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GREENHOUSE CLUSTER

Diagnostic Study
in Imereti Region

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EU Innovative Action for Private Sector Competitiveness in Georgia (EU IPSC)

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| LIST OF ABBREVIATIONS

AA	Association Agreement
ADA	Agribusiness Development Activity
AMMAR	Agriculture Modernization, Market access and Resilience project
CNFA	Cultivating New Frontiers in Agriculture
DCFTA	Deep and Comprehensive Free Trade Area Agreement
EU	European Union
FAO	Food and Agriculture Organization
EBRD	European Bank for Reconstruction and Development
EU4Business	European Union for Business
GCCI	Georgian Chamber of Commerce and Industry
GEF	Global Environment Facility
GEL	Georgian Lari
Geostat.	National Statistics Office of Georgia
GHCD	Greenhouse Cluster Development
GI	Geographical Indication
GIPA	Georgian Institute of Public Affairs
GIZ	The Deutsche Gesellschaft für Internationale Zusammenarbeit (German Corporation for International Cooperation)
GoG	Government of Georgia
GRDD	Georgian Rural Development Department
HoReCa	Hotels/Restaurants/Cafes
HS	Harmonized System
IAZ	Imereti Agro Zone
IFAD	International Fund for Agricultural Development
IOM	International Organization for Migration
IPSC	Innovative Action for Private Sector Competitiveness
NACE	Nomenclature of Economic Activities
NFA	National Food Agency
NGO	Non-Governmental Organizations
LEPL	Legal Entity Under Public Law
LLC	Limited Liability Company
MEPA	Ministry of Environmental Protection and Agriculture of Georgia
TBSC	Tbilisi Business Service Center
R&D	Research and Development
RDA	Regional Development Agency
SMEs	Small and Medium Enterprises
SRCA	Scientific-Research Center of Agriculture
SWOT	Strengths, Weaknesses, Opportunities and Threats
ToT	Training of Trainers
UN	United Nations
UNIDO	United Nations Industrial Development Organization
UNJP	UN Joint Programme
USD	United States Dollar
USAID	United States Agency for International Development

1 | INTRODUCTION

The Cluster Diagnostic Study has been prepared under the programme EU Innovative Action for Private Sector Competitiveness in Georgia (EU IPSC). The Programme is a joint initiative of the European Union and four UN Agencies – United Nations Development Programme (UNDP), the Food and Agriculture Organization (FAO), United Nations Industrial Development Organization (UNIDO) and the International Organization for Migration (IOM). The overall objective of the UN Joint Programme (UNJP) is to enhance entrepreneurship and business sophistication by strengthening the capacities of Government and local entities to develop and operate clusters and supporting companies directly with strategic investments and better connect to diaspora groups, while also demonstrating the effectiveness of these strategies to businesses.

UNIDO's component of the UNJP aims at strengthening the capacities of policymakers and other stakeholders to identify and develop clusters. In 2019, UNIDO conducted mapping of emerging and potential manufacturing and agribusiness clusters in Georgia. The study identified 57 clusters in Tbilisi and 9 regions and ranked them according to a set of criteria comprising economic, social and environmental factors.

Out of 57, eight clusters were selected for an in-depth diagnostic study based on the following four criteria:

1. Highest growth potential (from top 20 clusters)
2. Priority clusters for Government
3. No prior diagnostic studies conducted for the cluster
4. No major technical assistance provided by development partners to support the cluster development

In addition to the above-mentioned eight cluster diagnostic studies, on request of the Ministry of Environmental Protection and Agriculture, UNIDO has agreed to conduct additional in-depth diagnostic study for the greenhouse cluster in Imereti region.

This study has been prepared according to the UNIDO cluster development approach by TBSC Consulting under supervision of the UNIDO Project team: Ms. Ebe Muschialli, Associate Industrial Development Expert, Mr. Vedat Kunt, International Cluster Expert, and Mr. Giorgi Todua, National Project Coordinator, and overall guidance of Mr. Fabio Russo, UNIDO Senior Industrial Development Officer.

This diagnostic study is prepared for Greenhouse Cluster, located in Imereti.

2 | METHODOLOGY

The first step of the research was collecting preliminary data, using UNIDO cluster mapping report, association/NGO bulletins, donor and state agencies reports, available statistics. Similar data and market information at the international level was also gathered for the benchmarking.

The research continued with defining the greenhouse cluster in Imereti taking into account two major dimensions: products and place. Based on the initial desk research and interviews, basic characteristics of the greenhouses and major products produced were identified. As a result, greenhouse owners were divided based on their size and capacity, and herbs and greens production was identified as the main cluster product.

Afterward, in-depth interviews with key stakeholders were conducted. This included greenhouse owners, collectors, exporters, support institutions (NGOs, governmental agencies), associations/networks/co-operatives, service providers (input suppliers, farmers service centers), and other players of the greens value chain (e.g., supermarket). In total, in-depth interviews were conducted with 14 enterprises of various sizes and capacity (including 1 cooperative and 1 cold storage facility), 4 service providers and 8 support institutions. Additionally, a quantitative telephone survey was conducted with a sample of 154 farmers in Imereti region (sampled proportionately to the estimated share of the municipality greenhouses in total number of greenhouses in the region).[1]

At the final stage, the information from the desk research as well as from the primary data collection (interviews) was analyzed and key findings were derived. Several analytic frameworks were used during the analysis, including Value Chain Analysis, SWOT Analysis, Porter's Five Forces Analysis. In addition to this, Cooperation Matrix and Cluster Map were developed to analyze existing cluster connections, linkages that need to be developed or strengthened, and critical stakeholders determined. In the end, the vision for the cluster was developed guided by overall sectoral understanding and inputs received from the analysis. A set of recommended actions for reaching these objectives were also determined.

2.1 ORGANIZATION OF THIS DOCUMENT

This Report is organized into several Chapters, Sections, and Sub-Sections. The first Chapter defines the greenhouse cluster in Imereti with a brief sectoral overview, followed by the overview and analysis of international greenhouse cluster scenarios and features for benchmarking purposes. In the following Chapter, available vital statistics about greenhouses, and herbs and vegetables production are presented. The next Chapter provides a comparative analysis of value chains and economics of Imereti and international benchmark clusters. The next Chapter is about the nature of cooperation in the cluster, followed by the Chapter about the analysis of cluster business operations, using various economic tools. The final Chapter summarizes findings, sets Cluster Vision and provides recommendations for further long and short-term interventions.

[1] List of stakeholders interviewed, and municipalities and regions covered by the telephone survey are presented in Annex I and Annex II respectively.

3 | CLUSTER DEFINITION

Production of herbs and vegetables under controlled conditions, in polyethylene greenhouses, is one of the most common agricultural production systems in Imereti region, the western part of Georgia. Favorable climatic conditions and soil properties in the region, combined with the high recognition on the post-soviet markets, helped Imereti to establish a reputation of herbs and vegetables production region over the years.

Location

According to the Ministry of Environmental Protection and Agriculture of Georgia (MEPA), Imereti region has the highest number of greenhouses in the country, and they are presented in almost all municipalities of the region. Therefore, due to the proximity of these municipalities to each other, the whole region is considered as one large greenhouse cluster rather than a municipality-oriented one. At the same time, it should be noted that the biggest concentration of greenhouses (thus the main concertation of cluster members) is observed in Tskaltubo municipality, followed by Samtredia and Baghdati municipalities.

Product

Farmers in the region produce up to 30 different varieties of crops typical for Georgian cuisine. However, the production of herbs and greens has historically been the leading sub-sector in Imereti and has shown strong growth momentum in the last several years. The research done by USAID in 2011 identified Imereti region as the major production zone for greens in Georgia.[2] Other sectoral reports and donor research also identified herbs and greens to have a strong potential of exports to the high-value markets.[3] Furthermore, it is worth mentioning that Kutaisi Greens is a protected Geographical Indication (GI) in Georgia.[4] The registry for GIs indicates that unique taste, fragrance and high quality of Kutaisi Greens is a result of unique microclimate conditions within the territories of Imereti (namely, Vani, Samtredia, Terjola, Zestaponi, Baghdati, Khoni and Tskaltubo). The local climatic conditions have a special favorable effect on leaf vegetables such as: dill, parsley, coriander and celery.

Therefore, production of herbs and greens is considered as a main type of activity for the greenhouse owners in the region and generates a big chunk of their incomes on a more or less systematic basis. Although, the majority of the greenhouse owners who grow herbs (mainly during the off-season) also lead vegetable production during the seasonal periods, as complementary activity. Consequently, herbs and greens were selected as the main product category, and the report emphasizes on challenges and opportunities from the herbs and greens perspective mainly. [5] Vegetables are also considered as part of the cluster and are described when applicable. Lastly, it should be noted that some of the greenhouses also produce berries and this is an increasing category.

[2] Vegetable Market Assessment Georgia, 2011, USAID. Link for the report: https://land-links.org/wp-content/uploads/2018/03/USAID_Land_Tenure_EPI_Vegetable_Market_Assessment.pdf.

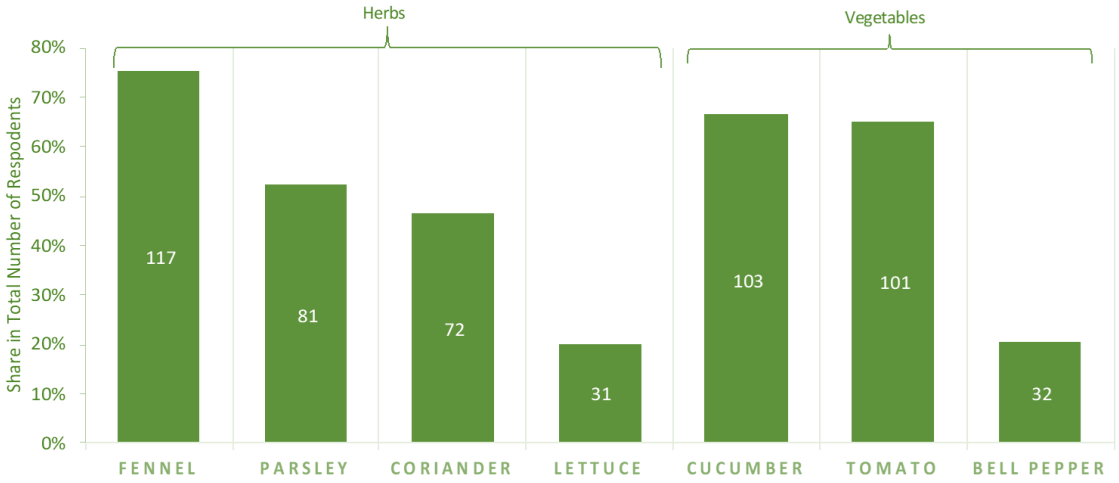
[3] Agricultural Value Chains in Imereti and Racha, Greenhouse production of herbs, Czech University of Life Sciences Prague in collaboration with People in Need and the Association of Young Economists of Georgia from, 2014. Link for the report: http://enpard.ge/ge/wp-content/uploads/2015/05/Market-Assessment_Dairy_AYEG_ENG-3-files-merged.pdf.

[4] Association "Kutaisi Greens" registered Kutaisi Greens as a geographical indication in 2016. The association is currently inactive.

[5] Nevertheless, Greenhouses in all product categories share many of the challenges, and all recommendations presented in this report will equally benefit development of each mentioned product category and consequently, Greenhouse Cluster generally.

Main product varieties (both herbs and non-herbs) cultivated by the greenhouses in Imereti region include fennel, parsley, coriander, cucumber, tomato, bell pepper and lettuce. Other types of greens such as Arugula (7% of the respondents) or celery (6% of the respondents) are also produced but in significantly lower quantities. The majority of these products are later sold in fresh conditions.

Chart 1: Main Products Cultivated by Greenhouse Farmers in Imereti



Source: Survey of Cluster Members, TBSC Consulting

Producers

Based on the expert evaluation (using the various estimates, including the estimates by MEPA), today there are more than 3,000 small-scale, several medium, and two large commercial greenhouses in Imereti, and more than 5,000 farmers are involved in the cultivation/production.

Table 1: Characteristics of Georgian Greenhouses According to Their Size

CATEGORY	CHARACTERISTICS
FAMILY FARMS	• Up to 2,000 m^2, the majority in the range of 300 – 600 m^2 • Farmers own agricultural land suitable for greenhouse production of herbs and vegetables • Sell products mainly to the partners on the local market or to local middleman
MEDIUM-SCALE AND LARGE GREENHOUSES	• Over 2,000 m^2 • Controlled climate and growth systems, modern technologies • Medium-sized producers with suitable agricultural lands in several places in the village • Purchase vegetables and mainly herbs from local producers/act as middlemen • Sometimes carry out exports

Source: TBSC Analysis

Among the producers, two largest greenhouses, Herbia and Imereti Greenery, are worth mentioning.

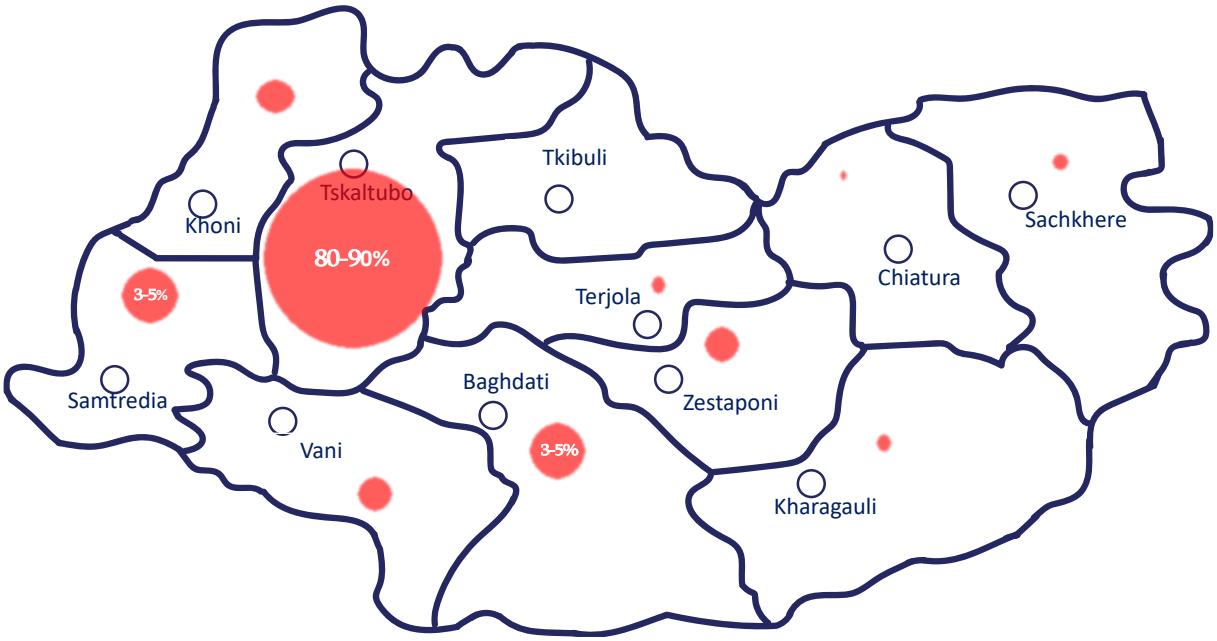
Herbia is a grower, packer, and shipper of GLOBALG.A.P. -certified culinary herbs and vegetables with no chemical fertilizers or insecticides. It was established in 2006 and is a pioneer in the field of packaged herbs offered to local consumers. It operates 3 ha of greenhouse and a modern refrigerated warehouse with 2 packing lines in Tskaltubo municipality.

Imereti Greenery is a Dutch-Georgian enterprise established in 2016, with 2 ha of greenhouse in Samtredia municipality. It operates hydroponic farming - a modern method of production, where crops are cultivated without soil by using mineral nutrients in a water solvent, making it more sufficient and sustainable.

Along with the producers, Imereti Agro Zone LLC (IAZ) should also be mentioned. The Ministry of Environmental Protection and Agriculture of Georgia (MEPA) through the Rural Development Agency (RDA) founded IAZ intending to create a Greenhouse Cluster in Imereti region with a one-window service principle and a full value-added chain production. The company will implement the IAZ Greenhouse Cluster Project to reach its target goals. This is a very important initiative for the sector. Firstly, because it highlights the cluster's potential and its importance for the country. Secondly, this project will be significant support for the region and the cluster in the upcoming years.

4 | CLUSTER LOCATION MAP

Distribution of Greenhouses by Municipalities



Source: Expert Estimates Based on Multiple Sources of Evaluation

5 | CLUSTER HISTORY

Agriculture is an indivisible part of Georgian history and cultural heritage; it has always played an important role in the economy of the country and various regions, including Imereti.

Starting in the Soviet Union, Imereti region was famous for cucumber and tomato production (both in greenhouses and open fields) and supplied a significant amount of the produce to the Soviet Union states. However, after the collapse of the Soviet Union, the Georgian agricultural sector lost its primary export markets. Input costs needed to maintain production significantly increased. Due to the limitation of the electricity supply, greenhouses could not produce cucumber and tomato in winter as they used to before. Therefore, manufacturers started searching for an alternative way to continue the production process. The solution was found - favorable climate and natural conditions made it possible to produce herbs in greenhouses in winter without using heat. In the late 90s, 3-4 thousand tons of herbs were exported from Georgia and the industry continued to develop in the upcoming years.

In 2006, Georgia had to face a new obstacle – a Russian embargo on the supply of fresh produce, including herbs. This initially harmed local manufacturers, as the Russian market was the main export destination for Georgian herbs. Although, many manufacturers found alternative ways to export products to Russia, for example exporting through Ukraine.

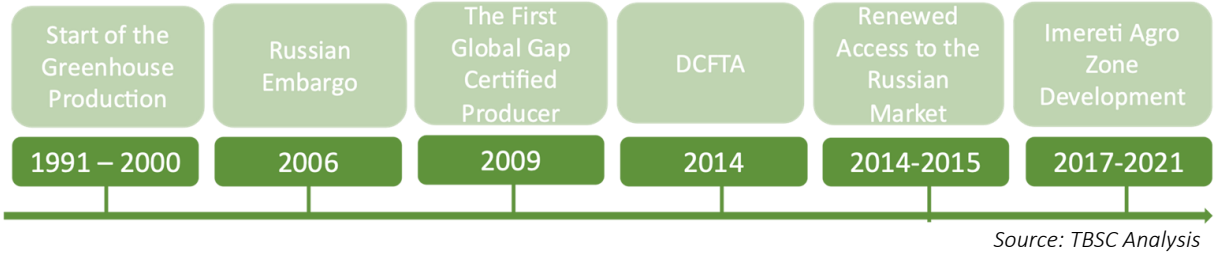
Meanwhile, "Herbia", the biggest herb producer company in Georgia started working on the GLOBALG.A.P. certificate and received it in 2009. Owning a GLOBALG.A.P. certificate meant that the quality of the product met the expectations of the wide range of the European markets.

In 2014, Georgia signed a Deep and Comprehensive Free Trade Area Agreement (DCFTA) with the EU. This created new opportunities for the producers of Georgian herbs to export agricultural products to the EU markets freely – the market with a high demand for high-quality fresh herbs.

In 2015, Russia started the re-opening process for the Georgian producers of several categories of products, including herbs. This meant increasing sales for the local producers.

Later, in 2017, Imereti Agro Zone, a state-owned LLC, was founded by the Rural Development Agency of Georgia. This was one of the important turning points of the cluster as this project meant strong support from the Government and possibly large investments in the sector. In 2021, the project was launched and Expression of Interest was opened for the stakeholders.

Chart 2: Greenhouse Cluster History and Major Turning Points



Source: TBSC Analysis

6 | CLUSTER PRODUCTION PROCESS

High season for production of herbs and greens in greenhouses in Imereti region starts around September and lasts until the end of April. The regional climate conditions in Fall and Winter periods make it possible to produce many of the types of herbs and greens (but not all) without climate control and heating systems. This is an advantage of the cluster as these months are off-season for many other countries, and demand on imported herbs and greens in such markets increases.

On the first stage, around September, the soil is processed, which is followed by soil plowing. Tractors and farm equipment are required at this stage, that are either owned by the farmer or rented from the mechanization centers (usually lacking modern, high-tech equipment). Time required for soil plowing varies based on a type of herb produced. Afterward, desired crops are sown and cultivated, fertilized and treated. In general, compared to vegetables, herbs require less attention in terms of fertilizers and disease treatment. Although for the crops to grow in the right direction, frequent hand processing is needed throughout the whole period from planting until harvesting. In this regard, the most problematic is access to quality inputs and then proper usage of such inputs, which largely defines final quality of the harvest. In winter periods some households water their greenhouses once or twice a month, while others water once every 3-4 days. Around November crops are harvested and in December, they are sold either on the domestic or the export market. Number of harvests varies depending on the herb produced. For example, dill can be harvested approximately 11-12 times per season, parsley - approximately 5 times, coriander - 5-7 times and so on.

Number of processing and storage facilities in Imereti region is limited. Most of the farmers handle harvest manually, wash the greens and herbs, and quite often sell the products in wet condition to increase the weight and give it a better appearance.

After the harvest of herbs and greens is over, the greenhouse is cleaned for the new cultures. When the weather gets warmer, greenhouse owners start planting vegetable cultures, such as tomatoes and cucumbers.

In the March-April period, soil processing and plowing takes place again. Plowing time depends on the weather and the type of vegetable. For instance, tomato is usually plowed in March, while cucumber is plowed in late April-May. Afterward, plants are given time (10-14 days) to adapt to the soil. After this period, fertilizing stage takes place. Once every 10-14 days plants are processed with organic or non-organic fertilizers. Simultaneously with the fertilizing stage, plants are checked on diseases. If needed, treatment against diseases is applied. Irrigation, during summer periods usually takes place once in every two days. Around late May and the beginning of August, harvest is received.

