



# FEASIBILITY STUDY FOR AGRICULTURAL FOOD LOGISTICS HUBS IN GEORGIA

AND CONSIDERATIONS FOR MODERNIZATION OF THE  
FRESH FOOD SUPPLY CHAIN

FINAL

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FRESH FOOD SUPPLY CHAIN

FINAL

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# ABSTRACT

This report is a feasibility study for Agricultural Food and Logistics Hubs (AGFLH) in Georgia and follows the pre-feasibility study. It analyzes the potential locations for the Hub while looking at the market and financial feasibility as well as making recommendations for the design and technical aspects. The report makes recommendations on the locations and design of the Hub for each location, as well as the facilities that each would need. Recommendations on potential financing scenarios are also presented.

**Note:** After the initial development of this feasibility study and financial model, the concept has been socialized with and presented to different investors in the January-June 2012 period. Based on their feedback, the specific financing options that are currently being discussed as of June 22, 2012 are not included in the feasibility study being presented herein.

# ABBREVIATIONS

AGFLH	Agriculture Food and Logistics Hub
BOT	Build, Operate, Transfer
CIS	Commonwealth of Independent States
DCFTA	Deep and Comprehensive Free Trade Agreement
EBRD	European Bank for Reconstruction and Development
EFSA	European Food Safety Authority
FIZ	Free Industrial Zone
FSC	Farm Service Center
GoG	Government of Georgia
HACCP	Hazard Analysis and Critical Control Points
ICAS	Investment Climate Advisory Services
IMF	International Monetary Fund
MSC	Machine Service Center
TAS	Transaction Advisory Service
TMA	Tbilisi Metropolitan Area

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# I. EXECUTIVE SUMMARY

## Project Summary

This study reviews the existing limitations and gaps in the fresh produce value chain in Georgia and proposes an Agricultural Food and Logistics Hub (AGFLH) modernization solution that can attract investment and be implemented immediately. The solution was developed through a practical two-stage (pre-feasibility and feasibility) process to identify infrastructure requirements, market pricing/occupier “willingness-to-pay,” and investor interest. The project design reflects the transitional nature of Georgia’s fresh produce value chain and seeks to facilitate that transition.

The existing domestic fresh produce value chain faces a number of challenges, including:

- Loss of market share to (primarily Turkish) imports
- Lack of cold storage/warehousing and transportation bottlenecks (the inability to elongate produce life and create longer seasons/price premium)
- High volumes of waste (produce spoilage) and waste disposal costs
- Lack of food safety systems and standards and quality measures
- Compliance with new environmental legislation
- Harmonization with EU Food Safety standards and access to EU markets

The proposed logistics hub infrastructure design is intended to:

- Create a domestic supply chain system that doesn’t disrupt or displace the existing system (through affordability or other issues), but creates a new and expanding domestic cool chain
- Protect the indigenous value of Georgian fresh produce
- Create infrastructure that enables a new value chain, from domestic produce through to import and export distribution
- Locate the AGFLH at the strongest points of supply chain and transport consolidation
- Match the AGFLH infrastructure locations to the highest regional levels of food consumption
- Maximize geo-connectivity (clear routes to strongest export markets, strongest through trade logistics and other logistics HUBS developments in Europe, Central, West and Southern Asia)
- Secure local supply chain connectivity (of customer and buyer outlets) by maintaining a location where the distance from produce collection to delivery point is still part of the Tbilisi urban area and preferably less than 15km from the main consumption center
- Create a phased development to de-risk the transitional nature of the project
- Create a development that features added-value high revenue functions to underpin the financial viability and furthermore has expansion space to expand core functions
- Create an interface with the urban cityscape and options to expand into a non-food-logistics and business park.

The detailed feasibility analysis sets out a program to successfully deliver the two hubs, one in Tbilisi and one in Batumi.

