



# VEGETABLE MARKET ASSESSMENT

REPORT

FINAL

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# **VEGETABLE MARKET ASSESSMENT**

REPORT

FINAL

USAID ECONOMIC PROSPERITY INITIATIVE (EPI)

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# CONTENTS

I.	EXECUTIVE SUMMARY.....	1
II.	APPENDICES .....	4
	A. BACKGROUND.....	5
	B. METHODOLOGY.....	6
	C. FINDINGS.....	7
	D. RECOMMENDATIONS.....	40
	E. ADDITIONAL INFORMATION .....	44

## LIST OF FIGURES

FIGURE 1: ANNUAL VEGETABLE PRODUCTION OUTPUTS (GEL MILLION).....	9
FIGURE 2: VEGETABLE AND POTATO PRODUCTION IN GEORGIA ('000 MT) .....	10
FIGURE 3: PRODUCTION THROUGH TRANSITIONS – 1980-2009 (,'000 MT).....	10
FIGURE 4: AVERAGE ANNUAL YIELDS (MT PER HECTARE) – 2006-2010.....	11
FIGURE 5: ANNUAL CONSUMPTION VOLUMES .....	12
FIGURE 6: IMPORTS AS A PERCENTAGE OF DOMESTIC CONSUMPTION.....	13
FIGURE 7: IMPORT AND EXPORT VOLUMES FOR VEGETABLES AND POTATOES - 2010 .....	13
FIGURE 8: KEY VEGETABLE IMPORTS ('000 USD) – 2000-2010 .....	14
FIGURE 9: KEY VEGETABLE EXPORTS ('000 USD) – 2000-2010 .....	14
FIGURE 10: MAP OF FSC AND MSC NETWORK .....	16
FIGURE 11: FOOD PROCESSORS AND CANNERIES PRODUCTION OUTPUT (GEL '000).....	18
FIGURE 12: INDIVIDUAL VEGETABLE PRODUCTION VOLUME ('000 MT).....	21
FIGURE 13: PRICE ANALYSIS FOR 4 MAJOR VEGETABLES (IN GEL) .....	21

FIGURE 14: VEGETABLE IMPORTS TO GEORGIA BY VOLUME, VALUE AND ORIGIN.....	21
FIGURE 15: VEGETABLE EXPORTS FROM GEORGIA BY VOLUME, VALUE AND ORIGIN .....	22
FIGURE 16: VEGETABLE PRODUCTION ZONES .....	23
FIGURE 17: NUMBER OF VEGETABLE FARMS BY REGION – 2010 .....	24
FIGURE 18: NUMBER OF POTATO FARMS BY REGION – 2010 .....	24
FIGURE 19: SOWN AREAS IN HECTARES – 2010.....	26
FIGURE 20: NUMBER OF VEGETABLE FARMS BY SIZE CATEGORIES .....	26
FIGURE 21: NUMBER OF POTATO FARMS BY SIZE CATEGORIES.....	27
FIGURE 22: BREAKDOWN OF FARMS BY REGION AND SIZE (CUMULATIVE).....	28
FIGURE 23: ANNUAL OUTPUT GROWTH RATES .....	33
FIGURE 24: VEGETABLE MARKET VALUE CHAIN.....	36

# I. EXECUTIVE SUMMARY

## BACKGROUND

This Vegetable Market Assessment was prepared under the United States Agency for International Development (USAID) Economic Prosperity initiative (EPI) within the Agricultural Sector Component. The purpose of this market assessment is to assess the vegetable market for export potential, linkages, gaps, positive leveraging points, and areas of improvement, in order to depict a larger picture of how the vegetable sector can achieve a higher level of competitiveness.

## METHODOLOGY

EPI has identified the development of the Vegetable Market in Georgia as one of its main priorities and is in the process of developing several initiatives to stimulate further growth in this sector. This assessment will serve as the foundation for developing an action plan that will identify steps to increase market access for vegetable market actors, to promote the expansion and implementation of necessary infrastructural components that are currently barriers to growth and competitiveness, and to promote food safety certifications for commercial vegetable market actors to increase their competitiveness within Georgian and international markets.

The objective of the scope of work for this consultancy is to assess the vegetable market for export potential, linkages, gaps, positive leveraging points, and areas of improvement; the consultant conducted extensive quantitative and qualitative research. To accomplish this objective, the consultant interviews with industry experts to identify the barriers, gaps, and synergies within the vegetable market value chain.

## FINDINGS

### PERFORMANCE AND OUTLOOK

Georgian agricultural output in 2010 was GEL 2.32 billion (USD 1.39 billion) with 9.95% of its turnover originating in vegetable production. With more than 59,000 hectares of production, vegetable growing provides GEL 230.9 million (USD 138.3 million) of output. Agriculture (including hunting, fishing, and forestry) is the 5<sup>th</sup> largest industrial sector and contributed to 8.4% of Gross Domestic Product (GDP) in 2010.

The general short and long-term outlook for the vegetable sector is “stable, with slow growth;” however, there are many opportunities to quickly create value if producers can overcome the constraints that currently impede growth.

With the recent development of the Farm Service Center (FSC) and Machinery Service Center (MSC) network, the extensive free technical trainings provided by this network, the increased supply and variety of high-quality cultivars and other inputs, and the introduction and usage of new technologies, the vegetable sector is well positioned to make strong productivity gains. However, the immediate need for credit financing to pay for these innovations still presents a challenge that will continue to impede growth without the introduction of new financial instruments appropriate to agricultural operations.

The absence of a critical mass of postharvest handling facilities – such as collection centers, cold storages, food packagers, and processors – also constrain opportunities for growth. Without these facilities, it is possible that any increases in productivity will be negated by the inability to sell excess supply or by supply degradation due to the lack of appropriate storage options.

According to GeoStat's 2005 Farm Census, only 17.8% of all Georgian farms (129,498 farms) produce mainly to sell their products, as opposed to producing for self-consumption. Out of this 17.8%, only 0.38% (486 farms) are registered enterprises. In other words, 0.07% of all farms are registered enterprises that grow crops for commercial purposes. Considering the fact that the majority of Georgia's vegetable producers have not begun production for commercial purposes, it will be difficult to realize any growth from economies of scale without significant consolidation initiatives and/or significant investment in greenhouses.

## TRENDS

Since the 2006 Russian embargo began, the agricultural sector has suffered dramatically due to the loss of its largest export market. Additionally, the global financial crisis and the war with Russia in August 2008 also negatively impacted production volumes. From 2006 to 2009, vegetable production output decreased from GEL 271.9 million to GEL 207.9 million, representing a decrease of 23.5% in production. Despite these negative external impacts, there are strong signs of a rebound growth, as output increased by 11.1% from 2009 to reach GEL 230.9 million in 2010.

The life cycle of the Vegetable Market in Georgia is Early Stage, with a focus on Quality Growth. After years of little to no growth or reinvestment, there have been significant advances over the past five years that have added tremendous capacity and potential to the market. Recent successes include not only positive developments – such as better inputs, newer technologies, and the introduction of the FSC and MSC network – but also the elimination of significant market risks, such as the distribution of chemicals of unknown origin and composition being sold as legitimate fertilizers and pesticides.

Average yields per hectare for vegetable production have remained relatively flat (3.0% growth) from 2006-2009, while a new growth trend has begun with increasing potato production yields, which has resulted in a 55.4% increase in yields for the same time period.

From 2006-2009, domestic consumption for vegetables was relatively stable, ranging from 234,000-259,000 MT, while domestic production was always lower, ranging from 165,000-190,000 MT. Not only were 100% of the domestically produced vegetables consumed, but additional imports were required in order to satisfy these recent demand levels. According to these measurements, vegetable production needs to rise by at least 34% and as much as 57% to just satisfy domestic demand. Likewise, farmers only need to increase potato production by an additional 9% -15% to satisfy domestic demand.

Of the vegetables that are imported, most are staple crops, like potatoes, tomatoes, legumes, cucumbers, garlic, and onions. Imports of these crops were at relatively low volumes until rising significantly from 2005-2007, and leveling off, or even decreasing from 2007-2010. For example, only USD 263,000 of potatoes were imported 2004 before increasing to more than USD 12 million in 2007 and dropping back to USD 713,000 in 2010.

## RECOMMENDATIONS

While there are many gaps in the Vegetable Market value chain that need to be addressed directly and resolved to increase the sector's productivity, profitability, and competitiveness, there are several that are more structurally significant and demand a higher priority in EPI's action plan. The following items are the high priority recommendations that will not only address a major specific infrastructural component or operational process gap, but will also contribute to resolving other gaps identified in this report.

- Infrastructure
  - Cold Storage Facilities: By meeting the currently high demand for storages from producers, processors, and wholesale distributors, EPI will stimulate increased primary production, expand processing seasons, and extend the domestic vegetable sales period.
  - Food Packaging: By introducing affordable vegetable packaging, produce will be better preserved and protected in all postharvest handling processes. This is particularly important for exports, where profitability depends on product survivability.
- Workforce Enhancement
  - Training on Inputs and Technologies: By training producers on using inputs and technologies properly, EPI will stimulate better quality and higher production.
- Market Access
  - Collection Facilities and Transportation Routes: By developing mechanisms for rural farmers to collect production, creating linkages between these facilities with wholesalers and facilitating new transportation routes, EPI will enable producers to sell their produce in higher-priced markets to generate higher revenues.
- Certifications and Standards
  - GlobalGAP and Hazard Analysis and Critical Control Point (HACCP): By promoting GlobalGAP among producers and HACCP among processors and postharvest handling facilities, EPI will enable producers to access major export markets with high-value products and will create visible models of proper food safety and handling procedures.
  - Smallholder GlobalGAP: By promoting the Smallholder GlobalGAP designation, EPI will not only improve access to markets for numerous small producers, but will also stimulate much-needed profitability gains.
  - Commodity Grading System: By implementing European CODEX standards, purchasers – including processors, wholesalers, and export markets – can set grade targets for their operations, which will increase demand for specific qualities of production, which will also stimulate quality gains among producers.

## **II. APPENDICES**

- A. BACKGROUND**
- B. METHODOLOGY**
- C. FINDINGS**
- D. RECOMMENDATIONS**
- E. ADDITIONAL INFORMATION**

# A. BACKGROUND

## DEFINITIONS

For the purpose of this assessment, “Vegetable Market” refers to the primary production of vegetables (including potatoes), and includes both open field producers as well as greenhouse producers. This assessment refers to vegetables and potatoes collectively as “vegetables,” but potatoes are broken out from vegetables for statistical purposes. Furthermore, this definition does not include other annual crops, such as wheat, maize, melons, and gourds or crops used for fodder purposes. All references to performance of the “Vegetable Industry” focus on actual vegetable sector production and exclude all other market actors. Support services provided to the Vegetable Market by input providers, processors, storages, distributors, etc., are outlined in a separate section.

## MAIN ACTIVITIES

The main activities of the Vegetable Industry include:

- PreProduction
  - Soil testing and ground preparation
  - Seedling production
  - Equipment and machinery rental services
  - Research and development
  - Technical training
- Production (including planting)
  - Equipment and machinery rental services
  - Planting of seeds or seedlings
  - Irrigation systems
  - Application of fertilizers, herbicides, and pesticides
- Postharvest
  - Sorting produce according to size and quality
  - Cleaning and packaging
  - Drying and processing
  - Storing produce in cold storages and other facilities
- Distribution
  - Delivering produce to local fresh markets
  - Wholesalers purchasing and transporting produce to consumer markets
  - Export preparation and shipment
  - Retail market outlet sales

## B. METHODOLOGY

EPI has identified the development of the Vegetable Market in Georgia as one of its main priorities and is in process of developing several initiatives to stimulate further growth in this sector. This assessment will serve as the foundation for developing an action plan that will identify steps to increase market access for vegetable market actors, to promote the expansion and implementation of necessary infrastructural components that are currently barriers to growth and competitiveness and to promote food safety certifications for commercial vegetable market actors to increase their competitiveness within Georgian and international markets.

The objective of the scope of work for this consultancy is to assess the vegetable market for export potential, linkages, gaps, positive leveraging points, and areas of improvement; the consultant conducted extensive quantitative and qualitative research. To accomplish this objective, the consultant interviews with industry experts to identify the barriers, gaps, and synergies within the vegetable sector value chain that represent potential opportunities to increase growth and competitiveness. While undertaking this assessment, the consultant utilized the following methods:

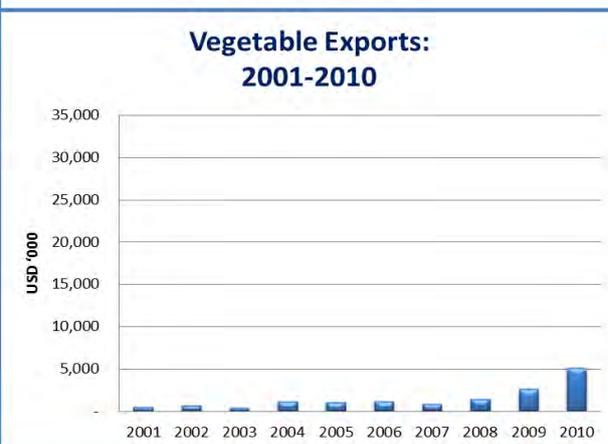
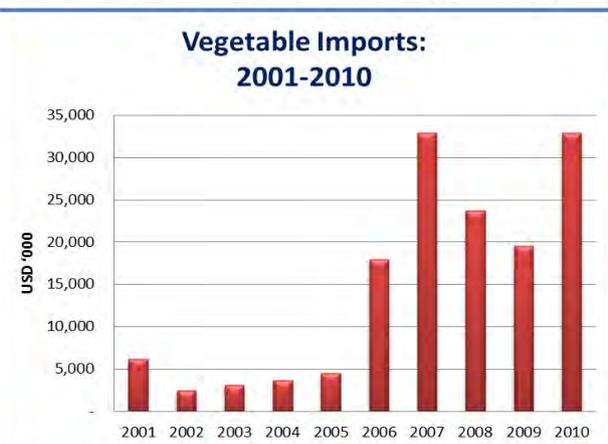
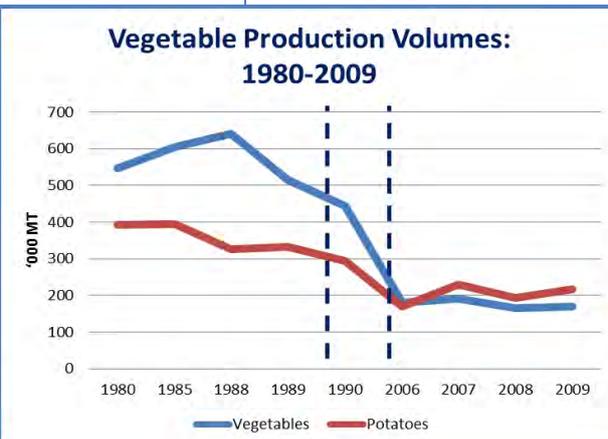
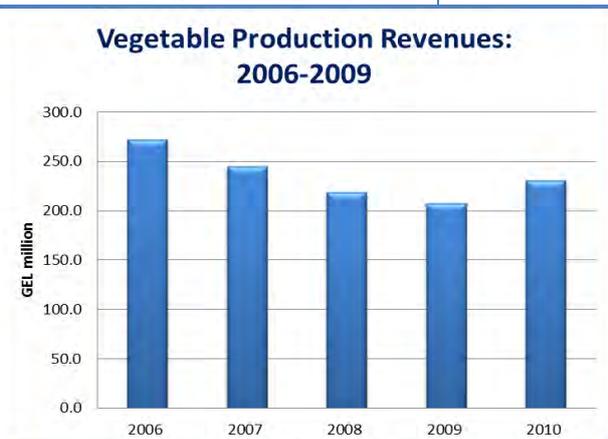
- Desk Review (see Annex E – Resources Used)
  - Available industry reports
  - Published and online data
  - Government statistical information
- In-Depth Interviews of Industry Experts (see Annex E – Interviews Conducted)
  - The consultant conducted 45 in-depth, face-to-face interviews of approximately 30-60 minutes each. Respondents included:
    - Primary vegetable and potato producers, including open field and greenhouse producers;
    - Input providers, including commercial entities that provide soil preparation services, raw materials, crop protection products, and machinery;
    - Representatives of food processors and cold storages;
    - Representatives of distribution channels, including wholesale distributors, institutional purchasers, and retail outlets;
    - Commercial banks and other nonbank financial institutions that provide services to vegetable market actors;
    - Representatives of International Financial Institutions (IFIs) or donor organizations with programs to support agricultural development and food safety policies in Georgia;
- Industry and development experts in the agriculture sector.