Below are given pictures of some of the greenhouses in the region and their production process.[6]

[6] Pictures are taken from the following sources: 1. "Agricultural Value Chains in Imereti and Racha, Greenhouse production of herbs" Czech University of Life Sciences Prague in collaboration with People in Need and the Association of Young Economists of Georgia from, 2014 2. www.jholo.ge 3. Social media platforms of Herbia and Imereti Greenery

Small Tractor for Soil Cultivation

Harvesting of Dill

Greenhouse in Imereti

Greenhouse in Imereti

Greenhouse in Imereti

Greenhouse in Imereti

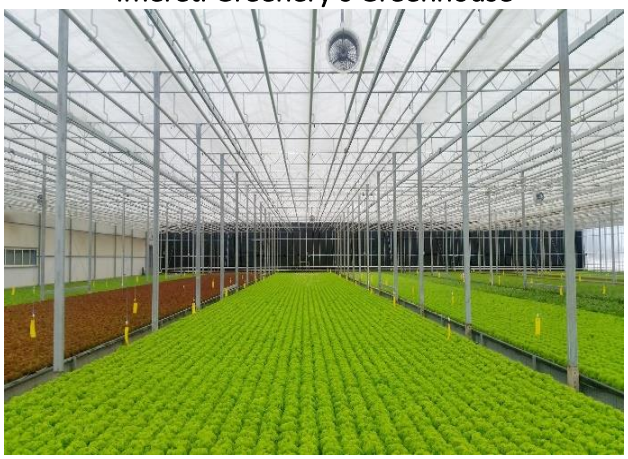
Herbia's Greenhouse

Herbia's Greenhouses

Herbia's Packaged Herbs

Herbia's Processing

Imereti Greenery's Greenhouse



Imereti Greenery's Greenhouse

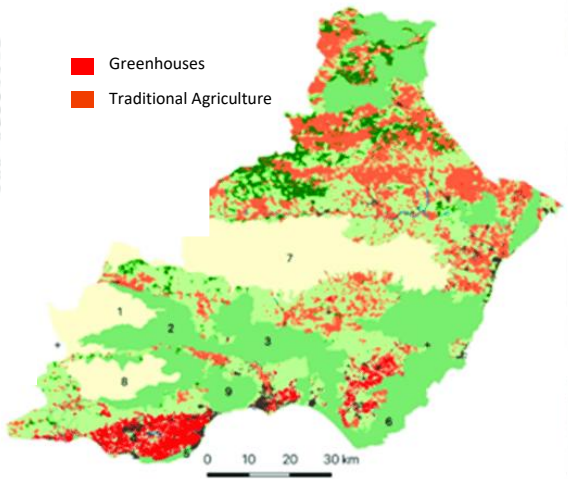
7 | SELECTED COUNTRY ANALYSIS

For the Greenhouse Cluster analysis, understanding of potential opportunities and benchmarking cases of Almeria Greenhouse Cluster and Agriport Greenhouse Cluster were selected. The first one is located in Spain and it is a good example of the benefits of joint actions and proximity of the cluster members, as well as benefits of strong associations/unions and cooperation in general. The second cluster is located in the Netherlands and it is an example of strong and structured support from the developer, which attracted large growers from the neighboring clusters, and could be relevant to Imereti cluster as well.

7.1 ALMERIA CLUSTER OF FRUITS AND VEGETABLES – FROM "NADA" TO TOP EXPORTER IN THE COUNTRY

Almeria is a province in Spain where 60% of the Spanish greenhouses are concentrated, and around which major agro-industrial cluster has arisen. The cluster covers more than 30,000 ha of land (mainly concentrated in Camp de Dalias region), where average landholding of greenhouses is 2 hectares, most held by farmers or SMEs who are members of the 80 agricultural cooperatives and producer organizations that export more than 80% of their production. Almeria's main production areas are vegetables like tomatoes, peppers, cucumbers, eggplants, watermelons, melons, lettuces, etc.[7]

Location of the Cluster



Source: Google Maps

[7] Source: https://www.avkvalves.eu/en/cases/water-cases/desalination-plant-in-andalucia.

Greenhouses in Almeria, Spain

Source: Getty Images

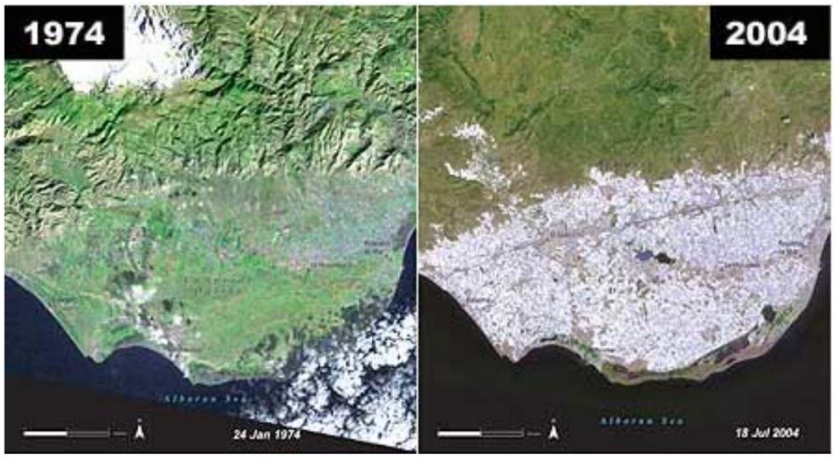
Source: Sea World

Source: Agro Sol Export

Source: "Greenhouse Agriculture in Almeria - A Comprehensive Techno-Economic Analysis"

The agricultural sector in the region employs about 76,000 people (in addition to owner-farmers) and annual turnover for 2018-2019 was around 2 Billion Euros (an annual increase of 5.3%).[8] Today this province in Spain is one of the biggest suppliers of greenhouse vegetables in EU. However, before 20th century this region was considered as a "desert".[9]

Satellite Images Reflecting the Development of Intensive Greenhouse Horticulture in the Campo de Dalias (Almeria)



Source: The Open Geography Journal, 2011, Volume 4

To explain such development and concentration of the greenhouses in the province and region, various natural, institutional, social and technological factors, which developed in parallel to each other, should be considered.

[8] Source: Giagnocavo, C. The Development of the Cooperative Movement and Civil Society in Almeria, Spain: Something from Nothing? Sustainability 2020, 12, 9820. https://doi.org/10.3390/su12239820.

[9] Source: Aznar-Sánchez, José A.. (2011). Territory, Cluster and Competitiveness of the Intensive Horticulture in Almería (Spain). The Open Geography Journal. 4. 103-114. 10.2174/1874923201104010103.

Firstly, location of the region and its natural climate conditions were the main factors that pushed the development of this new economic activity, as it gave producers opportunity to produce and supply Europe in off-season months. At the same time, proximity to EU market also played positive role, due to lower transport costs and transit times. However, technical support by the Ministry for Agriculture via the former National Institute of Rural Development and Colonisation was also crucial to activate and benefit from these natural resources. Thirdly, Campo de Dalias region was targeted by the Plan General de Colonización (a Settlement Plan) that interested peasant families from neighboring mountains to move to Almeria which had better productivity and profitability.[10] These are the main three pillars on which Almerian horticulture developed, though it continued growing and developed into a well-functioning cluster with concentration on development of production systems and auxiliary sectors, innovation and marketing.

From the 80s the agro-industrial cluster began to emerge in Almeria around production and marketing of vegetables. Before this, necessary inputs for the production were mostly imported from other countries or other provinces of Spain. However, as number of greenhouses grew, considerable growth was observed in terms of establishment of production and distribution centers inside the region, and development of firms in different sectors of auxiliary activities around horticulture production. Service providers and other industrial companies also started to move or establish in the region or close proximity. Today, horticulture of Almeria encompasses a network of around 243 companies that include handling and processing, auxiliary/complimentary industries, and other business sectors, such as transport.[11]

All above mentioned put greenhouse farmers in preferential positions. Almeria's advantage has become the proximity to most of the customers and suppliers, especially in the Camo de Dalias region. All sides (farmers, service and input providers, R&D centers) benefit from short communication lines and continuous exchange of information. Today *Almeria-based firms are influencing their suppliers by explaining their needs or pointing out to the shortcomings of the offered products. They act as a field test for the introduction of new products, helping to speed up the rate of innovation. At the same time, the suppliers benefit from the presence of so many customers who are both highly knowledgeable and demanding*.[12]

Over the period of time, the province became a center of the R&D in Spain in horticultural direction. R&D centers started to focus on solving problems farmers faced and promoting development of innovations. Furthermore, Almeria Innovation and Technology Park (PITA) was also established that still closely collaborates with other R&D centers in the province.

The Spanish Government and the EU have also supported through infrastructure, technical advice and access to finance. Strict national and European norm on product quality and safety also makes the region competitive and farmers here are able to meet requirements of the most stringent and demanding countries. Around 80% of the farmers in the province certify the production under quality systems. The most commonly used standard is the GLOBALG.A.P. certificate (almost 50%).[13] Due to the influx of migrants from Eastern Europe and North Africa, relatively cheap labour is also available for farmers.[14]

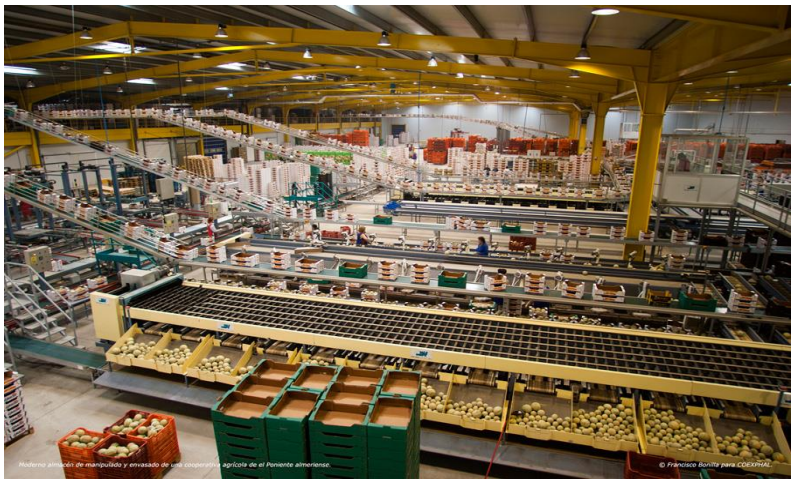
[10] Source: Aznar-Sánchez, José A. (2011). Territory, Cluster and Competitiveness of the Intensive Horticulture in Almería (Spain). The Open Geography Journal. 4. 103-114. 10.2174/1874923201104010103.
[11] Source: GLOBALG.A.P. Online Platform. The article available at: https://www.globalgap.org/uk_en/media-events/news/articles/Almeria-Report-Certification-Biological-Control-and-Education-Drive-Spains-Greenhouse-Powerhouse/
[12] Source: Aznar-Sánchez, José A (2011). Territory, Cluster and Competitiveness of the Intensive Horticulture in Almería (Spain). The Open Geography Journal. 4. 103-114. 10.2174/1874923201104010103.
[13] Source: GLOBALG.A.P. Online Platform. The article available at: https://www.globalgap.org/uk_en/media-events/news/articles/Almeria-Report-Certification-Biological-Control-and-Education-Drive-Spains-Greenhouse-Powerhouse/.
[14] Source: https://www.coolgeography.co.uk/gcsen/CRM_Food_Almeria_Spain.php.

Marketing in Almeria is usually centralized, with majority of farmers selling final products mainly through the cooperatives or Sociedades Agrarias de Transformación (SAT), a special type of civil society organization for the production, processing and marketing of agricultural goods; with a smaller proportion of farmers selling their products in Alhóndigas, or agricultural trading and bidding firms and using private marketers.[15]

A network of commercial and cooperative relationships should also be highlighted that has formed over the years and both strengthened and integrated the cluster. Almeria's rapid growth is largely a result of two interlinked cooperation-based institutions- its cooperative bank and farmers' cooperatives. For example, COEXPAL, ECOHAL and TECNOVA, with large coverage of the farmers or member institutions, can be highlighted.

The Association of Organizations of Fruit and Vegetable Producers of Almería (COEXPHAL) was founded in 1977 and today unites more than 80 companies and cooperatives, representing 70% of exports and 65% of fruit and vegetable production of Almeria.[16] This, in total, unites more than 8-10 000 farmers under the umbrella. Since its inception, COEXPHAL has led the main positive changes that occurred in the Almeria fruit and vegetable sector: improvements in marketing channels, access to more than 40 export destinations, search for new market opportunities, implementation of biological control, etc. through research projects, organization of courses and study days, field advisory and so on.

Modern Handling and Packaging Warehouse of an Agricultural Cooperative in Western Almeria, Member of COEXPHAL



Source: COEXPHAL

Some of the most important actions COEXPHAL has taken to add value for members include: Sustainable Agriculture (Biological Control and integrated production as an alternative to pesticides), Food Safety and Quality Certification at the highest EU standard for 100% of its members; coordination of its cooperatives to qualify as a Producer Organization under EU Regulations and promoting EU Organizational Integration.[17]

The ECOHAL was created in 1986 and includes six limited liability companies (all auctions) with a large marketing volume: they represent about 20% of the production and 15% of the total Almeria exports.[18]

[15] Greenhouse Agriculture in Almeria - A Comprehensive Techno-Economic Analysis;
March 2016, Publisher: Cajamar Caja Rural, ISBN: 978-84-95531-75-9; Available at:
https://www.researchgate.net/publication/297732115_Greenhouse_Agriculture_in_Almeria_A_comprehensive_techno-economic_analysis.
[16] Source: COEXPHAL website that can be accessed at: https://www.coexphal.es/la-asociacion/.
[17] Source: https://www.coopcampus.eu/Partners/Coexphal.
[18] Source: C. PÉREZ-MESA, Juan, and Emilio GALDEANO-GÓMEZ. 2021. Agriculturejournals.Cz. https://www.agriculturejournals.cz/publicFiles/29583.pdf.

The TECNOVA (created in 2001) includes 105 companies, institutions and organizations belonging to the industry and auxiliary services of agriculture, post-harvest and agro-industry. It is actively engaged in management and development of R&D projects with companies, fosters relations between its members and the agents of the science-technology-company system, and organizes technical seminars and training courses on technology and greenhouse farming.[19]

7.2 AGRIPORT GREENHOUSE CLUSTER – ROLE OF THE DEVELOPER

A role of greenhouse hubs is quite important in strengthening cluster collaboration. The horticulture sector in the Netherlands is concentrated in several clusters, which emerged due to several advantages such as increased transport efficiency and concentration of knowledge and innovation. At the same time, new clusters keep emerging due to the lack of expansion possibilities in existing greenhouse clusters.

One of such relatively new clusters/greenhouse concentrations is observed in Agriport – cluster located a 30-minute drive from Amsterdam where one of the largest greenhouses are concentrated. Agriport is a 500-ha project location designed for a large-scale greenhouse development. Since the start in 2005, over 600 million Euros were invested in horticulture and energy infrastructure.[20] Today it is one of the most developed clusters, with large available land, where growers cooperate in several areas such as processing/packing of the products as well as ownership of an energy company.

The most important players for the cluster are the property developer Agriport A7, Municipality of Hollands Kroon, Greenport NHN (formal network of regional partners around agribusiness) and nine greenhouse companies. One of the key aspects of this cluster is its governance and the role of the developer (Agriport A7) in its successful formation.

Agriport Greenhouse Cluster

[19] Source: TECNOVA website accessible at: http://www.fundaciontecnova.com/en/about-us/.
[20] Source: https://investinnhn.com/invest/investment-opportunities/agriport-a7.

Source: The Multiple Dimensions of Greenhouse Clusters in The Netherlands, Martijn Barendse

Development of Agriport is a good example of cooperation between the municipality and the Agriport A7, a private developer of the greenhouse cluster. In 2006, the Municipality of Hollands Kroon approved the initial plan of Agriport A7 to establish a processing location along the highway A7, provided that other companies could be established here as well. The goal was to attract the companies willing to expand and create larger scale greenhouses from the neighboring Westland greenhouse cluster, where constructing large-scale greenhouses was no longer possible. The municipality did not have the expertise and the finances to set up a land-use plan and asked Agriport A7 to arrange it.

The business model of the developer (Agriport A7) is based on land sales, which can be achieved by the overall development of the cluster and increasing its attractiveness. The developer plans the area in a way to minimize costs for the greenhouse owners and facilitates growers. For example, growers can receive technical support and use the networks of Agriport 7 to go through the planning and license procedures.

All established companies in Agriport are growers of vegetables and mainly come from the Westland cluster. One of the main reasons for moving to the Agriport was that the upscaling process in Westland was not fast enough and the cluster was operating on a traditional basis.

Today, Agriport A7 is a project location for large-scale greenhouse horticulture, agribusiness, logistics and data centers.[21] The average size of a greenhouse in the Netherlands is between 2.5 and 3 hectares, whereas in Agriport it is about 60 hectares.[22] Large-scale greenhouse horticulture makes up by far the largest part in terms of space use with 630 hectares, 40 hectares are used as a business park and 75 hectares are used for other non-related clusters. The companies choose Agriport as their business location because of the available land, proximity to Amsterdam, energy infrastructure and also the shared residual flows. For example, one company uses waste materials from another company in the cluster as a raw material for the energy production.[23]

In Agriport, the growers have set clear reasons to work together. Farmers even mention that before moving to Agriport, cooperation was not strong enough but the establishment in the area led to conversations with the other growers. Agriport A7 also strongly supported such cooperation. For example, the most important collaboration between the growers, the energy cooperative ECW, is founded by Agriport A7 to make the area more attractive. There were parcels of land that had to be sold and all growers needed high-voltage electricity. However, it required large investments that individual growers could not afford. Agriport A7 founded Energy Combination Wieringermeer (ECW) and gave every company, which bought a parcel of land in Agriport, a share in ECW; currently, Agriport A7 has no share in ECW anymore.

[21] The technology and data cluster were also established on the territory due to the "large lots, a robust electricity network and redundant fiber optic connections with dark fiber to the Amsterdam Internet Exchange, and the possibility of using residual heat in the neighboring greenhouse horticulture companies, which will make it easier to disconnect from the natural gas network in the future".

[22] Source: https://www.fdiintelligence.com/article/61974.

[23] Source: https://investinnhn.com/invest/investment-opportunities/agriport-a7.

Besides ECW, there are many other types of collaboration among growers. Some companies are doing joint cooling, packaging and sorting of the products. Furthermore, some companies have a collective employment agency. Currently, five companies are united under a packaging cooperative.

Besides internal cooperation, growers in Agriport also cooperate with Westland cluster members, which serves as a logistical hub for the Agriport cluster members as well. Greenport NHN is an important organization when it comes to collaboration in the vertical chain. For example, they are collaborating with vegetable processors to increase the durability of bell peppers.

In the development of the greenhouse cluster, the Municipality of Hollands Kroon also takes a facilitating role and actively cooperates with Agriport 7 when required.

As a result of joint efforts of a developer, enterprises, associations and cooperatives, as well as municipal Government, today Agriport is a well-developed cluster that is further growing and attracting more and more investments.

8 | VITAL STATISTICS OF THE GREENHOUSE SECTOR IN GEORGIA/IMERETI

8.1 MAIN ECONOMIC INDICATORS

Number of Greenhouses and Their Size

Official statistics on the number of greenhouses in the region is not available. Geostat data shows only 18 enterprises registered under NACE Rev.2 Code 01.13.0 "Growing of vegetables and melons, roots and tubers". However, according to the multiple sources of experts, the number of greenhouses in the region is more than 3,000, most of them located in Tskaltubo municipality. Based on the interviews with various stakeholders and experts, approximate concentration of greenhouses in each region was identified.

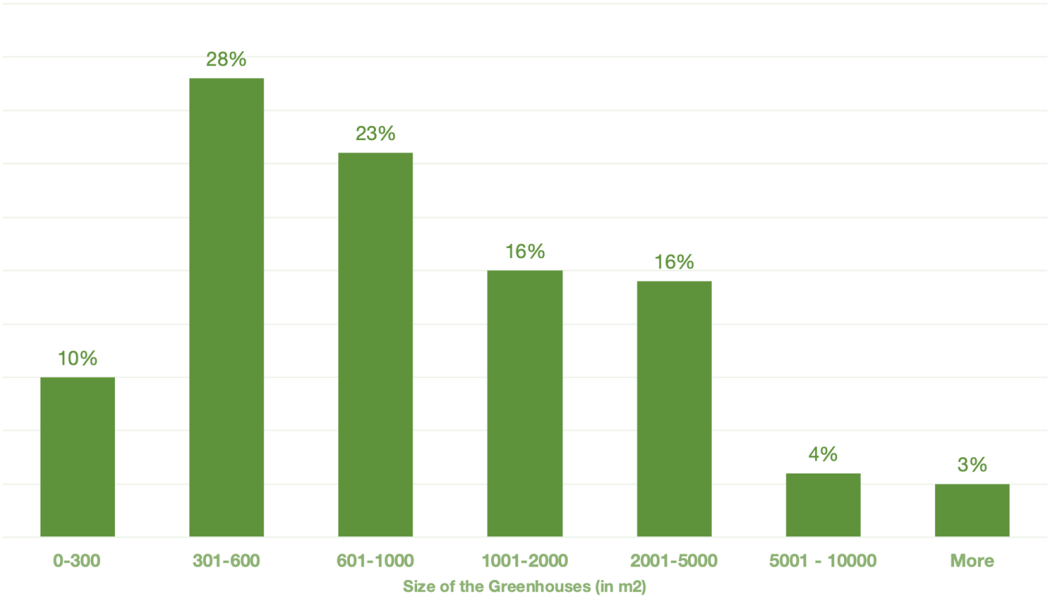
Table 2: Distribution of Greenhouses by Municipalities in Imereti Region

REGION	% IN TOTAL
TSKALTUBO	90%
SAMTREDIA	4%
BAGHDATI	4%
KHONI	1%
ZESTAPONI	1%
VANI	1%
KHARAGAULI	0%

Source: Expert Estimates Based on Multiple Sources of Evaluation

The majority of the greenhouses in the region are small in size and in a range of 300-600 m^2. Only few of the greenhouses in the region are more than 1 ha (10,000 m^2).