## Target Markets & Projected Demand

Demand was projected based on a market analysis that examines fresh produce imports and exports. It is evident that opportunities for growth in fruit and vegetable production are substantial for both fresh and processed products. Agricultural production is generally increasing – up over 37% between 2006 and 2009 (though weather fluctuations such as those in 2010 can significantly impact production). Despite this domestic production growth, 57% of the vegetable market is still supplied by imports. Georgia also imports over 40m GEL of fresh fruit, and fruit processors operate only four months out of the year because of insufficient fresh fruit supply. Farmers have significant capacity to expand production and/or increase yields, but both production increases and export opportunities are severely constrained by the lack of cold storage facilities and efficient cool chain.

With the introduction of new infrastructure for cold storage/processing and cool chain management within the Agricultural Food and Logistics HUB, on-season produce can be stored and sold throughout off-season months, taking advantage of market supply opportunities (as above) and generating greater sector revenue through price advantage. Existing market demand above can be unlocked by the infrastructure developed within the AGFLH, particularly:

- Cold storage and distribution infrastructure
- Market access and more direct transportation and consolidation system
- Implementation of food safety and product quality standards
- Facilities for post-harvest handling.

## Value Proposition

The feasibility analysis defines the range and scale of value-added functions and services that can transform the current domestic supply chain capabilities to the expanded nature of the Agricultural Food and Logistics HUB phases. The proposed AGFLH program covers the entire life-cycle of mixed logistics development in two regional centers. The provision of cold storage and wholesale and distribution infrastructure can have a significant economic impact, based on its affordable pricing and the opportunity to export non-seasonal produce. In addition, the ability to meet new trade agreement obligations and export Georgia's indigenous produce into the European marketplace creates an expanded, long-term value proposition. New co-adjacencies created by the AGFLH's food logistics and business and tourism infrastructure will also add value to the surrounding communities and urban area, as a potential food business cluster could develop.

## Design and Technical Feasibility

The proposed design is based on an evolution across five phases that adds functionality as the AGFLH is adopted by users and occupants. These phases are:

- 1) Domestic food supply chain/wholesaler market
- 2) Import and export food supply chain infrastructure
- 3) Office, education, and exposition facilities
- 4) Railway integration and wholesale/food distribution expansion
- 5) Non-food logistics and business park

The design develops a new cool chain system for domestic produce and provides chill storage to extend produce life through a daily, weekly, and monthly cycle. It also creates co-adjacencies with the import and export supply chain, so that produce stored can be transferred easily into an export environment. Similarly, a close relationship with imported produce should allow for exchange between domestic and import produce where there are gaps in variety or season. Technical design details for the feasibility stage are limited to internal operational options on racking, as this is normally associated with a more detailed design phase.

This phased approach provides a working solution to the domestic supply chain modernization needs, and creates a development mix and financial mix that makes the project financially viable and mitigates financial risks.

The feasibility appraises the suitability of a number of sites and makes a recommendation for specific sites in Tbilisi and Batumi. The site appraisal and suitability assessment was based on both trade connectivity and the broader urban development context. The recommended sites are integrated with the Tbilisi master plan (and also the model for Batumi) and are also supported by further transportation analysis. This study also includes CGI renderings of the AGFLH that can support the marketability and investor process.

### **Financial Feasibility**

Based on the design master plan and the structures contained in the plan, the feasibility assessment includes a financial and development model that covers three core phases over a 6-year development timeframe. Phases 1 and 2 represent the major agricultural food logistics and distribution infrastructure, and Phase 3 includes private sector investment opportunities to participate in the core activities. Phases 4 and 5 are land bank development opportunities that are not core to the medium-term financing requirements of the project. The financial model presented assumes a phased occupancy growth for the AGFLH over the first three years of operation (30% / 30% / 40%). To verify the project feasibility and identify potential funding structures and to sources, the model has already been 'soft tested' with the ADB. The full model is annexed as a separate Excel file.