# C. FINDINGS

## INDUSTRY PERFORMANCE

### Key Statistics Snapshot

Industry Revenues: 2010 <b>GEL 231 million</b>	Revenue Growth: 2006-09 <b>(23.5%)</b>	Revenue Growth: 2010 <b>11.1%</b>
Vegetable Production: 2010 <b>387 metric tons</b>	Exports: 2010 <b>USD 5.1 million</b>	Imports: 2010 <b>USD 32.9 million</b>



### Industry Structure

Life Cycle Stage	Early Stage	Regulation Level	Low
Revenue Volatility	High	Technology Change	Moderate
Investment Requirements	Moderate	Barriers to Entry	Low
Industry Assistance	Moderate	Industry Globalization	High
Concentration Level	Low	Competition Level	High

## LIFE CYCLE STAGE

The life cycle of the Vegetable Market in Georgia is Early Stage, with a focus on Quality Growth. After years of little to no growth or reinvestment, there have been significant advances over the past five years that have added tremendous capacity and potential to the market. Recent successes include not only positive developments – such as better inputs, newer technologies, and the introduction of the FSC and MSC network – but also the elimination of significant market risks, such as the distribution of chemicals of unknown origin and composition being sold as legitimate fertilizers and pesticides.

Despite these gains, vegetable producers and processors face many significant challenges, including:

- General lack of market and price information;
- No economies of scale to increase competitiveness with regional competitors;
- Poor primary production practices;
- Low-quality postharvest handling systems;
- Limited access to credit for operations and capital investments;
- Limited access to production inputs and technical training services;
- Poor harvest and postharvest infrastructure;
- Limited access to major domestic and export markets.

Gains in production and competitiveness will be realized over the next few years by these successes, but the specific challenge that will impede this industry is that growth will be limited by the current absence of any significant economies of scale among vegetable producers. With more than 99% of all producers farming plots smaller than two hectares, it is impossible to realize cost-efficiency measures and profitability potential unless some form of consolidation occurs, despite the implementation of new technologies and better inputs.

## CURRENT PERFORMANCE

### Financial Performance

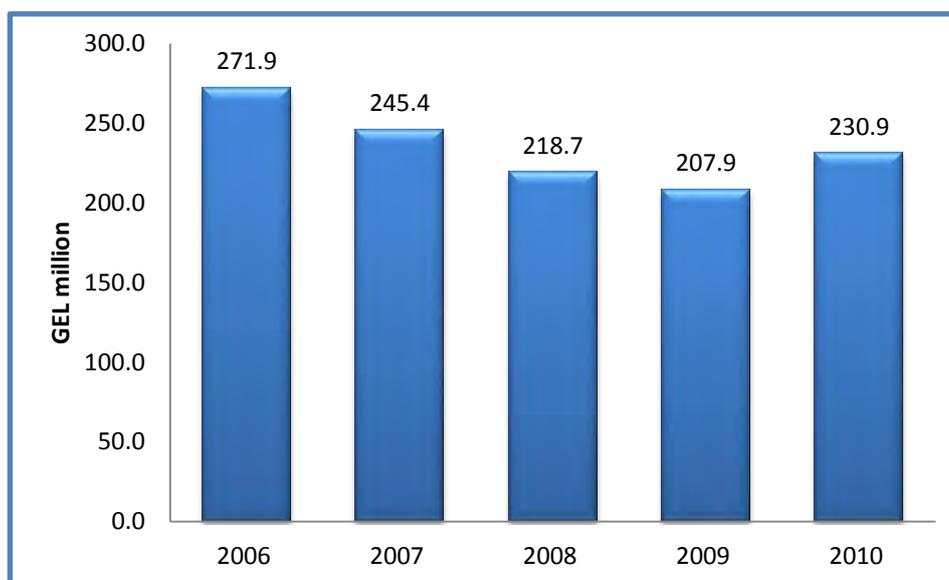
Georgian agricultural output in 2010 was GEL 2.32 billion (USD 1.39 billion) with 9.95% of its turnover originating in vegetable production. With more than 59,000 hectares of production, vegetable growing provides GEL 230.9 million (USD 138.3 million) of output. Agriculture (including hunting, fishing, and forestry) is the 5<sup>th</sup> largest industrial sector and contributed to 8.4% of GDP in 2010.

Since the 2006 Russian embargo began, the agricultural sector has suffered dramatically due to the loss of its largest export market, but the market is showing signs of recovery. Additionally, the global financial crisis and the war with Russia in August 2008 also negatively impacted production volumes.

From 2006 to 2009, vegetable production output decreased from GEL 271.9 million to GEL 207.9 million, representing a decrease of 23.5% in production. Despite these negative

external impacts, there are potential signs of a growth, as output increased by 11.1% from 2009 to reach GEL 230.9 million in 2010.<sup>1</sup>

**Figure 1: Annual Vegetable Production Outputs (GEL million)**



Source: GeoStat, 2011

## Supply Analysis

Historically, Georgia's economy has been, to a great extent, based on agricultural production, especially in fresh and processed vegetables. During the Soviet period, farms and greenhouses were very productive. Greenhouse vegetable production for off-season produce was a well-developed sector during the second half of the twentieth century. In fact, there are still thousands of small greenhouses throughout the country; however, most are unheated, need rehabilitation, and cannot currently contribute meaningfully to off-season production.

After the dissolution of the Soviet Union, the central market economy collapsed, large Soviet *kolhoz* and *sovhoz* (large Soviet state-owned farms) were broken up into small farm plots, input drivers became increasingly more expensive, and supply lines to international demand markets were broken. Combining these factors with the energy crisis in the early 2000s and the degradation of irrigation systems throughout the country in the mid-2000s led to a significant decrease in domestic production. This made it necessary to rely heavily upon imported products from the international markets.

As can be seen in Figure 2, production volumes during the Soviet period were very high, as much as 2.95 times larger than current production volumes, as can be seen in Figure 3.

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<sup>1</sup> GeoStat, National Statistics Office of Georgia. "Gross Domestic Product of Georgia in 2010". [www.geostat.ge](http://www.geostat.ge).

**Figure 2: Vegetable and Potato Production in Georgia ('000 MT)**

	1980	1985	1988	1989	1990
<b>Vegetables</b>	546	604	641	515	443
<b>Potatoes</b>	393	394	326	332	294

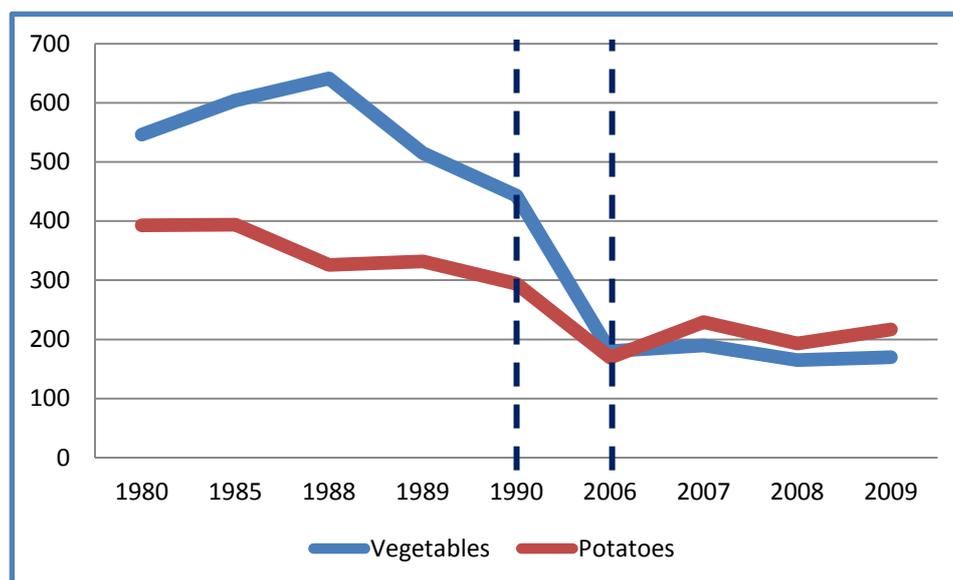
Source: Народное Хозяйство СССР, 1991.

Although a major food exporter during the Soviet era, production trends decrease sharply in 1985-1990. In this period, vegetable and potato production had already decreased by 26.7% and 25.4%, respectively.

From 1990 to 2006, there was a prolonged period of contraction, followed by stagnation, in the agriculture industry, characterized by significant decreases in production volumes across all agricultural sectors. As can be seen in Figure 2 below, vegetable and potato production volumes decreased by an additional 59.4% and 42.5%, respectively.

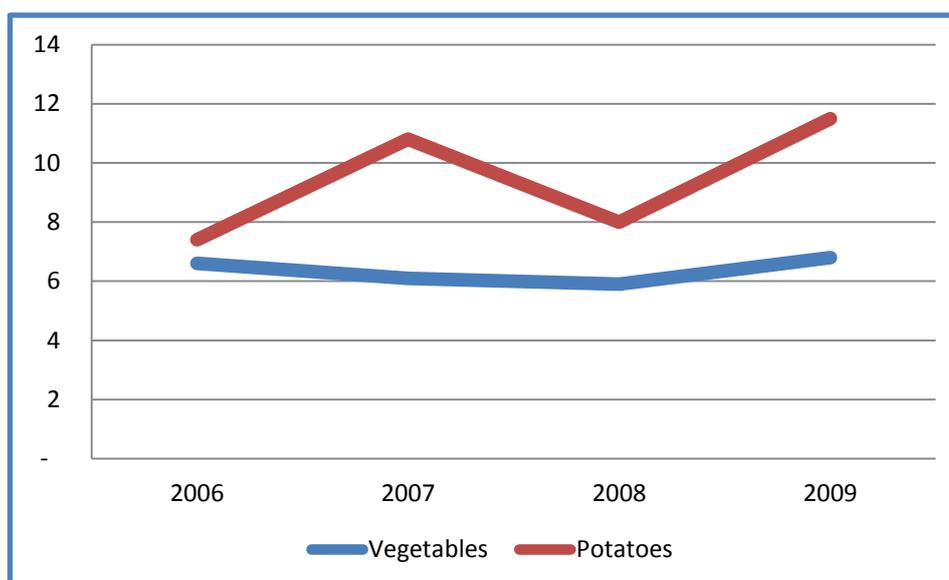
In 2006, production volumes stabilized and a new growth trend is beginning to emerge, with an 11% growth in total production volumes from 2006-2009. However, price strength is still a major issue, since total production output (in GEL) decreased by 23.5% for the same time period.

**Figure 3: Production through Transitions – 1980-2009 ('000 MT)**



Source: GeoStat, 2011

As can be seen in Figure 4, average yields per hectare for vegetable production have remained relatively flat (3.0% growth) from 2006-2009, while a new growth trend has begun with increasing potato production yields, which has resulted in a 55.4% increase in yields for the same time period.

**Figure 4: Average Annual Yields (MT per Hectare) – 2006-2010**

Source: GeoStat, 2011

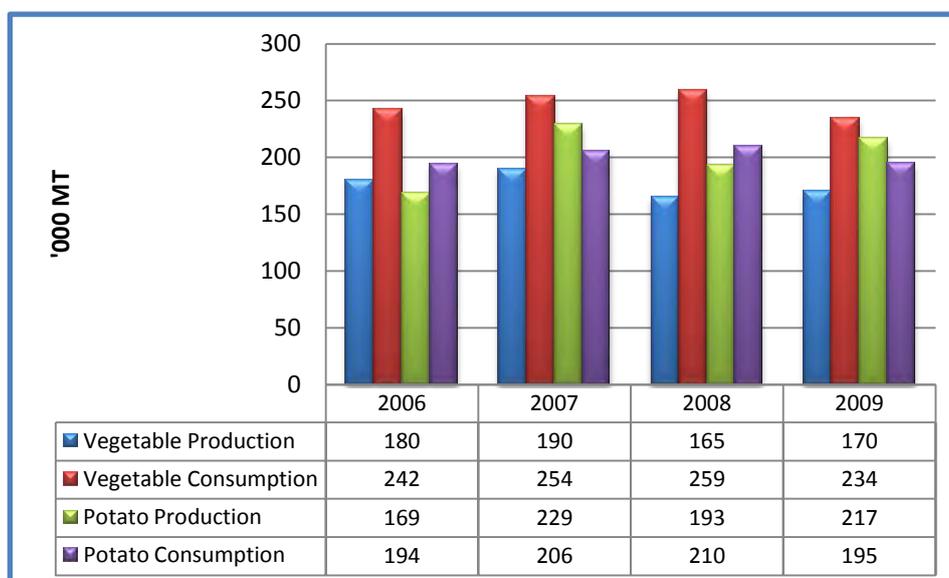
Many industry experts contribute these decreases to several factors. One of the main factors had to do with soil preparation. For many years, farmers were not performing soil tests or using fertilizers and pesticides to treat the soil and protect crops, so the soil's natural fertility diminished. During this period, the prices of available chemicals were very high for the average farmer to purchase, and chemicals of unknown origin were sold in markets at below-market rates. Furthermore, many farmers had no training on the application of these chemicals, so this negatively impacted yields.

Another factor that influences yields was the degradation of the existing irrigation systems that had not been replaced or updated since the Soviet period. Many farmers are unable to properly irrigate their crops, which also negatively impacted yields. Furthermore, the seeds that were available in the market were of low quality and had low yield potential. New seeds were necessary to increase yield potential; however, many farmers could not afford to purchase them.

At this time, the farm machinery that had been in use since the Soviet period also began to break down, and new machinery was necessary. Those farmers that owned operating machinery, or had purchased new machinery, charged fees to other farmers to till their fields. However, many farmers could not afford these services, and this lack of quality machinery contributed to a further decrease in yields.

### **Demand analysis**

For the Georgian vegetable market, demand is most easily estimated by domestic consumption rates. Figure 5 offers a comparison of vegetable and potato production and consumption from 2006-2009.

**Figure 5: Annual Consumption Volumes**

Source: GeoStat, 2011

From 2006-2009, domestic consumption for vegetables was relatively stable, ranging from 234-259,000 MT, while domestic production was always lower, ranging from 165-190,000 MT. Not only were 100% of the domestically produced vegetables consumed, but additional imports were required in order to satisfy these recent demand levels.

According to these measurements, vegetable production needs to rise by at least 34% and as much as 57% to just satisfy domestic demand. If production exceeds these rates, then producers will either decrease their prices to stimulate additional consumption or target international markets through exported products.

Demand levels for potatoes also remained relatively stable from 2006-2009, ranging from 195-210,000 MT; however, production levels were more erratic. Domestic production actually exceeded demand in 2007 and 2009. Considering the differences between production and consumption values in 2006 and 2008, farmers only need to produce an additional 9-15% just to satisfy domestic demand. As such, potato production represents a significant opportunity for developing its export potential.