Chart 3: Frequency Distribution of the Interviewed Greenhouses by Their Size (m2)



Source: Survey of Greenhouse Farmers, TBSC Consulting

Employment and Average Income

Official statistics of employment and the average income of laborers is not available on vegetables or/and greens level neither for Georgia nor for Imereti region specifically. However, based on a survey it was identified that most of the greenhouses are family-owned and, on average, three family members are involved in cultivation and business operations. Around 60% of the interviewed enterprises stated that 1 to 3 family members help in the greenhouse business. Additionally, greenhouse owners hire a seasonal workforce for the harvest season. Most of the greenhouses have established connections with a group of workers and tend to hire the same people throughout the seasons, though some rotate such workers. Depending on the size of the greenhouse and the types of products cultivated, greenhouse owners hire 3 to 20 workers per harvest day/week. Most of the small greenhouses hire up to 10 seasonal workers per week, while larger greenhouses can hire more than 20-40.

The large majority of the respondents stated that employment has remained somewhat unchanged over the period of in 2016-2019.[24] Only 6% of the respondents have increased employment in the named period.

Table 3: Change in Employment Among Interviewed Greenhouses, 2016-2019

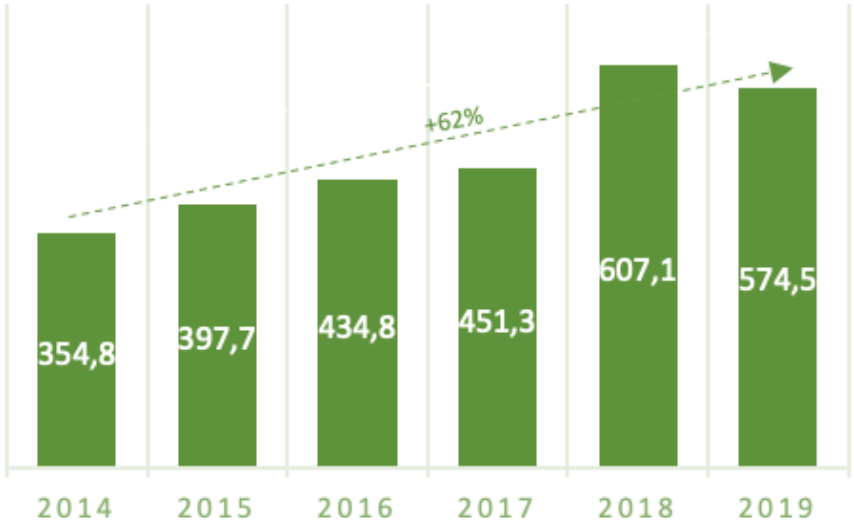
	NO CHANGE	INCREASE	DECREASE	UNSTABLE
NUMBER OF GREENHOUSES	112	9	28	5
SHARE IN TOTAL	73%	6%	18%	3%

Source: Survey of Greenhouse Farmers, TBSC Consulting

The average income of the employed has been increasing except in 2018-2019, with a 6% decrease in these years, amounting to 574,5 GEL per month.

[24] 2020 was reviewed separately to identify impact of the Covid-19.

Chart 4: Average Monthly Remuneration for Agriculture, Forestry and Fishing Sectors in Imereti (in GEL)

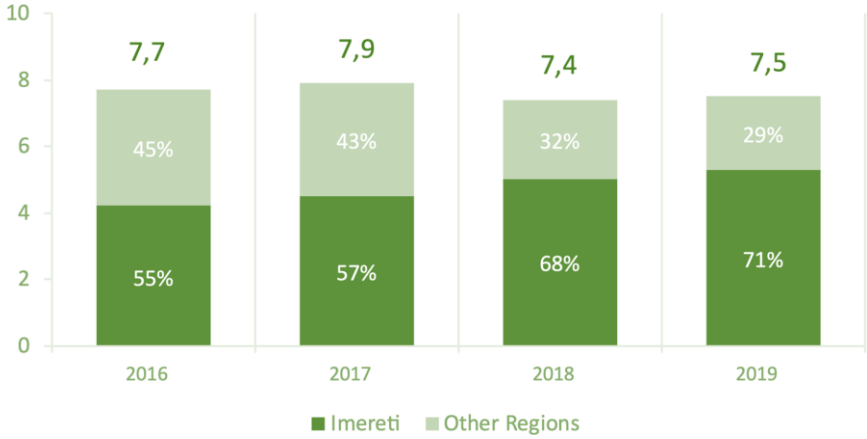


Source: Geostat

Production Volume

Production of greens in Georgia has been somewhat stable in the last four years, though production in Imereti region has increased annually. In 2019, Imereti produced 71% of greens produced in Georgia. This is a positive economic trend for the cluster and illustrates regional competitiveness in the country.

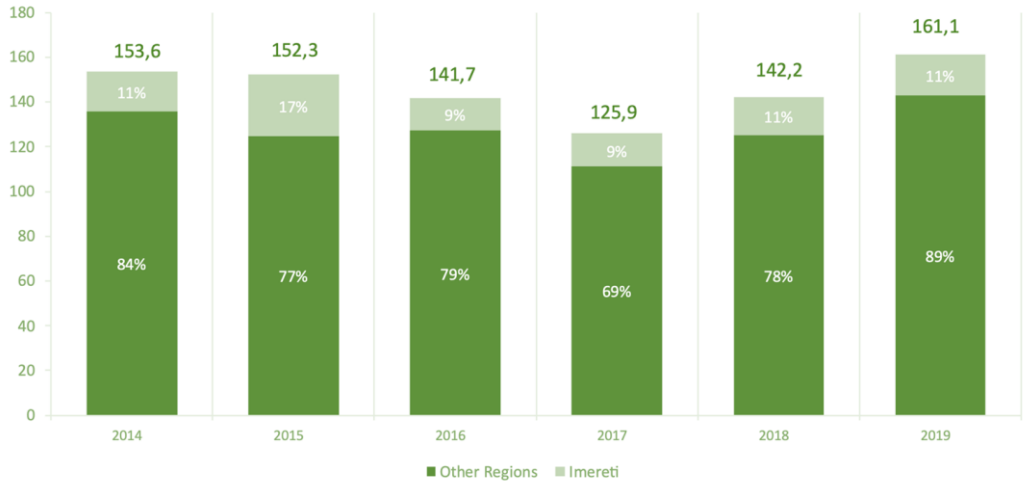
Chart 5: Production of Greens in Georgia (Thsd. Tons)



Source: Geostat

Production of all vegetables in Imereti has also shown growth tendency in the last four years amounting to 18,100 tones in 2019, which was around 13% of total Georgian vegetable production. However, Imereti region does not have as significant advantage in production of various vegetables as compared to other regions as in the case of herbs and greens specifically. Though, while Georgian vegetable sector grew by 5% in 2018-2019, the sector in Imereti grew by 25% which shows some competitiveness of the region in the country.

Chart 6: Production of Vegetables in Georgia (Thsd. Tons)

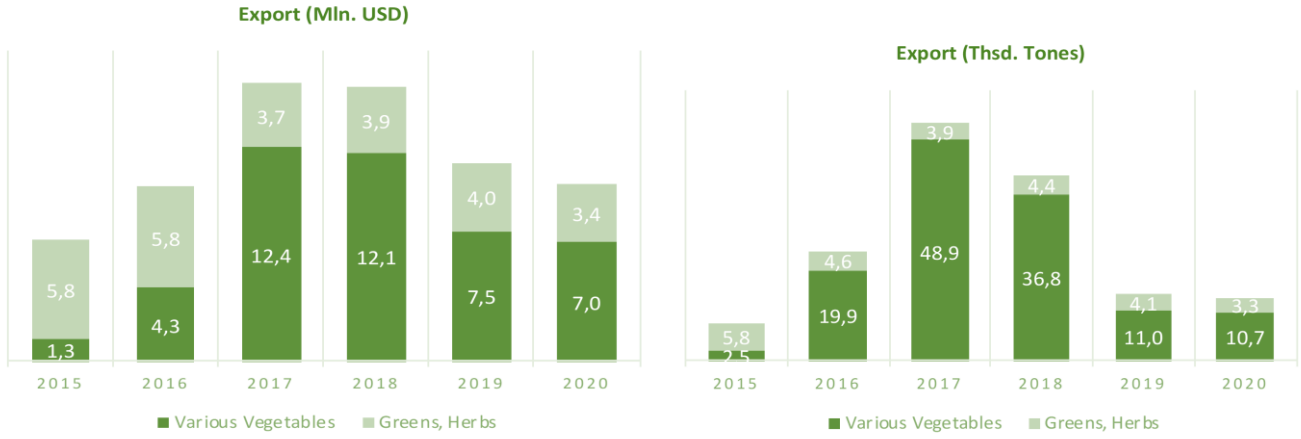


Source: MEPA

Export and Import[25]

Exports of vegetables in total have shown a negative growth tendency and have decreased by more than 100% in the last three years. Export of greens has been fluctuating in the last 6 years. It declined in 2017 but started to grow again up until 2020. In 2020, since the Covid-19 outbreak, exports were declined and amounted to 3,4 Mln USD which is the lowest number in recent years.

Chart 7: Vegetables and Greens and Herbs Export from Georgia (Value and Quantity), 2014-2020[26]



Source: Geostat

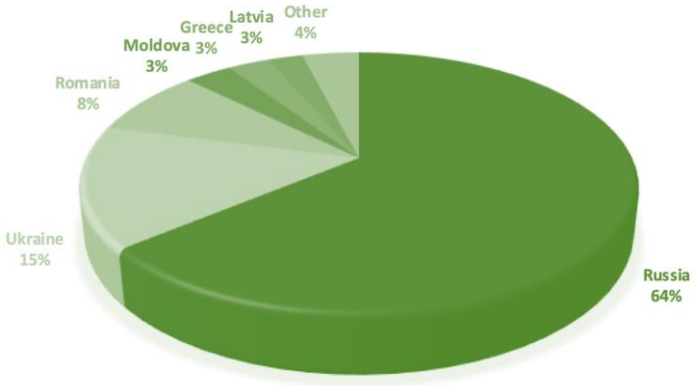
For the vegetables sector generally, main export countries are Russia (52%), Armenia (10%) and Azerbaijan (6%), followed by Ukraine, Romania and Turkey with less than 5% share each.

[25] Fresh herbs are not accounted with a separate HS code, therefore, export and import data exclusively for herbs is not available. However, large majority of the herbs from Georgia are exported under HS Code "070999 Fresh or chilled vegetables n.e.s." together with some exports of greens under 070920 (asparagus), 070970 (spinach), 070940 (celery), which have been used for export and import statistics in this report. For the vegetables' exports/imports, "07 Edible vegetables and certain roots and tubers" HS code was used.

[26] Data for 2020 is preliminary and is subject to clarifications/editing. However, generally, changes in the final data are not significant as compared to the preliminary statistics.

For herbs and greens, Russia and Ukraine remain the first positions in terms of value exported. Though Romania, Moldova, Greece and Latvia should also be mentioned as in total around 662 tons of herbs and greens were exported to these markets.

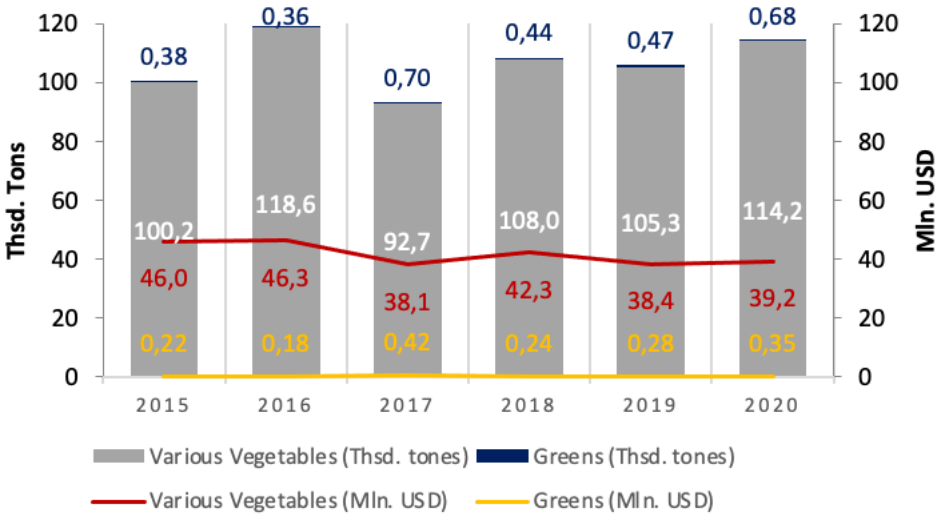
Chart 8: Main Exports Markets for Georgian Herbs and Greens by Product Volume, 2019



Source: Geostat

Import of greens and herbs have been somewhat stable in recent years, both in terms of value and quantity, though has increased slightly in 2016-2017. However, in all years analyzed Georgia has shown a positive trade balance for greens- exports always exceeding imports. Imports of vegetables fluctuated over the years, but not significantly, with an increased value between 2019-2020.

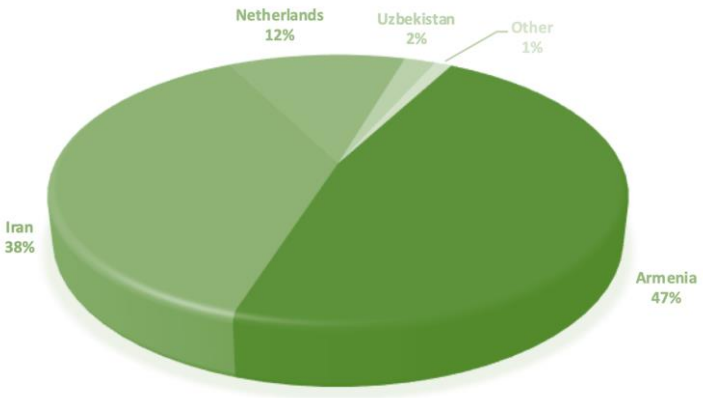
Chart 9: Vegetables and Greens Import in Georgia (Value and Quantity), 2014-2019



Source: Geostat

For the vegetables sector generally, major importers in Georgia are Turkey (54%), Uzbekistan (10%), Azerbaijan (8%) and Iran (7%). Herbs and greens are mostly imported from Armenia, followed by Iran, Netherlands and Uzbekistan.

Chart 10: Main Import Markets of Herbs and Greens in Georgia by Product Volume, 2019

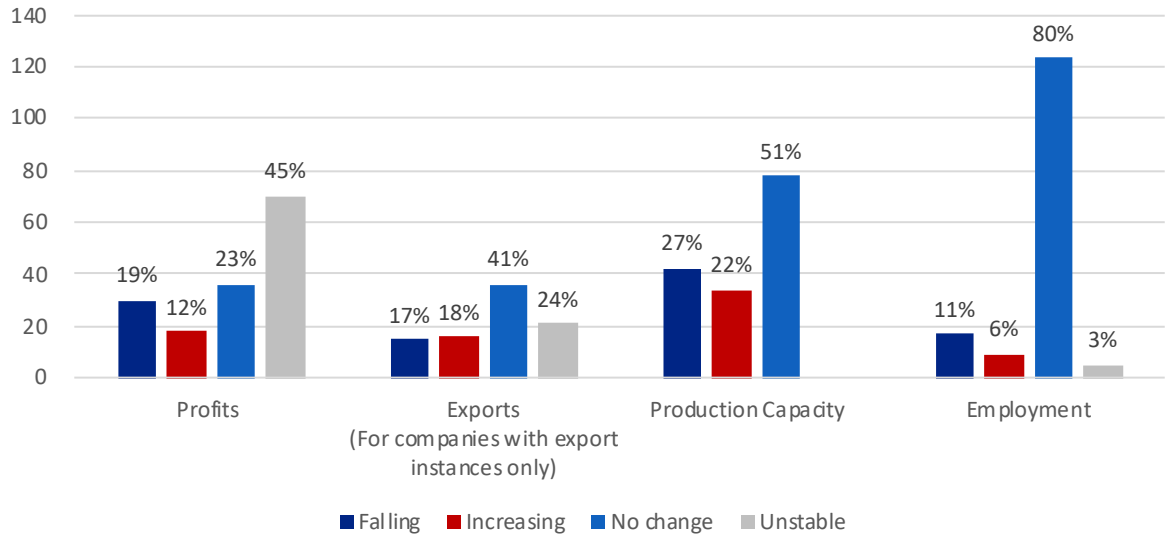


Source: Geostat

Change in Main Business Indicators

Interviewed farmers were asked to indicate tendencies on some of the main business indicators in the period of 2016-2019.[27] There is a mixed picture in terms of profits among the interviewed farmers, which is a direct result of high price fluctuations on main products produced (especially herbs). Production capacity has remained unchanged for most of the farmers as a majority of them already have a quite high-capacity utilization. A large majority of the greenhouse owners did not state significant change in employment either as they hire roughly the same number of workers every season.

Chart 11: Change in Main Business Indicators, 2016-2019



Source: Survey of Greenhouse Farmers, TBSC Consulting

[27] Impacts of Covid-19 and 2020 is discussed separately later in this report.

8.2 SERVICE PROVIDERS

Cold Storage Facilities

Availability of cold storage facilities in the region is an important aspect for the cluster development, especially for increasing exports of non-fresh products and selling products off-season. The results of the Survey of Slaughterhouses, Elevators and Refrigeration Facilities carried out by Geostat in 2019 showed that there are only four cold storage facilities currently operating in Imereti region. At the same time, according to RDA, there were 9 cold-storage facilities in Imereti co-financed through the preferential agro-credit since 2013.

Table 4: List of Cold-storage Facilities in Imereti Region Co-Financed Through the Preferential Agro Credit Project

	COMPANY NAME/BENEFICIARY	TYPE	MUNICIPALITY
1	LTD Geguti 2005	Cold storage	Tskaltubo
2	IE Robert Nadiradze	Cold storage	Samtredia
3	LTD Ukhvi	Cold storage	Tskaltubo
4	IE Malkhaz Tvaliashvili	Cold storage	Kutaisi
5	Cooperative Spartaki	Cold storage	Vani
6	IE Vasil Gikashvili	Cold storage	Zestaponi
7	Cooperative Agromomavali	Cold storage	Zestaponi
8	LTD Herbia	Cold storage	Tskaltubo
9	IE Bejhan Tvaliashvili	Cold storage	Tskaltubo

Source: RDA

Laboratories

Farmers who are willing to carry out soil laboratory analysis there is a laboratory in Kutaisi, as well as in neighboring region of Guria. However, according to the research conducted by FAO, most of the farmers who have done such testing previously used a laboratory in Tbilisi.

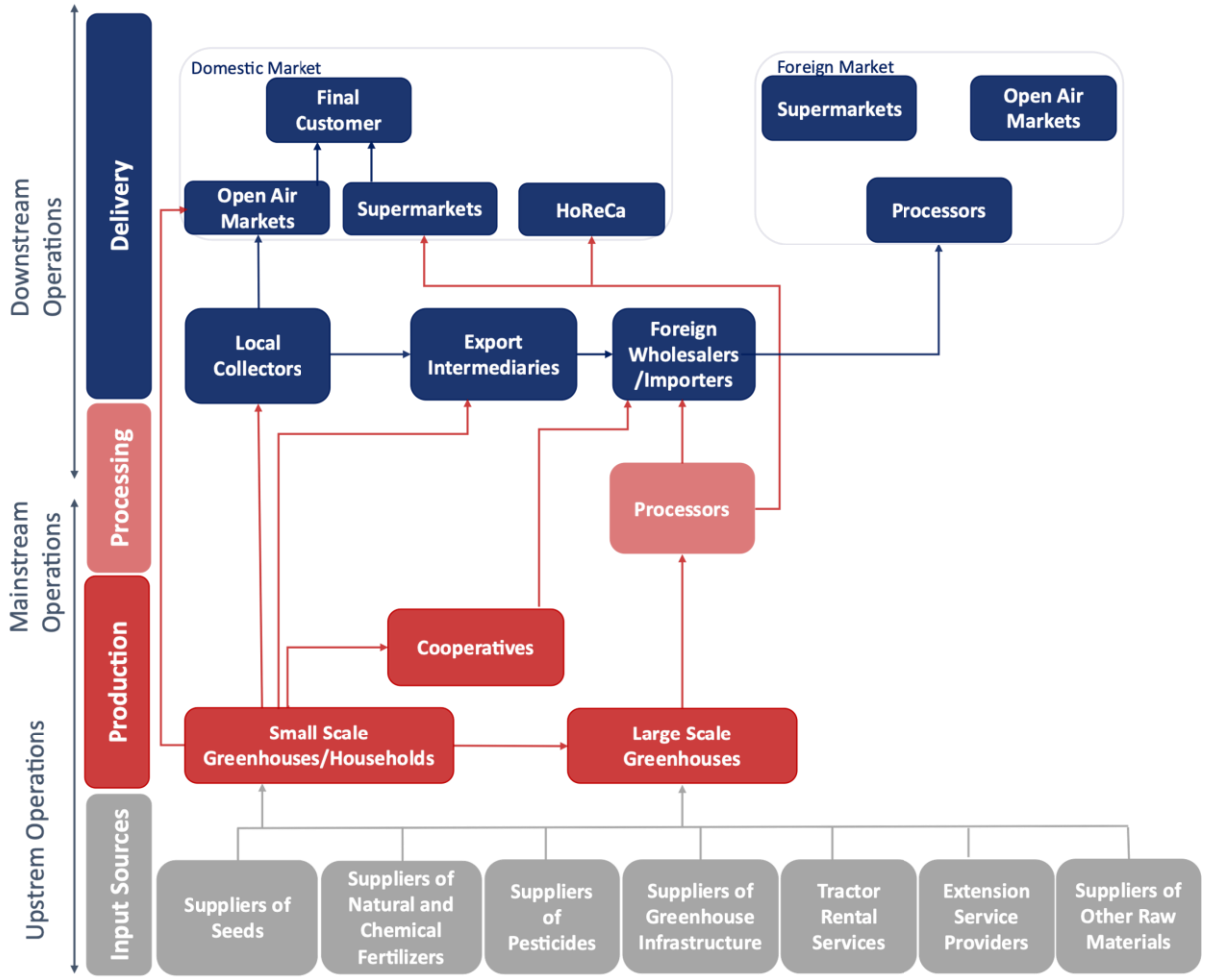
9 | COMPARATIVE VALUE CHAIN ANALYSIS OF HERBS PRODUCTION

This chapter analyzes herbs cluster value chain in Imereti, its main actors and the value addition along the way. Afterwards, the analysis includes parallels and comparisons with the benchmark countries.

