews, most of the female and male collectors do not seem to have a sound understanding of the notion of sustainable use of NTFPs, expressed in proper picking/collecting manner and overall human behavior for forest conservation. Both male and female employees of the cooperatives seem to lack NTFP market information and the latest processing technologies. They are mostly based on the existing demand for NTFPs (processing facilities) and concentrate on such products, whereas better opportunities might exist beyond the box.

With regards to the Processing Facility, they hire local 25 inhabitants in the factory on full-time bases and employ up to 100 inhabitants collecting seasonal NTFPs for them. According to them, 60% of both part-time and full-time employees are females. In this regard, the obstacle faced by the Processing Facility, is related to the deficiency in a number of collectors as human resources in the villages aim to collect NTFPs. According them, as mentioned also earlier, the main reasons could either be a tendency that people, especially youth, migrate from villages to urban areas, or inhabitants being lazy and there is a need for encouragement.

7.1.2 PRIMARY PRODUCTION

7.1.2.1 NTFP sector in Georgia

Healthy food and organic products gain increased worldwide market attention over time, where Non-Timber Forest Products (NTFPs), easily satisfying organic production criteria. They also have the potential to cover the important segment of such a group of products. Moreover, they acquire great importance in terms of economic, environmental, and social benefits, as well as forest resources' sustainability. Besides, NFTPs produced in Georgia, especially organic, seem to have the opportunity to rise competitiveness at national and global markets. Over time, many international donor organizations (USAID, EU, Oxfam, BLF, EBRD, and others) within different agriculture development programs, have paid important attention to the support of NTFP production industry in Georgia. It is noteworthy, that activities and roles in NTFP sector in Georgia, similar to the international experience from developing countries are gendered, varying with product characteristics and segment of the chain.

Organic NTFP producers in Georgia

Based on Caucascert[146], which is the first active local certifying body issuing certificates proving the organic nature of the product, there are 105 entities with active certificates, with only 4 of them being situated in Mtskheta-Mtianeti. From there, only two entities are cultivating non-timber forest products, however, currently, none of them is operating in Tianeti Municipality and Lower Pshavi area.

In fact, nationwide there are only 9 entities cultivating NTFPs. The market of certified organic production is dominated by wineries and beekeeping farms in Georgia.

Members of Elkana, though, can be considered as potentially organic farmers. In Georgia, out of Elkana's 148 members that are involved in production of fruits or berries, only 16 of them are situated in Mtskheta-Mtianeti region, while 6 out of these 16 are operating in Tianeti Municipality. There are no members of Elkana in Lower-Pshavi region.

7.1.2.2 NTFP sector in target regions

Consisting of five main municipalities (Mtskheta, Tianeti, Dusheti, Akhalgori, Stepantsminda), Mtskheta-Mtianeti floristic region is rich in non-timber forest products, including fruits and berries, as well as herbal plants. In total, there exists up to 55 and 92 varieties of forest fruits and herbal plants, respec-

[146] Caucascert - http://caucascert.ge/files/RegGe060420.pdf

tively[147]. Particularly, in Tianeti Municipality and Lower Pshavi region, there are 9 forest fruits and 9 Medical Herbs[148] and 2 mushrooms frequently available. The table below lists these NTFPs with English, Georgian and Botanical names. Besides, the last column marks those products currently collected and processed within the region.

Table 72: Main NTFPs available in targeted regions and the ones collected

#	Main NTFPs available in Tianeti and Ukanapshavi	Botanical Name	Georgian Name	Collected and processed in targeted regions
Forest Fruits				
1	Rosehip	Rosa canina	ასკილი	✓
2	Wild Apple	Malus orientalis	მაჟალო	✓
3	Wild Caucasian pear	Pyrus caucasica	პანტა	
4	Hawthorn	Crataegus kyrtostyla	კუნელი	
5	Wild Blackberry	Rubus caucasicus	მაყვალი	
6	Wild Sea-Buckthorn	Hippophaë rhamnoides	ქაცვი	✓
7	Cherry plum	Prunus divaricata	ტყემალი	✓
8	Blackthorn	Prunus Spinosa	კვრინჩხი (ღოღნაშო)	
9	Wild Cornel	CORNUS MAS	შინდი	
Medical Herbs				
1	Primula Veris	Primula macrocalyx	ფურისულა	✓
2	Yarrows	Achillea millefolium	ფარსმანდუკი	✓
3	St. John's wort	hypericum perforatum	კრაზანა	
4	Alopecurus	Alopecurus ventricosus	მელაკუდა	
5	Dandelion	Tarazacum Officinale Wig	ბაბუაწვერა	
6	Rhododendron caucasicum	Rhododendron caucasicum	დეკა	
7	Oregano	ORIGANUM VULGARE	თავშავა	
8	Nettle	Urtica dioica	ჭინჭარი	
9	Wild Mint	Calamintha grandiflora	მთის პიტნა	
10	Licorice (Liquorice)	Glycyrrhiza glabra	ძირტკბილა	
Mushrooms				
10	Agarics	Agaricus	ქამა სოკო	
11	Pleurotus ostreatus	Pleurotus ostreatus	ხის სოკო	

Source: Field research

As shown on the above table, today 6 main NTFPs (4 fruits, 2 medical plants) are being collected and processed in targeted regions. One of the most important characteristics to be considered by the collectors when planning a collection or processing of particular NTFPs is the crop period throughout the year cycle. Thus, the tables below summarize crop seasonality for each available product in the targeted regions, where collected NTFPs are marked in green.

[147] BLF and Oxfam supported guidebook, prepared by Marina Zhordania, biodiversity expert.

[148] Desk research and conducted interviews.

Table 73: Harvest period of NTFPs

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Rosehip	Rosehip								Rosehip			
Wild Apple									Wild Apple			
Wild Caucasian pear									Wild pear			
Hawthorn								Hawthorn				
Wild Blackberry								Wild Blackberry				
Wild Sea-Buckthorn								Wild Sea-Buckthorn				
Cherry plum							Cherry plum					
Blackthorn									Blackthorn			
Wild Cornel								Wild Cornel				
Medial Herbs												
Primula Veris				Primula Veris								
Yarrow						Yarrow						
St. John's wort					St. John's wort							
Alopecurus			Alopecurus									
Dandelion					Dandelion							
Oregano						Oregano						
Nettle						Nettle						
Wild Mint								Wild Mint				
Agaricus (mushroom)							Agaricus (mushroom)					
Pleurotus ostreatus				Pleurotus ostreatus								

Source: Field and desk research

As shown on the above table, rosehips (Rosa Canina) has the highest crop duration lasting up to 5 months from mid-September to late January. This is followed by Yarrows from early June to September. An entrepreneur or collector deciding on NTFP business, has to analyze the seasonality for each NTFPs. Tianeti Municipality cooperative – "Tianetis Nobati' does the same- - trying to allocate production of NTFPs equally and load their facility throughout the year.

Based on the interviews, we identified up to 200 collectors involved in NTFP collection in targeted regions. Depending on already-known demand and the price, they collect different non-timber forest products and medical herbs, usually involving several members of their families. As both the female and male respondents reported, high-value products are primarily male-collected, while women collect mostly berries. The processing in all cases is done solely by females. The collection process is being carried out with bare hands and rarely with few simple collection equipment and plastic containers. In some cases, collectors conduct hand sorting and home (solar) drying processes, which are done

by females. But mostly, gathered forest products are directly sold to the cooperative or processing facilities the same day they are collected, or within 2-3 days at maximum, getting direct payment in cash on spot. On the other hand, they may sell small amounts of several products directly to the local farm markets (Tianeti or Tbilisi "Deserter" Market), if they find it more profitable. As identified during the interviews, revenues from NTFPs are seasonal and on average they comprise of up to 40-50% of collector's annual family incomes. This is one of the rarest sectors, where, according to the interviews, women have power on income distribution, as at certain domains (berries, etc.) they carry out all the activities such as collecting, transporting, and selling to final clients themselves.

Besides, one main actor has been identified in Tianeti Municipality and Lower Pshavi region. It is Tianetis Nobati, that purchases wild forest products from at least 200 collectors from different villages. The cooperatives are run by their members (13 members of which 8 is women) and led by both male and female directors, however, it was identified that the negotiation part is under male director's responsibility. This collection center has small storage, drying and cooling facilities. Once small quantity of NFTP aggregation is made, the collectors transport the products to the cooperatives and are being paid on spot for full amount collected, with no delays in payment. On the other hand, the cooperatives sell most of their products (98%) to the processing facilities, or to the local market (2%). Such products are either processed (sorted, dried, simply packed), or sold as raw.

The cooperative was founded under the support of international donor organizations (EU ENPARD - Oxfam, later BRIDGE Innovation and Development). This explain the high participation of women in cooperatives' operational activities, as well as in decision making process. Based on our observations, such cooperatives play an important role for stimulating local inhabitants for NTFP collection and if operated properly, they would become significant agents in the development of NTFP sector in the region.