### Imports and Exports

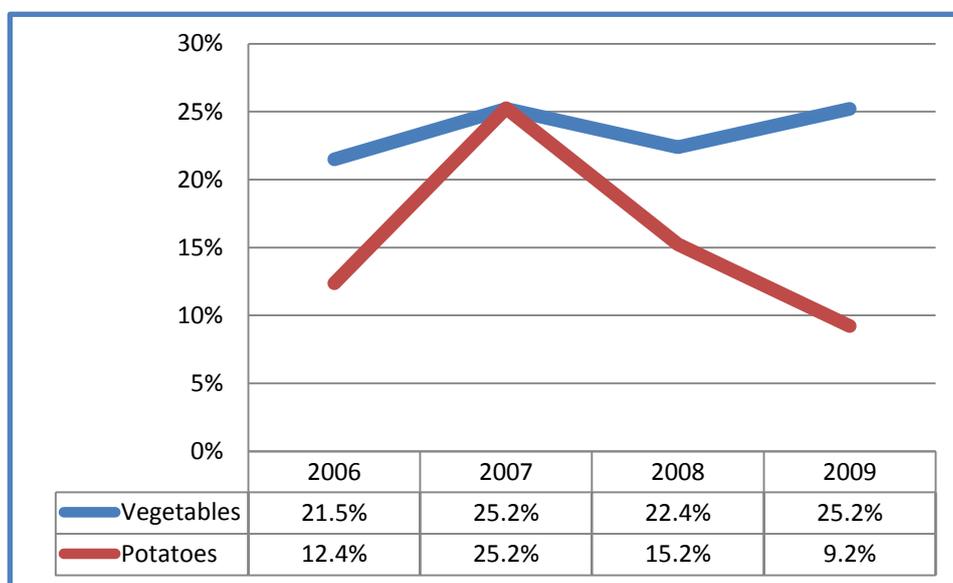
Throughout the period of the Soviet Union, Georgia was a significant fresh and processed food source for other Soviet countries. In fact, Georgia exported 43% of its food industry products, including 1.6% outside the Soviet Union, in 1987. Throughout the 1980s, Georgia exported 7% of its overall domestic agricultural production and imported only 8.7%.<sup>2</sup>

In 2009, vegetable and potato imports made up 25.2% and 9.2%, respectively, of domestic consumption in Georgia, as can be seen in Figure 6. For the same period, exports of

<sup>2</sup> AgVANTAGE SAVE Program, Final Report, Annex 4, 2006.

vegetables and potatoes were 2.1% and 0.5%, respectively, of domestic consumption. Compared to import and export volumes during the period of the Soviet Union, Georgia's balance between imported and exported products has evolved into a form of dependence on imports with very little export activity.

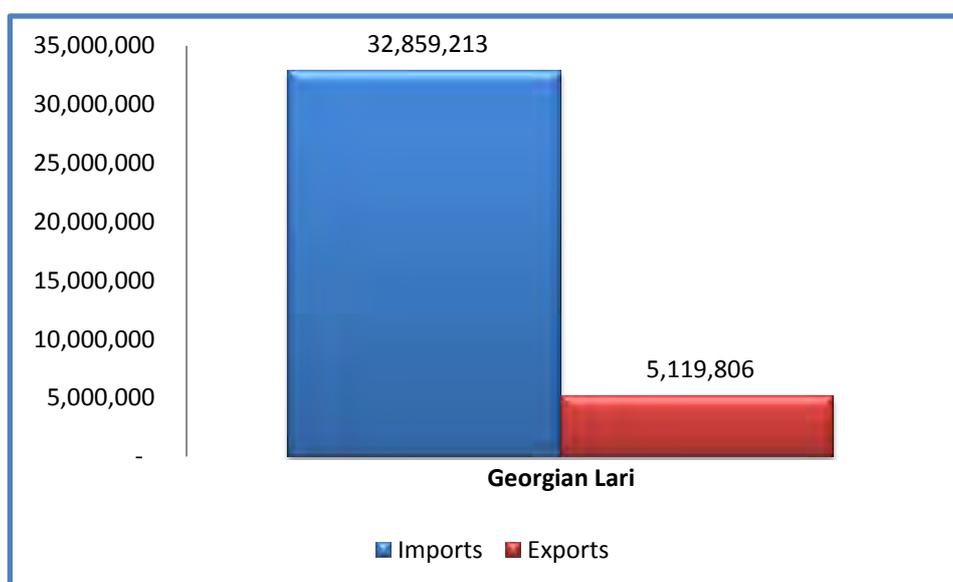
**Figure 6: Imports as a Percentage of Domestic Consumption**



Source: GeoStat, 2011

This dependence on imports is demonstrated by Figure 7, which shows that exports of vegetables and potatoes in 2010 were only USD 5.1 million, while imports were USD 32.9 million, which is 6.5 times the amount of exports.

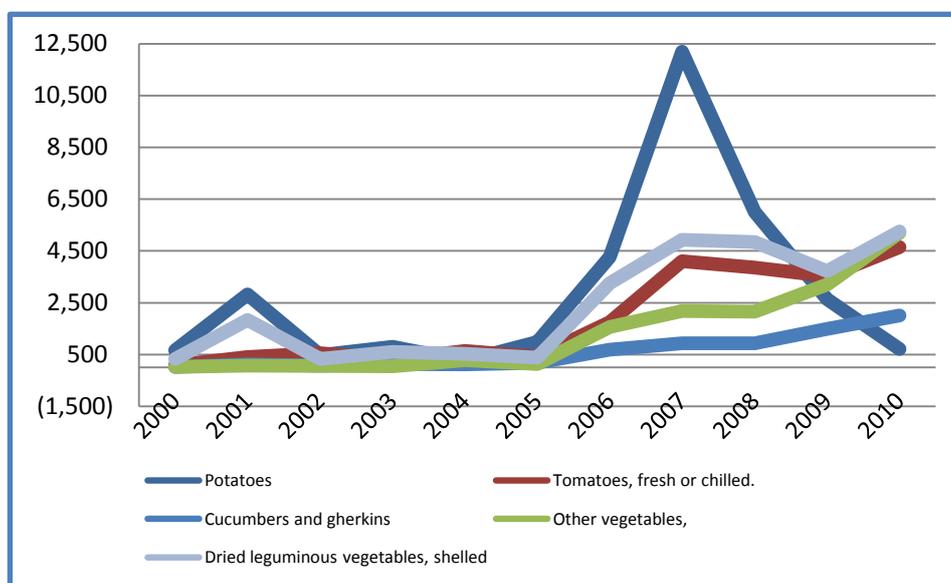
**Figure 7: Import and Export Volumes for Vegetables and Potatoes - 2010**



Source: GeoStat, 2011

While most vegetables are imported during winter months, the vegetables that are imported the most are staple crops, like potatoes, tomatoes, legumes, cucumbers, garlic, and onions. As can be seen in Figure 8, imports of these crops were at relatively low volumes until rising significantly from 2005-2007, and leveling off, or even decreasing from 2007-2010.

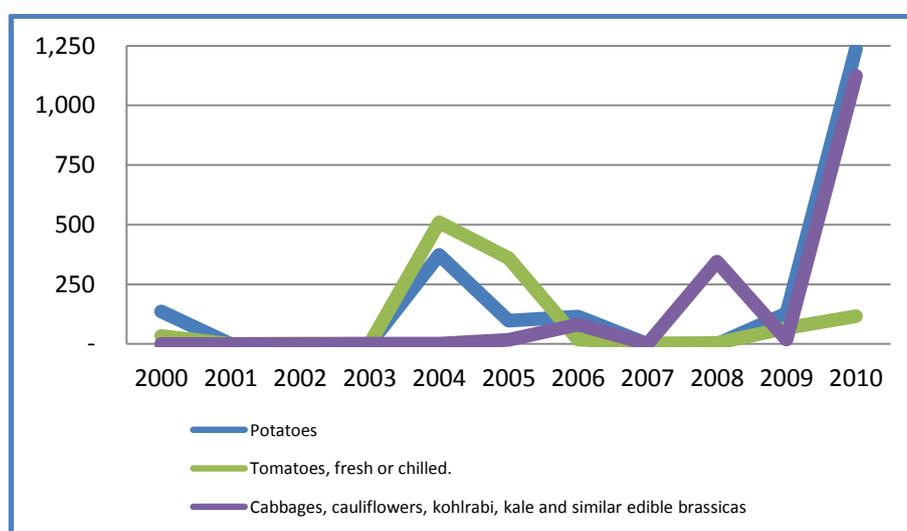
**Figure 8: Key Vegetable Imports ('000 USD) – 2000-2010**



Source: GeoStat, 2011

As can be seen in Figure 9, exports from 2000-2003 were essentially zero, before certain crops, such as potatoes, tomatoes, cabbage, and cauliflower began to be exported in small quantities from 2004-2006. Other vegetables, such as greens, were exported in increasing quantities from 2006 until today. Potatoes, cabbage, and cauliflower increased from virtually no export sales in 2009 to more than USD 2.3 million in 2010.

**Figure 9: Key Vegetable Exports ('000 USD) – 2000-2010**



Source: GeoStat, 2011

Despite its long history exporting products during the Soviet period, Georgian farmers are just beginning to realize the potential of exporting to international markets. This presents not only an opportunity to expand production, increase product quality, and access new markets, but also a challenge to identify which products and quantities that international markets demand. Furthermore, in order to export to most international markets, farmers, and processors alike will need to increase their product certifications to satisfy food safety standards in the importing country. This challenge will not only make their products more competitive in Georgia, but internationally as well.

## SUPPORT SERVICES TO VEGETABLE SECTOR

### Inputs

Farmers at most levels of production understand that better inputs result in higher yields and profitability. Specifically, by using high-quality cultivars – such as hybrid seeds – and by introducing drip irrigation, greenhouse management systems, regular fertilizer and pesticide schedules, and proper harvest and postharvest techniques, yields have begun to increase among the large and medium-sized farms. As long as there is support from the government and donor agencies to promote these practices and to provide technical skills training, small farms will emulate these techniques, and vegetable production should expand quickly in the next three to five years.

The speed at which Georgian farmers will implement these technologies depends on several factors, including:

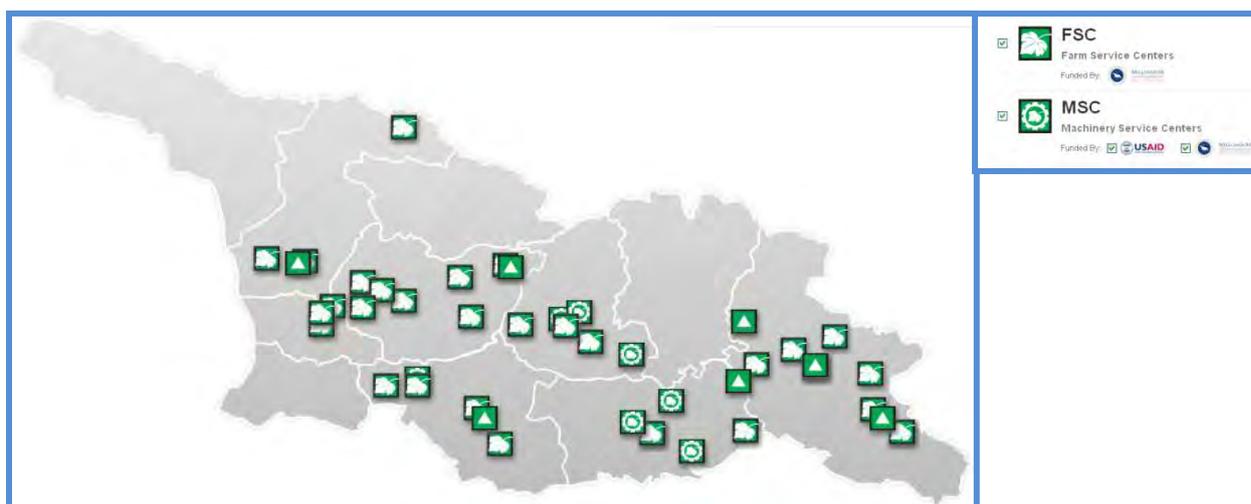
- Improved access to markets
  - Very few farms and greenhouses are producing high-value crops for export markets because most do not satisfy the requisite food safety certifications or adhere to internationally recognized production standards like GlobalGAP.
  - Major wholesalers do not purchase vegetables from small farms because they require a stable supply of quality produce, which is not available from individual farmers. Developing supply line infrastructural components to consolidate, sort, and channel small farm productions will offer wholesalers an alternative supply line to exclusively purchasing from larger farms.
- Obtaining export-related certifications
  - As production increases among small farmers, the medium and large farms will face increased competition and oversupply domestically and will look for ways to access export markets to sell their products. To do so, these farms (and food processors as well) will need to obtain food safety certifications, such as GlobalGAP and HACCP, to satisfy export market standards.
- Increased access to credit
  - Most small and medium farms operate have little to no short-term cash reserves for purchasing inputs. This problem is compounded by the fact that they will not receive revenues from their production until after harvest. By increasing the number of credit programs and by introducing forward contracting, farmers can access the credit they need for working capital and to make input purchases.

- New cold storage facilities
  - With 170,000 MT of vegetables and 217,000 MT of potatoes currently produced, there is only 12,005 MT of vegetable storage capacity across the country.
  - Many farmers have the ability to produce more; however, they do not simply because there is no financial incentive to do so. Most regions have no cold storage for fresh vegetables, and any excess produce would be liquidated at a fraction of the price at the end of the harvest or would simply spoil. By introducing new cold storages, farmers will have the financial incentive to produce more, since they will be able to store crops throughout the off-season and sell at premium prices.

### *Sources of Inputs*

While seeds, fertilizers, and pesticides can still be purchased in bazaars, independent stores, and markets across the country, a new model of distribution has emerged as an activity under the MCC’s “Agribusiness Development Activity (ADA)” program and USAID’s “Access to Mechanization” program, which supported entrepreneurs and suppliers to develop a network of 33 FSCs and 10 MSCs across the country. These build on the Georgian government’s similar program to provide access to farm machinery throughout Georgia. These programs have been very successful, with new FSCs and MSCs being continually introduced. The current FSCs and MSCs can be seen below:

**Figure 10: Map of FSC and MSC Network**



Source: CNFA, 2011

Not only do the FSCs and MSCs provide consolidated access to seeds, chemicals, tractors, and other inputs, but they also provide extension services, such as soil testing, and technical trainings on the application of new technologies and chemicals. Additionally, staff members at the FSCs work directly with the farmers to identify their soil and pest challenges and to offer the appropriate solutions.

The majority of FSCs purchase their products from dealers that are present in Georgia; however, some import many of their products from the following countries: Turkey, India,

America, Germany, Belarus, Ukraine, China, Kazakhstan, Bulgaria, Switzerland, Moldova, Belarus, Italy, Netherlands, Belgium, China, Czech Republic, France, Spain, and Slovenia.

According to a survey of FSC and MSC managers, conducted in February 2011:

- Three FSCs work with both vegetable and fruit producers in exporting their products.
- 20 FSCs have demonstration plots, while 19 FSCs do not but are interested in establishing them.
- 18 FSCs have some type of cold storage facilities available to producers, while 21 additional FSCs are interested in establishing them.
- No FSC or MSC has a greenhouse, but 35 FSCs are interested in creating them, while four only have no interest in establishing a greenhouse.

The FSC/MS network is a valuable infrastructural component to the agricultural sector, as well as a sustainable system in its own right. Annual sales revenues for the FSCs were GEL 23.7 million and they have more than 134,000 customers.