9.1 GEORGIAN HERBS VALUE CHAIN ANALYSIS

The following chart illustrates the herbs value chain in Imereti that is described later in this section.

Chart 12: Herbs Value Chain in Imereti



Source: TBSC Analysis

Main Value Chain Actors

Suppliers of Inputs. Suppliers of seeds, fertilizers, pesticides and greenhouse infrastructure are mostly located in Imereti region, which purchase inputs from importers in Tbilisi. Availability of quality materials in the region is sometimes limited, and farmers have to sacrifice quality over the price or/and availability. Some of the larger greenhouses import directly from foreign producers or purchase in Tbilisi from the importers.

Small Scale Greenhouses. These are usually households that have 3-4 greenhouses in the proximity of their houses. These greenhouses are not oriented towards commercial production and mainly sell their products to the domestic market through small wholesalers (which deliver products to the open-air markets), directly to the open-air markets and to export intermediaries in smaller quantities. Export intermediaries usually purchase herbs from several farmers, consolidate and then supply foreign importers (usually in post-soviet countries).

Post-harvest value addition is very limited in the case of small greenhouses. Farmers usually sell harvested herbs on the day of harvest, without any storage or processing. After the harvest, farmers only filter herbs to remove damaged ones and put selected herbs together with rubber bands. Though in the case of selling

to export intermediaries, the small greenhouses farmers sometimes keep herbs in storage for few days and pack them in carton boxes.

Large Scale Greenhouses. There is only a limited number of large-scale greenhouses in the region. These large greenhouse farms produce herbs and also purchase from several farmers to prepare for bulk sales. Contracts are not very common between small and large-scale greenhouses and transactions depend on verbal agreements annually. The exception is Herbia that uses contract manufacturing with several farmers, and also has a processing factory where herbs are packed and packaged. These greenhouses either supply larger supermarkets or sell to foreign importers (also mainly in post-soviet countries).

Cooperatives. There are several cooperatives (officially registered 18 cooperatives), mainly established through donor or governmental funding. These cooperatives usually have cold-storage warehouses, where around 15-20 members store herbs before supplying foreign importers.

Local Collectors. These are intermediaries that purchase herbs from small-scale farmers and then resell them to the open markets. They usually try to pressure prices and purchase at as low price as possible. No contract manufacturing practice is observed between local collectors and farmers. Transportation is usually arranged and covered by the collectors.

Export intermediaries. These are the middleman between farmers and foreign importers, who do not own any greenhouse and concentrate solely on reselling. These intermediaries usually do not have contracts with the farmers and each year negotiate prices based on the market situation. They usually have high bargaining power, set prices and only purchase from farmers that agree on their price terms. In most cases, export intermediaries provide and cover costs of transportation, storage and packaging. According to the interviewed farmers, there are around 10 export intermediaries, some of which own cold storage facilities and some rent from others.

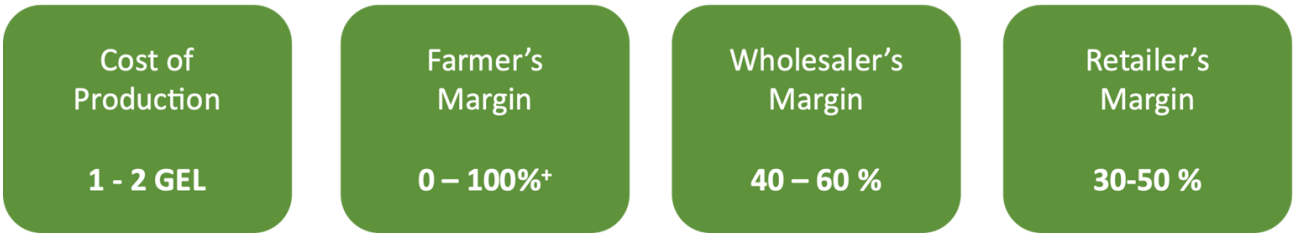
Supermarkets. Supermarkets purchase packaged and non-packaged herbs, mainly from large-scale greenhouses or collectors. The main criterion for the supermarkets is continuous supply and relevant certification in some cases (e.g., certificate that states that the product is produced without chemical fertilizers). At the same time, according to one of the respondents, there is a growing trend among consumers of shopping at supermarkets as compared to open-air markets, as well as increasing demand for packaged goods. This was confirmed during the interviews with the supermarket chain, which mentioned these preferences as the major drivers of the growing success of Herbia (the only seller of packaged herbs). Demand for the same quality products and packaged herbs is expected to increase in the future, which can create new opportunities for the farmers.

Costs and Margins

Costs and margins vary by seasons (on-season vs off-season), where it is sold (regions vs capital, open market vs supermarket), what is the export price and so on. Therefore, costs and margins vary as well. The cost of production of 1 kg of herbs is around 1,6 GEL on average for a farmer. The majority of the costs come from the workforce, which is around 50-55% of the total production costs. If the farmer is in charge of transportation to the collector or export intermediary, then around 0,05 GEL (for unrefrigerated trucks) is added to cover this cost. Regarding farmer's markup – this is fluctuating a lot from year to year, and even day to day according to the respondents. There are years when farmers have the highest markup, more than 100% (e.g., in March 2021), while in other seasons there can be no markup at all, and producers have to sell at the price of cost of production.

As interviews indicated, on average markup of a wholesaler is around 40-60%, while for retail stores it is around 30-50%.

Chart 13: Costs and Margins for Herbs Value Chain in Imereti



Source: TBSC Analysis

9.2 SUMMARY COMPARISON OF GREENHOUSE CLUSTERS

The table below summarizes various aspects of value chain characteristics, as well as general cluster/sector features, compared to available information on benchmark clusters.

DOMAIN FOR COMPARISON	ALMERIA GREENHOUSE CLUSTER	AGRIPORT GREENHOUSE CLUSTER	IMERETI GREENHOUSE CLUSTER
CLUSTER LOCATION AND CONCENTRATION	• Favorable climate conditions of the region • 60% of the Spanish greenhouses concentrated in Almeria around which agro-industrial cluster has developed • Close proximity to the EU markets as an advantage of the cluster	• Favorable climate conditions of the region • One of the most developed clusters in the country, initiated and developed by private developer Agriport A7 • The available land, energy infrastructure and proximity of Amsterdam as an advantage of the cluster • Proximity to the EU markets as an advantage of the cluster • Proximity to the well-developed Westland cluster which is a logistical hub for the region	• Favorable climate conditions that result in unique taste and fragrance of the products (especially herbs) • Highest concertation of greenhouses in the country • Favorable location (proximity to the airports and ports) • Strong support from the Government which established developer Imereti Agro Zone • Cluster still at early stages of development
GREENHOUSE CHARACTERISTICS	• Average landholding of 2 ha, most held by farmers or SMEs who are members of the 80 agricultural cooperatives and producer organizations • Mainly plastic greenhouses	• Cluster of large-scale horticulture projects – the average size of a greenhouse about 60 hectares • Advanced, high-tech greenhouses	• Average landholding of 0,05 ha • Mainly polyethylene plastic greenhouses

EXISTING COLLABORATION	• Strong concentration and collaboration among various value chain members of the cluster (farmers, buyers, input and service providers, equipment providers, R&D institutions) • Strong cooperatives and associations operating on the market	• Existing strong cooperation in several areas such as joint processing/packing of the products as well as ownership of an energy company • Agriport A7 as a strong facilitator of the collaboration among companies • Existing associations and cooperatives among cluster members	• Some level of collaboration among farmers • Limited collaboration examples with other players of the value chain (e.g., collectors, exporters, R&D institutions) • Limited number and capacity of cooperatives and associations
INPUT AND SERVICE PROVIDERS	• Large number of input and service providers located on cluster premises or in proximity • Strong rivalry and high quality of domestic inputs	• Input and service providers operating on the premises of the cluster • Strong external connections with other clusters in the country, especially with the Westland Greenhouse Cluster	• Limited access to quality inputs and services • Moderate rivalry among input and service providers in the region
LABOR FORCE	• Good access to skilled and semi-skilled labor • Availability of relatively cheap labor due to the influx of migrants from Eastern Europe and North Africa	• Good access to skilled labor • Collective employment agencies among growers	• Good access to semi-skilled labor • Competitive labor costs
VALUE ADDITION	• High post-harvest value addition • Modern standard processing plants on the premises of the cluster • Processing mainly centralized in cooperatives and associations	• High post-harvest value addition • Modern standard processing plants on the premises of the cluster	• Lack of processing plants • Limited post-harvest value addition

		• Joint actions on the processing level (e.g., five companies united under a packaging cooperative) • Good access to the Westland cluster - a logistical hub	
MEANS OF SALES	• Majority of the products sold through cooperatives that are usually members of a larger association with significant marketing capacity, or through Sociedades Agrarias de Transformación or SAT, with a smaller proportion of farmers selling their products through agricultural trading and bidding firms and an even smaller proportion selling their products using private marketers • The surveyed farmers are divided equally among cooperatives (40 %) and, a special type of civil society for the production, processing and marketing of agricultural goods (38 %) • Strong bargaining power of farmers through cooperatives and joint sales/actions	• Strong bargaining power of growers due to their size and strong existing cooperation • Growers sell jointly through the cooperatives and associations, or directly to the European buying centers and large supermarket chains	• Farmers usually sell products individually to the collectors/export intermediaries or open-air markets • Few cooperatives that sell member farmers' products • Limited bargaining power of farmers due to the lack of joint actions
QUALITY STANDARDS AND REQUIREMENTS	• Subject to strict national and European quality and safety assurance procedures	• Subject to strict national and European quality and safety assurance procedures	• Large majority of the farmers and processors do not meet

			requirements of high-value markets (e.g., the EU) • Only phytosanitary certificate and certificate of origin are issued for the exports
EXPORTS AND ITS POTENTIAL	• Member state of the EU, which gives the cluster beneficial trade opportunities • Relatively stable prices on target export markets • Developed infrastructure and logistics in the country • Ability of the cluster members to meet the most vigorous quality requirements of the export destination countries • Strong marketing network of Almeria's associations and cooperatives with the buyers across the EU (and not only)	• Member state of the EU, which gives the cluster beneficial trade opportunities • Relatively stable prices on target export markets • Highly developed infrastructure and logistics in the country • Ability of the cluster members to meet the most vigorous quality requirements of the export destination countries • Strong marketing network of growers, cooperatives and associations with the buyers across the EU (and not only)	• DCFTA that lets the cluster export with preferential trade regime • Close proximity to the traditional export markets (post-soviet countries) and strong marketing networks • High price fluctuations on main export markets • Limited development of infrastructure and logistics necessary for exports • Lack of financial and technical capacity to meet the quality requirements of the new, high-value export countries • Lack of marketing networks on new, high-value markets
R&D ORIENTATION	• Center of the R&D in Spain in horticultural direction • Farmers and R&D centers located in close proximity, with constant cooperation among them	• Leading country in terms of innovation and R&D in the horticulture sector, which is reflected in almost every cluster in the country • Continues investments in R&D among Agriport cluster members	• Limited R&D capacity and development

SUPPORT INSTITUTIONS	• The Spanish Government and the EU support the cluster through infrastructure, technical advice and access to finance	• Strong cooperation between the municipality and the Agriport A7	• Strong support from the Government through establishment of IAZ • Existing donor programs that work on financial and technical strengthening of the sector generally

10 | NATURE OF COOPERATION

The following Chapter describes the activities of various technical and financial institutions and other relevant bodies (e.g., NGOs) along with their current linkages. The nature of cooperation and its potential among core firms is also described. At the end of the Chapter, a co-operation matrix scores the current status of the linkages of the various networks and stakeholders (principal firms, support institutions).

10.1 SUPPORT INSTITUTIONS

NNLP Rural Development Agency, The Ministry of Environmental Protection and Agriculture of Georgia

NNLP Rural Development Agency implements a variety of programs/projects initiated by the Ministry of Environmental Protection and Agriculture of Georgia and manages subordinate agricultural companies. The agency is one of the key supporters of the greenhouse cluster in Imereti.

The most important activity of the agency is the implementation of the "Preferential Agrocredit Project" since 2013. Within the frame of the project, the enterprises engaged in the processes of primary agricultural production, processing and storage can receive preferential agro credit/agroleasing from the financial institutions for fixed and current assets. This project involves commercial banks and financial institutions that grant agro credits.

Another state program offered by the RDA is "Agro-Production Promotion" which aims to promote the primary production of annual and perennial crops. The amount of co-financing of the Agency per beneficiary for arranging the greenhouse and/or irrigation system amounts up to 50% (but not more than 50 000 GEL), and in the case of an agricultural cooperative, the shareholders of which have contributed to it not less than 70% share and have not less than 0.1 ha agricultural land, the amount of co-financing shall be determined not more than 50% of the value of goods/services to be procured (but not more than 500 000 GEL). The program was just launched in 2020 and already has 22 greenhouse beneficiaries in Imereti region.

In 2015, the RDA also implemented the "Program of Agro-Production Promotion", within the framework of the "Agriculture Modernization, Market Access and Resilience project "(AMMAR). The program was funded by the International Fund for Agricultural Development (IFAD) and the Global Environment Facility (GEF), allocating around 10 Mln GEL to greenhouses in Georgia, including Imereti.

Another relevant program is "Co-financing of Processing and Storage Enterprises" which is an important part of the cluster development and has been operating since 2014. In the frame of this project, processing and storage facilities can receive co-financing of up to 40% of the total costs, which can be up to 500 000 GEL.

Table 5: Number of Beneficiaries of Various RDA Financed Projects in Imereti, as of 2021

	NUMBER OF GREENHOUSE BENEFICIARIES	NUMBER OF STORAGE AND PROCESSING FACILITY BENEFICIARIES
PREFERENTIAL AGROCREDIT PROJECT	691	11
AGRO PRODUCTION PROMOTION	22	-
AMMAR	21	-
CO-FINANCING OF PROCESSING AND STORAGE ENTERPRISES	-	1

Source: RDA

All above mentioned projects were oriented on improving infrastructure in the sector (financing fixed assets only), both in primary agriculture (greenhouses) and post-harvest handling (cold-storage facilities). As a result, existing greenhouses were able to improve greenhouse technology and equipment (e.g., installing heating systems), as well as new greenhouses and cold storage facilities were established. There is no study or official statistics showing impact on the revenues as a result of the state assistance programs, but the evidence suggests that the impact of the programs is immense. According to RDA estimates, majority of the greenhouse beneficiaries and all cold storage facilities listed above in the table were established with the financial support received through the state programs (as opposed to developing existing facilities).

Lastly, once the IAZ project is launched and implementation starts, the agency is considering the possibility of creating grant programs for the mentioned project participants/beneficiaries. Therefore, financial and technical support can be provided in this regard.

LEPL National Food Agency

The National Food Agency is a legal entity of public law in the field of agricultural management in Georgia, which creates a *"desire for safety and quality".* The Agency operates since January 3, 2011.

National Food Agency is responsible for issuing phytosanitary certificates required for exports and for activities that control/enforce plant protection codes in Georgia. This also includes inspections of farmers. The agency operates several regional representative offices in Imereti region where exporters can apply for the certification.

The LEPL Scientific-Research Center of Agriculture (SRCA)

The LEPL Scientific-Research Center of Agriculture (SRCA) was established in 2014 by the Government of Georgia, to restore scientific-research activities in the agricultural sector. The center has published several informational brochures and carried out research projects on the proper cultivation of various vegetables (e.g., cucumber, tomatoes) to spread the knowledge among farmers. Information on herbs production is limited and not available to the farmers. There is a lack of information on growing vegetables and greens in greenhouses specifically. However, the center has published several papers on the comparison of different greenhouse technologies in Georgia and recommendations for the farmers in this regard.

The center has a demonstrative base of annual crops in Mtskheta region. Several activities are carried out on this base: elite seed production of annual crops and testing of species, cold storage for seedlings and planting material, seed and seedling material certification and standardization laboratory, production of

bio (organic) products. It also covers several greenhouses and demonstrative areas. Although, such a base does not exist in west Georgia where climate and soil properties differ from the Mtskheta region.

It should be noted that the process of voluntary certification of planting material began in 2018 and is carried out by the Scientific-Research Center of Agriculture. The process of certification of planting materials is regulated by law, the purpose of which is to define the unified principles of state regulation in the field of protection of seeds and planting material and to provide the market with quality seeds and planting material.

Overall, the R&D direction of greens and vegetables in Georgia is still developing and there is a need for active communications between local centers and international R&D institutions in this field, to be able to bring the best international practices that can be customized to Georgian greenhouse owners' needs and specifications.

Georgian Chamber of Commerce and Industry (GCCI)

Georgian Chamber of Commerce and Industry is the biggest business union in the country. The Chamber collaborates with leading Donor Organizations and implements projects and activities tailored to the business needs. The chamber has the largest regional representation in Georgia, including the regional chamber in Imereti. This chamber is in charge of issuing a Certificate of Origin for herb exports if the export destination country has such a requirement. Additionally, the chamber has contributed significantly to the establishment of "Georgian Herbs Producers Association" in Kutaisi.

Georgian Herbs Producers Association

Georgian Herbs Producers Association was founded in 2017 and today unites owners of greenhouses and cooperatives, with a total of around 30 companies/cooperatives, which include more than 200 individual farmers. The GCCI provides technical support to the association, e.g., the office, meeting rooms. The association also actively cooperates with various donor organizations to organize various activities for the members. For example, in the frame of "SME Development and DCFTA in Georgia" with the support of GIZ and the European Union, the association has conducted trainings for its members on GLOBALG.A.P. certification and its requirements. Currently, the association does not have paying members and operates with somewhat limited financial resources, and support of third-party organizations.

Imereti Agro Zone (IAZ)

Imereti Agro Zone (IAZ) is an LLC founded and owned by the Rural Development Agency of Georgia (RDA), intending to create a Greenhouse Cluster in Imereti with a one-window service principle and a full value-added chain production by implementing the IAZ Greenhouse Cluster Project. In the frame of this project, the infrastructure and greenhouses will be developed on a total area of up to 220 ha in Tskaltubo and Baghdati land plots. The cluster will unite investors, farmers, support service providers, distributors, exporters, R&D and educational centers in one place while benefiting from proximity to the Kutaisi International Airport. The Government on its side will contribute by providing and developing all necessary infrastructure.

The goal of this project is to create a cluster where the majority of the producers cultivate homogenous products with the same quality standards and have access to other certified players of the value chain (e.g., packing facilities, exporters, distributors). As a result, Imereti will have a larger mass of homogenous products that will be suitable for a continuous supply of high-value markets.

Donor Agencies

Several donor organizations are operating in Georgia that provide various technical and financial programs for the Georgian agricultural development, that also cover herbs and vegetables in Imereti. These organizations include the UN Food and Agriculture Organization, EBRD, International Fund for Agricultural Development (IFAD), USAID and so on.

EU4Business-EBRD Credit Line is one of such support programs, consisting of loan/leasing finance and cash-back incentives financed by the EU. The initiative is designed to support Georgia's SMEs and entrepreneurs in aligning their businesses with EU Directives, helping them reach out to new market opportunities by investing in upgrades of their production processes and services.

In 2018, Food and Agriculture Organization (FAO) and the European Bank for Reconstruction and Development (EBRD) organized international conference Herbs of Georgia in Kutaisi. The event was supported by the EU in the framework of EU4Business Initiative and in close cooperation with the Ministry of Environmental Protection and Agriculture of Georgia and attracted over 60 participants from the industry. The goal of the event was to highlight investment opportunities in the culinary herbs value chain based on the findings of value chain assessment and technological audit carried out by the team of international and national experts.[28]

FAO is also supporting measures related to the alignment of food safety measures with EU legislation, animal health protection, surveillance, monitoring and traceability system, and approximation of phytosanitary legislation and standards to international and EU standards. In this frame, FAO has provided technical assistance to support the sustainable development of seed production by promoting a seed certification system in Georgia.

The USAID Agriculture project focuses on promoting selected value chains categories, which also includes herbs, perishable vegetables and berry crops. The program has two directions – grants and technical assistance, which provide projects for all actors of the value chains (farmers, collectors, processors, exporters, etc.). The grants component offers various co-financing opportunities, while the technical assistance component is oriented on increasing the capacity of the value chain actors and increasing the quality of education/knowledge.

In the frame of the technical component, the project provides continuous support to the farmers to adopt various food safety standards and certificates, including GLOBALG.A.P. This includes co-financing of up to 50% of the adaptation costs (consultations, restructuring, certification process). At the same time, to increase the awareness about the GLOBALG.A.P. certificate USAID Agriculture Project has conducted trainings for the farmers.