In total, the cooperative 'Tianeti's Nobati' employed up to 200 collectors, including 13 individuals as cooperative members, collecting the following amounts of NTFPs in 2018 and 2019:

Table 74: Total NTFPs collected by 'Tianetis Nobati' in 2018 and 2019

		2018	2019
	Certified Organic	Tianetis Nobati (kg)	Tianetis Nobati (kg)
Rosehip	No	8 000	12 000
Wild apple	No	15 000	15 000
Wild Sea buckthorn	No	4 000	4 000
Cherry plum	No	30 000	40 000
Primula veris	N/A	4 800	6 000
Yarrows	BIO only in 2018	6 000	1 000

Source: Field research

Lastly, with regards to the processing facilities, they can be regarded as main players in the value chain since they set prices and demand on products. In majority of cases, they do not provide pre-payments to collectors or to the cooperatives for intended products, however, they are represented as stable actors for long-term cooperation[149]. Their production includes collecting, sorting, washing, processing, packing and labeling NTFPs. There are 2 main and 1 small processing facilities linked and cooperating with collectors and the cooperative: "GeoFlower", "Kakheti BIO" and "Georgian Natural Product -GNP", from Zhinvali (Dusheti Municipality), Tsnori (Kakheti) and Tbilisi, respectively. None of them is located in our targeted regions. On their end, 'GeoFlower' and 'Kakheti BIO' have as reliable international partners as Martin Bauer (Germany), and Rose office (Germany). While "GNP" is operating only at local market.

[149] During an interview, a representative from one of the Cooperatives marked about the case, that once they had much better price offer for one of the NFTPs from other client, compared to that they had with the Processing Facility. But as they sought stable and long-run cooperation with this latter one, they rejected the higher price offer

Primary production of a value chain includes primary, simple handling of forest products before they are being processed. It is mainly related to cooperatives and the processing facilities, however, in some cases, the collectors also have simple handling processes of fresh NTFPs at home before they bring to the destination. Women and men participate in all aspects of the collection, however, as both the female and male respondents reported, high-value products are primarily male-collected, while women collect mostly berries. The processing in all cases is done solely by females. They may clean, also conduct hand sorting and even some of them dry at home circumstances. Such cases are rare, and mostly, the inhabitants bring the same NTFPs in the same condition, as they have been collected. As in the cases of fruit and vegetable value chains, cleaning and sorting, repetitive activities in NTFPs case are done by women.

For cooperatives, this set of processes is covered: primary storing – normally, received NTFPs are stored at rooms with ambient temperature, but in some cases, they use chiller refrigerators (chiller is available at 'Tianetis Nobati"). Further, the fruits are hand sorted and washed, depending on a kind of NTFPs (for example, wild apples, collected and produced for GeoFlower, are directly sold to them, with no complex hand sorting or washing). Processing facilities can be regarded to have the similar processes for NTFPs within primary production, definitely with larger quantities.

7.1.3 STORAGE

The collectors apply simple storages in their own living houses, warehousing collected NTFPs there only for a day or two, before bringing them to the collection points.

With regards to the cooperatives, limited space for storage is one of the main reasons hindering an increase in the capacity of the cooperatives. According to its members, the existing small warehouse and processing space in the entity result in delays in production. Sometimes they use their refrigerator/chiller to procrastinate the fruits before others in queue are being processed, but the capacities are not sufficient. There occurs a risk of cross-contamination that hampers the production process.

7.1.4 PROCESSING

This is a core processing component of the NTFP value chain where the main production processes take place. Linked only to the cooperative and Processing Facility, the processes vary between the products and the terms of agreement among the actors. For both players, such processes can be chilling, either to lower down the humidity in the fresh fruits, or to keep them unspoiled in the queue before other fruits are processed. The processes also involve chopping (mainly wild apple), *shelling, destoning/Pitting* (stone fruits), *drying* (all products), *boiling* (mainly for Cherry plum). At processing stages, the women are often the ones who are given the most labor-intensive tasks. These tasks require dexterity and patience; therefore, it is paramount that the process is modernized and mechanized to remove the hurdle that is on them.

As mentioned, these processes are linked to the cooperatives and processing facilities, and not related to the collectors currently. The final products received after the main processing of NTFPs are: dried rosehip, dried rosehip seed, dried rosehip shell, rosehip infusion, dried wild apple, dried primula veris, dried yarrows, dried sea-buckthorn and plum-cherry sauce (Tkemali).

7.1.5 PACKAGING

Simple packaging materials are used by collectors (mainly sugar bags) and cooperative (50kg bags and plastic containers) for transporting products to the destination points. Besides, the cooperative of 'Tianetis Nobati' owns small capacity vacuum packing machine. Although not yet actively used, the machine is planned to be applied for preparing dried fruits in small quantity packages, that could be sold at the local market with higher added value.

For processing facilities, the packaging materials and overall packing process is an important part of the production. As the products are mostly in bulk, there is no need for high quality or durable packages. Locally produced packaging materials easily satisfy such standards.

Table 76: Total exports for organic NTFP products from Georgia according to Caucascert; Source: Caucascert

	2013		2014		2015		2016		2017		2018		2019	
Product	**kg**	**Price Euro**	**kg**	**Price Euro**	**kg**	**Price Euro**	**kg**	**Price Euro**	**kg**	**Price Euro**	**kg**	**Price Euro**	**kg**	**Price Euro**
Nettle	8 920	€ 14 72	12 090	€ 22 971			34 455	€ 67 396	33 375	€ 66 415				
Nettle leaves											40 500	€ 82 222	28 270	€ 75 010
Wild apple	40000	€ 68 000	26 000	€ 45 500	39 860	€ 75 335	39 910	€ 73 033	40 000	€ 64 860	51 180	€ 96 208	79 870	€ 149 353
Licorice			46 942	€117486	170 655	€ 450529	292 460	€ 624 199	75 000	€ 195 000	182 500	€ 479 075	335 040	€ 785 661
Wild Blueberry			1 110	€ 20 535	1 000	€ 18 500	1 000	€ 16 728						
Blueberries whole													4 225	€ 87 195
Blackberry leaves			1 860	€ 4 650	8 000	€ 20 000	29 030	€ 69 909	33 481	€ 84 371	65 604	€ 168 815	79 662	€ 208 472
Blackberry whole													1 550	€ 19 344
Wild Sea-buckhorn			1 220	€ 11 590	957	€ 9 092	957	€ 8 160	1 000	€ 7 500			7 615	€ 58 123
Fir tree cones			5 000	€ 50 000										
Fir tree seeds					6613	€ 288 455								
Cones									8 831	€ 78 329				
Cone seeds									6 358	€ 214 078				
Abies Nordmanniana Seeds											5 159	€ 226 137	2 727	€ 117 282
Abies Nordmanniana cones											5 730	€ 57 300		
Lindenflower whole													1 700	€ 13 940
Dandelion whole													6 250	€ 24 875
Wine (bottle)					2 500	€ 12 785			1 200	€ 7 164	2 400	€ 12 522	4 068	€ 39 513
Hazelnut Kernels									14 735	€ 103 369				
Tea											500	€ 6 353	584	€ 12 909
Bilberry Fruit											12 575	€ 7 882		
Herbs											25 589	€ 154 567	2 542	€ 15 240
Laurel													590	€ 1 787
Rose oil													1	€ 12 200
Rosehip seeds									14 102	€ 9 798	39 400	€ 43 047	37 425	€ 24 742
Rosehip shells									3 780	€ 21 352	12 400	€ 40 753	20 100	€ 69 676
Total	**48 920**	**€ 82 272**	**94 222**	**€ 72732**	**229 585**	**€ 874 696**	**397 812**	**€ 859 425**	**233 283**	**€ 860 747**	**450 426**	**€ 1393379**	**612 219**	**€ 1 715 322**

7.1.6 TRANSPORTATION

As mentioned earlier, the collectors' transport collected products to the cooperative with own vehicles (however, in rare cases, if NTFPs are far to be picked, the cooperative helps them with transportation. For instance, when picking herbs). In case of the cooperatives, transportation is made both by themselves and the processing facilities, based on the agreement. On the other hand, processing facilities have their own vehicles for local land transportation. When exporting, they cooperate with several local transport and logistics' companies. They choose the best price options using tender, announced in advance, for a certain export trading.

7.1.7 SALES

7.1.7.1 Price of NTFP in Georgia

Prices of organic products at retail market in Georgia

The statistics of the prices of the NTFP products were gathered at the end of February 2020 in selected supermarkets and groceries shops.[150] Even though nowadays, the organic products do not have a significant amount of buyers in Georgia and the market can be still regarded of being at emerging stage, a few stores are having a particular share of the organic market. Desk research based on the selected organic shops[151] gave an opportunity to obtain the prices on some organic products.

A detailed list of the prices of organic products can be found in Table 72.

Table 75: List of the prices of organic products in supermarkets in Tbilisi

	Retail Store	Unit	Price (GEL per unit)	Imported or Local
Currant	Sunflower Health Food Store	1kg	₾ 12	Local
Currant	Organica.ge	1kg	₾ 73.3	Imported
Frozen currant	Sunflower Health Food Store	1kg	₾ 15	Local
Cranberry tea	Soflidan.ge	1kg	₾ 128.5	Local
Cranberry tea	Sunflower Health Food Store	1kg	₾ 85	Local
Cranberry fruit porridge	Carrefour	1kg	₾ 24.86	Imported
Cranberry fruit porridge	Georgita	1kg	₾ 31.39	Imported
Red berry fruit porridge	Georgita	1kg	₾ 31.04	Imported
Aesculus Juice	Goodwill	1l	₾ 5.1	Local

Source: Desk research

Comparison of organic and non-organic prices in Georgia

The comparison of the above prices for organic products to the prices of their non-organic counterparts based on the prices collected in February 2020 reveals several patterns. Firstly, obviously there was a higher price for organic products observed, but the magnitude of the price difference was significantly different for each product. However, in most cases the prices were at least double for the organic counterpart of the product.

In general, unlike cultivated products, organic certification of NTFPs is easier to achieve and can be attained within a year's time. The core standpoint is providing those particular forest territories which have ecologically clean geographical location, are not contaminated and have not been chemically treated within the last three years.