The financial model includes:

- Project and master plan for Tbilisi (to be replicated in Batumi to form the two centers)
- Construction cost schedule
- Revenue schedule
- Forecasted Income Statements
- Depreciation schedule
- Payback analysis for aggregate and individual phases
- Phased development model for Phases 1 and 2
- Long-term land lease revenues from Phase 3 from private sector investors

Phases 4 (Railway integration and wholesale/food distribution expansion) and 5 (non-food logistics and business park) are land development opportunities that are created by the core AGFLH facilities.

Based on ADB discussions, the financial model assumes a sovereign loan structure at a concessionary finance rate. The ADB review suggests that the project is viable and an attractive project from many respects, including its social and economic reforms and social inclusivity and

sustainability impact. With sovereign loan financing, the USD 128 million project (based on a cost per center of USD 64 million for Phases 1-3) is projected to achieve a 25-year payback period (including 6 years of phased construction). At a 0.9% discount rate, the project's NPV is USD 124 million, with an IRR of 7.6%

Based on concerns about the impact of additional ABD lending on Georgia's overall IMF sovereign loan ceiling, a Public/Private Partnership (PPP) structure based on a combination of a Sovereign Loan that is short term (5 – 7 years, and therefore presumably outside of IMF restrictions) and a market-based private sector package of ADB (private sector) loans and private sector equity (including from operators such as Semmaris) and other commercial lending is also possible.

### **Organizational/Managerial Arrangement**

The feasibility identifies three distinct operational/organizational models, including a single mode investor/operator; a landlord-tenant structure with a management company; and a limited liability partnership. At this stage, the project lends itself to a single mode investor/operator structure, if the desire is to secure private sector operator equity at day one. However, this may prove difficult during the period where the asset is held by the public sector in preparation for transfer to a private sector operator, and instead a landlord/tenant with an operator management structure may be the most feasible.

### **Conclusions/Recommendations**

This pre-feasibility and feasibility project has placed its emphasis on creating a route to the delivery of a successful Agricultural Food and Logistics Infrastructure in the two centers of Georgia (Tbilisi and Batumi). Representatives from all parts of the Value Chain believe that the project is feasible and can deliver critical infrastructure to Georgia to enable it to compete, not only within the agri-food sector but also within the wider logistics and trans-shipment sector.

The project also creates wider economic and socioeconomic reforms for Georgia, including sustainable agriculture, trade harmonization (EU food safety), social inclusion (skills and workforce development), urban development, and can act as an enabler for urban tourism. To realize these potential benefits, the next steps are to:

- 1) Formulate and agree on a mandate to take the project forward with specific Memorandum and Articles (it is likely that this feasibility document could form a large part of the M&A) including agreement on the 'lead' stakeholders.
- 2) Identification, agreement on and structuring of the project vehicle
- 3) Identification of resources required for the next stage (apportionment of risk to allocation of resources), applicability of resource and funding assistance
- 4) Agreement on key professional service appointments (subject to procurement strategy)
- 5) Development of detailed Action Plan and Program Management Structure

In addition to the traditional ADB financing option, the Transaction Advisory Service facility (TAS) could be structured to implement the project as a PPP.

### **Relevant Developments After the Original Development of this Feasibility Study and Financial Model**

After the initial development of this feasibility study and financial model, the concept has been socialized with and presented to different investors in the January-June 2012 period. Based on

their feedback, the specific financing options that are currently being discussed as of June 22, 2012 are not included in the feasibility study presented herein.

# **II. APPENDICES**

- A. BACKGROUND**
- B. MARKET FEASIBILITY**
- C. DESIGN AND TECHNICAL FEASIBILITY**
- D. FINANCIAL FEASIBILITY**
- E. ORGANIZATIONAL/MANAGERIAL FEASIBILITY**
- F. CONCLUSIONS AND NEXT STEPS**
- G. FINANCIAL MODEL**

# A. BACKGROUND

## THE PRODUCT

The USAID/EPI Feasibility for the Agricultural Food and Logistics Hub (AGFLH) presents the case for a transitional project, with a modernized domestic food supply chain at its center.