Another direction of the USAID Agriculture Project is increasing the capacity of the associations, and the project is planning to provide technical support to the Georgian Herbs Producers Association in Imereti in the nearest future. Additionally, the project is also planning to create demonstrative plants for herbs growing in Imereti, as well as in Guria and Adjara, to increase the quality of practical educational programs.

Lastly, organizations mentioned above (USAID, FAO, EBRD) are also closely coordinating and cooperating with the Imereti Agro Zone, and some of them have already provided support to this cluster development

[28] Source: http://www.fao.org/georgia/news/detail-events/en/c/1129910/.

initiative. Therefore, once the project implementation starts, more support is expected to come from these parties.

Educational Institutions

Akaki Tsereteli State University is the biggest university in the region, located in the regional capital Kutaisi. The university has an agrarian department that offers courses in the following direction: Agricultural Raw Materials for Food Production, Technology and Expertise, Agro Engineering, Agronomy, Garden and Park Agriculture, and Tourism. At the same time, the university has partnered with the Georgian Rural Development Department (GRDD) of the Georgian Institute of Public Affairs (GIPA) to develop short-term courses on herbs and vegetables growing through the financial support of the USAID Agriculture Project. The curriculum for the above-mentioned short-term courses has already been developed with the involvement of international and local experts and is currently undergoing the accreditation process. Courses are expected to open from September 2021; these two universities will also partner with various regional community colleges to increase their coverage. This can be a very positive step forward for the cluster development as currently, formal education in the field of greens and herbs cultivation, quality control, certification, processing or marketing is very limited.

Mechanization and Input Providers, Agricultural Extension Agencies

Several centers in the region offer mechanization services and sell various inputs. At the same time, some of them also offer consultancy and advice to the farmers. For example, “Agroservice” has united 28 independent Farm Service Centers across the country, more than half of them originally established by CNFA through the Millennium Challenge-funded ADA program. In Imereti, there are three such farmer service centers where farmers can purchase new technology, seeds, and chemicals, and also, can benefit from agro consultation upon purchase. Consultations mainly concern the proper usage of various inputs and raw materials. Cartlis is also another input supplier that was named by several producers. The company sells necessary inputs, technology and also provides consultations to the local farmers.

CORE FIRMS

Imereti region has a very strong concentration of farmers who produce the same variety of products in close proximity. Additionally, other actors of the value chain such as collectors, distributors, cold-storage warehouses, etc. are also located in the region. Therefore, despite the number of challenges, the sector has a solid potential for further cluster expansion and growth.

Furthermore, several existing collaboration practices were observed during the interviews which can also be considered as a positive sign of cluster development. For instance, a large producer Herbia cooperates with around 100-150 small farmers. Herbia gives directions and advice to the farmers, from which it purchases the harvest. The company uses contract manufacturing and has long-term relations with some of the herb suppliers.

The level of information and knowledge sharing among farmers is also high. For instance, 44% of the respondents of the survey of the greenhouse farmers stated that they are already cooperating in this regard, while another 33% are willing to cooperate in the future. There are “leader” greenhouses in villages from which other small-scale greenhouse owners learn. There are also successfully working cooperatives with around 10-20 members who share the knowledge and successful practices with each other. For example, cooperative Dovlati was founded in 2010 when most of the members had simple wooden

greenhouses. In the time frame of 10 years, with the support of the cooperative, most of the members were able to shift to the metal greenhouses with polyethylene roofing.

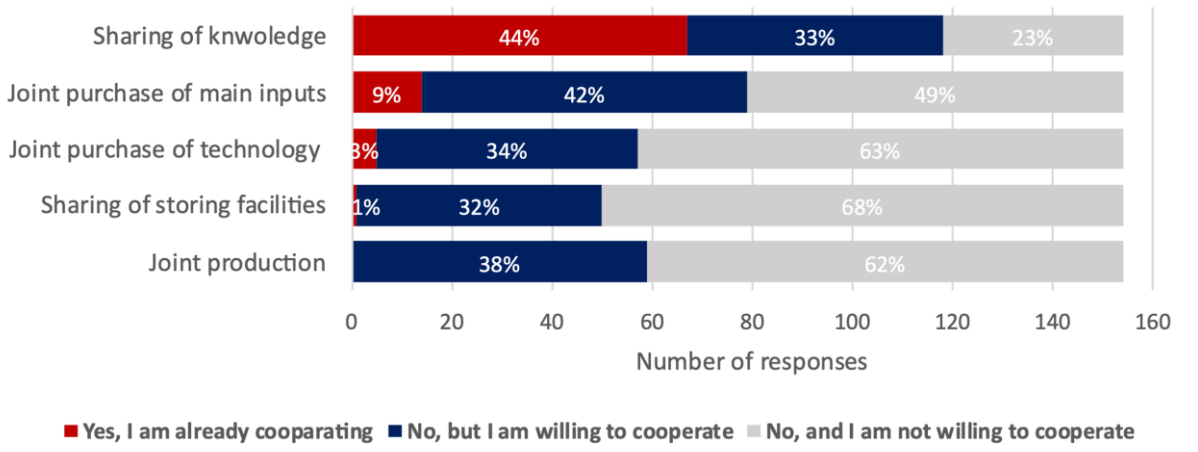
At the same time, in some exceptions, there are also a number of farmers who are not willing to cooperate due to the high competition, and do not share successful practices with neighboring farmers (or even share misleading information in some cases).

There is an interest and willingness to make joint input purchases to increase bargaining power over the suppliers and receive discounts. Among interviewed farmers, 9% are already cooperating in this regard, while 42% stated that they would like to cooperate in the future if the possibility comes. This is a positive indicator of collaboration and trust among farmers. Even though almost half of the respondents were unwilling to jointly purchase inputs, there seems to be a sufficient number of farmers willing to cooperate and possibly motivate others to do so as well in the long-term perspective.

Joint production practices were not observed in the market among interviewed greenhouse owners. Farmers see each other as competitors and find it challenging to cultivate greenhouses (62% of the respondents). However, if the farmers decide to enter new markets and receive quality certifications, joint production and collaboration of several small-scale farmers will be decisive.

Joint purchase of technology was observed among 3% of the respondents. The majority of them (63%) stated that they are not willing to cooperate in this direction. Generally, even though technology and equipment tend to be expensive, and costs can be shared among producers, sharing increases contamination risks. Additionally, farmers sometimes need the same technology and mechanization in the same period which makes sharing somewhat challenging.

Chart 14: Existing and Possible Cooperation Perspectives



Source: Survey of Greenhouse Farmers, TBSC Consulting

11 | COOPERATION MATRIX

Cooperation Matrix

	Family Farms	Medium Scale and Advanced Greenhouses	Collectors/Export Intermediaries	Foreign Wholesallers/ Importers	Suppliers of Raw Materials/Farmer Service Centers	Rural Development Agency	National Food Agency	Scientific-Research Center of Agriculture	Imereti Agro Zone	Georgian Herbs Producers Association	Georgian Chamber of Commerce and Industry	Donor Agencies	Educational Institutions	Total
Family Farms	X	2	2	0	2	3	1	1	1	2	1	2	1	18
Medium Scale and Advanced Greenhouses	2	X	1	3	2	4	2	1	2	3	3	2	2	27
Collectors/Export Intermediaries	2	1	X	3	0	3	2	1	1	3	2	2	0	20
Foreign Wholesallers/Importers	0	3	3	X	0	0	0	0	2	2	0	0	0	10
Suppliers of Raw Materials/Farmer Service Centers	2	2	0	0	X	2	1	1	1	2	0	2	0	13
Rural Development Agency	3	4	3	0	2	X	4	3	4	3	3	4	2	35
National Food Agency	1	2	2	0	1	4	X	3	3	2	3	2	1	24
Scientific-Research Center of Agriculture	1	1	1	0	1	3	3	X	2	1	1	2	2	18
Imereti Agro Zone	1	2	1	2	1	4	3	2	X	2	2	4	1	25
Georgian Herbs Producers Association	2	3	3	2	2	3	2	1	2	X	4	3	0	27
Georgian Chamber of Commerce and Industry	1	3	2	0	0	3	3	1	2	4	X	3	1	23
Donor Agencies	2	2	2	0	2	4	2	2	4	3	3	X	2	28
Educational Institutions	1	2	0	0	0	2	1	2	1	0	1	2	X	12
Total	**18**	**27**	**20**	**10**	**13**	**35**	**24**	**18**	**25**	**27**	**23**	**28**	**12**	**X**

Source: TBSC Analysis

Based on the evaluation, Rural Development Agency has the highest score, thus the strongest linkages with various players in this sector. The large majority of the projects initiated by the Ministry of Environmental Protection and Agriculture have been implemented by the agency which explains its long and well-established connections. The bilateral strongest linkages are observed between the agency and medium scale and large greenhouses, National Food Agency, Imereti Agro Zone and various donor agencies.

High score was also given to the large and medium greenhouses as over the years these companies were able to establish relations both with the private and public sector, benefiting from several support projects offered in this field. Smaller farmers were scored relatively low.

Georgian Herbs Producers Association and donor agencies were also ranked relatively high. Even though the association does not cover the majority of the farmers in the region, it has established strong connections with various actors and benefits from a strong network. The strongest linkages for the association were observed with large and medium enterprises, Georgian Chamber of Commerce and Industry, and donor agencies.

Imereti Agro Zone also received a high score. The company has very strong linkages with the governmental institutions to implement the "Greenhouse Cluster Development (GHCD)" project. Its representatives have also met several large-scale producers for consultations and planning. Lastly, it has strong support from almost all the donor agencies operating in the agricultural sector of Imereti region.

12 | ANALYSIS OF BUSINESS OPERATION AND CLUSTER ANALYSIS

12.1 ANALYSIS OF BUSINESS OPERATIONS

Market and Marketing

Herbs and vegetable cluster in Imereti unites more than 5,000 farmers that produce undifferentiated products, serving the same consumer segment. These producers are mainly self-employed household farms that are concentrated on the domestic market and meeting domestic demand. Though, some of the herbs are exported. Products do not meet certification and quality standards set by western countries (e.g., EU), but are considered as high-quality ones based on their appearance, texture and taste, which can be attributed to the good weather conditions and a limited number of treatments (e.g., pesticides). Its unique taste and quality are also proved by the fact that Kutaisi Greens is registered as a GI in Georgia and is evidenced by the corresponding technical study.

The majority of the farmers (60% of the respondents) sell their herbs and greens to the export intermediaries, who then supply post-soviet countries such as Russia, Ukraine, Azerbaijan, Belarus, Baltic states. Georgia enjoys a long history of herbs supply and high recognition on the mentioned markets. Additionally, these countries do not have any rigorous quality or certification standards so farmers can export without any technical difficulties. Fennel is the most exported product category among herbs.

Even though demand for quality herbs and greens in the EU countries is considerably high and Georgia enjoys free trade agreements with them, export in this direction is still very limited. This is due to the lack of proper infrastructure, technology, certification, and inability to meet constant volume requirements. Additionally, awareness of Georgian products in the EU is very low. Some instances of exports to the EU were observed mainly in countries with less strict requirements, e.g., Poland, Greece.

Promotional activities as well as brand recognition are almost non-existent in this sector. For most of the producers price is the main determining factor of sales. Packaging is also done in a simple manner with no differentiation among various producers. Herbs are only sorted to remove damaged produce and then tied together with the rubber bands and are ready for the final market. The only producer of herbs that carries out full processing procedures and uses packaging as a marketing tool is Herbia, with increasing sales on the domestic market.

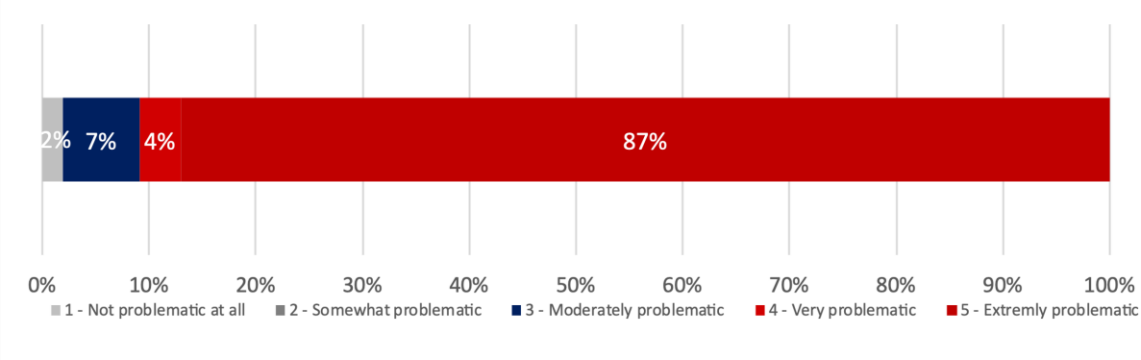
Exporters and collectors use their existing linkages with the domestic supermarkets and foreign importers that have been established over the years. Proper packaging and quality certification for marketing purposes is almost non-existent for export markets as well. While on traditional markets exporters do not see the need of such activities due to the existing high recognition of Georgian herbs (though it may become more and more necessary as the competition increases), such activities are crucial for the new

markets where recognition of Georgian herbs and greens is very low, and linkages between Georgian exporters and foreign buyers are very weak. As of now, there is no existing marketing platform that would support Georgian producers and exporters to reach and penetrate new markets.

Among problematic areas for the farmers, fluctuation of the production volumes was identified. Production volume each year is decided by the farmers mostly based on the sales and market situation in the previous season. Due to the absence of the demand forecast, products with good price and sales in the previous year tend to be oversupplied in the next year. Exports, mainly carried out in winter, also lack forecasts and depend on irregular demand from the foreign importers, which is not the case in many western countries.

Dramatic fluctuations in the price were also named as one of the biggest problems among the interviewed farmers. The large majority of the farmers evaluated this problem as extremely problematic. Farmers naturally prefer to have a set price each year rather than very high prices in some years and very low in others, which makes the business challenging. However, contracts and set minimum prices between producers and collectors/middleman is mostly non-existent today. Herbia is the only exception as it contracts some of the farmers, sells its products at a fixed price on the domestic market and does not follow the price fluctuations.

Chart 15: How Problematic is Price Fluctuation Among Greenhouse Farmers

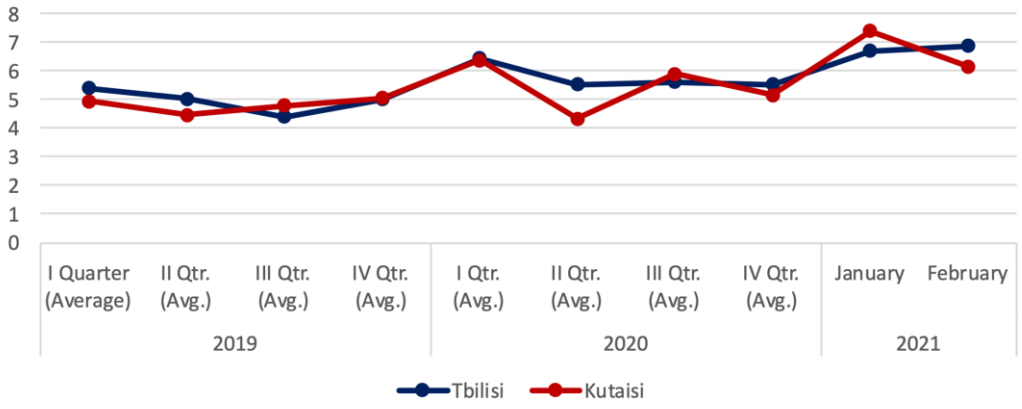


Source: Survey of Greenhouse Farmers, TBSC Consulting

Prices are generally affected by weather conditions, target export market conditions and middleman/collectors. When the weather is warm enough to grow plants outside without greenhouses, the supply increases and prices drop as a result. At the same time, with high supply, collectors try to pressure prices and purchase products at the lowest price possible. However, prices are most significantly affected by the emerging competition in export destination countries. Recently, in the post-soviet markets, which are the main export targets for Georgian herbs, Iran has become an important low-price supplier of herbs (due to the low labor costs and no need for greenhouses). In seasons when Iran has a good yield and high supply, prices on Georgian herbs are further pressured and lowered.

As a result, prices fluctuate from month to month, and according to the respondents, sometimes even daily. As for 2021, the increase in prices was observed, mainly due to the higher demand on target export markets (as a result of poor yield in Iran). The Chart below illustrates average retail market prices of herbs according to the consumer basket for two regions – Imereti and Tbilisi. According to the data for the first two months of 2021, the average price as compared to the corresponding quarters in the previous years has an increasing trend.

Chart 16: Average Retail Market Prices of Herbs



Source: Geostat

Covid-19 Impact

Covid-19 had some negative effects on greenhouse farmers throughout 2020. Closing open-air markets and the HoReCa sector due to the pandemic significantly affected the sales of many of the greenhouse owners (45% of the respondents were affected); some of them had to throw away a portion of their harvest as there was no demand. For example, vegetable producer Imereti Greenery mainly supplies the HoReCa sector and for several months its sales were reduced to zero. The company also faced challenges with the annual GLOBALG.A.P. certification. As international travel was banned to Georgia, the certifying body auditor was not able to travel to the country. As a result of significant drop in sales (almost 100% decrease in certain months), Imereti Greenery, the leading producer of vegetables in the region, faced serious financial difficulties. In April 2021, the company filed for bankruptcy.[29] This is a serious precedent for the cluster. On the one hand, it emphasizes serious risks associated with Covid-19, and on the other hand, illustrates importance of market diversification and limiting dependence on one segment of the buyers/one sector of the economy (HoReCa in this case).

The production process was also somewhat affected, especially for the larger greenhouses. Workers harvesting the vegetables and greens were not willing to work with 10 other workers in a greenhouse due to the risks of virus transmission. One respondent mentioned that he introduced shifts of 5 workers a day in some cases to keep a safe distance.

Furthermore, new regulations also affected exports. In 2020, after the Covid-19 outbreak in Georgia, GoG introduced a nationwide curfew. For the first two weeks, before receiving transportation permits, exporters could not collect a sufficient number of herbs. Afterwards, permits issued by the Government somewhat helped the exporters/collectors, but they continued to struggle with the second curfew. As the herbs are perishable products, they need to be collected and properly stored in few hours after the harvest, which usually took place in the late evenings. Even though collectors received the permits, limitations related to some workers or greenhouse owners, who did not have such permits, significantly prolonged the collection process.

However, it should be noted that none of the farmers see the Covid-19 impact to be very significant (18% of the respondents think that it had no negative effect at all). Especially when herbs are mostly harvested in winter seasons by which time farmers were somewhat prepared. For Herbia, Covid-19 even had a

[29] Source: Business Media Georgia; https://bm.ge/ka/article/sapartnioro-fondis-mier-dafinansebuli-quotimereti-grineriquot-gakotrda/79768/.

somewhat positive impact, and demand for their packaged herbs increased as it is considered a safer form of a product during the pandemic. Moreover, herbs' prices increased this season as compared to the previous seasons, which represents an opportunity for the farmers for generating higher incomes.

Chart 17: Negative Impacts of Covid-19 on Greenhouse Farmers

Source: Survey of Greenhouse Farmers, TBSC Consulting

Climate and Seasonality

Imereti region is characterized by a humid and subtropical climate that creates proper conditions for the cultivation of greens and herbs, especially in Tskaltubo municipality. Studies done on the regional climate, as well as soil tests, proved to be suitable for quality herbs production. However, many of the respondents expressed concerns regarding natural disasters such as strong winds in the region that damages the greenhouses and requires constant renovations. There are many instances when farmers were not able to reconstruct damaged greenhouses due to the lack of financial resources and had to leave the market due to this cause.

Different parts of the region are suitable for the cultivation of different types of greens and vegetables, depending on local soil property. Though, soil analysis is not very common among farmers. Therefore, some of the farmers use improper seeds and spend resources on varieties that are not suitable for the region. At the same time, several respondents expressed need and interest in such analysis, but are unable to carry it out due to the lack of financial resources.

Herbs are grown in greenhouses from around October till the end of April as winter temperature is suitable for most of the greens currently produced. Therefore, no heating or climate control is required. In the summer period, many of the greenhouse owners tend to grow other vegetables, mainly cucumber and tomatoes.

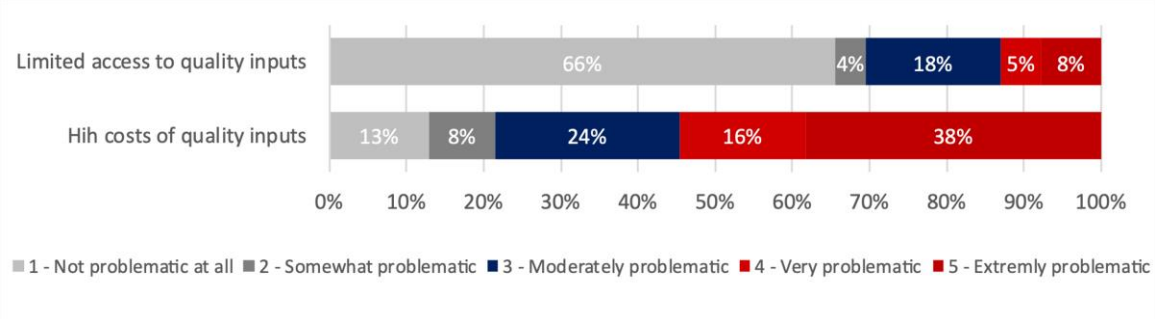
Inputs

The main inputs used by greenhouse owners in Imereti are seeds, fertilizers, and herbicides. Pesticides are used in rather limited amounts as pests' diseases are not so common in winter months when the herbs are grown. This is an advantage of the region, especially for future exports. Several farmers also do not use chemical fertilizers. For example, Herbia and its supplier greenhouses. Though, improper usage of pesticides and other inputs have also been observed on the market which negatively affects the final quality. For example, manure that is not fermented, containing many negative microorganisms, is still commonly used, which is a prerequisite for various fungal and bacterial diseases as well as sources of pests.