[150] The National Statistics Office of Georgia does not gather information on non-timber forest products

[151] Selected organic shops include: Sunflower Health Food Store; Biofarm Pona; Georgita; Tserti; Soflidan.ge

7.1.7.2 Sales of NTFP in target regions

Sale channels are different for each value chain actor, indeed. The collectors sell a vast amount (99%) of collected NTFPs to the cooperative and a very small amount at the local market. The cooperative sells most of their products (98%) to the processing facilities, and some to the local market (farm market; attempts to HoReCa sector, e-commerce). With regards to the processing facilities, repeating the above-mentioned, they sell 99% of their products on export. The main clients and export countries are: 'Martin Bauer Holding', export countries: Germany, Spain, Turkey, Poland, Russia. 'Rose Office', export countries: Germany.

7.1.7.3 Exports of organic NTFPs

Table 73 summarizes the total export of certified organic NTFPs for the last seven years. This information was provided by the first operating local certifying agent -Caucascert[152]. Organic products provided in the table below have been exported either to the EU market, or to those which recognize such EU organic standards (for example, it doesn't harmonize with USDA Organic standards, for the US market). Besides, import and international trade data on specific organic NTFP products were unavailable, since the products at customs are cleared with general 4-digit codes that cover much broader group of products. This is one of the issues of NTFPs sector, also mentioned below.

According to the table below, among all certified organic NTFPs, Licorice plant has the highest value of total exports amounting to € 2.7million, with an aggregate exported quantity of 1.1MT, during 6 years, from 2014 to 2019, followed by Wild Apple and Abies Nordmanniana Seeds while the lowest total export has been of Laurel, only € 1,787 for 590 kg. Although this product was exported only in 2019, the amount is also the lowest among other NTFPs per year export values.

Among the main NTFPs that the value chain actors are collecting and processing in our targeted regions (see section 4.2), the table gives export information for three of them: Wild apple, Sea-buckthorn, and Rosehip. However, the latter NTFP has been exported and processed in two forms: shell and seeds (see green colored products in table below).

The value of total exports for Wild apple for 7 years (2013-2019) amounts to € 572 289 for the total quantity of 317MT. In 2019, per year exported quantity doubled compared to 2013, while the price per kg of Wild apples grew at a compound annual growth rate (CAGR) of 1.6%.

The first export of certified organic wild sea-buckthorn has been made in 2014, with the total quantity of 1,2MT of dried product at €9.5/kg. Export price has been declining year by year, amounting to €7.6/kg last year (2019). Overall, for the 7 years (2013-2019), the total export value amounted to € 94 465 for the total exported quantity of 11,749kg. Although exports of wild sea-buckthorn were not made in 2018, the total exported quantity of 7,615kg in 2019 amounted to 65% of the total exports for the 7 years.

With regards to certified organic Rosehip seeds and shell, the export has been launched for the last 3 years, with the total value and quantity of € 77 588 for 91MT of Rosehip seeds; while € 131 781 for 36MT of Rosehip shells. In 2019, compared to 2017, per year exported quantity of Rosehip shell grew by 165%, while 4 times more Rosehip seeds (20MT) were exported in 2019, compared to 2017.

In total, the top 5 export countries of certified organic NTFPs from Georgia are as follows: Germany – with the total exports amounting to €4,060,429 during the 2013-2019 period; followed by Denmark (€1,051,581); Turkey (€ 754,941); Czech Republic (€ 48 502); and Switzerland (€ 35,228). It is worth noting that the first export in Turkey, being today the 3rd largest importing countries of organic NTFPs from Georgia, appeared only in 2019.

[152] Accredited by German DAKKS - Germany. Accreditation is according to the Green Caucasus standards equivalent to Regulation (EC) No. 834/2007

7.2 EXTERNAL STAKEHOLDER ANALYSIS

7.2.1 STATE AUTHORITIES

In assistance of rural development, two government entities stand out: "Rural and Agricultural Development Agency" and "Regional Information Consultation Centers", both under the Ministry of Environment and Agriculture of Georgia. Besides, the National Forest Agency stands as the main state authority ensuring sustainable use of forest products and biodiversity of Georgian forest funds.

Regional Information Consultation Centers

Regional Information Consultation Centersoperate under the Ministry of Environment and Agriculture of Georgia, within the ministry's department of their respective municipality. The centers provide information and advice to the farmers and cooperatives on various issues related to agriculture; monitor implementation of various projects in the respective municipality; act as main actors in regional agricultural data collection and represent more general interests of the Ministry of Environment and Agriculture of Georgia. The following areas of the centers' responsibilities are relevant for the NTFP in interest within the scope of the report:[153]

- Promoting bio-production
- Promoting the dissemination of international experience in the production and sale of agricultural products and food
- Promoting the development of agricultural cooperatives within the scope of its competence,
- Making recommendations to the interested parties on the storage conditions and terms of the harvest
- Providing information to interested parties on the availability of mechanization in municipalities, as well as their rational use

Agricultural and Rural Development Agency (ARDA)

ARDA is an agency which operates under the Ministry of Environment and Agriculture of Georgia. Main objective of the agency is to promote the development of agriculture in Georgia. Its key functions include planning and management of projects initiated by the Ministry of Environment and Agriculture as well as management of subordinate agricultural companies.

The collection of non-timber forest products is eligible for less ARDA programs, compared to other agricultural products, as it does not include primary production of the product itself. The detailed list[154] of those projects that assist NTFP value chain is displayed in table 77. In addition to those listed in the table, young entrepreneurs can seek assistance from ARDA within the program "Supporting Young Entrepreneurs in Rural Area - "Young Entrepreneur".[155]

Table 77: Government programs supporting the actors of fruit value chain

[153] Core competencies of Regional Information Consultation Centers: https://mepa.gov.ge/Ge/Page/RegionalInformationConsultationCenters

[154] The detailed description of each project is provided in Annex 12

[155] "Supporting young entrepreneurs in rural area - "Young Entrepreneur" - http://danida.arda.gov.ge/guest/about

	Program of Agro-production Promotion: Processing and preserving	Co-financing of Agro processing and storage enterprises	Preferential Agrocredit Project: Fixed Assets	Preferential Agrocredit Project: Agro-leasing	Preferential Agrocredit Project: Produce in Georgia
Input Supply – Nursery					
Input Supply - Fertilizers and pesticides					
Input Supply - Machinery & Equipment					
Primary Production					
Storage					
Processing					
Transportation (Distribution)					
Sales (Retailers)					
Export					

Source: ARDA

Beneficiaries of the projects of ARDA

According to the data of implemented projects by ARDA, over the period of 2013-2019, a total of 17 beneficiaries in Tianeti Municipality got the support, however, the program was "Preferential Agrocredit Project" for each of the 17 beneficiaries. The number of beneficiaries is a negligible number compared to the total amount financed in Georgia under this project (9303). Out of these 17 beneficiaries, one cooperative used the loan to develop a wild fruit processing facility.[156]

National Forest Agency

The core mission of the National Forest Agency is to take care of Georgian forest funds, ensuring sustainable use of it, biodiversity, as well as its restoration. The agency regulates the use of timber and non-timber forest products. It also stands as a main authority issuing certificate, whether a specific forest funds have been treated with chemicals, for instance against some diseases, or not. The latter certificate of proof is a principal account for Non-timber forest product (NTFP) organic certification.

[156] It was not possible to identify beneficiaries in Lower Pshavi region explicitly using the statistics provided by ARDA. In Dusheti municipality, 1 enterprise, which is "LTD Iberia Fruits", was co-financed in 2015 within the project "Co-financing of Agro processing and storage enterprises" and in 2019 within the project "Program of Agro-production Promotion: Processing and preserving". The company operates processing and storage plant of berries Within "Preferential Agrocredit Project", 37 beneficiaries received preferred loan in Dusheti municipality over the period of 2013-2019, out of which 5 was concerned with developing a fruit garden, two was concerned with processing fruits, two was concerned with developing a vegetable garden and three was concerned with developing beekeeping

7.2.2 DONOR ORGANIZATIONS

Millennium Challenge Account and USAID REAP were international donor organizations that supported programs providing significant support to Agriculture Sector players in Georgia. These are the programs that one of our main actors – GeoFlower processing facility - applied for and received grant and preferential loans for setting up the business. GeoFlower's East-North branch factory is now located in Zhinvali (Dusheti Municipality), which is a very convenient location for Tianeti Municipality and Lower Pshavi NTFP collectors and cooperatives.

Later in 2016, the processing facilities also applied for so-called EBRD 'cashback" program, through which local small and medium size businesses were subsidized in interest rates of their business loans from local commercial institutions.

It is important to emphasize a 3-year "Collecting and Processing Non-timber Forest Products - Opportunity to Gain Markets for Women's Groups"[157] project that was implemented in Mtskheta-Mtianeti region during 2014-2017. The project was implemented in cooperation with RCDA (Rural Communities Development Agency), "OXFAM Georgia", "Bridge Innovation and British charity "Big Lottery Fund". The project specifically focused on creating female cooperatives, who collected and dried non-timber forest products. The program helped the farmers to unite resources and export NTFP to big international markets[158].

Projects such as the USAID "ZRDA activity in Georgia" and ENPARD (European Neighborhood Program for Agriculture and Rural Development) do not currently support Mtskheta-Mtianeti region. Another big project "The USAID Agriculture program" includes Mtskheta-Mtianeti region because of its coverage of the whole Georgia, however, it does not include NTFP in its target products.