The new domestic supply chain will be food safe and elongate product life (through chilled storage), leading to positive economic performance and export- and import-readiness.

The feasibility demonstrates the design of new infrastructure to do this and how the technical changes would work. The infrastructure also acts as an enabler to added-value food sector functions and can be extended to a non-food logistics center environment, with a rail trans-shipment interface. The enabling function also extends to enlarge the city experience in Tbilisi with a tourism interface and impact on the livability index through its connectivity and proximity to residential areas.

In Batumi, the AGFLH development helps to enable the city master plan, as the existing market is relocated from the port area (an Asian Development Bank project and investment) and provides a logistics gateway to the adjoining EU marketplace.

This feasibility report follows on from the pre-feasibility assessment for an AGFLH which focused primarily on understanding the production and economic structure (and culture) of the current domestic fresh produce supply chain and wholesale markets operations across Georgia.

The pre-feasibility assessment also identified:

- Gaps and limitations of the current domestic food supply chain system
- Current food transport and logistics systems and attributable costs
- Size/capacity and cost of the AGFLH
- Sites and/or locations and basic appraisal criteria
- Revenue and cost of the AGFLH and suggested sources of capital
- Operational characteristics of the AGFLH
- Platforms for required legislation
- The development context in terms of the Tbilisi City Plan and integration with Sustainability/Livability and Tourism initiatives
- Project risk assessment
- Current logistics investment profile in Tbilisi
- Investor/Operator Business Model
- Future Strategies for AGFLH that would integrate expanded fresh food product (meat, fish and seafood, dairy, poultry, and flowers), rail and trans-shipment facilities, renewable energy developments, added-value business (warehousing, processing,

packaging, and non-food logistics) and co-working hubs in neighbor countries such as Armenia and Azerbaijan.

The full feasibility has significantly extended the findings of the pre-feasibility assessment, particularly in the areas of:

- Market feasibility
- The design and technical feasibility for the AGFLH
- The financial and investment feasibility
- The feasibility of legislation impact and compliance
- The feasibility for added-value business and wider cities context development integration
- The value proposition
- An integrated action/delivery plan

## **LOCATION(S) OF PROJECT/AGFLH**

The pre-feasibility assessment and feasibility work program have considered the following criteria in judging the most appropriate locations for AGFLHs:

- Consolidation and/or assembly points within Georgia for fruit and vegetable production, distribution, and sales. In the form of existing wholesale and retail market locations, courier and transport company locations, routes/destinations when transporting food product, and population and consumption levels within the regions and cities of Georgia.
- Availability of suitable sites that meet key benchmark criteria for fresh produce wholesale market development and food supply chain logistics efficiency
- Integration with city-wide development plans and added-value business investment

The pre-feasibility assessment based on the above criteria concluded that the most appropriate locations for the AGFLHs would be Tbilisi and Batumi.

## **SIZE, BASED ON INPUTS AND OUTPUTS**

The pre-feasibility assessment concluded the following on AGFLH size based on the following data and analysis:

- Production flows of fruit and vegetables at 2009 GeoStat measures (e.g. total production 861,500 tons)
- Existing points of consolidation (see Wholesale/Growers Market Map) across East and West Georgia
- Population and consumption trends of Tbilisi (70% of consumption and a population of 2.5m in the Tbilisi Metropolitan Area, or TMA) and Batumi (including Kutaisi), (30% of consumption, a population of 0.3m, but an additional 1m+ visitors)
- Almost equal production flow and volume 'consolidation' at Tbilisi (364,600 tons) and Batumi (422,300 tons) with the difference being the transportation of potato volumes to Tbilisi.

In considering the above data, the required size and capacity for the two hub locations can be approximated as follows:

- Based on a standard euro pallet size of 600kg and a warehouse rotation/turnover of 15 x 45,000 pallet places, the facility would have a throughput capacity of 405,000 tons
- AGFLH size would be approximately 37,800 m<sup>2</sup> and require circulation space of 38,200 m<sup>2</sup> if the AGFLH structure was all at grade (i.e. no multi-level functionality)
- Total site area required is therefore approximately 14 hectares for each site.