Many international seed and chemical distributors sell their products exclusively through the FSCs and have abandoned selling through proprietary distribution centers or in the markets. These distributors regularly host free training seminars at the FSCs for farmers on the benefits of their products and how to properly apply them to crops. Additionally, they offer farmers advice on when to fertilize their crops and how often they should apply pesticides.

One input that is completely underserved that is necessary for both domestic and export distribution is proper vegetable-specific packaging. In Georgia, there is only one vegetable packaging manufacture, Georgia Plastic in Adjara. This lack of capacity makes it very difficult for producers to protect their produce during postharvest handling processes. For example, instead of delivering tomatoes to wholesalers in single-layer boxes, farmers use large bulk banana boxes that allow the tomatoes to touch and weigh down on each other, which decreases overall shelf-life and damage the middle and bottom tomatoes. When comparing the proper single-layer packaging provided by distributors of imported tomatoes, retail stores and wholesalers report that they would prefer to pay extra for vegetables that are properly sorted and packaged.

## Outputs

### *Food Processors*

In 1990, Georgia's 58 canneries produced approximately 760 million cans of food every year. Most of these canneries are outdated, pose significant health hazards, and have been abandoned. With little to no investment or updating of machinery, this sector quickly decreased in production outputs. By 2003, total output had dropped to only 1 million cans.<sup>3</sup>Currently, there are only three significant commercial food processors (canneries) operating in Georgia today: Marneuli, Bazi, and Kula. Although they are growing rapidly, their ability to expand is limited.

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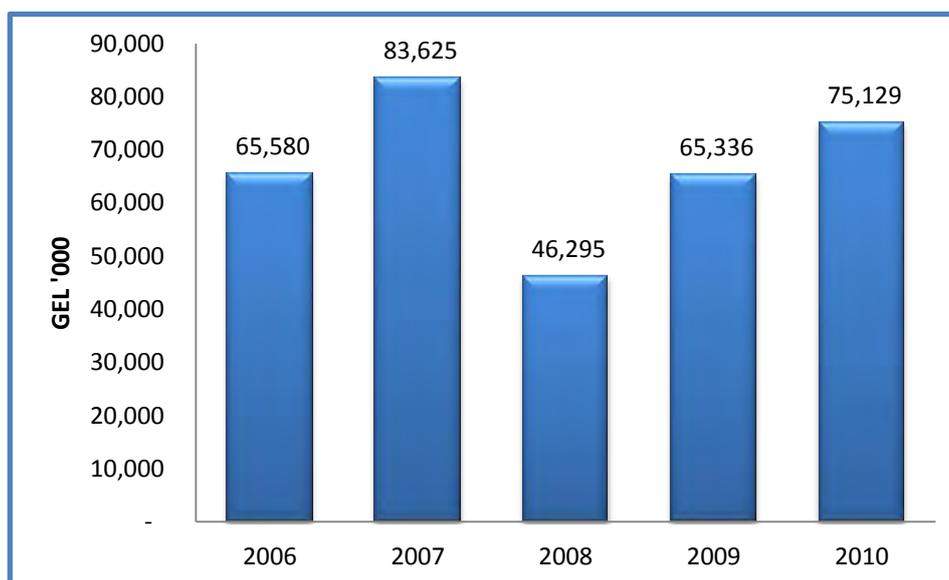
<sup>3</sup>Elizabeth Cullen Dunn, "Post-Socialist Spores: Disease, Bodies, and the State in the Republic of Georgia", *American Ethnologist*, Vol. 35/2, pp. 246, 249.

For example, Kula processed 20,000 MT during the 2010 harvest season and plans to process 27,000 MT in 2011 (35% growth). Although Kula is currently exporting to 18 countries, its ability to expand will quickly plateau, limited mainly by insufficient vegetable supplies and scarce cold storage facilities. Because Georgian farmers do not produce vegetables year-round, processors operate for only four months per year (June to October), which results an asset utilization rate of 33%.

If farmers could provide a stable supply of vegetables in the off-season, processors could extend production into the winter and spring. Likewise, if cold storages were available, processors could purchase vegetables during harvest, store them until November, and process them in the off-season.<sup>4</sup> Each of these structural improvements could allow processors to increase their production time and volumes, increase their asset utilization rates, expand their markets, and increase turnovers. Additionally, if processors can optimize their delivery schedules to coordinate between the harvesting and process schedules, they could increase the overall process efficiency of their operations.

Once a well-developed sector, food processing is again in its early stage of development as much of the old infrastructure is unusable and must be completely replaced with new, modern technologies. As can be seen in Figure 11, in 2008, production output decreased by 44.6% from 2007; however, there seems to have been a trend reversal from 2008-2010, as output increased by 62.3%. Currently, output sits at 89.8% of 2007 output figures, which will likely be surpassed in the next 12-18 months.

**Figure 11: Food Processors and Canneries Production Output (GEL '000)**



Source: GeoStat, 2011

### *Transportation*

For most small farms, the local fresh market is the best option for selling their produce. However, some hire individual trucks to ship their produce to the major domestic markets,

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<sup>4</sup>While many vegetables can be stored for several months, some can be stored for only 1-3 months.

which increases costs dramatically and reduces farm profitability. Wholesalers often include transportation services when they make purchases from medium and large farms; however, these farms generally have their own trucks to ship their produce to market.

One currently available option that many producers do not utilize is shipment by Georgian Railways' refrigerated containers. Shipping by railway is a significantly cheaper option than shipping by truck throughout Georgia and to neighboring countries. For example, to ship a 40-foot container (up to 34 tons) from Poti to Tbilisi by train would cost approximately GEL 400 for the entire container, while shipment by truck (including loading and unloading) can cost up to GEL 1,700 to ship the same amount. Over the last two years, Georgian Railways has begun to offer both 40-foot and 20-foot refrigerated containers; however, these are not highly utilized but do present significant opportunities for cost savings and creation of synergies among producers.

### *Export Preparation*

Currently, there are very few exporters shipping vegetables to international markets, with the majority of these being either wholesale distributors or primary producers. However, they do not offer a standard service of cleaning, sorting, grading, and packaging other farmer's produce to prepare it for export. Furthermore, due to the small sizes of farmers, most small farms will not pursue food safety certifications because of the costs involved and will, therefore, not export.

According to a survey of FSC and MSC managers, conducted in February 2011, three FSCs work with both vegetable and fruit producers in exporting their products.

## INDUSTRY OUTLOOK

The general short and long-term outlook for the vegetable sector is "stable, with slow growth;" however, there are many opportunities to quickly create value if producers can overcome the constraints that currently impede growth.

With the recent development of the FSC and MSC network, the extensive free technical trainings provided by this network, the increased supply and variety of high-quality cultivars and other inputs, and the introduction and usage of new technologies, the vegetable sector is well positioned to make strong productivity gains; however, the immediate need for credit financing to pay for these innovations still presents a challenge that will continue to impede growth without the introduction of new financial instruments appropriate to agricultural operations.

The absence of a critical mass of postharvest handling facilities – such as collection centers, cold storages, food packagers, and processors – also constrain opportunities for growth. Without these facilities, it is possible that any increases in productivity will be negated by the inability to sell excess supply or by supply degradation due to the lack of appropriate storage options.

Furthermore, without the necessary GlobalGAP certifications, it will be very difficult for Georgian producers to break into high-value markets as exports. This is due to the current requirement from international wholesalers to purchase only produce that has been certified according to GlobalGAP.

According to GeoStat's 2005 Farm Census, only 17.8% of all Georgian farms (129,498 farms) produce mainly to sell their products, as opposed to producing for self-consumption. Out of this 17.8%, only 0.38% (486 farms) are registered enterprises.

Considering the facts that the majority of Georgia's vegetable producers have only begun to consider production for commercial purposes and that only 0.07% of all vegetable farms are more than two hectares, it will be difficult to realize any growth from economies of scale without significant consolidation initiatives.

The vegetable sector is extremely limited by a general lack of an economy of scale – 99.93% of all vegetable farms are less than two hectares. Without massive consolidation, any growth from this sector will only be realized through increased productivity gains. These gains could be achieved through several factors, including:

- Increased yields per hectare through the usage of higher quality inputs and modern technologies;
- Additional hectares sown through the increased availability of machinery to farmers;
- More producers becoming active in off-season production in heated and unheated greenhouses;
- Shift to high-value crops from low-value crops.

With the recently established – and currently expanding – FSC and MSC network, the probability of increasing production yields through usage of better inputs and newer technologies is very high for most commercial producers. While the average family holding still operates at a subsistence level and cannot afford these inputs, many should be able to increase their production levels to begin distributing some produce commercially by using higher quality inputs and through modern technology implementation.

Due to the increased availability of farm machinery at the MSCs, there is a high probability that farmers will increase the number of hectares sown, although this growth in land sown will increase slowly as the majority of farmers cannot yet afford to rent the machinery and, instead, still opt for manual labor. With increased productivity gains from higher yields, larger producers will quickly see the value in increasing their production capacity through more land sown and will therefore expand operations accordingly.

Despite the presence of a few large commercial greenhouses and several clusters of many greenhouses across the country, there are still very few heated greenhouses. While unheated greenhouses in western Georgia can grow cold-resistant crops in the off-season, their ability to grow other high-value crops that are not cold-resistant is extremely limited. Any new investments in heated greenhouses will mostly likely result in immediate productivity gains and growth. Georgia's potential for heated (and unheated as well) greenhouses is barely utilized and there is room for dramatic growth.

Since smaller producers tend to plant according to which crops sold well and at higher prices in the previous season, there is a slight probability that some gains will be seen through shifting to high-value instead of low-value crops. However, if this results in oversupply, the expected high prices will not be realized unless the excess can be exported to the international markets. Generally, due to the currently low levels of production, there is very little potential for productivity gains through shifting crops.

## **PRODUCTS AND MARKETS**

### **PRODUCTS**

The following table outlines individual vegetable productions from 2006-2009.

**Figure 12: Individual Vegetable Production Volume ('000 MT)**

	2006	2007	2008	2009
Tomatoes	70	80	63	51
Cabbages	36	34	42	40
Cucumbers	19	20	19	31
Onions	16	12	11	10
Eggplants	12	13	5	10
Greens	8	7	5	8
Other Vegetables	7	2	4	6
Peppers	5	4	6	3
Red Beets	4	11	3	4
Garlic	3	3	2	2
Carrots	1	3	6	4
Potatoes	169	229	193	217

Source: GeoStat, 2011

One important trend to note is that many small farmers will adjust crop selections according to the previous season's prices. For example, because the prices of cucumbers were high in 2008, many additional farmers planted cucumbers in 2009 instead of tomatoes and pepper, resulting in capacity gaps in other crops. Production increases need to be implemented across the range of vegetables produced with particular emphasis on high-value crops over low-value alternatives.

### Price Analysis

Below is the price analysis for vegetables from farm gate to retail sales. The figures are annual average numbers; however, they can vary significantly throughout the year. For example, retail prices for tomatoes vary from GEL 1.5 per kg in the summer to GEL 8 per kg in the winter. Some types of tomatoes, like cherry tomatoes, are the most expensive and the average retail price would be around GEL 15. Retail prices for other vegetables are relatively stable throughout the year. Additionally, grocery store chains charge an additional premium above the standard retail prices at vegetable outlets.

**Figure 13: Price Analysis for 4 Major Vegetables (in GEL)**

Commodity	Farm Gate	Wholesale	Mark-Up	Retail	Mark-Up
Tomatoes	0.60	2.22	270%	2.75	24%
Potatoes	0.70	0.84	20%	0.95	13%
Onions	1.00	1.31	31%	1.60	22%
Carrot	1.00	1.29	29%	1.50	16%

Source: Interviews with producers and wholesalers, 2011

## INTERNATIONAL MARKETS

**Figure 14: Vegetable Imports to Georgia by Volume, Value, and Origin**

	Fresh Vegetables	Non-Fresh Vegetables	Fresh Vegetables	Non-Fresh Vegetables
	In Metric Tons		In USD '000	
Armenia	6,437		975	
Azerbaijan	3,361	444	672	105

	Fresh Vegetables	Non-Fresh Vegetables	Fresh Vegetables	Non-Fresh Vegetables
	In Metric Tons		In USD '000	
Belgium		2		5
Bulgaria		5		9
China	934	3,028	404	1,460
Djibouti		220		136
Germany	115	16	93	42
Italy		439		511
Iran	870		224	
Jordan	73		35	
Kazakhstan	516		64	
Kyrgyzstan		1,753		826
Malaysia		12		13
Netherlands	478		526	
Syria	164		80	
Tajikistan		571		167
Turkey	44,451	503	11,759	459
Ukraine	4,897	536	483	178
Uzbekistan		268		166
<b>TOTAL</b>	<b>62,296</b>	<b>7,797</b>	<b>15,317</b>	<b>4,077</b>
<b>SUBTOTAL</b>		<b>70,093</b>		<b>19,394</b>
<b>ADJUSTMENT</b>		<b>217</b>		<b>136</b>
<b>MT TOTAL</b>		<b>70,310</b>		
<b>USD TOTAL</b>				<b>19,529</b>
<b>GEL TOTAL</b>				<b>32,622</b>

Source: Ministry of Finance, 2011

The following table outlines vegetable exports by volume, value, and origin. One important trend is that Georgian producers do not export any significant “non-fresh” vegetables, whether dried or frozen. Therefore, all exports are classified as “fresh.”

**Figure 15: Vegetable Exports from Georgia by Volume, Value, and Origin**

	All Exported Vegetables	
	Metric Tons	USD '000
Armenia	609.85	122.88
Azerbaijan	1,975.53	1,217.93
Belarus	81.30	76.08
Estonia	14.92	42.62
Iraq	45.83	13.75
Latvia	62.96	130.37
Moldova	49.44	24.76
Romania	73.86	9.64
Russia	277.80	178.42

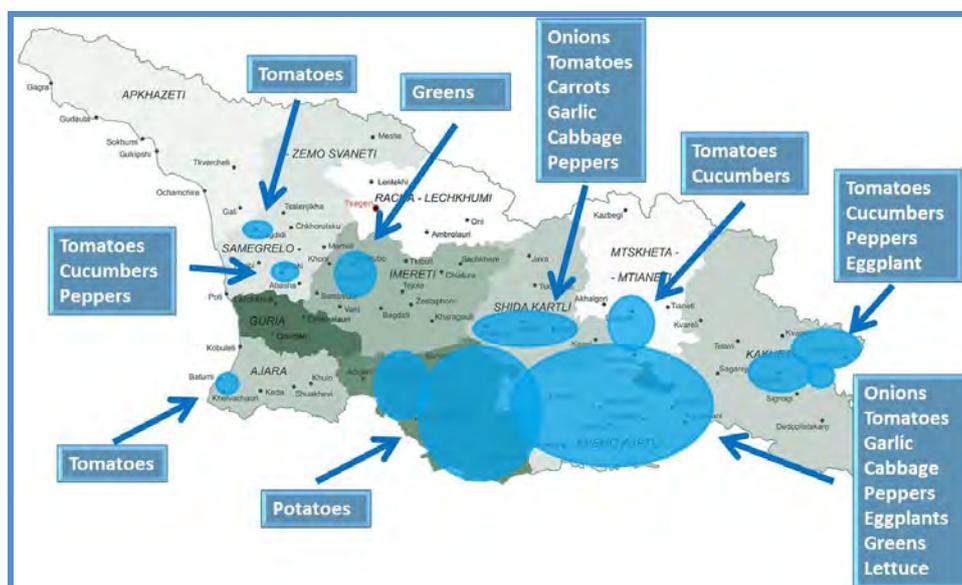
	All Exported Vegetables	
	Metric Tons	USD '000
Turkey	18.20	2.37
Ukraine	1,903.63	778.71
<b>SUBTOTAL</b>	<b>5,113.32</b>	<b>2,597.52</b>
<b>ADJUSTMENT</b>	<b>8.74</b>	<b>1.62</b>
<b>MT TOTAL</b>	<b>5,122.05</b>	
<b>USD TOTAL</b>		<b>2,599.14</b>
<b>GEL TOTAL</b>		<b>4,341.68</b>

Source: Ministry of Finance, 2011

### BUSINESS LOCATIONS

Georgia’s major production zones are identified in the Figure below. Due to soil and climate conditions, potatoes are grown in southern Georgia, while fresh vegetables are grown primarily in eastern Georgia. It is important to note that northern Georgia is mountainous and is more suitable for cattle production than for vegetables.