There is an ongoing USAID Agriculture Program, implemented by CNFA in Georgia, that is now active. Its goal is to accelerate the growth of agricultural sub-sectors demonstrating the potential for creating jobs and increasing revenues for MSME actors. Notably, the program, among others, selected these sub-sectors: berries, culinary herbs, stone fruits, pome fruits etc. The program provides competitive matching grants, technical assistance, and capacity building, resulting in strengthened value chain linkages and increased access to markets for MSMEs. Besides, Organic certification, together with general food safety, is among the core directions of the program.

Recently the World Bank has launched agriculture and agribusiness program, supporting the Government of Georgia in the assessment of private sector participation in Georgian agribusiness, from farm to fork. Besides, they are aiming to help private companies manage current pandemic crisis and recover the productive capacity of jobs afterwards.

In particular, Tianeti Municipality and Lower Pshavi communities currently are not supported by specific programs of international donor organizations. ELKANA project "Organic Agriculture and Rural Tourism Development in Mtskheta-Mtianeti region" with the financial support of "Austrian Development Cooperation" is one of the few projects targeting the region at present.

7.2.3 FINANCIAL INSTITUTIONS

Based on the interviews, equally half of the collectors had problems repaying loans to commercial banks. The reason was the same for all: not affording monthly payments. One respondent could not make such payment for years, and a small loan of GEL 200 has increased to GEL 800. Then, finally, it was cut-off during the presidential elections by the end of 2018.

The amounts of loans were within the range 800-2000Gel and the purpose of such loans for most of the respondents was to use them for home appliances. Only one respondent had health issues and took the loan. None of them ever used insurance services.

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[157] Source: ENPARD, http://enpard.ge/en/oxfam/

[158] The detailed description of each project is provided in Annex 13

With respect to the cooperative, 'Tianetis Nobati' had relation with commercial banks. Initially, the cooperative applied for APMA's preferential loan program and built the facility. In 2019, they applied for program supported by ARDA – co-financing of agro processing and storage enterprises. Using this loan, they will expand the production territory of the cooperative. They have never had problem of repaying the loans. However, the main problem they stressed is access to working capital loans - high interest rates, hardly achievable –is the primary reason of hindered capacity of the cooperative. Working capital and cash are critically important when cooperating with collectors since they work the whole day to be paid today, not tomorrow or day after. Therefore, the core problem they asked us to mark, is access to working capital loans. This cooperative never used insurance services.

The processing facility used APMA's preferential loan. They also applied for so-called EBRD 'cashback" program earlier, where local small and medium- size businesses were subsidized in interest rates of their business loans from local commercial institutions. The difficulties of repaying the loan has never occurred.

7.2.4 SECTORAL ASSOCIATIONS

As mentioned in fruits' and vegetable's sections above, we can consider sectoral associations existing currently in Georgia below:

- Biological Farming Association Elkana
- Georgian Association of Organic Producers
- Association of Supporting Greenhousing
- Georgian Farmers Association

"Tianetis Nobati' cooperative is a member of 'Georgian Farmers Association' also hoping for getting membership of Elkana association after COVID-19 pandemic.

7.2.5 CERTIFICATION AGENCIES

As mentioned earlier, Caucascert is the first local certifying body issuing organic certificates in compliant with the EU standards. The processing facility - GeoFlower and its operation has been certified organic by Caucascert. Calculation of inspection and certification costs depend on multiple factors, that can be found in Annex 8: pricing policy of Caucascert.

Besides, for the recent period, few more organic certification bodies have been operating at local market: Ecocert[159], originating from France, however conducting inspections in over 80 countries, including Georgia; Eurocert[160] based in Georgia and is accredited for certification also in food safety and quality standards; and Ecoglobe[161], located in Armenia since 2002 certifying organic production in the region.

Caucascert is being accredited only with the EU standards[162], which means that the products certified by Caucascert can be recognized as 'organic' only by the EU market. Unlike the rest certifying bodies, that provide accreditation for the EU, USA and Japanese Organic markets.[163]

It is worth noting that most of the interviewed female and male collectors did not know anything about bio certified products and their benefits. However, the cooperative members stated that certificating cooperative with food safety, management standards, as well as bio certification, are important inputs for proper functioning of production and guarantee for long-term cooperation with the processing facilities, as well as directly exporting to international markets.

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159 https://www.ecocert.com/

160 https://www.eurocert.ge

161 https://ecoglobe.com/

162 Caucascert has recently applied for USAID program in order to receive accreditation for NOP Organic certification

163 There has been a practice of joint cooperation between Caucascert and Ecoglobe, certifying Georgian product with NOP organic standards (USDA Organic certification). Caucascert not yet having NOP Organic certification played only as an inspection agent

7.3 PROFITABILITY AND OPPORTUNITY ANALYSIS

This section, initially, analyses profitability of existing business model between the value chain actors. In particular, it studies costs and revenues of collectors and the cooperative that allow to determine the most and the least profitable products and deals. On the other hand, the second half of the section, gives opportunity analysis as a process of discovering possible revenue enhancements and/or expense reduction options, that in turn can lead to new market opportunities, increased efficiency, and profitability.

7.3.1 PROFITABILITY ANALYSIS OF NTFP SECTOR IN TARGETED AREA

Revenues

Firstly, we determine existing revenues earned by the collectors and the cooperatives from different NTFPs. I.e. practice today - how the pie is split between stakeholders. Based on the interviews, collected/processed quantities and prices for particular NTFPs have been identified for the years of 2018 and 2019. The table below illustrates how much quantities of each NTFT and at what prices they have been traded between the collectors and the cooperative - 'Tianetis Nobati'. Recall, this cooperative consists of 13 members (most of them appearing to be collectors as well) and employing the total up to 200 local inhabitants (collectors) from different villages of the targeted area.

Data Below is based on what "Tianeti Nobati' has received from collectors and paid to them directly in cash at spot.

Table 78: Income of NTFP Collectors received from 'Tianetis Nobati'

		2018			2019		
	Certified Organic	Qnt Collected (kg)	Price/kg	Income (Collectors)	Qnt Collected (kg)	Price/kg	Income (Collectors)
Rosehip	No	8 000	0,80 ₾	6 400 ₾	12 000	1,00 ₾	12 000 ₾
Wild Apple	No	15 000	0,18 ₾	2 700 ₾	15 000	0,22 ₾	3 300 ₾
Wil Sea-Buckthorn	No	4 000	0,80 ₾	3 200 ₾	4 000	0,80 ₾	3 200 ₾
Cherry plum	No	30 000	0,50 ₾	15 000 ₾	40 000	1,00 ₾	40 000 ₾
Primula Veris	N/A	4 800	4,00 ₾	19 200 ₾	6 000	4,00 ₾	24 000 ₾
Yarrows	Only in 2018	6 000	0,60 ₾	3 600 ₾	1 000	0,60 ₾	600 ₾
TOTAL				**50 100 ₾**			**83 100 ₾**

Source: Field research

It is worth to note, that the above figures may not cover the total incomes earned by collectors from collecting NTFPs, as they also earn additional revenues from other sales channels (local market, directly to consumer etc.). However, according to the interviews, such incomes are minor.

In the table below, we collected data on Tianetis Nobati's revenues generated by sales of NTFPs goods that they purchased from the collectors (above table) and sold them to their clients. Such goods are sold either non-processed, or after being processed. Given date on processed/non-processed column means that such revenues have been received by selling particular NTFP, either processed or non-processed.

Table 79: Revenue of "Tianetis Nobati' cooperative from processed/non-processed NTFPs

		2018			2019		
	Certified Organic	Pro-cessed	Non-pro-cessed	Total Reve-nue (Coop-erative)	Pro-cessed	Non-pro-cessed	Total Reve-nue (Coop-erative)
Rosehip	No	-	8 000 ₾	8 000 ₾	3 000 ₾	12 000 ₾	15 000 ₾
Wild Apple	No	-	3 300 ₾	3 300 ₾	-	3 750 ₾	3 750 ₾
Wild Sea-Buckthorn	No	-	4 000 ₾	4 000 ₾	-	4 000 ₾	4 000 ₾
Cherry plum	No	18 000 ₾	-	18 000 ₾	48 000 ₾	-	48 000 ₾
Primula Veris	N/A	22 000 ₾	-	22 000 ₾	29 500 ₾	-	29 500 ₾
Yarrows	Only in 2018	9 000 ₾	-	9 000 ₾	1 000 ₾	-	1 000 ₾
TOTAL				**64 300 ₾**			**101 250 ₾**

Source: Field research

It is worth mentioning that, mostly, demand for specific NTFPs comes from big processing facilities. Such interrelation is described in section 5 above.

Profitability of each NTFPs

Rosehip

The table below gives average price, total revenue, total cost and profit information of the collector having an existing trade-off between selling 100kg of collected NTFP through different sales channels. Given the total costs, they are mainly transportation costs bringing the products to different places, via car or local transport.

Table 80: Collectors' profit calculation for 100kg of Rosehip

Rosehip Profitability (Collectors)	Collector Selling raw rosehip to the Cooperative (transportation: car)	Collector Selling raw rosehip to the Processing Facility (transpor-tation: car)	Collector selling raw rosehip at local market in Tianeti (trans-portation: Local transport)	Collector selling raw rosehip at local market in Tbilisi (trans-portation: Local transport)
Quantity (Kg)	100	100	100	100
Average Price (GEL)[164]	1,0 ₾	1,2 ₾	3,0 ₾	4,0 ₾
Total cost (GEL)	10 ₾	15 ₾	20 ₾	56 ₾
Revenues (GEL)	100 ₾	120 ₾	300 ₾	400 ₾
Profit (GEL)	90 ₾	105 ₾	280 ₾	344 ₾
Prime Cost (GEL/kg)	0,1 ₾	0,2 ₾	0,2 ₾	0,6 ₾
Profit Margin (GEL/kg)	0,9 ₾	1,1 ₾	2,8 ₾	3,4 ₾
Profit Margin (%)	90%	88%	93%	86%

Source: Field research

[164] These are average prices for the year 2019

For instance, given that average price for local transport round ticket from Tianeti Municipality to Tbilisi amounts to 10₾, also assuming that a collector would need 5 visits, on average, for selling 100kg of raw rosehips at Tbilisi local market, a total cost would amount to 50₾ plus 6₾ - which is an average mobility cost of a collector from home to forest, back and forth, picking rosehips. Such total cost assembling is given in the last column of the table above.