The feasibility work program has further defined the size based on additional input and output criteria as follows:

- Supply chain input systems based on the number of farmers bringing produce to the facility for sale in Tbilisi or Batumi
- Supply chain input systems based on the number of farmers acting as agents for other farmers and bringing a consolidated load to the facility
- The number of buyers and/or customers visiting the facility to purchase and/or collect produce for retail or food service outlets
- The supply chain input and output system for larger wholesalers and importers/exporters.

## **ECONOMIC AND SOCIAL IMPACT ON LOCAL COMMUNITIES**

According to the Georgia Sector Competitiveness Overview prepared by the World Bank Group's Investment Climate Advisory Services (ICAS) in June 2009, the logistics and transportation sector provides significant potential for exports and job creation in Georgia and should be of interest to the country's government, donors, and other players. The study claims that the logistics and transportation potential of the country is related to its entry/exit position between Caucasus, Central Asia, and the rest of the world. As such, Georgia is expected to naturally develop into a logistics and transport hub for the Caucasus region, particularly for services such as intermodal hubs and trans-shipment. Additionally, the Overview highlights the agribusiness sector – particularly wine, vegetables, and fruits – among the most promising for growth and employment impact.

The pre-feasibility assessment has identified the potential to create 3,000 jobs within the first three years of operation of the AGFLH. The feasibility work program expands on the employment creation profile and provides more detail.

## **SUSTAINABILITY**

The pre-feasibility assessment highlighted the volume of fresh produce waste (potentially 30% of domestic production), its impact on the growing urban waste landfill requirement (where 71.4% of waste is organic), and the loss of revenue incurred from lack of cold storage capacity (which allows for storage of produce and elongated shelf life).

These issues are expanded in the feasibility work program as a key part of economic sustainability.

The feasibility also considers sustainability of design and construction of the AGFLH facility, in particular the use of indigenous materials for construction and the creation of renewable energy (through photovoltaic, anaerobic digestion, and other energy saving and recovery systems) to reduce energy requirements for temperature control.

# B. MARKET FEASIBILITY

## INDUSTRY DESCRIPTION PRE-FEASIBILITY STUDY

The pre-feasibility assessed the domestic fresh produce supply chain and its distribution and retail system in Georgia.

Extended data on the fresh produce supply chain in Georgia (including import and export data) is presented to highlight:

- Size and scope of the market and its various segments
- Current life cycle and future direction of the sector
- Competitive position
- Future demand areas and assumptions on growth

Some commentary is included in the market analysis explaining how the strategy for the AGFLH is also interdependent with the life cycle of the commercial property sector.

## THE CURRENT SITUATION: FRESH PRODUCE SUPPLY CHAIN

Small rural producers and independent markets and retail outlets provide close to 90% of the operating fresh produce supply chain system in Georgia. This statistic is the reverse in most western countries, where the fresh produce food supply chain systems are consolidated into a small number of major supermarkets who control 90% of the food supply chain, including the rural production base (which also tends to be based on a small number of very large farms). Such a consolidated system is called a composite food supply chain.

The composite system in the UK, controlled by five supermarkets, is the most technologically advanced and efficient in the world, delivering consistently safe and high-quality (albeit standardized) food at low prices. The downside to the system is that profit margins tend to be extracted from the producer/supplier base, affecting domestic production and promoting import/price driven sourcing. It can be the enemy of 'real' variety, choice, and taste.

The perfect fresh produce supply chain system lies somewhere between Georgia's diverse system and the UK's efficient supply chain.

## HOW DOES THE CURRENT FRESH PRODUCE SUPPLY CHAIN IN GEORGIA LOOK AND OPERATE?

The current fresh produce supply chain is comprised of many small producers (with holdings that average 1.22 hectares), representing 90% of the production base. This production base contributed 12.5% of GDP to the Georgian economy in 2010, generating USD 268 million.