All the above-mentioned inputs are mostly bought locally, from the local retail sellers, who buy inputs from the importers in Tbilisi. Farmers generally prefer imported inputs over domestic (e.g., seeds) due to the perceived high quality. For example, the seeds are mostly imported from Russia, Ukraine, Netherlands, Switzerland and Italy, though some farmers produce their own. Even though there are no quality control mechanisms in the place at this moment (e.g., required certification of the inputs) and there are cases when farmers are not satisfied with the purchased input, the majority of the greenhouse owners stated that quality materials are available if the farmer can afford it (e.g., 66% of the respondents do not see "access to quality inputs" as a problematic area).

The price difference can be quite large (more than 1 000% difference in some cases) depending on the quality of inputs bought and the country of origin. Additionally, the fluctuations in exchange rates constantly cause price increase in the materials. Therefore, farmers sometimes need to sacrifice quality for the price. 87% of the respondents find high costs of quality inputs to be challenging generally, while 38% of the respondents consider it to be extremely problematic.

Chart 18: Problems Associated with the Production Inputs



Source: Survey of Greenhouse Farmers, TBSC Consulting

Technology and Equipment

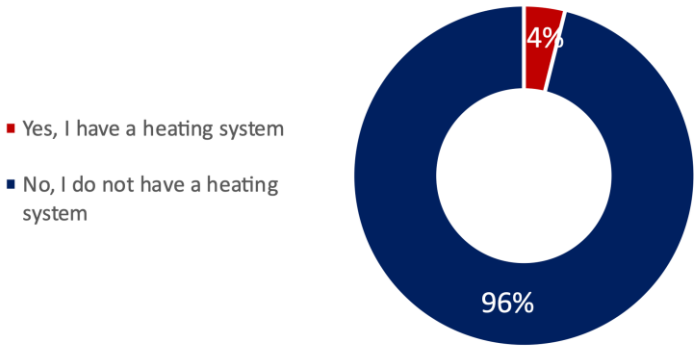
Primitive greenhouse technologies are widespread in the cluster, and the small scale of farmers makes it challenging to justify large investments in technology update. Most of the greenhouses in Imereti are around 500 m^2 in size, use wood or metal construction, and mainly polyethylene roofing (though some have glass roofing as well). These greenhouses also have some type of irrigation systems, usually drip irrigation.

It should be noted that some of the respondents mentioned that while polyethylene roofing is usually expected to be used for around 36 months, farmers keep using it for longer periods until it is damaged

and no longer usable. At the same time, the use of improper metal construction is also common, which can get into the reaction with water and affect the plant quality.

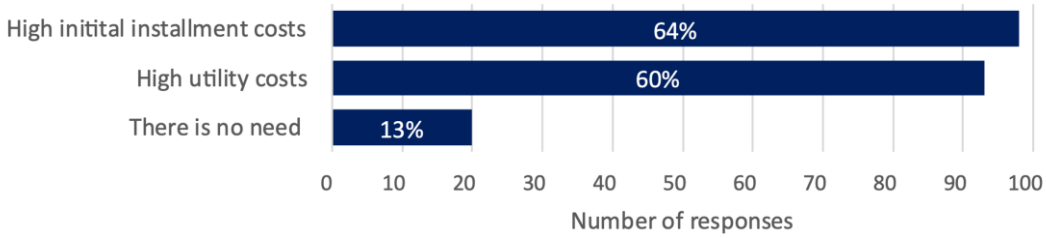
The majority of the respondents (96%) do not have a heating system in their greenhouses due to its high initial investment costs (64%) as well as its high utility costs (60%).

Chart 19: Share of Greenhouses with the Heating System



Source: Survey of Greenhouse Farmers, TBSC Consulting

Chart 20: Reasons for Not Having Heating System

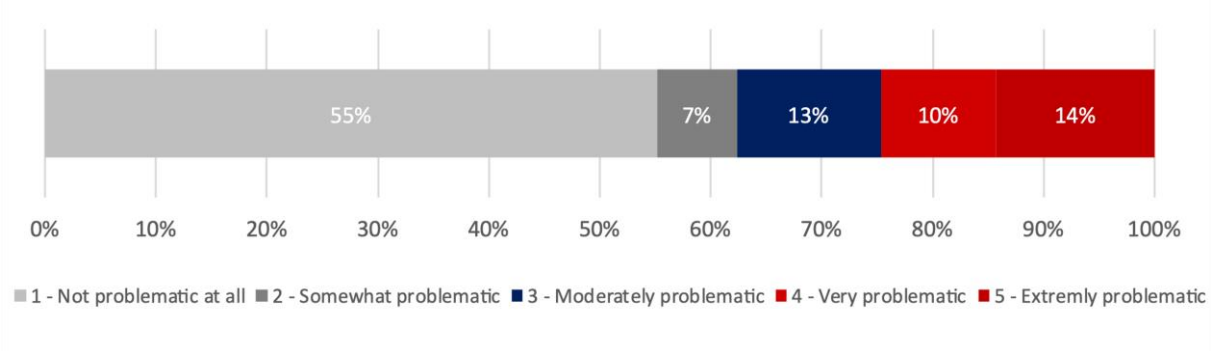


Source: Survey of Greenhouse Farmers, TBSC Consulting

With the given pressure on prices from the major export markets, Georgian producers cannot see the justification to invest in heating systems and further increase production costs. However, if the Georgian herb growers were to increase the growth of new types of herbs for the new markets (e.g., Basil), greenhouses without climate control systems will not be sufficient anymore. In this regard, possibilities of alternative energy can be studied. For example, Imereti Greenery is using thermal energy in its greenhouses. Besides the heating system, the majority of greenhouses have no ventilation or humidity retainer either.

Farmers usually own small tractors or sometimes lease from the mechanization centers. Generally, most of the respondents are satisfied with the farm equipment they own and do not see it as particularly problematic.

Chart 21: How Problematic is Lack of Modern Farming/Greenhouse Equipment

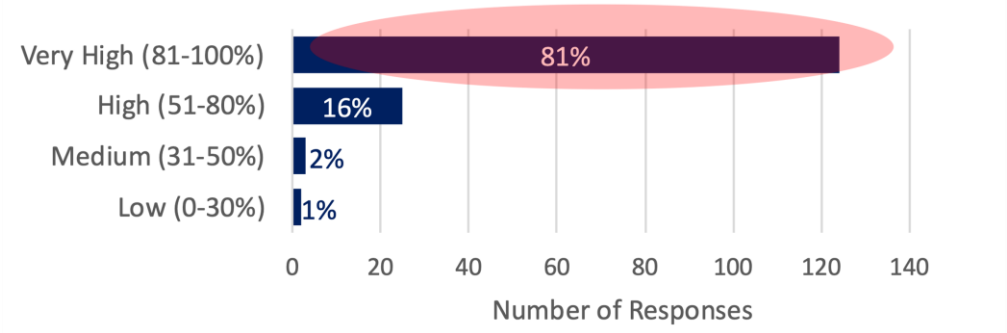


Source: Survey of Greenhouse Farmers, TBSC Consulting

Based on desk research and in-depth interviews with the key stakeholders, it can be concluded that Imereti greenhouse owners do not own advanced technology and equipment (except few large commercial growers), which is expected given the small scale of each farm making it difficult to justify such investments. Need and willingness to improve greenhouse technology and equipment have been named by most of the respondents. Most often mentioned greenhouse technologies or equipment that need update/creation were roofing (14% of respondents), irrigation (12%) and heating (11%) systems.

The utilization of the capacity of the sector is high, which indicates the implicit need for expansion. Most of the respondents have 81-100% of their capacity utilized. Therefore, despite unstable prices and lack of modern equipment, demand for Georgian herbs as well as vegetables remains strong, and farmers continue the cultivation.

Chart 22: Capacity Utilization



Source: Survey of Greenhouse Farmers, TBSC Consulting

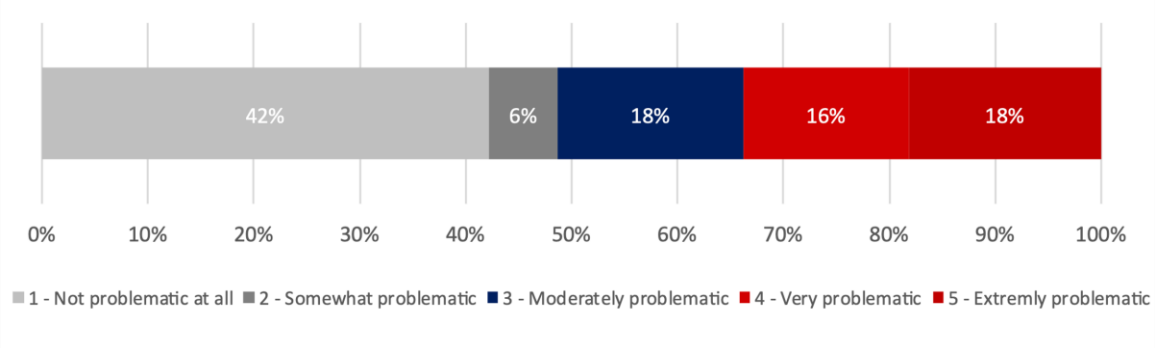
Human Resources and Availability of Workforce

Herbs and greens production is labor-intensive and therefore, labor costs make up a large portion of the production costs. In Georgia, labor costs are considered to be relatively low with around 20-30 GEL per day per worker, which ends up being about 50-60% of the production costs. This gives Georgian products an advantage on high-value markets, in which sometimes high labor costs make herbs production economically unjustified.

The supply of workforce is influenced by a high migration rate (especially a high number of migrant women that are the main workforce for greenhouses) from the region, which may create difficulties in the future. Most of the respondents mentioned that they are able to find the workforce due to their connections

locally or through the help of family members and relatives. However, if this sector continues to grow, this may become more and more problematic unless there are enough incentives to motivate women to stay.

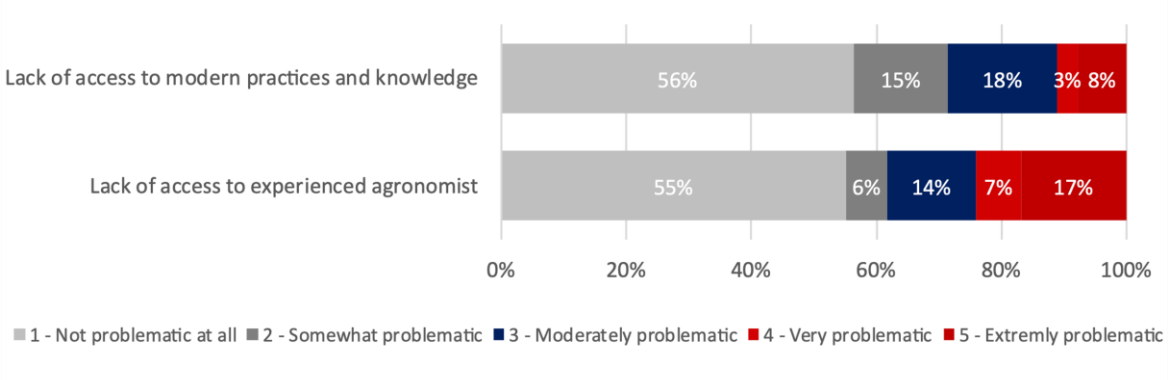
Chart 23: How Problematic is Lack of Available Seasonal Workforce



Source: Survey of Greenhouse Farmers, TBSC Consulting

As for the knowledge, farmers in Imereti region have a long history and experience of herbs and vegetables production in greenhouses. However, this knowledge is becoming obsolete and there is a strong need for new knowledge. Lack of qualified agronomists is the biggest challenge as farmers struggle with receiving qualified agro advice. However, this is not necessarily perceived as problematic by the small farmers as more than half (55%) of the respondents stated that lack of access to modern knowledge and practices, as well as to the agronomist, is not problematic at all.

Chart 24: How Problematic is Access to Knowledge and Modern Practices



Source: Survey of Greenhouse Farmers, TBSC Consulting

The majority of the interviewed farmers still expressed willingness to take advice and participate in activities that would improve their competency, which is an important factor for further cluster development. However, to interest them, the farmers training and other educational programs need to be carefully planned and customized to the needs of the region. A large number of the farmers mentioned that they had experiences with the trainings that are based on general international practices not applicable to their specific needs. Thus, there is some skepticism towards the quality of such programs.

Educational materials, especially on herbs cultivation in greenhouses, are very limited in Georgia. Several respondents mentioned that they usually search for materials in the Russian language as no or very limited information is available in Georgian. On one hand, this is a good indicator of farmers' desire to learn more and develop, and on the other hand, it illustrates the need for more informational activities for farmers to be able to get familiar with modern international practices applicable to Georgia.

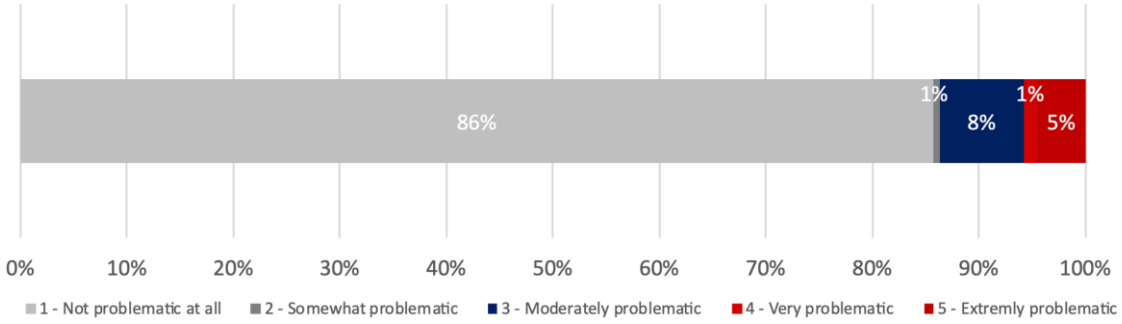
Lastly, several respondents mentioned limited knowledge of consultants at farmer service centers from which farmers receive information on proper usage of various inputs. In this regard, Agroservice (33 farmer service centers developed with USAID support) representative stated that Agroservice is aware of such challenge and there are several on-going and planned ToT programs to retrain and improve the qualification of the consultants.

Quality Certification and Standards

Farmers' production standards are derived from Georgia's final market requirements, which are lax in terms of food safety standards and certification. The majority of these products are sold in Georgia or post-soviet countries that do not require rigorous quality assurance mechanisms (only phytosanitary document is required, and certificate of origin in some cases). Therefore, a large majority of Georgian farmers do not have any motivation to receive certification about food safety and quality from accredited laboratory facilities. At the same time, fluctuating low prices offered on these markets make it challenging to invest large financial resources in such certificates.

According to several sectoral research, Georgian fresh herbs have vast potential to enter the EU, due to their flavor and competitive prices. However, to be able to export on this market, greenhouses (as well as processing/packing facilities) need Food Safety Certificates. In this case, the most required certificate is GLOBALG.A.P. - a farm assurance program, translating consumer requirements into Good Agricultural Practice. To receive such certificate, farmers need to go through the annual audit and certification. However, as mentioned above, most of the farmers do not see the need for such certification as the EU market is not their target at this moment.

Chart 25: How Problematic is Absence of GLOBALG.A.P. Certificate



Source: Survey of Greenhouse Farmers, TBSC Consulting

Several farmers did try to receive a GLOBALG.A.P. certificate with joint efforts through the co-financing of USAID in the past. These farmers have gone through several trainings and workshops and are familiar with all the requirements and steps they need to undertake. However, they mentioned that it ended up being too expensive at this moment. Additionally, farmers expressed concerns regarding the lack of linkages with the buyers on new high-value markets, which makes the certification process seem useless.

Only one herb's producer (Herbia) and one vegetable producer (Imereti Greenery) were identified with such a certificate. However, despite the certification, Herbia is still not exporting to many of the EU countries with the given limited quantity of the production, as such markets require a regular supply of large amounts of quality herbs. Therefore, if more farms were to adopt such standards and produce the same quality products in larger quantities, such certification can be used as a marketing tool to enter high-

value markets in the EU, and increase the price margins for the producers. In this regard, IAZ can play a crucial role to open the doors to the EU market and create incentives for higher standards. Once the large mass of standardized products is created and exported through IAZ, over time, other greenhouses will get involved in the process as well.

Lastly, it should also be noted that by signing the Association Agreement (AA) and the Deep and Comprehensive Free Trade Area (DCFTA) Georgia has committed to bringing Georgian legislation in line with the EU legislature. In this direction, the Georgian Government is planning to make certification mandatory for producers of seeds and saplings in the upcoming years. Thus, further increasing the average quality of herbs and vegetables in the country, including Imereti region.

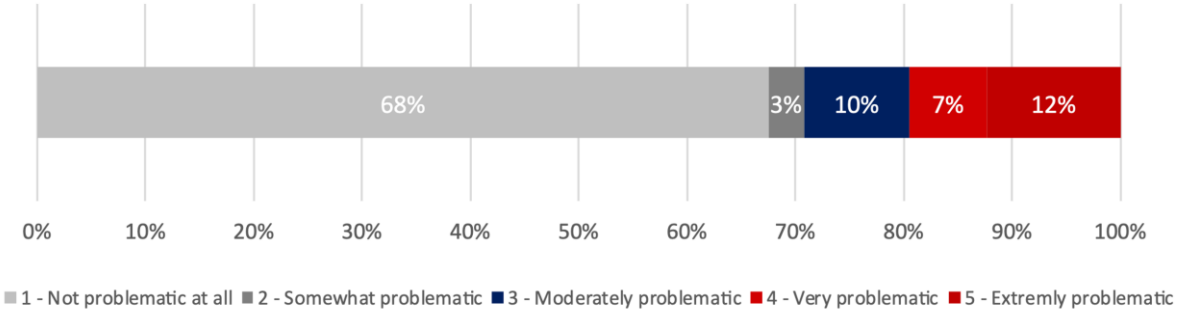
Infrastructure and Logistics

The location of the region is quite favorable for export purposes. Kutaisi airport is a key identified advantage of the region. Though the airport currently lacks a cargo terminal which is planned to be established in the frame of an Imereti Agro Zone project. The region also is located in proximity to the two ports in Georgia- Poti and Batumi. Road transportation is quite developed and relatively less expensive, which is actively used by the collectors or middleman.

There are also two laboratories functioning in Imereti and Guria. These laboratories have sufficient resources for soil analysis. Though, some farmers have used laboratories in Tbilisi.

The cluster in the region lacks the infrastructure that is required to be able to export fresh products to advanced markets. For example, unavailability of packing houses and pre-cooling technologies (for summer months). Establishing such facilities requires large financial investments that are not affordable for the majority of small and medium-scale farmers. At the same time, small and some medium-size farmers do not see the need for the proper storage facilities and still store their products in basements and cellars and use standard household air conditioners for climate control.[30] Additionally, as farmers are mostly involved in cultivation and it is up to collectors and exporters to store and process (if any) the products, large majority of the interviewed farmers do not see lack of access to the cold-storage and processing facilities as particularly problematic.

Chart 26: How Problematic is Lack of Access to the Cold-Storage and Processing Facilities



Source: Survey of Greenhouse Farmers, TBSC Consulting

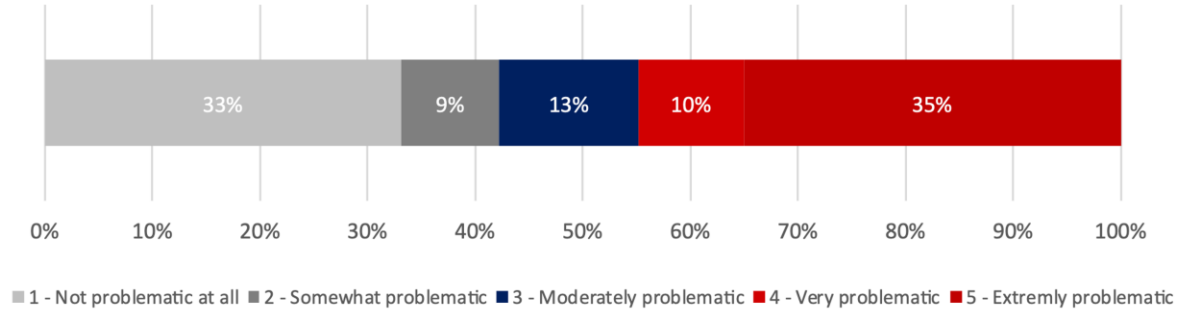
[30] Agricultural Value Chains in Imereti and Racha, Greenhouse production of herbs, Czech University of Life Sciences Prague in collaboration with People in Need and the Association of Young Economists of Georgia, 2014.

The sector does not have a well-working logistic system. Many of the respondents reported that if they were to have a packing and packaging facility, it would not be enough to deliver the product to the customer as other parts of the value chain are not well functioning either. Herbia faced the same problem several years ago, which pushed the company to establish its vertically integrated supply chain, which covers all steps from the harvesting to distribution and market placing.

Access to Finance

The majority of the interviewed enterprises stated that they use or have used a loan from a microfinance organization or a bank to finance their operations and upgrade greenhouse technology. Many of them have benefited from the "Preferential Agro Credit Project" and various government support programs. Though, high-interest rates and collateral requirements of financial institutions make access to finance challenging. Furthermore, fluctuations in prices and significant changes in annual farmers' income make farmers hesitant to take financial risks, especially the smaller ones.