Although the most profitable option for a collector occurs to be selling rosehips at Tbilisi local market, it is much more time consuming, as well as quantity limited sale channel option. It will be difficult for a single collector to sell more than 100kg of rosehips in the local market. In contrast, they can sell as much quantity directly to the cooperative as they can collect.

With regards to cooperatives, the table below gives the total revenue, direct cost, and profit calculation for rosehips. As in 2019, 'Tianetis Nobati' sold rosehips both in raw and dried conditions to two different processing facilities (as given in the revenues section above). We give profit calculation in two scenarios: they sold the full amount of collected rosehips to processing facility 1; or they dried the full amount of collected rosehips (yield 50%) and sold to processing facility 2:

Table 81: Cooperative's profit calculation for rosehip

Rosehip Profitability (Cooperative)	Cooperative selling raw rosehip to the Processing Facility 1 (No transportation cost)	Cooperator selling dried rosehip to the Processing Facility 2 (transportation with car)
Quantity (Kg)	12 000[165]	6000
Average Price (GEL)	1,2 ₾	3,0 ₾
Total cost (GEL)[166]	12 000 ₾	15 120 ₾
Revenues (GEL)	14 400 ₾	18 000 ₾
Gross Profit (GEL)	2 400 ₾	2 880 ₾
Prime Cost (GEL/kg)	1,0 ₾	2,5 ₾
Profit Margin (GEL/kg)	0,2 ₾	0,5 ₾
Profit Margin (%)	17%	16%

Source: Field research

Total direct cost, or Cost of Goods Sold (COGS), when selling dried rosehips to processing facility 2 covers: money paid to collectors (12,000 x 1₾); the cost of drying and sorting 12MT of rosehips (12,000x 0.25₾); plus, transportation cost of bringing 6MT of dried rosehips from Tianeti to Tbilisi (120₾). In total, it amounts to 15,120 GEL as shown in the second column of the table above.

[165] Total quantity of raw rosehips collected by 'Tianetis Nobati' in 2019

[166] Excludes fixed and other indirect costs

Wild Apple

The table below illustrates collectors' profitability per 250kg of wild apples with sales through two different channels. It is worth noting that there is no practice of selling this product at the local market.

Table 82: Collectors' profit calculation for 250kg wild apples.

Wild Apple Profitability (Collectors)	Collector selling wild apple to the cooperative (transportation: car)	Collector selling wild apple to the processing facility (transportation: car)
Quantity (Kg)	250,0	250,0
Average Price (GEL)	0,22 ₾	0,25 ₾
Total cost (GEL)	15,00 ₾	20,00 ₾
Revenues (GEL)	55,00 ₾	62,50 ₾
Profit (GEL)	40,00 ₾	42,50 ₾
Prime Cost (GEL/kg)	0,06 ₾	0,08 ₾
Profit Margin (GEL/kg)	0,16 ₾	0,17 ₾
Profit Margin (%)	73%	68%

In 2019, 'Tianetis Nobati' sold a total amount of 15 tons of raw wild apple to the fruit processing facility. Profitability details are shown below:

Table 83: Cooperative profit calculation for wild apples.

Wild Apple Profitability (Cooperative)	Cooperative selling unsorted wild apple to processing facility (No transportation cost)
Quantity (Kg)	15000
Average Price (GEL)	0,25 ₾
Total cost (GEL)	3 300,00 ₾
Revenues (GEL)	3 750,00 ₾
Profit (GEL)	450,00 ₾
Prime Cost (GEL/kg)	0,22 ₾
Profit Margin (GEL/kg)	0,03 ₾
Profit Margin (%)	12%

Source: Field research

Sea-Buckthorn

Alike rosehips, the table below gives collector's profitability analysis per 100kg of collected sea-buckthorn, having a trade-off between different sales channels: cooperative, processing facility, local markets: Tianeti and Tbilisi:

Table 84: Collectors' profit calculation for 100 kg of sea-buckthorn

Sea-buckthorn Profitability (Collectors)	Collector selling unsorted sea-buckthorn to the cooperative (transportation: car)	Collector selling unsorted sea-buckthorn to the processing facility (transportation: car)	Collector selling sorted sea-buckthorn at local market in Tianeti (transportation: Local transport)	Collector selling sorted sea-buckthorn at local market in Tbilisi (transportation: Local transport)
Quantity (Kg)	100	100	50	50
Average Price (GEL)	0,8 ₾	1,0 ₾	2,5 ₾	3,0 ₾
Total cost (GEL)	10 ₾	15 ₾	15 ₾	35 ₾
Revenues (GEL)	80 ₾	100 ₾	125 ₾	150 ₾
Profit (GEL)	70 ₾	85 ₾	110 ₾	115 ₾
Prime Cost (GEL/kg)	0,1 ₾	0,2 ₾	0,3 ₾	0,7 ₾
Profit Margin (GEL/kg)	0,7 ₾	0,9 ₾	2,2 ₾	2,3 ₾
Profit Margin (%)	88%	85%	88%	77%

Source: Field research

The cooperative sold 4,000kg of unsorted sea-buckthorn to the processing facility. The cooperation terms and profitability as of 2019 are shown below:

Table 85: Cooperative's profit calculation for sea-buckthorn.

Sea buckthorn Profitability (Cooperative)	Cooperative selling unsorted sea-buckthorn to processing facility (No transportation cost)
Quantity (Kg)	4000
Average Price (GEL)	1,0 ₾
Total cost (GEL)	3 200,0 ₾
Revenues (GEL)	4 000,0 ₾
Profit (GEL)	800,0 ₾
Prime Cost (GEL/kg)	0,8 ₾
Profit Margin (GEL/kg)	0,2 ₾
Profit Margin (%)	20%

Source: Field research

Cherry-Plum (Tkemali)

Collectors profitability per 100kg of cherry-plum with sales through different channels:

Table 86: Collectors' profit calculation for 100 kg of Cherry-Plum.

Cherry-Plum Profitability (Collectors)	Collector Selling Tkemali to the cooperative (transportation: car)	Collector Selling Tkemali to the processing facility (transportation: car)	Collector selling Tkemali at local market in Tianeti (transportation: Local transport)	Collector selling fruit at local market in Tbilisi (transportation: Local transport)
Quantity (Kg)	100	100	100	100
Average Price (GEL)	1,00 ₾	1,20 ₾	2,80 ₾	3,50 ₾
Total cost (GEL)	10,00 ₾	35,00 ₾	20,00 ₾	50,00 ₾
Revenues (GEL)	100,00 ₾	120,00 ₾	280,00 ₾	350,00 ₾
Profit (GEL)	90,00 ₾	85,00 ₾	260,00 ₾	300,00 ₾
Prime Cost (GEL/kg)	0,10 ₾	0,35 ₾	0,20 ₾	0,50 ₾
Profit Margin (GEL/kg)	0,90 ₾	0,85 ₾	2,60 ₾	3,00 ₾
Profit Margin (%)	90%	71%	93%	86%

Source: Field research

Totally, 'Tianetis Nobati' collected 40 tons of raw cherry-plum in 2019, processed them and received 33,600 liters (yield 84%) of cherry-plum sauce base (used to prepare Tkemali sauce). There have been 3 different sales channels for selling cherry-plum sauce as given below:

Table 87: Cooperative's profit calculation for Cherry-Plum.

Cherry-Plum Profitability (Cooperative)	Cooperative selling processed Tkemali to processing facility (With transportation)	Cooperative selling processed Tkemali to Tianeti market (With transportation)	Cooperative selling processed Tkemali to Tbilisi market (With transportation)
Quantity (Kg)	33600	33600	33600
Average Price (GEL)	2,60 ₾	2,80 ₾	3,50 ₾
Total cost (GEL)	56 538 ₾	56 067 ₾	56 538 ₾
Revenues (GEL)	87 360 ₾	94 080 ₾	117 600 ₾
Profit (GEL)	30 822 ₾	38 013 ₾	61 062 ₾
Prime Cost (GEL/kg)	1,68 ₾	1,67 ₾	1,68 ₾
Profit Margin (GEL/kg)	0,92 ₾	1,13 ₾	1,82 ₾
Profit Margin (%)	35%	40%	52%

Source: Field research

Medical Herbs: Primula Veris and Yarrow

We united the two medical herbs in one table below and it gives profitability analysis per 100kg of each. There are only two sales channels for collectors to sell primula veris and yarrows: cooperative and processing facility. There is no local market for these medical products.