The distribution and retail system for fresh produce consists of 19 market centers (grower's market and retail market infrastructures) across the country.

The fresh produce supply chain operates in a relatively simple process:

- The producer transports his produce to the growers market by vehicle (usually an old car or transit van);
- At the grower's market, these cars and vans will align themselves in rows (rear door or trunk facing inwards) to create a 'buyers walk' or display area. This also serves as a form of storage as produce is kept within the vehicle's trunk or rear of the van; (see pictures below for typical arrangement).



- A buyer from the retailer (retail market stall holder or independent retail shop) or food service operator (who prepares and distributes produce to restaurants, hotels, etc.) will pick the produce, load it into their vehicle, and take it to their point of sale, one of the above.

The retail markets are generally very close to or are part of the grower's market; there is some merging of the producer and the retailer at the grower's market, who also retails direct to the consumer.

There is generally no substantial difference in the price of the produce (except for transport cost) at the grower's market, and prices are fixed by the two main market centers of Tbilisi and Batumi through informal (mobile telephone) information flow.

Price variability will take place at the retailer and food service operator when they add their variable margin. In some cases, this is proving to be unacceptably high (up to 50%) and begs the question of whether there is a bigger issue in the longer term for staple produce pricing systems within Georgia (as there is in France, for example).

### DOES THIS SYSTEM WORK?

The current system clearly does work to a large degree in Georgian culture, as consumers have easy access to an abundance of high-quality fresh produce (organic by default) and to variety through the traditional local community retail outlets, retail markets, and street sellers (e.g. 'melon street' scenario).

Restaurants and catering outlets also access the different quality and variety and use it in a different way, for example using a low quality tomato for a base of a dish or high quality (yellow or brown) tomatoes to enhance fine cuisine.

The ‘creep’ of supermarkets in Georgia is not competing well in fresh produce; recent press concerning the retailer Goodwill demonstrated that their fresh produce offer is usually small, of low quality, and very high price (suggested retailer margins of 50%).

### WHAT ARE THE ‘LIMITERS’ AND ‘GAPS’ OF THE CURRENT SYSTEM?

In domestic consumption terms, there are few gaps or limitations.

Statistics identify a gap in the ‘balance sheet’ for vegetables; production only meets 75% of the consumption requirement, while fruit production remains close to the consumption requirement. However, the statistics do not tell the full story and do not identify the ‘lost opportunity’ or opportunity cost of the current fresh produce supply chain system.

To identify and fully understand the lost opportunity, we must first look at production flows, distribution points, and logistics supply chain routes of the fresh produce supply chain. (See Tables 1-3.)

### Agricultural Fresh Produce Production Flows, Distribution Points (market center locations), Logistics routes

**Table 1: Summary Fresh Produce Production Flows:**

Produce Production Flows	Total Tonne	Import (T)	Import Value (m) \$	Export (T)	Export Value (m) \$	Waste (T)
<b>Potato</b>	216.8	0.7		1.2		2.0
<b>Vegetables</b>	170.3	27		3.8		4.0
<b>Melons</b>	43.7	0.76				
<b>Total</b>	430.8	28.4	7.1	5.0	2.5	6.0
<b>Fruit</b>	181.2	3.5		3.6		30%
<b>Grapes</b>	150.1	1.3		6.0		5.0
<b>Citruses</b>	93.6	4.9		12.0		
<b>Tea</b>	5.8	5.0				
<b>Total</b>	430.7	14.7	8.5	21.6	24.0	
<b>Totals</b>	<b>861.5</b>					