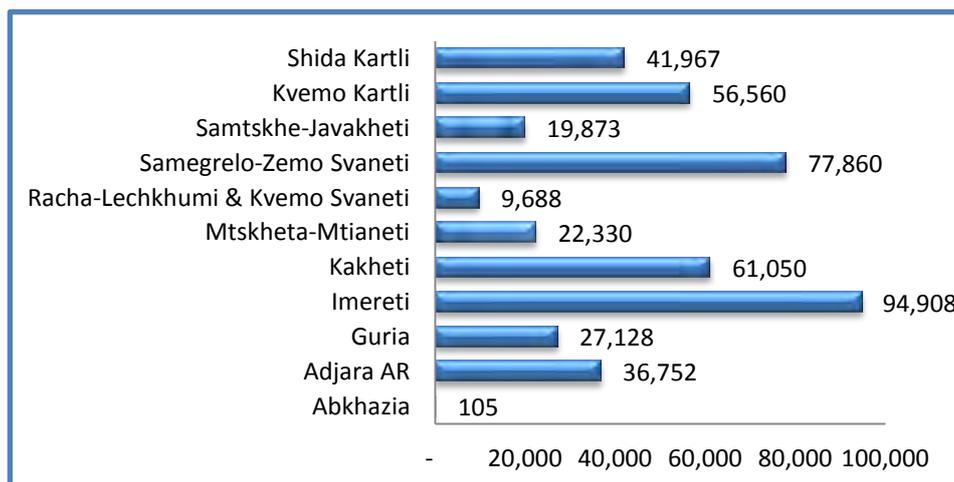
**Figure 16: Vegetable Production Zones**



Source: Expert Interviews, 2011

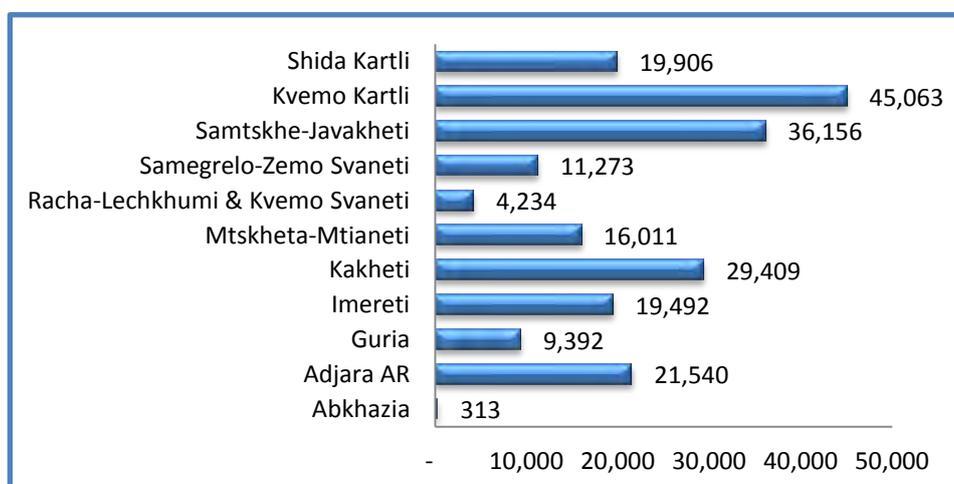
Locations of farms impact access to important domestic consumer markets – such as Tbilisi, Kutaisi, and Batumi – as well as to important supply lines for international markets. This is especially true for farms in rural areas that must transport their produce long distances, which increases the overall cost of production. As can be seen in Figures 17 and 18, the majority of producers are outside major consumer markets, as collected in the 2005 Agricultural Census conducted by GeoStat.

**Figure 17: Number of Vegetable Farms by Region – 2010**



Source: GeoStat, 2005

**Figure 18: Number of Potato Farms by Region – 2010**



Source: GeoStat, 2005

While there are clusters of greenhouses in Imereti, Kakheti, Adjara, and around Tbilisi, there are not many large-scale greenhouses over 1,000 m<sup>2</sup>. There are only two significant commercial greenhouses in Georgia: Ikon in Adjara, with 3.1 hectare of tomato and lettuce greenhouses, and Herbia in Imereti with 2.8 hectare of greens production.

Both of these greenhouses are heated and use modern technologies, such as drip irrigation and inputs. Both produce and sell produce at off-season prices. Ikon and Herbia realize very high yields of up to 300 t/ha. These greenhouses can be used as model success stories to promote the use of modern technologies. Ikon sells about 80% of its produce to the domestic market and exports about 20% to Turkey. Herbia also acts as a wholesale distributor to institutional buyers in Tbilisi and other markets.

Most of the smaller greenhouses are unheated and produce cold-resistant vegetables, especially in western Georgia, where the climate is warm enough to grow vegetables year-round. Additionally, many of these greenhouses have wood frames and are covered in plastic, which needs to be replaced every two to three years.

## MAJOR RISK FACTORS

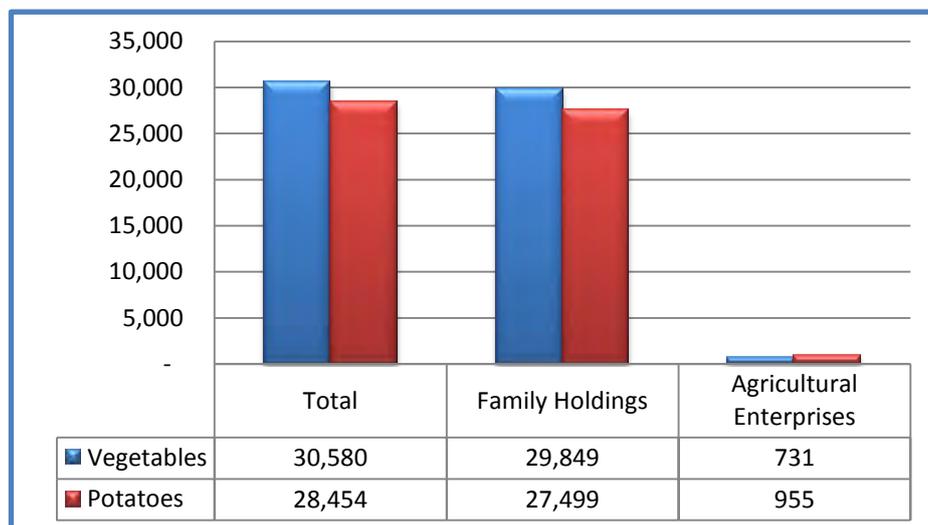
<b>Financial</b>	<ul style="list-style-type: none"> <li>• Poor business management and financial planning skills increase credit and liquidity risk, which increases the difficulty in accessing credit.</li> <li>• High cost of credit decreases the ability to expand while servicing debt.</li> <li>• The loss of a major market – such as with the 2006 Russian embargo – increases business risk.</li> <li>• Crop losses due to inclement weather, such as floods and droughts, decrease overall farm revenues and profitability.</li> </ul>
<b>Operational</b>	<ul style="list-style-type: none"> <li>• Greenhouses and farm structures need to be of sound construction, maintained regularly and be clean and sanitary to reduce the potential contamination of produce.</li> <li>• In addition to the physical human safety issues related to applying chemicals, improper application of fertilizers or pesticides can adversely affect the health of the plants and the long-term viability of the soil. Additionally, vegetables that have been harvested too early after an application may pose a food safety hazard.</li> <li>• Access to clean water supply is fundamental to farm production and should be regularly tested for microbial agents. Water is used in almost every aspect of farming operations. At any stage of production, there is the risk of mold, microbial agents, or viruses infecting vegetables.</li> <li>• Farm equipment and transport vehicles used for harvest and postharvest handling should be regularly sanitized to prevent exposure to microbial risk.</li> <li>• Packaging used for harvesting vegetables should be appropriate to prevent spoilage or bruising from occurring.</li> <li>• Short-term storage facilities should be cool and not exposed to direct sunlight. Long-term storage facilities should be climate controlled – including both temperature and humidity levels – according to vegetable needs.</li> </ul>
<b>Health and Safety</b>	<ul style="list-style-type: none"> <li>• Any equipment – including machinery – used in farming practices must be suitable for the task, properly maintained, with dangerous parts safeguarded, and that adequate training and information about the equipment is available. Equipment must be stable and stop controls, including emergency stops, must be provided.</li> <li>• Machinery should be maintained properly so people remain safe and healthy.</li> <li>• Producers should assess and control risks from hazardous substances, including substances used directly in work activities, such as cleaning chemicals, disinfectants, fertilizers, pesticides, bacteria, fungi, and other microorganisms.</li> <li>• Personal protective equipment provided for use at work must be made to an appropriate standard.</li> </ul>

## COMPETITIVE LANDSCAPE

### MARKET SHARE CONCENTRATION

Although 99.8% of all farms are considered “family holdings” and only 0.2% are considered “agricultural enterprises,” about 6% of all sown areas are held by agricultural enterprises. For vegetable and potato sown areas, only 2% are owned by agricultural enterprises, as can be seen in Figure 19 below:

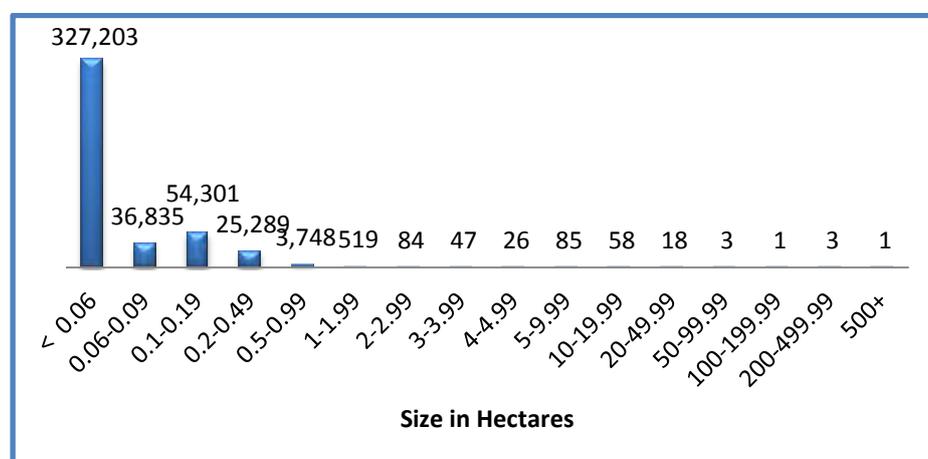
**Figure 19: Sown Areas in Hectares – 2010**



Source: GeoStat, 2005

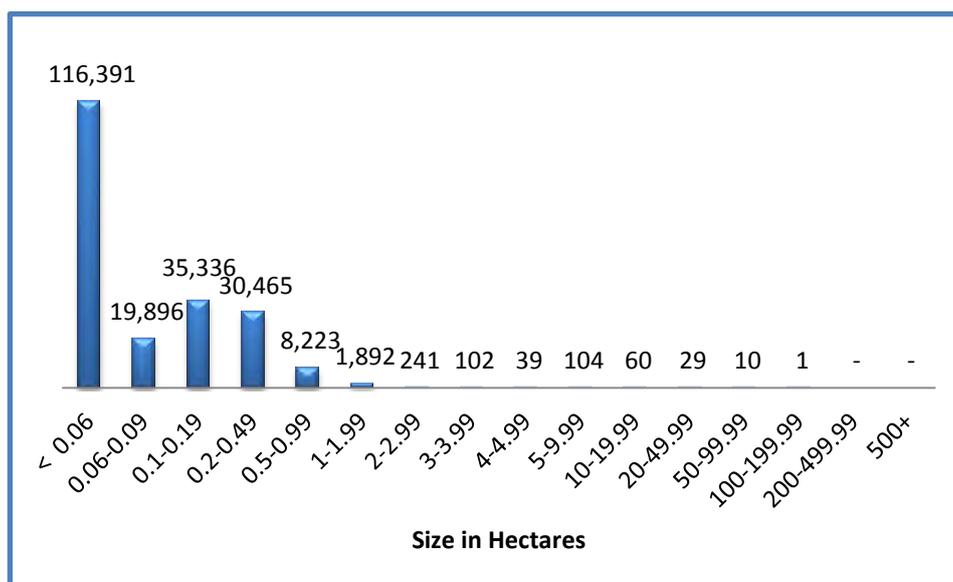
The level of fragmentation within the vegetable market is very high, as can be seen in Figures 20 and 21. The need for consolidation is demonstrated by the fact that 99.93% of all vegetable farms and 99.72% of all potato farms are smaller than two hectares.

**Figure 20: Number of Vegetable Farms by Size Categories**



Source: GeoStat, 2005

**Figure 21: Number of Potato Farms by Size Categories**



Source: GeoStat, 2005

Despite the high number of vegetable and potato farms present in Georgia, the vast majority are classified as subsistence farmer and only a small percentage sell their produce commercially. According to the 2005 Agriculture Census conducted by GeoStat, there are 729,542 farms in Georgia; however, only 129,498 (17.8%) of all farms (including vegetables) sell their produce commercially.

There are very few large-scale vegetable and potato producers. In Georgia, there are only 169 vegetable and 204 potato farms that produce on five hectares or more. Of these, 69.8% of vegetable producers and 66.2% of potato producers are located in Kvemo Kartli.

Clusters of large-scale producers can also be found in Adjara, Imereti, Kakheti, and Samtskhe-Javakheti.