Chart 27: How Problematic is Limited Access to Finance

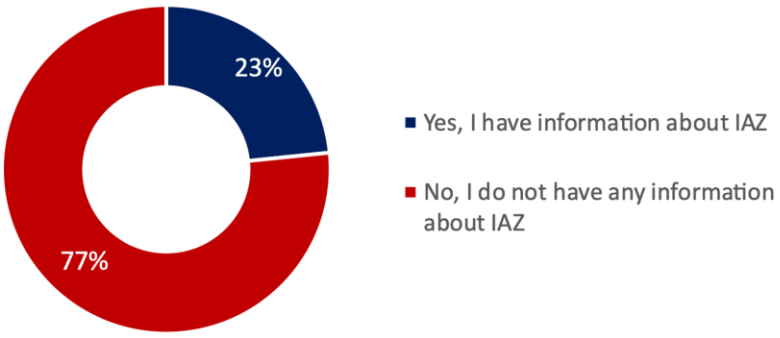


Source: Survey of Greenhouse Farmers, TBSC Consulting

Findings Related to Imereti Agro Zone (IAZ)

According to the 14 in-depth interviews with key greenhouse owners, large farmers are usually familiar with the concept and had provided consultations to the Government while developing the project. Such producers expressed positive expectations and stated that developing greenhouse infrastructure and unifying product quality will have a positive impact on exports, and farmers will be able to penetrate new high-value markets in the EU. At the same time, the level of awareness among small farmers is low and they do not have any information regarding the project, or the information is very limited.

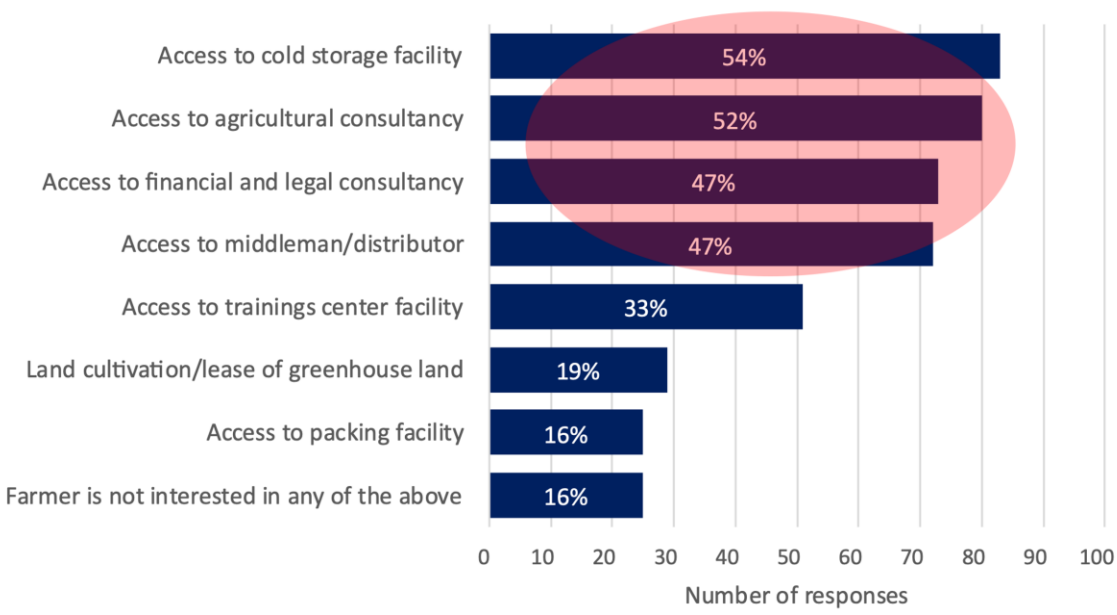
Chart 28: Level of Awareness Regarding the Imereti Agro Zone Initiative



Source: Survey of Greenhouse Farmers, TBSC Consulting

In relation to leasing or purchasing greenhouses on IAZ territory, it is less likely that small farmers who already own lands and greenhouses will establish new greenhouses on this territory. This is especially true for municipalities (e.g., Tskaltubo, Baghdati) where a large number of greenhouses already exist, and soil properties are efficient for herb production. At the same time, most of these farmers own greenhouse land in their household backyards or its proximity which gives them more work flexibility. Therefore, it is less likely for farmers to start commuting 20-30 km daily. However, larger farmers with larger capacity in these regions, and small farmers from other municipalities with fewer greenhouses and less favorable soil properties, could be interested in moving to (or starting) their production to such territory. Out of the 154 interviewed farmers, 29 expressed such interest, which is a good indication of interest in the region, especially given the early stages of development of the project.

Chart 29: Areas of Interest in IAZ Among Farmers

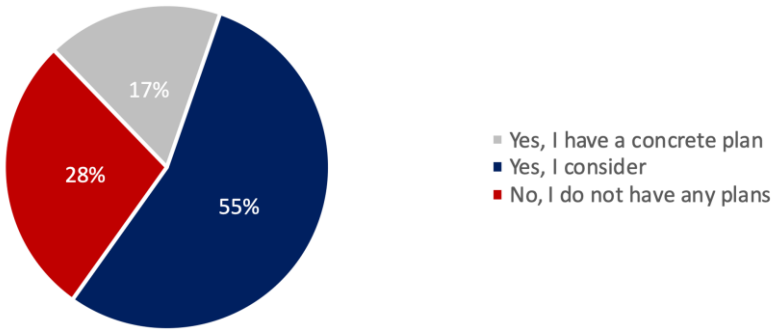


Source: Survey of Greenhouse Farmers, TBSC Consulting

Overall expansion plans of the existing farmers will influence the demand on new greenhouse capacity in the region, hence the demand on IAZ facilities. The majority of the respondents consider establishing new greenhouses in the coming 3 years, while 17% already have specific plans in this regard. However, it should

be noted that around 30% of the farmers who consider constructing new greenhouses, mentioned access to finance as a problematic issue, and only consider expansion if there are preferential loans or preferably grants.

Chart 30: Plans to Construct New Greenhouse(s) in the Next Three Years



Source: Survey of Greenhouse Farmers, TBSC Consulting

As mentioned above in this report, cooperatives and larger producers see a lack of contacts with buyers in new markets as a serious challenge. Even if they were to receive a GLOBALG.A.P. certificate, without such market contacts, entering new markets will be problematic. Therefore, some of the larger farmers perceive the function of IAZ as an intermediary between the local producers and such international markets. Based on the expert evaluations during in-depth interviews, estimated up to 5-10 farmers can be found in the region who are willing to jointly work for the GLOBALG.A.P. certification and benefit from the resources IAZ has to offer. After the successful examples and launch of the project, more farmers are expected to follow.

Opportunity for grants and co-financing was named by most of the respondents as a desirable component of the project that is missing at this moment.

It should be noted that some of the farmers also see IAZ as a strong competitor which may have negative effects on farmers' sales and product prices.

12.2 HERBS SECTOR SWOT ANALYSIS

The following table analyzes Strengths-Weaknesses-Opportunities-Threats for the Greenhouse Cluster in Imereti region by various aspects related to the sector (market, skills and human resources, raw materials, technology, and infrastructure). Each element of the strengths, weaknesses, opportunities and threats is then evaluated on a scale from 1 to 5, based on how important it is for this cluster and how strongly it is represented in the particular cluster – a combined score.[31] In the end, the average score for each element of SWOT by characteristic is calculated and presented.

It should also be noted that the SWOT analysis considers the perspective of the Imereti Greenhouse Cluster, which could be different than the perspective of the nation-wide greenhouse sector or perspective of the individual enterprises within the cluster.

[31] Note that the evaluation is based on authors' expert judgment based on interviews conducted and desk research carried out.

Strengths

Strengths	EVALUATIONS				
Market					
Favorable climate and soil conditions of the region					
High quality of herbs - appearance, texture and taste					
First steps made to register a PDO (“Kutaisi Greens”)					
Fair prices of Georgian herbs for high-value markets					
Long history in the production of herbs, greens and vegetables in the region					
High recognition on traditional, post-soviet markets					
Strong networks of exporter intermediaries on post-soviet markets					
Proximity to the ports and an airport					
Skills And Human Resources					
Experienced labor force					
Competitive labor costs					
General willingness of farmers to learn and improve competencies					
Available ad-hoc consultations on proper usage of inputs					
Practice of learning from the "best performing" farmers/greenhouses					
Technology and Infrastructure					
Availability of soil testing laboratories in the region					
Other Cluster/Sector Resources					
Strong support from government through Imereti Agro Zone					
Strong support from non-governmental institutions					
Presence of an association					
Presence of several well-functioning cooperatives					
Healthy business competition among local producers					
Identified willingness to cooperate (based on our survey results)					

Weaknesses

Weaknesses	EVALUATIONS				
Market					
Inconsistent quality of products preventing commercial exports to high-value markets					
Lack of region-wide production forecasts (what, where and how much)					
Limited bargaining power of producers over collectors/export intermediaries					
Limited post-harvest value addition					
High dependence on traditional markets, lack of export diversification					
Low market recognition and lack of linkages to high-value export market such as the EU					

Lack of scale of greenhouses making it difficult to justify investments in advanced machinery and technology, as well as certification					
Limited variety of products					
Seasonality - limited production of herbs in the Summer season					
Skills And Human Resources					
Lack of qualified agronomists					
A limited number of qualified consultants at service centers					
Lack of educational programs and materials specifically targeting herbs growing in greenhouses					
High level of migration, limited availability of the workforce in the region					
Raw Materials					
Inappropriate use of chemicals and major inputs					
Small-scale of operations limiting the bargaining power over input suppliers					
Dependence on imports of main inputs (seeds, herbicides, pesticides)					
Certification, Standards and Regulatory Base					
Lack of GLOBALG.A.P. certificate necessary to enter high-value export markets					
Limited quality assurance procedures					
Lack of GLOBALG.A.P. certificatory body in the region/country					
Technology and Infrastructure					
Limited development of logistics/distribution services					
Absence of cargo terminal at Kutaisi Airport so far					
Lack of the infrastructure that is required for the export of fresh products to advanced markets (lack of packing houses and pre-cooling technologies)					
Lack of modern/up-to-date greenhouse technology and machinery					
R&D					
Lack of strong linkages between academia and private sector					
Limited international know-how on cultivation in greenhouses (both among R&D institutions and farmers)					
Other Cluster/sector Resources					
Lack of contractual agreements between producers and collectors/export intermediaries					

Opportunities

Opportunities	EVALUATIONS				
Market					
Development of IAZ that will act as an anchor of the cluster, promote homogenous product production and open doors to the EU					
DCFTA and opportunities of the EU markets in case of GLOBALG.A.P. certificate					

Strong local demand on herbs, their popularity in Georgian cuisine					
Increasing international demand for herbs					
Remaining somewhat stable demand on international markets during Covid-19					
Increasing demand for consumer preferences toward packaged herbs					
The opportunity of alternative energy sources for advanced greenhouses					
Raw Materials					
Development of local supplier base of basic inputs such as seeds and seedlings					
Certification, Standards and Regulatory Base					
Existing minimum quality requirements for exports					
Other Cluster/sector Resources					
Access to finance programs (preferential agro credit, co-financing certification procedures)					
Skills development programs (e.g., trainings for the farmers and farmer service centers, short-term courses)					

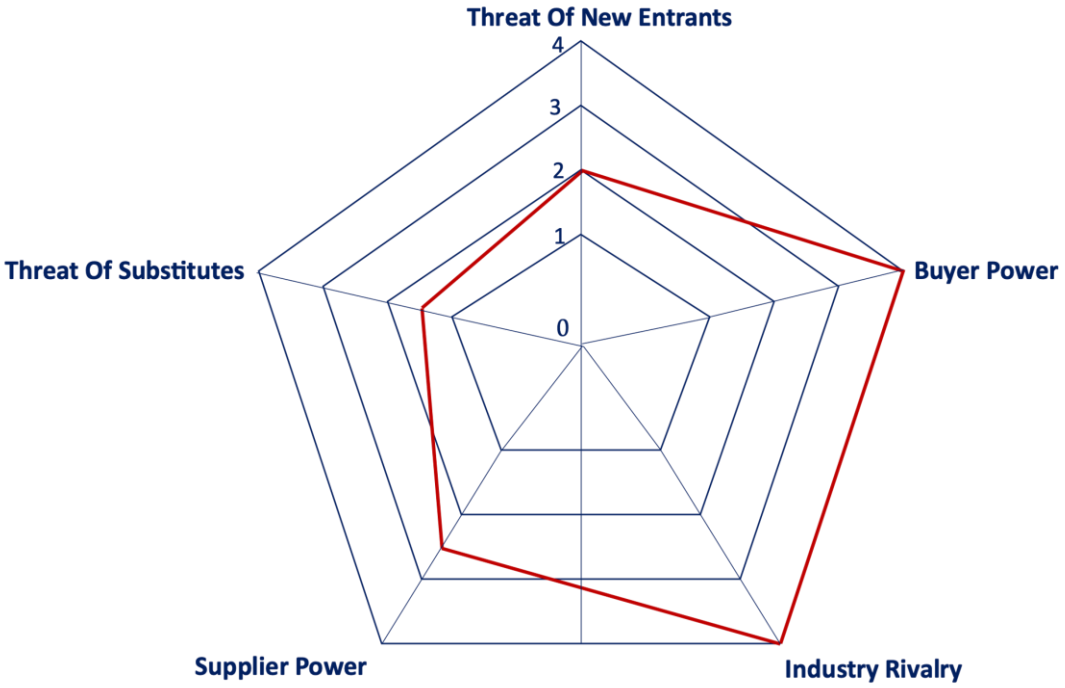
Threats

Threats	EVALUATIONS				
Market					
Political instability, greater uncertainty making it difficult to plan and invest					
Lack of infrastructure for timely and quality export procedures (e.g., lack of cargo terminal in the closest airport, lack of direct cargo flights from Tbilisi airport)					
Strong competition from the low-cost producers (e.g., Iran)					
High dependence on single export markets (e.g., Russia) with unstable political relations, which creates risks of export disruption					
Climate change and increased frequency of extreme weather events (e.g., strong winds)					
Economic instability, fluctuating exchange rates, making it difficult to plan					
Covid-19 pandemic, risks of lockdowns and disruption of supply and market links, production					
Skills And Human Resources					
Risks of protracted development of the skills and knowledge among the new generation, especially in terms of agronomists					
Raw Materials					
Increasing costs of input materials					
Certification, Standards and Regulatory Base					
High costs of GLOBALG.A.P. certification making it difficult to obtain for small size greenhouses					

12.3 PORTER'S FIVE FORCES – COMPETITION ANALYSIS

The following table summarizes competition on the market by using Porter's Five Forces, which is later described in this section.

Porter's Five Forces Analysis for Greenhouse Sector



Source: TBSC Analysis

Bargaining Power of Suppliers – Moderate to High. There are a moderate number of medium size input suppliers in the region that offer the same type of products of different quality and prices. Therefore, farmers have some opportunity to switch between few suppliers at no significant costs. However, these products cannot be substituted and there are no alternatives in most cases. At the same time, farmers depend on quality and price offered by local suppliers as purchasing better quality or better priced products in other parts of the country (e.g., Tbilisi) is logistically challenging and costly. At the same time, farmers have no tools that would enable them to evaluate the quality of the materials and can only rely on the supplier's advice, which has resulted in lower yields in some cases.

Bargaining Power of Buyers – High. On the domestic market, there are limited number of collectors and export intermediaries that purchase products from the small farmers, and these buyers have many alternatives to buy from. Moreover, switching costs are insignificant. As a result, these intermediaries set the prices according to the quantity supplied and international trends.

The same applies to the export markets, where foreign importers have higher power over the prices. However, switching costs for the buyers can be higher in this case as the number of large farmers or collectors that supply foreign importers is relatively lower.

The IAZ project could promote lowering the bargaining power of buyers as more domestic and international buyers will enter the market.

Threat of New Entrants – Moderate. The business environment in the country, as well as in the region, is considered to be friendly with minimum legal barriers. At the same time, the land is available at quite competitive prices. Brand loyalty is almost non-existent on the market and the new entrant can easily find its buyers. Especially, when switching costs from one supplier to another is also moderate or low for these buyers. However, depending on the size and complexity of a greenhouse development, investment requirements can vary significantly. While establishing a small greenhouse concentrated on domestic sales does not require significant investments in technology or logistical systems, larger, high-tech greenhouses are significantly more expensive to construct. At the same time, such companies usually face difficulties with logistics, such as distribution and delivery, and prefer a vertically integrated system that creates additional costs. Therefore, new small-scale greenhouses are created annually, but only a few larger-scale greenhouses have been created over the years. However, this threat might be increased with IAZ as it will attract more local and foreign investors to enter the market.

Threat of Substitute Products – Low. Most of the people use herbs for culinary purposes in which herbs are challenging to substitute. Moreover, when the herbs make an insignificant share in the final price of the meal. However, here substitution can be considered in terms of fresh and dried herbs, as well as spices in some cases. In Imereti region, most of the herbs are sold in a fresh form which face competition from the side of the dried herb (easily substitutable in most of the recipes). Additionally, packaged herbs vs unpackaged can also be discussed. As mentioned earlier in this report, there is an increasing demand for packaged herb products, while the majority of herbs produced in the region are not packaged.

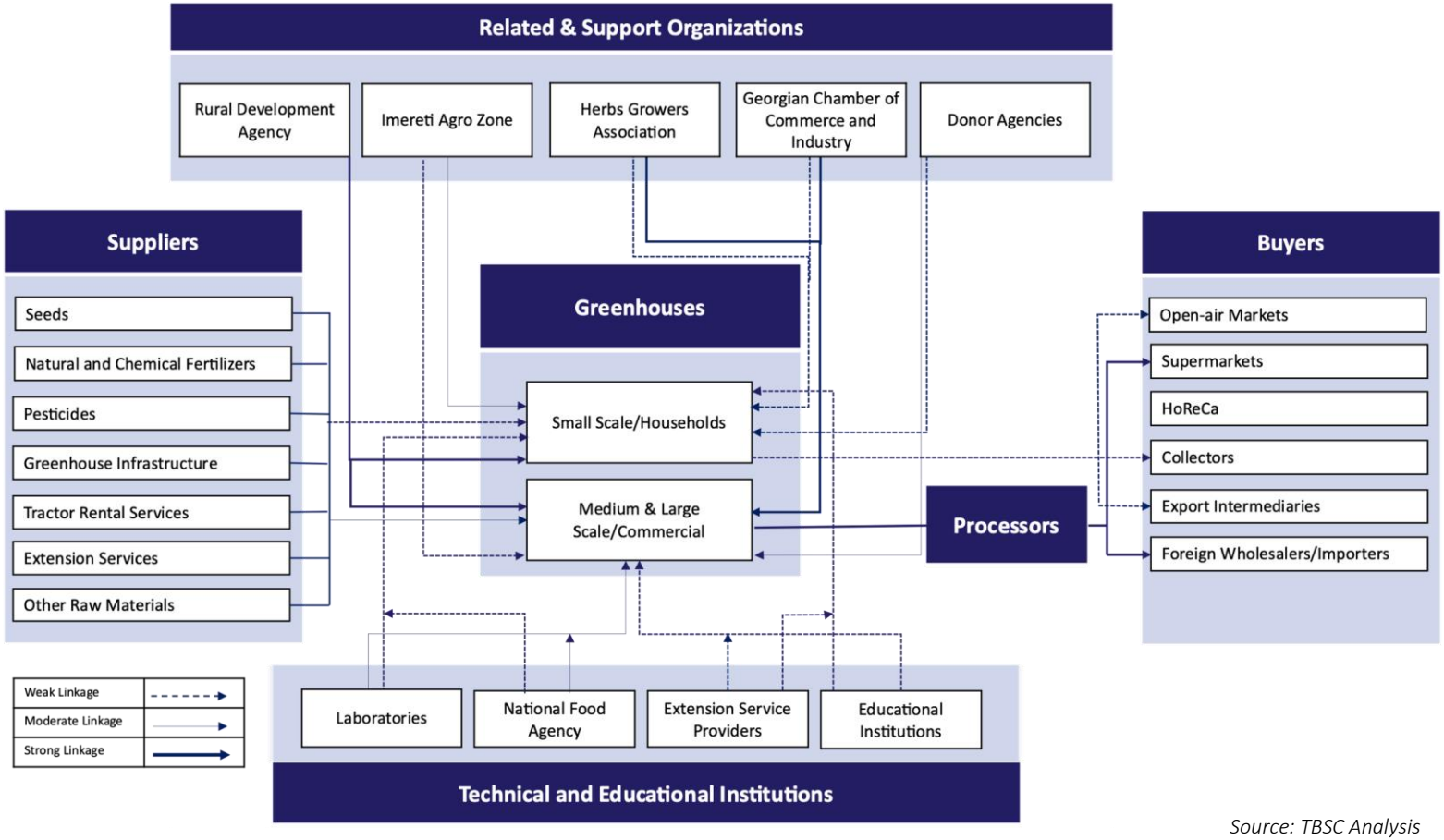
Industry Rivalry – High. There are a lot of greenhouses/competitors that are roughly equal in size and power and consumers can easily switch to a competitor offering for little or no cost. The concentration ratio of the industry is also quite low, with only a few large market players (e.g., Herbia in herbs market and Imereti Greenery in vegetables market). This creates pressure on prices as if certain farmers do not agree on the price offered by the buyers, these buyers can purchase from many of the other farmers. Lastly, barriers to entry are high for large companies due to their continued investments and high fixed costs. For the small farmers, such barriers are also high as for many of the households, production of herbs and vegetable can be the only sources of income, with not many other alternatives.

On export markets rivalry is extremely high. Markets such as Iran and Uzbekistan have become significant lower-price suppliers for Georgia's traditional export markets and constantly put pressure on local producers.

13 | CLUSTER MAP

The following table shows the main stakeholders of the greenhouse cluster, followed by the description of the existence/absence of linkages among them and the strength of such linkages.

Table 6: Greenhouse Cluster Map for Imereti Region



Source: TBSC Analysis

Linkages with the suppliers of various inputs can be considered satisfactory. Small farmers exchange information with the local service providers and if the quality of the product is satisfactory, they continue to do so. Though, joint purchases in this regard could further strengthen such linkages. The larger greenhouses have stronger linkages with the suppliers due to the larger scale of orders and are not necessarily limited to the regional sellers only.