Table 88: Collectors' profitability calculation for 100 kg of medical herbs

Profitability – Medical Herbs (Collector)	Collector selling to the cooperative (transportation: car)		Collector selling to the processing facility (transportation: car)	
Product	**Primula Veris**	**Yarrow**	**Primula Veris**	**Yarrow**
Quantity (Kg)	100,0	100,0	100,0	100,0
Average Price (GEL)	4,00 ₾	0,6 ₾	4,92 ₾	0,9 ₾
Total cost (GEL)	30,00 ₾	30,00 ₾	45,00 ₾	45,00 ₾
Revenues (GEL)	400,00 ₾	60,0 ₾	492,00 ₾	90,0 ₾
Profit (GEL)	370,00 ₾	30,0 ₾	447,00 ₾	45,0 ₾
Prime Cost (GEL/kg)	0,30 ₾	0,3 ₾	0,45 ₾	0,5 ₾
Profit Margin (GEL/kg)	3,70 ₾	0,3 ₾	4,47 ₾	0,5 ₾
Profit Margin (%)	93%	50%	91%	50%

Source: Field research

'Tianetis Nobati' received medical herbs from collectors, sorted, dried, and sold to processing facility (Kakheti bio, Roseoffice).

Table 89: Cooperative's profit calculation for medical herbs.

Profitability – Medical Herbs (Cooperative)	Cooperative selling dried medical herbs to processing facility (transportation with car)	
	Primula Veris	**Yarrow**
Quantity (Kg)	1000,0	250,0
Average Price (GEL)	29,50	4,0 ₾
Total cost (GEL)	27100,0	850,0 ₾
Revenues (GEL)	29500,0	1 000,0 ₾
Profit (GEL)	2400,0	150,0 ₾
Prime Cost (GEL/kg)	27,10	3,4 ₾
Profit Margin (GEL/kg)	2,40	0,6 ₾
Profit Margin (%)	8%	15%

Source: Field research

It is worth mentioning that in case of yarrows, in 2019 'Tianetis Nobati' could not manage to certify this product organic. This was the reason for so low demand, price (4,0₾/kg) and reduced sales, unlike 2018, when yarrows have been certified organic and the average price was 50% higher (6₾/kg) and total quantity sold was 6 tons, dried.

7.3.2 OPPORTUNITY ANALYSIS

As mentioned earlier, under opportunity analysis, we attempt to identify alternative ways to enhance revenues, with increased efficiency and profitability of NTFPs for the main actors of the value chain. In response, this could give rise to new export, as well as local niche market opportunities.

The principle is to analyze profitability of each possible final product derived from 1,000 kg of particular NTFP, split into different projects, considering additional variable costs and required fixed investments.

Rosehip

With the longest crop period and required simple storage conditions, rosehip appears to be the most 'durable' NTFP in the targeted region. Furthermore, rosehip pulp can be split in rosehip shell, seed, seed oil, and feather products, providing different market opportunities segmented mostly into cosmetics, food and beverages, and pharmaceutical industry.

The table below lists possible products that the cooperative, one of the main actors of value chain, can derive from 1000kg of raw rosehips, given as projects 1-5. Project 1 is simple: directly selling collected 1MT of rosehip to the processing facility, with a total gross profit of €59[167] (see also above of rosehip profitability table for cooperatives). Project 2 is drying and getting 500kg out of 1MT raw (yield 50%) and selling to the processing facility. Project 3: 'Tianetis Nobati' certifies wild collection and production with BIO certificate[168] and selling dried rosehips at 3.75₾, which is 25% higher price[169] than that of conventional. In Project 4, the cooperative purchases destoner machine, with a fixed investment of € 4,650 [170] (capacity 500kg/h), separates shells and seeds (yield 46% and 51%, respectively) from Bio rosehips and sells them both at €3.53/kg and €0.67/kg at the export market, respectively[171]. Finally, project 5 is similar to project 4, except for selling seeds, the cooperator purchases oil press machine for €14 900,00[172] and presses seeds (yield 5% of seeds), gets 10.2 kg of oil from 1MT of raw rosehip, and sells cosmetic product - organic rosehip oil at €32[173] per kg. As depicted in the table below, shifts in variable costs are minor for projects 4 and 5.

[167] Exchange rate: 1 EUR = 3.4 GEL

[168] Certification fee has been calculated for 12,000kg of raw rosehip and according to Caucascert certification price policy (Annex 14)

[169] Such shift in price from conventional to Bio has been identified from interviews with respondent rom Processing facility.

[170] Quotation of one of European de-stoning machines, produced in Austria (www.voran.at)

[171] Source: Caucascert export price information.

[172] Price from one of German oil pressing companies, capable of pressing seeds of rosehip (www.oelpresse.de)

[173] Price information from international exhibition Biofach 2019 in Nuremberg

Table 90: Total gross profit from sales of possible products derived from 1 MT of raw rosehips (2019 data)

	Project 1	Project 2	Project 3	Project 4		Project 5	
				BIO rosehip separated		BIO rosehip separated	
Rosehip Type	Raw	Dried	Dried, Certified BIO	Shell (BIO)	Seed (BIO)	Shell (BIO)	Seed Oil (BIO)
Additional Fixed Investment	0	0	0	4 650,00 €		14 900,00 €	
Shift in variable cost per kg	0	€ 0,15	€ 0,12	0,0004 €		0,0004 €	0,09 €
QTY after 1MT of rosehips processed (kg)	1000	500	500	230	255	230	10,2
Gross Profit (Local Market)	€ 58,84	€ 70,59	€ 115,84				
Gross Profit (Export Market)				€ 426,75	€ 130,35	€ 426,75	€ 282,69
Total Gross Profit	€ 58,84	€ 70,59	€ 115,84	€ 557,10		€ 709.44	

Source: Field research

Based on the above calculations, the best option for rosehip producer, today, would have been project 5, followed by project 4 - meaning that: fresh rosehips are dried, then destoned (seeds and shells separated) and two different products are sold at export market (mostly in Germany). Once again, given that shifting from project 3 to project 4, and from project 4 to 5, requires additional fixed investments.

If we link the above logic to the existing VC actors, the cooperatives are working on project 1 and 2, whereas the processing facilities operate in project 4. Up today, there does not exist any entity working on project 5, i.e. organic rosehip seed oil is not produced and exported from Georgia, as far as we have identified. On the other hand, this product is very trendy and demanding mostly at the EU market.

In respect to collectors, considering that selling dried rosehips yield higher value at the local market than fresh, one would think of installing home solar drying equipment for collectors with no operating costs. With regards to the cooperators, they are recommended to search for sales channels, or negotiate with existing ones to move from existing projects forwards.

Wild Apple

With regards to wild apple, it has been analyzed in the same way as rosehip. The process is the same: the collectors collect wild apples to cooperative, and the cooperative sells most of the quantity directly to the processing facility. Possible products that can be produced from wild apples, are dry wild apples and wild apple chips. The table below calculates wild apple's implied products and its values at local and export markets. Again, sample quantity takes is 1 Metric Ton (MT).

Table 91: Possible products and its values at end markets from 1 MT of wild apples

	Project 1	Project 2	Project 3	Projects 4
Wild Apple Type	Raw	Dried	Chips	Dried fruit for export (BIO)
Additional Fixed Investment	0	€ 2 206	€ 1640	
Shift in variable cost per kg	0	€ 0,53	€ 0,10	€ 0,23
QTY after 1MT of wild apples processed (kg)	1000	150	85	150
Value (Local Market, GEL)	$ 74	$ 153	$ 248	
Value (Export Market)				€ 165
Total Gross Profit	€ 74	€ 153	€ 248	€ 165

Source: Field research

The above calculations are based on the interviews (yield rate, price for raw fruit etc.), Caucascert organic NTFPs as well as desk research (local market prices for dried fruits and chips). According to the table, project 3 – making chips out of wild apple fruit and selling at local market, yields the highest profits. Surprisingly, project 4, which is an export of organic dried wild apples, is less profitable per 1MT of wild apple. But, on the other hand, it should be considered that such projects are run by big processing facilities and working on large quantities with economies of scale.

Based on the comprehensive interviews, project 2 and 3 -this is what "Tianetis Nobati" is planning in a near future – to sell dried fruit and chips, rather than raw (as they do now – project 1). However, the biggest obstacle they are facing now is a capacity of drying machine. According to the cooperative head, the existing drying machine can only dry 180kg raw fruit in 24 hours, yielding 25-27 kg of dried fruit and 15kg of chips - that is so low capacity that there is no sense of selling dry fruits for now. Therefore, we put one-time fixed investment of additional drying oven in project 2. Besides, as their drying machine works only on electricity, they have high operational costs per kg of wild apples. Thus, this cooperative is in need of more energy efficient drying machines that would enable them to produce higher value-added products, as depicted in above table. The respondent also mentioned that wild apple chips (project 3 above) are delicious and can find its customers at local market. However, for producing such products, there is a need of electric fruit chopper. Thus, we put additional fixed investment in project 3 for purchasing apple chopper. In general, apple chips are at the emerging stage at global market, but rather trendy in some countries (for example the USA). However, hardly any NTFP apple chips exist. Therefore, if branded as 'Wild Apple Chips", it could find its customers at international niche market as well.

Recently, they have applied for the USAID grant to purchase additional drying equipment. Supporting the cooperative with more efficient drying facilities is crucially important and should be considered.

With regards to the production of organic vs conventional wild apple, the conclusion can be derived from the fact that organic apple is priced at 25-30% higher than conventional. Besides, there is a demand for bio wild apple locally - the same processing facility would be willing to collect organic as well. Therefore, the cooperatives should financially evaluate the quantity collected versus the cost for certification. Supporting them in covering certification fee would enable them to implement organic collection and production practice with rational assumption of sustainability.

Besides, it is worth noting about one important niche market product worldwide - natural pectin (both organic and conventional) is made during processing of fruits and vegetable, from its pomace, mainly: apple, pear, quince, plum, carrot, citrus. Used as a natural thickening and gelling agent, it is most commonly used for producing jams, jellies, bakery. Pectin could have been a good option for wild apples, but further studies are required.