**Figure 22: Breakdown of Farms by Region and Size (Cumulatively)**

<b>FARMS (in ha)</b>	<b>100 +</b>	<b>50 +</b>	<b>20 +</b>	<b>10 +</b>	<b>5 +</b>	<b>4 +</b>	<b>3 +</b>	<b>2 +</b>	<b>Est. Sown Area</b>
<b>Vegetables</b>	<b>5</b>	<b>8</b>	<b>26</b>	<b>84</b>	<b>169</b>	<b>195</b>	<b>242</b>	<b>326</b>	<b>2,428</b>
Abkhazia	-	-	-	-	-	-	-	-	-
Adjara AR	-	-	-	-	-	-	1	3	7
Guria	-	-	-	-	-	-	-	-	-
Imereti	-	1	4	7	9	11	14	17	173
Kakheti	1	2	5	11	19	20	24	38	354
Mtskheta-Mtianeti	-	-	1	1	4	5	7	7	45
Racha-Lechkhumi and Kvemo Svaneti	-	-	-	-	-	-	1	2	5
Samegrelo-Zemo Svaneti	-	-	-	2	5	9	9	16	65
Samtskhe-Javakheti	-	-	-	1	3	3	8	17	53
Kvemo Kartli	4	4	14	58	118	134	158	198	1,556
Shida Kartli	-	1	2	4	11	13	20	28	170
<b>Potatoes</b>	<b>1</b>	<b>11</b>	<b>40</b>	<b>100</b>	<b>204</b>	<b>243</b>	<b>345</b>	<b>586</b>	<b>3,244</b>
Abkhazia	-	-	-	-	-	-	-	-	-
Adjara AR	-	1	2	4	8	9	10	15	127
Guria	-	-	-	-	3	3	4	5	20
Imereti	-	-	1	2	2	3	9	13	60
Kakheti	-	1	2	3	11	14	21	44	199
Mtskheta-Mtianeti	-	-	-	2	6	7	9	12	56
Racha-Lechkhumi and Kvemo Svaneti	-	-	-	-	1	1	5	5	17
Samegrelo-Zemo Svaneti	-	1	1	2	3	3	6	9	80
Samtskhe-Javakheti	1	3	6	16	32	43	79	200	834
Kvemo Kartli	-	5	28	71	135	155	196	273	1,817
Shida Kartli	-	-	-	-	3	5	6	10	34

Source: GeoStat, 2005

Key Success Factors

<b>Soil Fertility</b>	<b>Use of Quality Inputs and Technology</b>
Soil quality and preparation prior to planting and throughout the growing season is of primary importance. Soil testing identifies nutrient levels and any changes to be made.	The use of technologies like drip irrigation systems, fertilizers, and pesticides can exponentially increase production yields. High-quality seeds and seedlings also can contribute to higher yields.
<b>Postharvest Handling Processes</b>	<b>Access to Markets</b>
Proper harvesting, cleaning, sorting, grading, and packaging will maintain the natural quality and shelf-life of the vegetables, while cold storage and food processing will allow producers to increase production and sell more during the off-season.	Increased quality and production volumes will result in supply increases on the local market, which will stimulate additional exported vegetables and vegetable products. Access to key markets for high-value produce is vital to sustainable growth.
<b>Food Safety Certifications</b>	<b>Access to Credit</b>
Food safety management systems, like GlobalGAP and HACCP, conserve valuable resources, improve risk management, and increases sales and new investments for producers and exporters.	Working capital and input purchases often require access to credit sources. Without this, many farmers cannot afford to purchase correct inputs or pay for cold storage in the off-season.

**BASIS OF COMPETITION**

Georgia’s vegetable market can, in some ways, be characterized as one of “monopolistic competition.” Some vegetables are generally homogenous, but many can be differentiated on quality, shelf-life, and variety. Because the market is so fragmented, there are no farmers large enough to control the market, and therefore, all farmers must operate according to prices set by their competition or the wholesale markets.

Depending on the product, the domestically produced vegetables can be significantly differentiated from imported products. Additionally, the gradual rehabilitation of the greenhouse industry over the last five years has contributed to high-quality off-season production, which is of higher quality than many currently imported vegetables. Furthermore, with the introduction of new technologies for processing and for cold storage, on-season produce can be stored and sold throughout the off-season months, taking advantage of market supply opportunities and generating additional revenues for Georgian farmers.

**BARRIERS TO ENTRY**

As with any industry, barriers exist for new entrants that make it difficult to enter the market and restrict competition. The top three barriers to entry for primary production within the Vegetable Market are:

- Economies of Scale – larger farms can achieve cost efficiencies and lower sales prices that can prevent market access for smaller farms.
- Land and Equipment – high land and equipment costs require significant capital investment, preventing many new smaller producers from entering the market.
- Specialized Training – farm processes and the use of modern technologies and inputs require specific technical training to realize high production yields.

## INDUSTRY GLOBALIZATION

With an ever growing global population, the importance of maintaining an adequate food supply is becoming increasingly more important. As global agriculture demand grows, there is an increasing need to expand production within the Vegetable Market in Georgia. Export markets represent a stable flow of inbound revenues that directly benefit farmers and the economy as a whole.

Due to Georgia's strategic location as a transport corridor of the Southern Caucasus and a strategic transit center on the Silk Road route from Asia to Europe, the Vegetable Market is well positioned to take advantage of these export opportunities and begin exporting to Europe, Central Asia, and the Middle East.

## OPERATING CONDITIONS

### KEY EXTERNAL DRIVERS

<b>Population Growth</b>	<b>Economic Growth</b>
Domestic consumption drives demand for the vegetable market. As the population grows, the demand for more production also increases. International population growth in export countries also increases the general demand for more produce, increasing demand.	When the economy expands, businesses expand, jobs are created, prices increase, and salaries rise for the workforce. Likewise, the standard of living also increases, shifting the consumer's focus on price to one of quality, which drives the demand for high-quality produce.
<b>Consumer Preferences</b>	<b>Technological Advances</b>
The consumer's preferences on taste, quality, and cuisine are presented in their purchases. Generally, consumers are becoming more health conscious and many Georgian and international consumers are interested in organic produce, which can benefit producers.	New technologies for growing crops offer additional benefits in yield production, quality control, and plant protection. Not only does the increased use of new technologies increase production for individual producers, but it also tends to decrease the cost of new technologies.
<b>Environmental Conditions</b>	<b>World Markets</b>
In addition to the normal risks posed by weather conditions to crop viability, proper postharvest handling and storage ensure a longer shelf-life and consistent quality.	International commodity and food prices impact the vegetable sector, which can present additional risks of oversupply or opportunities to meet excess demand.
<b>Trade Agreements</b>	<b>Government Policy</b>
International trade agreements offer unique opportunities to access global markets under preferential terms.	Increased food safety regulations add new costs and burdens to producers, but also increase competitiveness and credibility.

### INDUSTRY ASSISTANCE

#### Direct Industry Assistance

In Georgia, there have been several government and international donor programs that have provided technical and financial assistance, either directly or indirectly, to the Vegetable Industry.

USAID administered a six-year, USD 23 million program called AgVANTAGE that strengthened the capacity of Georgia's agriculture sector, helping Georgian producers, processors, and marketers to better compete in local and international markets. One component of this project was to introduce modern postharvest handling technologies, especially in cold storages. This helped expand the market for Georgian fruits and vegetables beyond the traditional Russian market to new European markets. The project provided assistance to 9,800 individuals, created 830 permanent jobs and generated \$13 million in exports.

Since 2006, in cooperation with the Ministry of Education and Science, United Nations Development Program (UNDP) has arranged professional education programs in more than 30 professions in the centers in Akhaltsikhe, Telavi, Ambrolauri, Batumi, and Gori. This project included an agriculture extension component to benefit Georgian producers directly.

Many international agencies provide assistance to the Vegetable Industry, especially in the fields of economic development, agriculture, and aquaculture. Their programs work to increase the productivity and value of domestic production, as well as to implement new technologies and operational models.

Agencies involved in general agricultural industry assistance include:

- FAO - Food and Agriculture Organization
- UNEP - United Nations Environment Programme
- UNDP - United Nations Development Programme
- WB - World Bank
- CGIAR - Consultative Group on Agriculture Development
- IFAD - International Fund for Agricultural Development
- EBRD - European Bank for Reconstruction and Development
- DFID - Department for International Development
- ICARDA - International Center Agricultural Research in the Dry Area
- JICA - Japan International Cooperation Agency
- GTZ - German Technical Cooperation
- IFC - International Finance Corporation
- USAID – U.S. Agency for International Development
- SIDA - Swedish International Development Cooperation Agency
- DEFRA - Britain's Department for the Environment, Food, and Rural Affairs
- SECO - State Secretariat for Economic Affairs
- KfW - KfW Development Bank
- CARE - CARE Georgia and CARE International
- UNHCR - United Nations High Commissioner for Refugees

### **Indirect Industry Assistance**

In 2008, the Ministry of Agriculture introduced a program to provide credit at low interest rates for cold storage facilities.

In 2010, through USAID funding, CHF International Georgia worked with investors to establish a cold storage facility in Rustavi, giving farmers an extended selling season and the opportunity to sell products to the local supermarket chains, Vegini and Populi. The cold storage facility and quality control programs introduced by USAID and CHF International Georgia will significantly increase the value and quality of the vegetables and fruits received by farmers, increasing their profits.

CNFA administered a USD 20.2 million Agribusiness Development Activity (ADA), which is funded by the Millennium Challenge Georgia Fund, supports sustainable, long-term agricultural growth by strengthening commercial linkages. ADA awarded farmers and

agribusinesses matching grants to develop farm service centers, value-adding enterprises, value chain initiatives, and primary production practices.

In 2010, two cold storage facilities were established in the Kakheti region and have created a total of 72 jobs and will benefit more than 200 farmers. Supported by a grant of \$150,000 from CNFA's ADA, each company also made a matching investment to establish modern cold storage facilities for fruits in Sagarejo and Gurjaani, respectively.

CNFA's grants were used to purchase modern storage and cooling equipment. Environmental mitigation and marketing concerns were incorporated in the design processes to ensure sustainable and eco-friendly enterprises.

A recently opened cold storage in Kachreti provides small farmers with effective technology for storing perishable fruits and vegetables before sale. The cold storage had been launched by the United Nations Development Programme (UNDP) with funding from Swiss Agency for Development and Cooperation. At a cost of USD 19,000, it is part of UNDP's larger initiative to promote vocational education and training in Georgia. The facility can store up to 18 tons of fruit and up to 20 tons of vegetables a day with the storage cycle from 5 to 10 days, which is enough for serving around 160 small farmer families.

In Kachreti, UNDP combines vocational education programs with the assistance to local agriculture development. Last year, with funds from the Romanian government, UNDP set up a small-scale processing plant, which helps local farmers to process fruits and vegetables and to get their product ready for sale in attractive packing. Finally, several international organizations, including the IFC, the EU, the FAO, and USDA have introduced significant projects focused on improving food safety in Georgia.

## REVENUE VOLATILITY

Revenues in the vegetable sector have been highly volatile from 2006 to 2009. Although the average annual compounded rate of growth has been (4.0%), actual growth rates ranged from (10.9%) to +11.1%.

**Figure 23: Annual Output Growth Rates**

	2007	2008	2009	2010
<b>Growth (%)</b>	-9.7%	-10.9%	-4.9%	11.1%

Source: GeoStat, 2011

## REGULATION AND POLICY

### Trade Promotion

To promote production in Georgia and to increase investment into Georgia industries, the Government, has established bilateral treaties on investment promotion and protection with 32 countries and has concluded double taxation treaties with 27 countries internationally. Highlights of these treaties include the following trade regimes:

- Free Trade Regime – with CIS countries and Turkey (since November 2008)
- Most Favored Nation Regime (MFN) – with WTO member countries

- Preferential Regime (GSP) – with USA, Canada, Japan, Switzerland, and Norway
- Preferential Regime (GSP+) – with EU (> 7,200 items) since 2005
- Possibility of FTA with EU in nearest future<sup>5</sup>

Georgia's customs code is on par with European standards and has streamlined its customs procedures to simplify the import and export process. The key features that benefit Georgian farms include:

- Low import tariffs
- Few export/import licenses and permits
- No quantitative restrictions on import and export
- No customs tariff on export and re-export
- No value added tax on export
- Simplified export and import procedures<sup>6</sup>

### **Food Safety**

The 2005 Law on Food Safety and Quality was amended in June 2010 and is the foundation of Georgia's Food Safety Strategy, a key component of European Neighborhood Policy Action Plan and one of the integral parts of the upcoming "Deep and Comprehensive Free Trade Agreement" with the EU. This strategy focuses on consumer protection and on harmonization of Georgia's food safety policies with EU legislation.<sup>7</sup>

Under this strategy, the National Service for Food Safety, Veterinary and Plant Protection will be reorganized into the Food Safety Service, which will operate within the Ministry of Agriculture. More than 3,000 companies exporting food products have already been registered with the National Service for inspection and food safety control issues. The National Service plans to inspect high-risk enterprises annually and low-risk enterprises every two years. Enterprises that have obtained ISO or HACCP certifications will be inspected less frequently.<sup>8</sup>

The first steps will be to establish a set of registration rules and establish state control over producers and all distributors of food. Accordingly, the National Service shall exercise its authority for control and inspections in accordance with these regulations. Producers and processors – as well as distributors and exporters – will have to maintain these Food Safety and Quality Control standards for their products.

Recent developments in Food Safety Reform include:

- Institutional and legal reform spurred by the forthcoming FTA with EU.

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<sup>5</sup> National Investment Agency of Georgia website: [www.investinggeorgia.org](http://www.investinggeorgia.org).

<sup>6</sup> Ministry of Finance website: [www.mof.gov.ge](http://www.mof.gov.ge).

<sup>7</sup> LEPL National Food Agency website: [www.fvp.ge](http://www.fvp.ge).

<sup>8</sup> Ministry of Agriculture of Georgia website: [www.moa.gov.ge](http://www.moa.gov.ge).

- Renewed food safety control provisions for all product groups from 2011.
- Required to have HACCP (few exceptions for small, primary producers).
- Traceability on all stages of production, processing, and distribution.
- Recently enacted secondary legislation: General Hygiene Regulation (and Simplified Hygiene Rule), Regulation on Official Controls in food safety.
- Responsibility to ensure food safety lies with the private sector.<sup>9</sup>

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<sup>9</sup> Tevzadze, Maia. "Role of Food Safety Standards in Improving Agricultural Producers' Access to Markets". IFC presentation, March 2011.

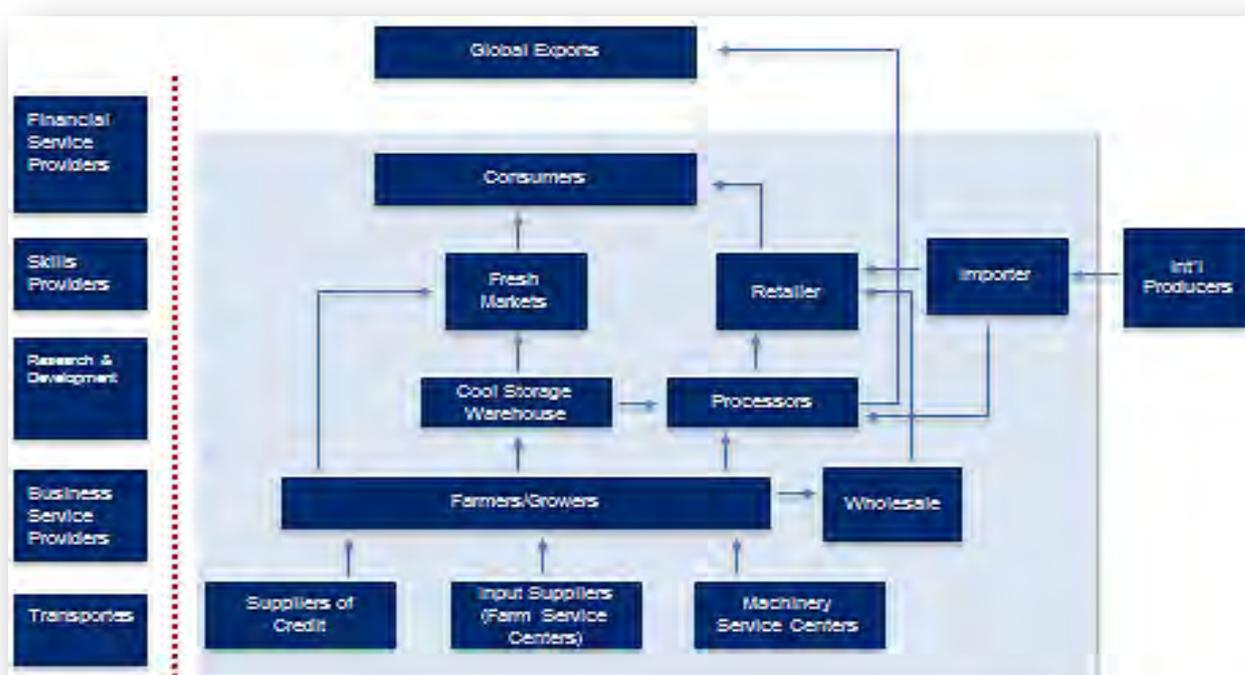
## VALUE CHAIN GAP ANALYSIS

### INTRODUCTION

The vegetable industry is composed of businesses that provide physical, advisory and financial input services to primary producers of vegetables (including potatoes); postharvest facilities that provide storage and processing; wholesale and retail distributors; and outlets and trading companies that provide import and export services.