The most significant part of the cluster that is currently missing is processing facilities that are essential for increasing exports and diversifying markets. Currently, processing of the herbs (packing, packaging) is very limited and in most cases is not carried out according to the quality requirements of the advanced markets. On the one hand, improper or insufficient processing operations cause a higher rate of losses and on the other hand, prevent domestic producers to export to high-value markets. Support to create higher quality processing facilities or support to Imereti Agro Zone in this process can result in new export opportunities.

Linkages with the buyers are quite weak for small-scale greenhouses. Most of the farmers do not have contractual agreements or set minimum prices agreed with the buyers. This creates high uncertainty for the farmers and makes it challenging to project future production quantity. These linkages are somewhat moderate for the larger greenhouses that have long-term relations with the supermarkets, HoReCa sector or foreign importers.

Linkages with the support organizations are moderate, though are stronger in the case of larger greenhouses. This is because of the larger financial and technical capacities of these greenhouses to use various co-financing opportunities that RDA or donor agencies have to offer. Development of cluster and increasing joint activities could further increase access to the programs for groups of small farmers and therefore, strengthen the linkages. Imereti Agro Zone also has moderate linkages with the farmers, though linkages with the small farmers can also be strengthened to increase awareness for the cluster initiative, and opportunities it has to offer. The association is also quite active and most of the key players in the region are its members. However, these linkages need to be strengthened to cover a larger share of the regional farmers than it currently does.

Linkages with the technical and educational institutions are relatively weak. Small farmers rarely use laboratory services due to the absence of quality certifications. Soil testing is also not very common among the farmers which sometimes results in lower yields and improper projection on what to produce in the specific village. Linkages of the larger farmers are stronger with the National Food Agency (NFA), as these greenhouses supply foreign buyers and use NFA services to receive phytosanitary certification. The number of extension services available is quite limited and therefore, linkages with the farmers are quite weak. This is especially problematic for the small farmers and such activities need to be increased. Linkages with educational institutions are very weak for both small and large-scale greenhouses. Access to continued education and promotion of the agricultural professions is crucial for the sector to grow and enter high-value markets in the upcoming future.

14 | VISION FOR THE CLUSTER

Greenhouse Cluster in Imereti is an emerging cluster that has several critical characteristics in place necessary for further growth and development:

- Favorable *climate conditions* enabling farmers to produce herbs off-season
- *Largest concentration of greenhouses* in the country, with *growing share of Imereti* in national herbs production
- Significant *demand on quality, fresh herbs and greens in the EU* and opportunities from the DCFTA
- Perceptions of the *common problems* (e.g., unstable export markets and price fluctuations) and identified *willingness to cooperate* (confirmed by our survey results)
- Existence of the *association,* with growing capacity
- Initiative of *Imereti Agro Zone*, as a strong potential to become a major driver of cluster collaboration and development (along with other support provided by the Government and donors).

These factors described above represent strong foundation and preconditions for successful formation and development of a modern business cluster with a unique competitive advantage. Based on this, long-term cluster vision was developed.

The long-term vision of the cluster should be to become a recognized supplier brand of premium quality produce (mainly herbs and greens) to the high-value markets such as the EU, by majority of the farmers producing *homogenous products* according to the *strict quality standards* and with strong emphasis on the benefits of the *protected geographic indications* and other instruments, as well as by: a) Leveraging all its key strengths b) Improving its weaknesses c) Capitalizing on the opportunities d) Taking steps to mitigate the identified threats.

Furthermore, while cultivation and production should remain decentralized but consistent, marketing and processing activities should become more centralized and become the main point of cooperation for the farmers, with *Imereti Agro Zone being a driver and a locomotive* for the cluster leadership.

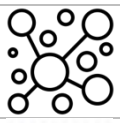
Above mentioned goals and targets can only be utilized if the farmers can access high-value markets, which is the main incentive for increasing average quality and standards of the cultivation or processing. Therefore, all activities, strategies and interventions should be market-driven, and oriented on capitalizing on opportunities on new export markets, e.g., the EU. In this process, support from the Government and non-governmental support organizations can be crucial as individual farmers/exporters lack financial and technical capacity to enter new markets.

It can be reasonably assumed that successful realization of Imereti Agro Zone and its Greenhouse Cluster Development (GHCD) Project is one of the main preconditions for successful development of greenhouse cluster in Imereti region. As mentioned above, with the given small size and capacity of the current players of the Imereti greenhouse value chain, there is a high risk of protracted transformation of the current agglomeration into the well-functioning cluster, unless there is a strong momentum created by such large-scale developments (ref. to the Netherlands greenhouse cluster case). Therefore, success or failure of the IAZ will largely determine success or failure of the Imereti greenhouse cluster development. Consequently, making sure that Imereti Agro Zone project is successfully realized is fundamental.

At the same time, to achieve sustainable development of the cluster in a long-term perspective, continued and sustained R&D activity will be important to realize the vision and maintain the competitive edge in this industry.

15 | KEY RECOMMENDATIONS AND CURRENT PRESSURE POINTS

Key recommendations are based on the understanding of what needs to be done to accomplish the defined vision, in all of the key cluster aspects or domains, such as access to markets or finance, skills development, cluster facilitation and so forth. The recommendations are grouped under six broadly defined programs.

PROGRAM	
IAZ CONCEPT ELABORATION AND LAUNCHING	
GREENHOUSE CLUSTER DEVELOPMENT AND EXPANSION	
MARKET ACCESS PROGRAM - PROMOTING BETTER MARKET PENETRATION AND EXPORTS	
SKILLS DEVELOPMENT PROGRAM	
IMPROVING TECHNOLOGY, EQUIPMENT AND INFRASTRUCTURE OF THE SECTOR	
PROMOTING R&D CAPACITIES OF THE SECTOR	

1	IAZ CONCEPT ELABORATION AND LAUNCHING	
DOMAIN: SUPPORT TO IAZ	EXISTING SITUATION	RECOMMENDED STRATEGY

	Key Strengths
	• Imereti Agro Zone (IAZ) initiative
		Leverage Strengths
		1. Help IAZ Elaborate the concept, Unique Value Proposition
		  • Together with IAZ, elaborate the cluster concept and future plans based on various surveys, analysis, successful international practices and so on
		  • Elaborate unique selling proposition for IAZ which will highlight its indispensable compelling factors in monetary terms, and motivate farmers/entrepreneurs to move to IAZ premises (e.g., new alternative energy models and preferential tariffs)
		  • Plan and finance study tours for IAZ in leading countries in terms of horticulture cluster development to bring international know-how and successful practices to Imereti (e.g., Spain, The Netherlands)
		  • Initiate and provide financial support to add "Access to Finance" component to the IAZ's Greenhouse Cluster Development Project to attract more farmers/entrepreneurs to the cluster premises
		2. Strengthen positions of IAZ and increase the project awareness among all target stakeholders (farmers, potential greenhouse owners, investors, input and service providers, educational institutions, etc.) to promote cluster development
		3. Provide technical support to IAZ to successfully launch the Greenhouse Cluster Development Project

PROPOSED TIMELINE OF IMPLEMENTATION AND ESTIMATE OF COSTS	N	2021	2022	2023	2024	2025	APPROX. COSTS (GEL)	RESPONSIBLE PARTY / COUNTERPART
	1.1						TBD	TBD
	1.2							
	1.3							

2	GREENHOUSE CLUSTER DEVELOPMENT AND EXPANSION	
DOMAIN: OVERALL POLICY AND CLUSTER DEVELOPMENT RELATED ISSUES	EXISTING SITUATION	RECOMMENDED STRATEGY
	Key Strengths • Support from non-governmental institutions • Presence of an association • Presence of several well-functioning cooperatives • Healthy business competition among local producers • Identified willingness to cooperate (based on our survey results)	Leverage Strengths 1. Promote active cooperation with Government agencies and donor organizations, together with the association to ensure joint actions and continued information sharing 2. Provide technical and financial support to the Georgian Herbs Producers Association to increase number of its members and its capacity
	Key Weaknesses • Lack of region-wide production forecasts (what, where and how much) • Limited quality assurance procedures	Improve Weaknesses 1. Support market-driven production: In close coordination with the collectors and IAZ, conduct market studies in target export countries and create forecasts, based on which recommendations will be given to the farmers – what to produce and in what quantity
	Key Opportunities • Existing minimum quality requirements for exports	Capitalize on Opportunities 1. Conduct feasibility on potential improvement in the quality requirements 2. Provide technical support to GoG in approximation of legislation and standards to the international and the EU standards

PROPOSED TIMELINE OF IMPLEMENTATION AND ESTIMATE OF COSTS	N	2021	2022	2023	2024	2025	APPROX. COSTS (GEL)	RESPONSIBLE PARTY / COUNTERPART
	2.1						TBD	TBD
	2.2							
	2.3							
	2.4							
	2.5							

3	MARKET ACCESS PROGRAM - PROMOTING BETTER MARKET PENETRATION AND EXPORTS	
DOMAIN: MARKETS AND MARKETING	EXISTING SITUATION	RECOMMENDED STRATEGY
	Key Strengths • Favorable climate and soil conditions of the region • High quality of herbs- appearance, texture and taste • First steps made to register a PDO ("Kutaisi Greens") • Long history in the production of herbs, greens and vegetables in the region • High recognition on traditional, post-soviet markets • Strong networks of exporter intermediaries on post-soviet markets • Fair prices of Georgian herbs for high-value markets • Proximity to the ports and an airport	Leverage Strengths 1. Develop a communication/marketing plan to position Georgian herbs and greens (possibly vegetables and berries) as premium quality products on new export markets (e.g., the EU); Special emphasis can be made on Geographical Indications (PDOs), and special taste and quality attributed to the products coming from Imereti region
	Key Weaknesses • Inconsistent quality of products preventing commercial exports to high-value markets • Limited bargaining power of producers over collectors/export intermediaries • Limited post-harvest value addition	Improve Weaknesses 1. Develop and publish herbs and greens cultivation standards based on scientific methods and increase awareness among farmers on production with acceptable quality 2. Continuously create, publish and update literature on proper usage of various inputs and best agronomy practices, including

	• High dependence on traditional markets, lack of export diversification • Low market recognition and lack of linkages to high-value export markets such as the EU countries • Limited variety of products • Seasonality- limited production of herbs in the Summer season • Inappropriate use of chemicals and major inputs • Small-scale of operations limiting the bargaining power over input suppliers • Dependence on imports of main inputs (seeds, herbicides, pesticides) and their increasing prices • Lack of contractual agreements between producers and collectors/export intermediaries	comparison of available brands and exact products available in the region, as well as in Tbilisi 3. Support development of farmer groups/cooperatives to increase their overall bargaining power in the value chain 4. Provide financial and technical support to establish modern-standard packing/processing and storage facilities in the region (possible through IAZ) 5. Provide technical support to the exporters (and in the future, to the marketing companies in IAZ) to create linkages with buyers in the EU, which will open new export markets and create realistic incentives for farmers to undergo the certification 6. In close coordination with the Imereti Agro Zone and existing association, plan and co-finance marketing activities on non-traditional export markets 7. Provide support to R&D institutions (e.g., Agricultural Research Center or future R&D facilities under Imereti Agro Zone project) to research feasibility of production of new varieties, as well as marketability of such products 8. Promote shift to high value-added premium products, create a communication plan that puts an emphasis on diversity 9. Access to finance program for promoting summer production: Create financial support programs for small farmers to purchase technology necessary for summer production (e.g., shading nets, climate control equipment and so on) 10. Provide technical support to the GoG to increase quality production of inputs domestically, e.g., seeds and seedlings 11. Support development of farmer groups/cooperatives for making joint raw material purchases (possibly direct imports by the farmer groups/cooperatives)

	Key Opportunities • Strong local demand on herbs, their popularity in Georgian cuisine • Development of IAZ that will promote homogenous product production and open doors to the EU • DCFTA and opportunities of EU markets in case of GLOBALG.A.P. certificate • Increasing international demand for herbs • Remaining somewhat stable demand on international markets during Covid-19 • Increasing demand for consumer preferences toward packaged herbs • The opportunity of alternative energy sources for advanced greenhouses	**Capitalize on Opportunities** 1. Provide technical and financial support for the development of packaging facilities according to the modern standards 2. Conduct feasibility on usage of alternative energy sources for the advanced greenhouses
	Key Threats • Political instability, greater uncertainty making it difficult to plan and invest • Economic instability, fluctuating exchange rates, making it difficult to plan • Covid-19 pandemic, risks of lockdowns and disruption of supply and market links, production • Climate change and increased frequency of extreme weather events (e.g., strong winds) • Strong competition from the low-cost producers (e.g., Iran) • High dependence on single export markets (e.g., Russia) with instable political relations, which creates risks of export disruption	**Mitigate Threats** 1. Conduct research on possible effects of climate change on the Imereti agriculture and create adaptation plan 2. Pilot joint GLOBALG.A.P. certification: Provide financial support to the selected group of medium and large farmers to jointly receive the certification and create success stories in the region 3. Conduct trainings for farmers on GLOBALG.A.P. requirements and provide recommendations

	• High costs of GLOBALG.A.P. certification makes it difficult to be obtained by small size greenhouses	

PROPOSED TIMELINE OF IMPLEMENTATION AND ESTIMATE OF COSTS

N		2021	2022	2023	2024	2025	APPROX. COSTS (GEL)	RESPONSIBLE PARTY / COUNTERPART
3.1			■	■	■	■	TBD	TBD
3.2			■	■				
3.3		■	■	■	■	■		
3.4		■	■	■	■	■		
3.5			■	■	■	■		
3.6		■	■	■	■			
3.7				■	■	■		
3.8		■	■	■	■			
3.9		■	■	■				
3.10			■	■	■			
3.11		■	■	■	■			
3.12		■	■	■				
3.13			■	■	■	■		
3.14		■	■					
3.15		■	■	■				
3.16	■	■	■	■	■			
3.17	■	■	■					

4	SKILLS DEVELOPMENT PROGRAM	
DOMAIN: SKILLS AND KNOWLEDGE	EXISTING SITUATION	RECOMMENDED STRATEGY
	Key Strengths • Experienced labor force • Competitive labor costs • General willingness of farmers to learn and improve competencies • Available ad-hock consultations on proper usage of inputs • Practice of learning from the "best performing" farmers/greenhouses	Leverage Strengths 1. Encourage knowledge sharing practices
	Key Weaknesses • Lack of qualified agronomists • A limited number of qualified consultants at service centers and input providers • Lack of educational programs and materials specifically targeting herbs growing in greenhouses • High level of migration, limiting available workforce in the region	Improve Weaknesses 1. Provide technical assistance to train small farmers in modern practices of agronomy and herbs/vegetables growing 2. Provide technical support to consultants (ToT) of various input suppliers to increase their competency and farmers' access to quality extension services 3. Create training programs that are customized to the needs and capacity of the local farmers; preferably involve several local greenhouse owners in the development of a curriculum 4. Regularly develop and distribute recommendations for the local farmers in Georgian language (e.g., how to use inputs properly, how to cultivate new variety of products, how to transfer foreign know-how in Georgia etc.)
	Key Threats • Risks of protracted development of the skills and knowledge among the new generation, especially in terms of agronomists	Mitigate Threats 1. Provide technical support to the local educational institutions (e.g., Akaki Tsereteli State University) to attract more students to the

		agronomy profession, possibly carry out a campaign among high school students

PROPOSED TIMELINE OF IMPLEMENTATION AND ESTIMATE OF COSTS	N	2021	2022	2023	2024	2025	APPROX. COSTS (GEL)	RESPONSIBLE PARTY / COUNTERPART
	4.1						TBD	TBD
	4.2							
	4.3							
	4.4							
	4.5							
	4.6							

5	IMPROVING TECHNOLOGY, EQUIPMENT AND INFRASTRUCTURE OF THE SECTOR	
DOMAIN: FACTORY, TECHNOLOGY AND EQUIPMENT	EXISTING SITUATION	RECOMMENDED STRATEGY
	Key Strengths • Availability of soil testing laboratories in the region	Leverage Strengths 1. Provide technical and financial support to increase accessibility and affordability of laboratories among farmers
	Key Weaknesses • Lack of scale of greenhouses making it difficult to justify investments in advanced machinery and technology, as well as certification • Absence of cargo terminal at Kutaisi Airport (preventing timely and quality export procedures) • Lack of the post-harvest infrastructure that is required for the export of fresh products to advanced markets (lack of packing houses and pre-cooling technologies)	Improve Weaknesses 1. Access to finance program: develop and finance customized financial support program for technology upgrade 2. Conduct feasibility of joint acquisition of technology and equipment 3. Provide technical assistance to the GoG and IAZ to create a cargo terminal in Kutaisi Airport

	• Limited development of logistics/distribution services	
	Key Threats • Lack of GLOBALG.A.P. certificatory body in the region/country	**Mitigate Threats** 1. Provide technical and financial support to the local certifying agencies to receive the right to issue GLOBALG.A.P. certificate

PROPOSED TIMELINE OF IMPLEMENTATION AND ESTIMATE OF COSTS

N	2021	2022	2023	2024	2025	APPROX. COSTS (GEL)	RESPONSIBLE PARTY / COUNTERPART
5.1						TBD	TBD
5.2							
5.3							
5.4							
5.5							

6	PROMOTING R&D CAPACITIES OF THE SECTOR	
DOMAIN: R&D	EXISTING SITUATION	RECOMMENDED STRATEGY
	Key Weaknesses • Limited on-going R&D activities • Lack of strong linkages between academia and private sector • Limited international know-how on cultivation in greenhouses (both among R&D institutions and farmers)	**Improve Weaknesses** 1. Provide technical and financial support to the R&D centers/activities (e.g., Agricultural Research Center or future R&D facilities under Imereti Agro Zone project) to increase country's research capacity and ensure sustainable development 2. Promote information sharing between research institutions and private enterprises (e.g., organizing various trainings, presentations, meetings, etc.) 3. Facilitate matchmaking and cooperation between domestic and international research centers

Proposed timeline of implementation and estimate of costs	n	2021	2022	2023	2024	2025	Approx. Costs (GEL)	Responsible Party / Counterpart
	6.1						TBD	TBD
	6.2							
	6.3							

16 | ANNEXES

16.1 ANNEX I – LIST OF IN-DEPTH INTERVIEWS

LN	COMPANY /ORGANIZATION/ GOVERNMENTAL ENTITY	CONTACT PERSON	POSITION
		ENTERPRISES	
1	HERBIA	Zurab Janelidze	Director
2	IMERETI GREENERY	David Chkheidze	Operations Manager
3	LLC SHERI	Beso Tsertsvadze	Director
4	GREENHOUSE	Rolandi Kiladze	Owner
5	GREENHOUSE	Tariel Gigiadze	Owner
6	GREENHOUSE	Avtandil Kvachidze	Owner
7	GREENHOUSE	Mzia Cheishvili	Owner
8	GREENHOUSE	Irina Makhatadze	Owner
9	GREENHOUSE	Zurab Kuprashvili	Owner
10	GREENHOUSE	Nino Khurtsidze	Owner
11	GREENHOUSE	Mindia Kavtaradze	Owner
12	GREENHOUSE	Davit Chkhaidze	Owner
13	GREENHOUSE	Natalia Tskhitishvili	Owner
		Support Institutions	
14	IMERETI AGROZONE	Archil Bukia	Director
15	GEORGIAN HERBS PRODUCERS ASSOCIATION	Emzar Ghvinianidze	President
16	REGIONAL DEVELOPMENT AGENCY (RDA), MINISTRY OF ENVIRONMENTAL PROTECTION AND AGRICULTURE OF GEORGIA	Tonrike Kapanadze	Head of Projects Management Department
17	THE USAID AGRICULTURE PROGRAM	Nugzar Jinjikhadze	-
18	RURAL DEVELOPMENT AGENCY	Merab Chikvaidze	Tskaltubo Municipality Representative
19	SCENTIFIC RESEARCH CENTER OF AGRICULTURE (SRCA)	Nodar Khatiashvili Tamar Jinjikhadze	Nodar Khatiashvili: Deputy Director in the Science Field
20	GDCI	Ekaterine Kimeridze	Director
21	USAID AGRICULTURE PROJECT	Maka Tevdoradze	Marketing and Export Promotion Manager
		Service Providers	
22	BORNAGRO	Giorgi Porchkhidze	Manager
23	GEGUTI LTD	Mamuka Tsikoridze	Director

24	AGROSERVICE	Sandro Osiashvili	-
25	"GLOBAL QUALITY AND STANDARDS PROGRAMME GEORGIA"	Phatima Mamardashvili	Consultant
26	INDIVIDUAL EXPORTER	Jaba Tkeshelashvili	Individual Exporter
27	GOODWILL	Ketevan Oniani	Herbs and Vegetables Purchasing Manager

16.2 ANNEX II - LIST OF MUNICIPALITIES AND VILLAGES COVERED BY TELEPHONE SURVEY

MUNICIPALITY	VILLAGE	
TSKALTUBO	• Geguti • Kvitiri • Maghlaki • Mukhiani	• Partskhanakanevi • Patriketi • Sakulia • Tkachiri
BAGHDATI	• Dimi • II Obcha • Rokhi	• Tsitelkhevi • Vartsikhe
SAMTREDIA	• Bashi • Ghaniri • Gomi • Jikhaishi	• Melauri • Nabakevi • Opeti
VANI	• Dikhashkho • Pereta • Shuamta	
KHONI	• Dedalauri • Gubi • Ivanidi • Kukhi	
ZESTAPONI	• Aragveta • Kveda Sazano • Rodinauli • Meore Sviri	
TERDJOLA	• Ghvankiti	
KHARAGAULI	• Vardzia	
SACHKHERE	• Sariki	