Sea buckthorn

This NTFPs are mostly collected 'roughly', with small branches and leaves[174], then sold to the cooperative, and the cooperative sells them directly to the processing facility. As mentioned in section 4, in 2019, the price for such unsorted sea buckthorn for collectors was 0.8Gel/kg, and for the cooperatives-1Gel/kg. However, based on the interviews, if sorted, the weight becomes half and the market price for hand -sorted sea buckthorn becomes 2.5-3gel/kg. This means that hand-sorted sea buckthorn will raise income for collectors as well as for the cooperative per kg. Though, hand-sorting is very complicated and should be done accurately. However, there exists simple hand equipment, with the price of around € 150 which will triple capacity of sorting. The same equipment could be used while picking the fruits in the forest. Such instrument will be useful and convenient for the cooperatives as well.

There also exists an interesting cosmetic industry market for sea buckthorn seed oil, but further studies are required to be conducted. Recently, an increased demand for organic wild sea buckthorn on export markets (NTFP export table 73), gives rise to higher value-added organic product at the local level. Besides, last year, one of the cooperatives made a trial production of 60 liters of jam/thick juice of sea buckthorn. They pressed the product and filled in 1-liter glass bottle, adding sugar for the taste as well as using it as a preservative agent (they neither boiled nor pasteurized the jam, but filled cold). According to them, they had successful sales of such product at one of the tourist zones in Mtskheta. They plan to restart the production, once the pandemic is over and tourists visit Georgia. We think that such a product will find devoted consumers at e-commerce platforms. Several such e-platforms already exist with agriculture profile and would willingly cooperate.

Cherry plum (Georgian Tkemali)

This is the most popular, traditional, and authentic sauce existing in Georgia. Both green, and red Tkemali are also known in CIS countries. The market for this product exists not only in CIS countries, but also at ethnic markets in Europe. It is "Tianetis Nobati" that collects Tkemali. They wash, sort, shell, destone, press, boil, and fill in 220-liter drums. Their main client is "Georgian Natural Product – GNP" – company specialized in production of spices and souses. According to the head of the cooperative, before the pandemic, they also had a successful attempt to reach HoReCa sector. In particular, one of the restaurants liked the cooperative's cherry plum (Tkemali) but could not continue further negotiations because of the lockdown.

We studied this potential direction interviewing one of the most active restaurant chains in Tbilisi having 3 restaurant branches. They purchase and process up to 220 liters[175] of Tkemali annually (nearly equal to 220kgs) at season, which is 73 liters per restaurant annual, and it is enough throughout the year. For the three restaurants, this number is not a significant amount. If 'Tianetis Nobati' makes it to reach and cooperate with, for instance, 100 such restaurants, they could have additional annual sales of 13,150 GEL.

We recommend and foresee fruitful cooperation with other local big processing companies producing this very sauce. Such can be: Marneuli Food Factory, Kula, Nena (of KTW group). All these three factories have sales at local, as well as international niche markets, as mentioned above.

Primula veris and yarrow

Both varieties of herbal plants are very important discoveries as valuable NTFPs. Neither collectors nor the cooperatives would spot these plants in the forests, ever, if there is not a demand coming from Kakheti BIO and initially from Rose Office GmbH. They are important NTFPs for collectors and the cooperatives, as their crop period is before the main autumn harvest season. Especially primula veris

[174] This may have negative effect on biodiversity, since, based on interviews, the collectors lack information about sustainability of NTFPs and particularly for this product

[175] Based on the interview with Originali Group restaurant chef.

that is picked in April and May, when the collectors and the cooperatives are not busy with any other NTFPs at all. The incomes are also noteworthy (see section 4). During the interviews, each collector was more enthusiastic about primula veris, as it has a good price (4gel/kg). Few of them were excited about yarrows, as they are low price products (0.6gel/kg), but yield rate of productivity, after drying, is better than that of primula veris. It is worth underlining, that Tianeti Nobati not being able to afford to certify yarrows as bio, they sold 6 times smaller amount (conventional) in 2019 for 4gel/kg, when they could have sold the products as organic in 50% higher price, as it was in 2018.

It is important to note that, on another end, primula veris does not need to be certified organic, as this herb is an ingredient only for medicines.

Each actor of the value chain is recommended to increase quantities collected and processed to generate more revenues from these NTFPs. In addition, 'Tianeti Nobati' cooperative should seek ways to cooperate with GeoFlower, as they also sell these products on export.

7.4 SWOT ANALYSIS

Table 92: SWOT analysis

Strength	Weaknesses
- NTFPs, fully export oriented sector (98-99%) at stable EU market - Cooperatives playing important role for stimulating local inhabitants for NTFP collection - Good tradition among population of NTFP collection - Strong leaders of cooperatives: high respect between the collectors and the cooperative directors. - Strong processing facilities with stronger international clients - Easily achievable (1 year) organic certification for most NTFPs - Good and stable quality of NTFPs - High concentration of women - High representation of women in cooperatives	- Very limited access for cooperatives to loans on working capital - Lack of associations providing intellectual support for collectors - Lack of intellectual support for Cooperatives: other existing NTFP applications, cultivation know-how, market information, marketing - Weak cooperation between educational institutions and cooperatives or collectors, resulting limitation in new technologies and R&D - Most of collectors seeing no gain from training sessions - Few laboratories checking mineral and vitamin content in the NTFPs - Hard to track NTFP import/export figures, cleared with 4-digit HS code, much broader aggregation - Problem of low capacity drying facilities in cooperatives, hindering the overall capacity - Lack of production equipment - Transpiration vehicle problem for the Cooperator/Collectors - Low recycling practice - Low level of youth engagement - Exclusion of PWDs - Gendered division of roles - Women's, PWDs' and youth's limited access to formal credit services - Unpaid or low-paid labor for women - Women's limited access to large markets - Women's and PWDs' limited access to mobility and means of transportation

Opportunities	Threats
- Increased global market demand for organic NTFPs - Initiation of new NTFP resulting stimulation of all VC actors - Good possibility of cultivating certain NTFPs – Japanese method of cultivation in wild circumstances. - Recycling fruit processing waste: pomace (pectin), compost, eco fuel etc. - Suitable and result oriented training for the workforce - E-commerce platforms for collectors and cooperative (B2C) - FTAs: EU, China, CIS, EFTA - Diagonal cumulation within DCFTA. For instance, Ukraine could have been a productive partner country in organic production aiming at the EU market - Skills development programs for youth, PWDs, and women	- Local population migrating from rural to urban areas - Possible negative effects of the pandemic - Violation of biodiversity of forest funds - Climate change – reducing availability of existing NFTPs - Environmental pollution - Hindered social norms and stereotypes

7.5 RECOMMENDATIONS

1. Support value chain respective actors in NTFPs' certified organic collection and processing.

Conclusion:

Certified organic NTFPs gain a higher potential of export, as well as the price for organic NTFP products appears to be 25-30% higher than that of conventional. Besides, as mentioned earlier, organic certification process for non-timber forest products is less time consuming and easily achievable. However, cooperatives, organizing NTFP collection within the target area, mostly cannot afford to cover additional cost for certification with their own (for example, because of not being able to afford the organic certifying, yarrows have been collected in 6 times smaller quantities in 2019 compared to 2018 –when organic).

Recommendation:

Support the respective value chain actors in NTFP's certified organic collection and processing, through fully or partially subsidizing occurred costs for certification. The outcome of this will not only be higher export potential of certified NTFPs, but it will also meet a number of internationally recognized standards, including protecting biodiversity - one of the core issues of wild collection (mentioned also below). Finally, it will generally contribute to forming a culture of organic wild collection, processing, and handling.

2. Increase awareness about sustainable use of NTFPs, importance of biodiversity and cultivation.

Conclusion:

Based on the conducted interviews, there seems to be irrelevant perception about the importance of biodiversity and sustainable usage of NTFPs. Some collectors think that the manner of NTFP picking, for example, does not really matter for biodiversity, rather it depends on the nature and the weather conditions mostly. Besides, the most respondents expressed an interest in forest farming, or NTFT cultivation methods. However, none of them had ever practiced in such agroforestry.

Recommendation:

Organize regular trainings and workshops dedicated to understanding the significance of biodiversity and its role in forest preservation. Besides, develop an effective monitoring system ensuring the respect of this vital principle. As mentioned in the above conclusion, achieving organic certification means to incorporate care for biodiversity, which, among other subjects, is an obligatory part of the process. It is being attained by regular trainings and inspections required by the organic standards (for instance, Green Caucasus standards equivalent to Regulation (EC) No. 834/2007). With regards to cultivation, increase awareness of the value chain actors about agroforestry of wild forest products, allowing them to assess possible benefits of this direction both in livelihood and sustainability of NTFP. Among good practices Japanese farmer Masanobu Fukuoka's[176] natural farming and permaculture method can be considered

3. Support value chain respective actors in implementing recycling systems

Conclusion

Representatives of the cooperatives and the processing facility seem to be attracted by the idea of implementing recycling systems in the production, however no evaluation and explicit estimations have been made relating to the benefits such systems could result in.

[176] https://f-masanobu.jp/en/

Recommendation:

Support an implementation of recycling systems through conducting evaluative research and elaborating projects estimating benefits of recycling in many aspects: decreasing the amounts of harmful chemicals and gas release from rubbish; decreasing operational costs through reusing recycled residue and implementing clean energy and sustainable systems; reducing pollution from production waste – impacting positively on natural environment.