The Vegetable Market Value Chain is mapped out in the organizational chart on the following page, demonstrating not only the relationships between the various market actors, but also charting the flow of inputs and outputs from pre-production to consumption.

**Figure 24: Vegetable Market Value Chain**



### GAP ANALYSIS

#### Inputs and Technologies

- Most small farmers purchase low-quality, low-yielding seeds from bazaars because they cannot afford to purchase high-quality seeds, with significantly higher yield potential, and cannot access agricultural credit.
- Pesticides and fertilizers are expensive for most small farmers who cannot afford to use these regularly.
- While almost all medium and large farms use pesticides regularly, only about 60% regularly use chemical fertilizers.

- Manure fertilizer management systems have become obsolete and there are no incentives to rebuild. Manure fertilizers are used rarely.
- Most farmers still use flood irrigation techniques as opposed to the more efficient, though more expensive, technique of drip irrigation. The main reason for this is that the irrigation systems are broken and dilapidated, and farmers must replace these systems completely. The secondary reason is because farmers cannot afford to purchase the necessary equipment for drip irrigation.
- Many farmers still apply chemicals inappropriately. One grocery store fruit and vegetable buyer reported that she rejected 25 MT of melons in the fall of 2010 because, upon testing at the grocery store's food laboratory, the melons contained extremely high levels of nitrites.

### Primary Production

- According to the 2005 Agriculture Census conducted by GeoStat, there are 729,542 farms in Georgia; however, only 129,498 (17.8%) sell their produce commercially. Most of these farms are too small to have the economies of scale to achieve cost efficiencies or maximize profitability.
- There are only two significant commercial greenhouses in Georgia: Ikon in Adjara, with 3.1 hectare of tomato and lettuce greenhouses, and Herbia in Imereti with 2.8 hectare of greens production. Both of these greenhouses are heated and use modern technologies, such as drip irrigation and inputs. Both produce and sell produce at off-season prices. Ikon and Herbia realize very high yields of up to 300 t/ha. These greenhouses can be used as model success stories to promote the use of modern technologies. Ikon sells about 80% of its produce to the domestic market and exports about 20% to Turkey. Herbia also acts as a wholesale distributor to institutional buyers in Tbilisi and other major markets.
- Additionally, there are clusters of greenhouses in the regions that produce several vegetables, mainly greens and tomatoes. These greenhouses are usually individually owned and too small to achieve economies of scale for production.
- There is only one greenhouse that has a GlobalGAP certification: Herbia in Imereti.
- There are no vegetable or potato farms with food safety certifications.

### Food Packaging Facilities

- There is currently only one supplier of vegetable packaging in Georgia. This supplier, Georgia Plastic, is in Adjara. Most boxes that are in use were previously used to ship imported products and are continually reused until they are damaged.
- Stand-alone food packaging services are non-existent.
- Grocery stores, like Goodwill and Populi, report that many of the vegetables delivered by farmers arrive in plastic grocery bags or packed in large banana boxes. Imported vegetables arrive in vegetable-specific packaging and are much more desirable than current Georgian practices.

### Cold Storage Facilities

- Total Vegetable Production volumes for 2009 were 404,000 MT, while there are only 12,005 MT of space available for vegetable storage in Georgia.

- Cold storage facilities in regions are virtually non-existent. Some farmers claim that they have no financial incentive to produce more vegetables, because the market cannot absorb additional production volumes at normal market rates. Any extra would be sold at a fraction of market rates or it would be discarded. However, if these farmers had access to cold storage facilities, then they would immediately increase production.
- Currently, many large farms have their own ad hoc storage facilities, while many medium and small farms store their produce in basements and cellars, using standard residential air conditioners for climate control. These techniques usually result in a significant loss of both quality and quantity of the produce.
- Processors are growing rapidly and need more storage. Kula has 2,000 MT of short-term storage on its premises, but currently needs an additional 500 MT. Because Kula is expanding its production from 20,000 MT of vegetables in 2010 to 27,000 MT in 2011 (35%), it needs additional storage to accommodate the overflow.
- Wholesalers cannot grow without access to cold storage. Wholesalers report that they have limited storage space, but it is used for daily purchases. There is significant interest to develop cold storages and expand wholesale activities of Georgian produce during off-season months; however, wholesalers claim that the banks will not finance them due to their generally low levels of fixed assets.

### **Food Processing**

- There are only three significant commercial food processors in Georgia: Marneuli, Bazi, and Kula. Their ability to process vegetables is limited by their capacity; for example, Kula can only process 20,000 MT per season without additional storage capacity.
- There are no processors that have food safety certifications; however, Kula is exporting to 18 countries (including Germany and EU country) because their products have been tested extensively in EU and Israeli food laboratories.

### **Consumption Gaps**

- From 2006-2009, domestic consumption for vegetables was relatively stable, ranging from 234-259,000 MT, while domestic production was always lower, ranging from 165-190,000 MT. Not only were 100% of the domestically produced vegetables consumed, but also additional imports were required in order to satisfy these recent demand levels.
- Demand levels for potatoes also remained relatively stable from 2006-2009, ranging from 195-210,000 MT; however, production levels were more erratic. Domestic production actually exceeded demand in 2007 and 2009.

### **Access to Markets**

- Wholesalers to the major domestic markets need a stable supply of vegetables, so they purchase only from large producers.
- Wholesalers will include transportation services from rural locations; however, many medium and large farms have their own transport vehicles to ship the produce to major markets.

- Small producers in regions either sell to local markets at depressed prices, barter, or higher independent trucks to transport their produce to the major markets.
- Most farms are not GlobalGAP or HACCP certified and can export products to only a limited number of export markets, such as to CIS countries.

### **Access to Credit**

- Agricultural loans make up only 0.8% of national commercial loan portfolio, because it is seen as a risky activity despite the fact that it is the most profitable portion of the loan portfolio for several banks.
- Because small farmers do not qualify for loans at commercial banks, they must access credit from micro finance institutions that charge approximately 35% interest per annum.
- Most small farmers take “personal” loans to use for farm from MFIs, so it is impossible to quantify the total amount of loans used for vegetable farms.
- One commercial bank started a new lending program in April 2011 that allowed farmers to take an installment loan to pay for seeds, fertilizers, and pesticides in the spring and to have a grace period of six to seven months to begin repayment, with an interest rate 15% per annum. However, this is limited in its scope because the program is only available in Kakheti and inputs must be purchased through Bank Constanta’s partner, Boran Distribution. One MFI, Credo, has a similar product; however, interest rates start at 35% per annum.
- Only one commercial bank (Procredit Bank) has a team dedicated to agriculture lending. Its agricultural (primary production) loan portfolio amounts to GEL 13 million, which is almost half of the national agricultural loan portfolio. The average loan size is approximately \$2,000, and the average interest rate is 22-24%.

## D. RECOMMENDATIONS

### INPUTS AND TECHNOLOGIES

- EPI consultants should promote the use of cultivars that are appropriate to the Georgian climate, taste, and culture that are available at a competitive price.
- FSCs introduce new technology, seeds, and chemicals and provide limited training upon purchase; however, there still needs to be consistent training and seminars on new technologies and their application. Distributors also provide similar seminars for farmers. EPI consultants should work with these organizations, possibly through the FSCs or AgroService Associations, to create a master calendar of training schedules and topics, so EPI consultants can identify where gaps are in the training topics.
- Very few farms and greenhouses are using advanced technologies to produce higher yields. EPI consultants should develop a promotional campaign or subsidy program to encourage usage, specifically identifying potential production yield increases that will generate additional revenues.
- EPI consultants should assist FSCs and input providers in establishing more “demonstration plots” for small farmers. Despite the fact that the FSCs are very successful, they currently serve a little more than 100,000 farmers. With approximately 730,000 farms in Georgia, many farmers still need access to this knowledge and training.
- EPI consultants should identify where the bottlenecks are for replacing irrigation systems and develop a strategy, if possible, to decrease their costs.
- EPI consultants should provide assistance to farmers who desire to raise seeds or seedlings domestically, especially through greenhouse production.
- EPI consultants should work with commercial training organizations or educational institutions to train a new generation of Georgian vegetable experts, possibly through an industry advisory body, who will be able to continue training producers and their employees in soil, input, and crop management techniques.

### PRIMARY PRODUCTION

- Because there are very few large-scale, heated greenhouses in Georgia, EPI consultants should work with potential investors, or current greenhouse operators, to develop business plans and financing strategies to increase investment within the heated greenhouse sector.
- Production increases need to be implemented across the range of vegetables produced with particular emphasis on high-value crops over low-value alternatives. EPI consultants should promote import substitution activities by promoting additional production in the four largest imports: potatoes, tomatoes, cucumbers, and legumes. More importantly, for export production, EPI consultants should promote high value, crops that can be produced efficiently and cheaply in Georgia to maximize profitability.
- EPI consultants prepare the larger commercial producers for export readiness by promoting GlobalGAP among producers and HACCP among the exporters. This

should be done while also introducing domestic producers to international wholesale distributors.

- EPI consultants should work with Vegetable Market actors to fix the gaps in the production and infrastructure chain for producers to access international markets. For example, if there are no cold storage facilities close enough to the producers, EPI consultants should work with market actors to establish a facility in the area.
- EPI consultants should also promote Smallholder GlobalGAP certifications for groups of farmers or greenhouses that can qualify under a GlobalGAP umbrella certification for individual smallholder farms.
- EPI consultants should promote increased production across the board, in conjunction with export demand surveys for local produce and export markets to identify what products will sell.
- EPI consultants should recommend and promote the implementation of the European CODEX product standards.
- EPI consultants should promote investment in vertically integrated ventures, specifically within greenhouses, cold storage, processing, and wholesaling. Any combination of these would result in substantial returns.

## **FOOD PACKAGING FACILITIES**

- EPI consultants should identify production facilities that can produce cardboard or plastic boxes that are appropriate for vegetables and mediate prices for farmers.
- EPI consultants should determine appropriate short-term, cost-efficient alternatives to cold storages, such as Modified Gas Packaging, which extends the shelf-life of produce.

## **COLD STORAGE FACILITIES**

- EPI consultants should undertake a survey of the major producer regions to identify where the major demand for cold storage will be and how many MT of storage could be utilized by the private sector at normal commercial rates.
- EPI consultants should identify what exactly are the financial and/or psychological barriers for farmers to use cold storages in lieu of basements and cellars, and develop an action plan to overcome these barriers.
- EPI consultants should consider financial solutions to stimulate new investment in cold storages from both domestic and foreign investors.
- EPI consultants should promote vertical integration between the cold storage sector and primary producers, the FSCs, wholesale distributors, or exporters.

## **FOOD PROCESSING**

- EPI consultants should work with current food processors to assist in developing additional capacity.
- EPI consultants should promote new investment in food processing sector.

## CONSUMPTION GAPS

- Vegetable production needs to rise by at least 34% and as much as 57% to just satisfy domestic demand.
- Considering the differences between production and consumption values in 2006 and 2008, farmers only need to produce an additional 9-15% just to satisfy domestic demand. As such, potato production represents a significant opportunity for developing its export potential.

## ACCESS TO MARKETS

- EPI consultants should work with the FSCs and collection centers to improve consolidation mechanisms for small farmers.
- EPI consultants should promote the development of additional transportation routes from rural Georgia to major domestic markets.
- EPI consultants should work with organic farming producers to identify which farms and producers are certified organic, as these could be exported to EU markets and sold at a premium.

## ACCESS TO CREDIT

- EPI consultants should work with MFIs banks to develop customized lending solutions for producers to access credit schemes, similar to Bank Constanta and Credo's products, throughout Georgia at commercial banking rates.
- EPI consultants should identify working capital solutions to finance cold storage services for vegetables.
- Because the commercial banks' credit committees have a low level of understanding of general agricultural processes, EPI consultants should provide trainings in agricultural lending practices and standards.

## SUMMARY

While there are many gaps in the Vegetable Market value chain that need to be addressed directly and resolved to increase the sector's productivity, profitability, and competitiveness, there are several that are more structurally significant and demand a higher priority in EPI's action plan. The following items are the high priority recommendations that will not only address a major specific infrastructural component or operational process gap, but will also contribute to alleviating pressure, or even resolving, other lower priority gaps identified in this report:

- Infrastructure
  - Cold Storage Facilities: By meeting the currently high demand for storages from producers, processors, and wholesale distributors, EPI will stimulate increased primary production, expand processing seasons, and extend the domestic vegetable sales period.
  - Food Packaging: By introducing affordable vegetable packaging, produce will be better preserved and protected in all postharvest handling processes.

This is particularly important for exports, where profitability depends on product survivability.

- Workforce Enhancement
  - Training on Inputs and Technologies: By training producers on using inputs and technologies properly, EPI will stimulate better quality and higher production.
- Market Access
  - Collection Facilities and Transportation Routes: By developing a mechanism for rural farmers to collect production, creating linkages between these facilities with wholesalers, and facilitating new transportation routes, EPI will enable producers to sell their produce in higher-priced markets.
- Certifications and Standards
  - GlobalGAP and HACCP: By promoting GlobalGAP among producers and HACCP among processors and postharvest handling facilities, EPI will enable producers to access major export markets with high-value products and will create visible models of proper food safety and handling procedures.
  - Smallholder GlobalGAP: By promoting the Smallholder GlobalGAP designation, EPI will not only improve access to markets for numerous small producers, but will also stimulate much-needed profitability gains.
  - Commodity Grading System: By implementing European CODEX standards, purchasers – including processors, wholesalers, and export markets – can set grade targets for their operations, which will increase demand for specific qualities of production, which will also stimulate gains among producers.

# E. ADDITIONAL INFORMATION

## RESOURCES USED

1	Caltrider Advisors	Cold Storage Industry Analysis
2	GeoStat	Gross Domestic Product of Georgia in 2010, Agriculture Census 2005, Agriculture of Georgia 2008, Agriculture of Georgia 2009
3	AgVANTAGE SAVE Program	Final Report
4	Elizabeth Cullen Dunn	Post-Socialist Spores: Disease, Bodies, and the State in the Republic of Georgia
5	National Investment Agency of Georgia	<a href="http://www.investinggeorgia.org">www.investinggeorgia.org</a>
6	Ministry of Finance	<a href="http://www.mof.gov.ge">www.mof.gov.ge</a>
7	Tevzadze, Maia	Role of Food Safety Standards in Improving “Agricultural Producers’ Access to Markets”. IFC presentation, March 2011.
8	Ministry of Agriculture of Georgia	<a href="http://www.moa.gov.ge">www.moa.gov.ge</a>
9	Ministry of Economy and Sustainable Development	<a href="http://www.economy.ge">www.economy.ge</a>
10	CNFA	FSC and MSC Survey Report, February 2011
11	Elkana	Agricultural Lending Study

## INTERVIEWS CONDUCTED

1	Raibul Kilasonia	Goodwill
2	Eka Pilauri	Populi
3	Archil Abramia	Ministry of Agriculture of Georgia
4	Giorgi Gogadze	Ministry of Agriculture of Georgia
5	Tamaz Dundua	Elkana
6	Niaz Dzipshipa	Holiday Inn
7	Oren Weiman	Diplomat
8	David Tsiklauri	USAID
9	Kakha Kokhleidze	Georgian SME Association
10	David Zaalishvili	Kala Group
11	Gia Gagoshvili	GMC Group
12	Sandro Gabunia	Radisson BLU Hotel
13	Nino Shanidze	KfW
14	Levan Lebanidze	Bank Constanta
15	Alexander Ebideridze	Noblex
16	Jim McNicholas	Millennium Challenge Corporation
17	Goderdzi Goderdzishvili	CARE International
18	Dennis Zeedyk	EPI ASC Component Lead
19	Steve Wade	EPI COP
20	Zura Chekurashvili	CNFA
21	Mamuka Gachechiladze	CNFA
22	Avtandil Korakhashvili	CNFA
23	Giorgi Iakobashvili	CNFA
24	Davit Kirvalidze	CNFA
25	Lasha Dolidze	CNFA
26	Maka Noselidze	FTF

27	Giorgi Chikovani	GRDS Wholesale Distributors
28	Vano Goglidze	Gori Baby Feeding Cannery/KULA
29	Robert Revia	Garemo
30	Goga Simonishvili	Gori Farm Service Center, LLC Agro Kartli
31	Tamaz Niparishvili	Kaspi Farm Service Center, I/E Tamaz Niparishvili
32	Zviadi Abashishvili, FSC	Kareli Farm Service Center, LLC "AgroserviceKareli"
33	Vano Lazarashvili	Farmer
34	Eduard Shermardini	Farmer
35	Muradi Tielidze	Farmer
36	Maradi Martkvishvili	Farmer
37	Zakro Mazmishvili	Farmer
38	Elizbar Dzamelashvili	Farmer
39	Nikoloz Elikashvili	Farmer
40	Teimuraz Simonishvili	Farmer
41	Khvicha Tatrishvili	Farmer
42	Zura Khutsishvili	Farmer
43	Emzar Chalauri	Farmer
44	Giorgi Mchedlishvili	Farmer
45	Soso Sabanadze	Farmer

## VALUE CHAIN MAPPING

1	Tamaz Niparishvili	FSC/MSB/Berries	Shida Kartli	Kaspi
2	Laurus	Bay leaf	SamegreloZemo Svaneti	Senaki
3	Shara-GzamsheniPirveli	Bay leaf	SamegreloZemo Svaneti	Khobi
4	LLC AromaProduct	Berries	Tbilisi	Tbilisi
5	"Ltd" "Phora"	Cold storage	Shida Kartli	Tbilisi
6	"Ltd" "Didube Marketi"	Cold storage	Shida Kartli	Tbilisi
7	Gudvili	Cold storage	Shida Kartli	Tbilisi
8	"Ltd" "Agrou"	Cold storage	Kvemo Kartli	Bolnisi
9	"Ltd" "Rustavi"	Cold storage	Kvemo Kartli	Rustavi
10	"Ltd" "Galaqsi"	Cold storage	MtskhetaMtianeti	Mtsketa
11	Jsc "Delidori"	Cold storage	MtskhetaMtianeti	Natakhtari
12	Merab Mchedlishvili	Fruit	Shida Kartli	Gori
13	Giorgi Naodashvili	Fruit	Shida Kartli	Gori
14	Amxanagoba Kheltubani	Fruit	Shida Kartli	Gori
15	Beglar Mikeladze	Fruit	Adjara	Khelvachauri
16	Agroexport "Ltd"	Fruit	Adjara	Khelvachauri
17	Ilia Giorgadze	Fruit	Kakheti	Gurjaani
18	Shanate	Fruit	Kakheti	Sagarejo
19	Aleksandre Kitesashvili	Fruit	Kakheti	Gurjaani
20	Geoflower	Fruit	RachaLechkhumi da Kvemo Svaneti	Tsageri
21	Rozeta Narushvili	Fruit	SamegreloZemo Svaneti	Zugdidi

22	Irakli Khozrevanidze	Fruit/Berries	Adjara	Khulo
23	Farkoni	Fruit/Berries	Imereti	Kutaisi
24	LLC Ango	Fruit/Berries	Adjara	Goginauri
25	Giorgi Mchedlishvili	Fruit/Cold storage	Shida Kartli	Gori
26	Gori Fruit Export Company	Fruit/Cold storage	Shida Kartli	Gori
27	I/E Nino	Fruit/Cold storage	Shida Kartli	Gori
28	I/E Irika Edilashvili	Fruit/Cold storage	Shida Kartli	Kareli
29	Association Shindisi	Fruit/Cold storage	Shida Kartli	Gori
30	I/E Ilia Giorgadze	Fruit/Cold storage	Kakheti	Gurjaani
31	Nergeta LLC	Fruit/Cold storage	SamegreloZemo Svaneti	Zugdidi
32	Geoconcentrate	Fruit/Processing	Shida Kartli	Gori
33	Citro	Fruit/Processing	Adjara	Batumi
34	Vagi	Fruit/Processing	Guria	Chokhatauri
35	Kampa	Fruit/Processing	MtskhetaMtianeti	Saguramo
36	Golden Fleece	Fruit/Vegetable	MtskhetaMtianeti	Mtskheta
37	Agroservis Kareli	FSC	Shida Kartli	Kareli
38	Nugzar Kiladze	FSC	Shida Kartli	Khashuri
39	Farmers House	FSC	Adjara	Batumi
40	Diana Kakhidze	FSC	Imereti	Tskaltubo
41	Nektari	FSC	Imereti	Chiatura
42	Agrosharmi	FSC	Imereti	Samtredia
43	Mamuka Tsikoridze	FSC	Imereti	Tskaltubo
44	Alva	FSC	Imereti	Sachkhere
45	Zurab Kartvelishvili	FSC	Imereti	Vani
46	Avtandil Guntsadze	FSC	Imereti	Zestaponi
47	Noblex	FSC	Kakheti	Kvareli
48	Giorgi Mindiashvili	FSC	Kakheti	Sagarejo
49	Bezhan Gonashvili	FSC	Kakheti	Dedoplistskaro
50	Sopkimia	FSC	Kakheti	Gurjaani
51	Tamari	FSC	SamegreloZemo Svaneti	Mestia
52	Gvaza	FSC	SamegreloZemo Svaneti	Senaki
53	Fermertasakhli	FSC	SamegreloZemo Svaneti	Khobi
54	Metskhoveleobis Bazari	FSC	SamtskheJavakheti	Akhaltzikhe
55	Sasoplosakonsultaciosamsaxuri	FSC	SamtskheJavakheti	Aspindza
56	Agasi Ezoiani	FSC	SamtskheJavakheti	Akhalkalaki
57	Agrotekhnocentri	FSC	SamtskheJavakheti	Adigeni
58	Agro Kartli	FSC/MSC	Shida Kartli	Gori
59	Terjola Farmers House	FSC/MSC	Imereti	Terjola

60	Solomon Koroglishvili	FSC/MSC	Kakheti	Gurjaani
61	Ambrosi Macharashvili	FSC/MSC	Kakheti	Lagodekhi
62	Agrosfero Gurjaani	FSC/MSC	kakheti	Gurjaani
63	Kakhi Mesablashvili	FSC/MSC	Kakheti	Telavi
64	Kartlis Holding	FSC/MSC	Kvemo Kartli	Bolnisi
65	Aibolit 20 Vek	FSC/MSC	Kvemo Kartli	Marneuli
66	Gia Kordzadze	FSC/MSC	Kvemo Kartli	Gardabani
67	“Ltd” Txilissaeksportokompania	Greenhouse	Guria	Ozurgeti
68	Valeri Mgeladze	Greenhouse	Guria	Ozurgeti
69	Givi Kvinikadze	Greenhouse	Imereti	Kutaisi
70	Revaz Chogovadze	Greenhouse	Imereti	Kutaisi
71	Agrokomi	Greenhouse	Imereti	Vani
72	Herbia	Greenhouse	Imereti	Tskaltubo
73	Mzeta	Greenhouse	Kakheti	Lagodekhi
74	Zaliko Kusiani	Greenhouse	Kakheti	Lagodekhi
75	Tamar Lazashvili	Greenhouse	Kakheti	Gurjaani
76	Laguna	Greenhouse	Kakheti	Sagaredjo
77	Zurab Didishvili	Greenhouse	SamegreloZemo Svaneti	Zugdidi
78	Murman Shengelia	Greenhouse	SamegreloZemo Svaneti	Zugdidi
79	Aikon Group	Greenhouse	Adjara	Batumi
80	Mengi LLC	Greenhouse	SamegreloZemo Svaneti	Senaki
81	IE Gonashvili	MSC	Kakheti	Dedoplistskaro
82	Laba +	MSC	SamtskheJavakheti	Akhaltsikhe
83	IE Nakhutsrishvili	MSC	Shida Kartli	Kareli
84	IE Petriashvili	MSC	Kvemo Kartli	Asureti
85	DV Plus	MSC	Kvemo Kartli	Bolnisi
86	IE Tvaliashvili	MSC	Shida Kartli	Shindisi
87	Alaverdi	MSC/Vegetables	Kvemo Kartli	Marneuli
88	Zurab Lazarashvili	Nursery	Shida Kartli	Gori
89	Kvenatkoca Cooperative	Nursery	Shida Kartli	Kareli
90	Alex Kukhianidze	Nursery	Shida Kartli	Kareli
91	Shota Jgenti	Nursery	Guria	Ozurgeti
92	Kartuli TxiliSio 2000	Nuts	Guria	Ozurgeti
93	David Chaprava	Nuts	Imereti	Kutaisi
94	Nutex	Nuts	Kakheti	Kvareli
95	Dorani	Nuts	Kakheti	Akhmeta
96	Ekopeks	Nuts	MtskhetaMtianeti	Mtskheta
97	Giorgi Bulia	Nuts	SamegreloZemo Svaneti	Zugdidi

98	Agro-plus	Nuts	SamegreloZemo Svaneti	Zugdidi
99	Westnut	Nuts	SamegreloZemo Svaneti	Zugdidi
100	Shengi	Nuts	SamegreloZemo Svaneti	Khobi
101	Sioni	Potato	Kvemo Kartli	Dmanisi
102	Nugzar Akulashvili	Potato	Kvemo Kartli	Bolnisi
103	Giorgi Devnozashvili	Potato	Kvemo Kartli	Dmanisi
104	Guram Mindiashvili	Potato	Kvemo Kartli	Bolnisi
105	Jemal Kvirikashvili	Potato	Kvemo Kartli	Marneuli
106	Gantiadi 1	Potato	Kvemo Kartli	Dmanisi
107	Gremislav Baiazov	Potato	Kvemo Kartli	Tsalka
108	Vartan Megrabiani	Potato	Kvemo Kartli	Tsalka
109	Jinisi Potato Cooperative	Potato	Kvemo Kartli	Tsalka
110	Neli Devnozashvili	Potato	Kvemo Kartli	Dmanisi
111	Aleksandre Tsikhelashvili	Potato	Kvemo Kartli	Dmanisi
112	Geolinksi	Potato	Kvemo Kartli	Tsalka
113	Teslis Mzarmoebelta Asociacia "Javakheti"	Potato	SamtskheJavakheti	Akhalkalaki
114	Giorgi Tsalqamanidze	Potato	SamtskheJavakheti	Akhaltsikhe
115	Martin Ezoian	Potato	SamtskheJavakheti	Akhalkalaki
116	Giorgi Nozadze	Potato	SamtskheJavakheti	Aspindza
117	Ioseb Tabatadze	Potato	SamtskheJavakheti	Aspindza
118	Shalva Tabatadze	Potato	SamtskheJavakheti	Aspindza
119	"Dovlati"	Vegetable/Cold storage	Imereti	Bagdadi
120	"SairmisTsklebi" JSC	Vegetable/Cold storage	Imereti	Vartsikhe
121	I/E Valodia Shindariani	Vegetable/Cold storage	SamtskheJavakheti	Akhaltsikhe
122	Marneuli LLC	Vegetable/Processing	Kvemo Kartli	Marneuli
123	Nugbari	Vegetable/Processing	Kvemo Kartli	Marneuli
124	Bazi LLC	Vegetable/Processing	Shida Kartli	Tbilisi
125	Edena LLC	Vegetable/Processing	Imereti	Terjola
126	Agro 1959	Vegetables	Shida Kartli	Kareli
127	David Chanishvili	Vegetables	Shida Kartli	Gori
128	Elguja Giorgadze	Vegetables	Kakheti	Gurjaani
129	Isabal Sologashvili	Vegetables	Kakheti	Kvareli
130	AV-Group	Vegetables	Kakheti	Telavi
131	Gocha Machitidze	Vegetables	Kvemo Kartli	Marneuli
132	Mirian Chkhitunidze	Vegetables	Kvemo Kartli	Marneuli
133	Zakirlusubov	Vegetables	Kvemo Kartli	Marneuli
134	Beniamin Memarnishvili	Vegetables	Kvemo Kartli	Marneuli

135	David Ebanoidze	Vegetables	Kvemo Kartli	Marneuli
136	TandT	Vegetables	Shida Kartli	kaspi
137	Geguti 2005 "Ltd"	Vegetables/Cold storage	Imereti	Tskaltubo

## LIST OF FARM SERVICE CENTERS

1	"Ltd" Kartlis Holding (ZazaAvalishvili)	Kvemo Kartli	Bolnisi
2	I/E Solomon Koroglishvili	Kakheti	Gurjaani
3	I/E Ambrosi Macharashvili	Kakheti	Lagodekhi
4	"Ltd" Aibolit 20 vek (ShaikBairamovi)	Kvemo Kartli	Marneuli
5	I/E Tamaz Niparishvili	Shida Kartli	Kaspi
6	Terjola Farmers House (Ramaz Tskipurishvili)	Imereti	Terjola
7	"Ltd" Agro Kartli (Giorgi Simonishvili)	Shida Kartli	Gori
8	"Ltd" Agrosfero Gurjaani(Ioseb Dzamanashvili)	Kakheti	Gurjaani
9	"Ltd" Noblex (Aleksandre Ediberidze)	Kakheti	Kvareli
10	I/E Diana Kakhidze	Imereti	Tskaltubo
11	I/E Tamari (Nino Ratiani)	SamegreloZemo Svaneti	Mestia
12	Livestock Bazaar (Pavle Gelashvili)	Samtskhe-Javakheti	Akhaltikhe
13	Nektari "Ltd"	Imereti	Chiatura
14	"Ltd" Agrosharmi	Imereti	Samtredia
15	I/E Gia Kordzadze	Kvemo Kartli	Gardabani
16	I/E Giorgi Mindiashvili	Kakheti	Sagarejo
17	I/E Mamuka Zikoridze	Imereti	Vani
18	LLC Alva	Imereti	Sachkhere
19	I/E Lasha Giorgadze	Guria	Chokhatauri
20	I/E KakhiMesabliashvili	Kakheti	Telavi
21	LLC Farmer's House	Adjara	Batumi
22	I/E ZurabKartvelishvili	Imereti	Vani
23	LLC Gvaza	Samegrelo	Senaki
24	I/E BezhanGonashvili	Kakheti	Dedoplistskaro
25	"Ltd" AgroservisKareli	Shida Kartli	Kareli
26	Farmers House LLC	Samegrelo	Khobi
27	I/E Avtandil Guntsadze	Imereti	Zestaponi
28	"LTD" Rural Advisory Service	Samtskhe-Javakheti	Aspindza
29	"Ltd" Sopkimia	Kakheti	Gurjaani
30	I/E Nato Giorgadze	Guria	Lanchkhuti
31	I/E Agasi Ezoian	Samtskhe-Javakheti	Akhalkalaki
32	LLC Agrotechnocentre	Samtskhe-Javakheti	Adigeni
33	I/E NugzarKiladze	Shida Kartli	Khashuri

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