4. Encourage respective stakeholders for sectoral association membership

Conclusion

None of the interviewed collectors have membership nor they apprehend possible benefits that can be gained from agriculture associations. With regards to the collection centers – cooperatives and processing facilities, they realize importance of associations are ready to cooperate with as many of them as possible, if this does not rise significant fixed costs.

Recommendation:

Encourage respective stakeholders to consider the membership of relevant agriculture associations. On one hand, this will provide informative and intellectual support to value chain actors, as well as it can play an important role in exchanging of information and spreading a word between the actors.

5. Support the Collectors in providing additional vehicle for organized collection of NTFPs

Conclusion:

Based on the interviews, one of the main obstacles the collectors face is a transportation means for wild collection, especially for medical herbs, picking areas of which are far from the populated places.

Recommendation:

Support the collectors in providing vehicles for organized collection of wild NTFPs that would enable them to move forward and carry out gatherings in far more remote forest areas.

6. Support in enriching value chain respective actors' input supply equipment and increasing storage

Conclusion:

The conducted interviews revealed a need for enriching input supply equipment both for collectors and the collection centers - cooperatives. Besides, cooperatives' limited storage space is one of the main reasons hindering an increase in productivity.

Recommendation:

Support collectors and cooperatives in purchasing necessary equipment and production inventory. For collectors, such equipment would increase collection productivity, as well as, for some NTFPs it would help in sorting. This in turn could generate higher profits (for example sea buckthorn). With respect to the cooperatives, during the interviews, upgrading existing production inventory has been named among top priority issues. Such inventory includes stainless steel tanks, pumps, shelling, destoning, and most importantly, drying machines. Besides, support the cooperative to enhance existing storage/warehouse space in order to increase productivity.

7. Support the cooperatives reduce operating costs

Conclusion:

According to the interviews with the members of the cooperatives, they face high operating costs during fruit processing out of which, the most dramatic is high electricity consumption of drying machine. This results in high unit costs of dried NTFPs.

Recommendation:

Support in purchasing solar energy based drying machines - clean, inexpensive, and renewable power source, with low operating cost, resulting in decreased unit costs for dried NTFPs.

8. Ensure better flow of information between value chain actors

Conclusion:

Miscommunication between the value chain actors has been one of the identified challenges that may hamper effective cooperation.

Recommendation:

Develop a platform for ensuring a better flow of information between value chain actors, resulting in improved utilization of available resources and improved cooperation. Among optional platforms, one could be linked to agriculture associations - regularly updating its members with all necessary information. Besides, the information spreading option could be an effective application of the existing practice of information paper distribution among collectors and cooperatives. Also, mobile SMS platform could be implemented informing every stakeholder about the news.

9. Support the cooperatives for better access to working capital loans

Conclusion:

According to the comprehensive interviews, one of the core issues was related to limited access to working capital loans, which, according to them, is the main reason for hampering the cooperatives' productivity and development.

Recommendation:

In support with financial institutions, assess solvency of the cooperatives, identify difficulties, and support them for better access to working capital loans.

10. Support in building self-reliance among collectors

Conclusion:

Based on the interviews with the value chain actors, targeted area inhabitants, especially youth, tend to migrate from villages to urban areas, or are lazy to work in NTFP sector. Some of the interviewed collectors seemed to lack self-reliance or trust in their own abilities to become successful in NTFP industry.

Recommendation:

Conduct related training and coaching sessions to corresponding actors of the value chain, with an aim of building self-reliance among collectors. Motivating inhabitants of targeted area with possible benefits of NTFP industry.

11. Support the stakeholders in producing high value-added products.

Conclusion:

Based on profitability and opportunity analysis, there exist possibilities for producing higher value-added products derived from existing NTFPs. It will result in necessity for delivering know-how, practical knowledge and skills for producing such products, as well as market information and export potential opportunities.

Recommendation:

Build capacity of the stakeholders in improving skills and abilities in producing higher value added and innovative products (for instance, rosehip shell/seed, rosehip seed oil, dried wild apple, wild apple chips - the ones describe in opportunity analysis sector above). Also, support them in identifying market opportunities and new sales' channels.

12. Identify NTFPs in targeted area not yet collected and with potential on local or export markets

Conclusion:

The study revealed a number of NFTPs (for example, Licorice –the highest value exported NTFP, nettle, dandelion, wild cornel, wild blackberry, wild Caucasian pear, wild mushrooms) with existing resources in the targeted area that are not collected nor processed. However, NTFPs could be in demand at local or export markets, thus they could generate additional revenues for the value chain actors.

Recommendation:

Conduct a study identifying new NTFPs with existing resources in the targeted area and being demanding on local or export markets.

13. Help the value chain actors through allocating and optimizing their activities throughout the year

Conclusion:

One of the most important parts of the industry is related to deciding on specific NTPFs and optimizing the allocation of activities (collection, processing) throughout the year.

Recommendation:

Help value chain actors allocate and optimize their activities during the year through evaluating and improving existing business processes, finally resulting in optimized operational costs for different NFTPs.

14. Support in assessing existing resources of each NTFP in targeted area

Conclusion:

There is hardly any study conducted assessing the existing resources of each NTFPs in the targeted area and in Mtskheta-Mtianeti region, in general. This is a significant challenge when evaluating the potential of NTFP sector in targeted area.

Recommendation:

Recommend the Georgian National Forest Agency, the Ministry of Agriculture and related state institutions to conduct a study assessing the existing resources of NTFPs in Mtskheta-Mtianeti region, underlying the significance of such data for NTFP industry development in Georgia.

15. Entrepreneurship opportunities for women, youth and PWDs

Conclusion:

The current research showed that the activities and roles in NTFP sector in Georgia, similar to international experience from developing countries are gendered, varying with product characteristics and segment of the chain. Women and men participate in all aspects of collection, however, as both female and male respondents reported, high-value products are primarily male-collected, while women collect mostly berries.

Recommendation:

Through grant support schemes, provide women, youth, and PWDs with entrepreneurship opportunities, more specifically opportunities for the development and advancement of women and youth-owned enterprises of high-value products and ensure that they get support on putting together a grant application.

16. Access to high-quality inputs, equipment, technology for fruits for women, youth and PWDs

Conclusion:

Typically, the collection process is being carried out with bare hands, rarely with few simple collection equipment and plastic containers, which explains women's high concentration in the sector. In some cases, collectors conduct hand sorting and home (solar) drying processes, which are done by females. At processing stages, women are often the ones who are given the most labor-intensive tasks. These tasks require dexterity and patience, therefore, it is paramount that the process is modernized and mechanized to remove hurdle from them. It appeared that in Tianeti, there are no disabled farmers, nor the cases of people with disability (PWD) involving in NTFP were observed, which can be stipulated by no access to the different capital assets, including machineries that determine an individual's, i.e. PWD's ability to productively engage in farming.

Recommendation:

Ensure women, youth, and PWDs have access to high-quality inputs, equipment, technology for fruits and have the knowledge, how to use them to achieve high quality product. This is of particular importance for women and PWDs, as improved techniques for grading and cleaning would save time. Also, it will provide opportunities for economic empowerment, as no access to these assets hinders their participation in the sector more proactively. Unfortunately, women have less opportunities to compare to men to increase output and less access to credit, technology, and training, thus they are at a disadvantage position at this level of upgrading.

17. Access to credit for women, youth and PWDs

Conclusion:

The land-related statistics for Tianeti Municipality, that include data on land and agriculture ownership disaggregated by gender and age is not available, however, the national statistics can allow the assumptions to Tianeti Municipality, according to which legitimated agricultural land is owned by three times more men, than women. When female and male farmers do not have equal access to capital, women and girls tend to participate in the activities where physical product transformation involves simple, relatively low-cost equipment. This notwithstanding, it appeared that in Tianeti there are no disabled farmers, nor the cases of people with disability (PWD) involving in farming were observed, which can be stipulated by no access to the different capital assets, including machineries that can determine an individual's, i.e. PWD's ability to productively engage in farming.

Recommendation:

Support access to credit, land for women, youth, and PWDs, by providing support schemes in partnership with financial institutions. This would open up economic opportunities for them and support the growth of women, youth, and PWD-owned beekeeping enterprise.

18. Training opportunities for women, youth and PWDs

Conclusion:

Both female and male respondents name wild collection skills as important know-how for productive work. This is of particular importance for women and PWDs, as improved techniques for harvesting, grading, and cleaning would save time. as Also, they will provide opportunities for economic empowerment, as no access to these assets hinders their participation in the sector more proactively. Unfortunately, women have less opportunity in comparison with men to increase output and less access to credit, technology, and training, thus they are at a disadvantage position at this level of upgrading.

Recommendation:

Provide tailored trainings for women, youth, PWDs to hone their skills in in NTFP, including improved techniques for collecting, grading, and cleaning to meet the market requirements, as well as in packaging, labeling, etc. The training time, location, and accessibility also need to be considered. If one group (e.g. women, girls, PWDs) must be at home during a specific time when others are available or vice versa, the training either should be scheduled at a time when all groups are available or separate trainings should be held. Having the same group trainings separately may create conditions where each group (women, youth, PWDs) are more confident in participating and expressing their needs. Adapting the trainings, in terms of contents, methods and materials, to the level of knowledge and previous experience of potentially interested members of diverse groups, will also be an effective way to attract vulnerable groups. Ensure that the training materials show neither a stereotypical representation nor underrepresentation of vulnerable groups, and that there is a fair portrayal of women, men, youth, PWDs in materials, so as to contribute to the lack of positive role models for the groups who are underrepresented in the field.


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