**Table 2: Fresh Produce Production Flows by sub-region**

Produce Production Flows	Total Tonne	Adjara AR	Kvemo Kartli	Samtskhe - javakheti	Other Region	Imereti	Samegrelo and Zemo, Svaneti	Shida Kartli	Kakheti	Guria	Mtskheta - Mtianeti	Tbilisi	Rustavi
Potato	216.8	16.7	35.3	144.1	20.7								
Vegetables	170.3		66.8	27.6	12.1	14	7	25.4	17.4				
Melons	43.7		3.7		4.5	12.6			22.9				
Sub - Total	430.8	16.7	105.8	171.7	37.3	26.6	7	25.4	40.3				
Fruit	181.2	8.2	7.1	19.1	16.6	17.4	25.9	66.8	20.1				
Grapes	150.1				20.7	30.3		16.4	82.7				
Citruses	93.6	78.3					2.8			12.5			
Tea	5.8	5.8											
Subtotal	430.7	92.3	7.1	19.1	37.3	47.7	28.7	83.2	102.8	12.5			
Totals	861.5	109.00	112.9	190.8	74.6	74.3	35.7	108.6	143.1	12.5			
Tomatoes	51.4												
Cucumbers	30.9												
Red Beets	3.6												
Cabbages	39.6												
Peppers (capsicum, paprika)	3.2												
Garlics	2.4												
Onions (dry)	10.2												
Greens (including green onion)	8.3												
Carrots	4.1												
Eggplants	10.2												
Other vegetables	6.4												
Total	170.3												
Apple	80.7		2.0	14.3	7.8	2.6	1.4	52.6					
Pear	11.1	0.9			3.3	1.4	2.5	2.1		0.9			

Produce Production Flows	Total Tonne	Adjara AR	Kvemo Kartli	Samtskhe - javakheti	Other Region	Imereti	Samegrelo and Zemo, Svaneti	Shida Kartli	Kakheti	Guria	Mtskheta - Mtianeti	Tbilisi	Rustavi
Quinces	2.2				2.2								
Plums	6.3		0.4	1.2	0.4	0.3		2.7	0.3		1.0		
Cherries	4	0.2	0.7		1.3	0.3	0.1	1.1	0.3				
Apricots	0.2				0.2								
Peaches	17.6		0.1		0.3	0.3	0.2	4.8	11.9				
Sour Plums	6.9	0.5			1.8	2.1	2.1			0.4			
Walnuts	8.2	0.4	0.3		1.2	2.1	1.1	1.1	1.0		1.0		
Hazelnuts	21.8	2.7			4.9	3.2	11.7		1.7	3.7	?		
Subtropical Fruit	21.4	2.1	2.3		0.7	4.8	7.9		2.9	0.7			
Berries	0.4				0.1	0.1			0.2				
Other Fruits	0.4				0.4								
Tangerine	90.5	76.5					1.9			12.7	?		
Orange	1.5	1.4					0.1						
Lemon	1.6	0.4					0.8			0.4			
<b>Total</b>	<b>274.8</b>	<b>85.1</b>	<b>5.8</b>	<b>15.5</b>	<b>21.8</b>	<b>17.2</b>	<b>29.8</b>	<b>64.4</b>	<b>18.3</b>	<b>18.8</b>	<b>2.0</b>		

**Table 3: Population, Consumption, Consolidation/Distribution (Growers/Retail Markets) by sub-region**

Population, Consumption, Markets	Adjara AR Batumi/Kobuleti	Guria Ozurgeti and Lanchxuit	Samtskhe - javakheti Axalcixe	Imereti Kutaisi and Samterdia	Samegrelo and Zemo, Svaneti Abasha, Zudidi and Senaki	Shida Kartli Gori	Kvemo Kartli Marneuli	Kakheti Tibaani, Kabani, Telavi	Mtskheta - Mtianeti Dusheti	Tbilisi Sadguri, Navtlukhi, Teleti, Gidani	Rustavi
Population (m)	0.123			0.192		0.144		0.59	0.57	1.15	1.09
Number of Markets	1	2	1	2	2	1	1	3	1	4	1
Supply Chain Direction	West (Batumi)	West (Batumi)	West (Batumi)	West (Batumi)	West (Batumi)	East (Tbilisi/Rust)	East (Tbilisi/Rustavi)	East (Tbilisi/Rustavi)	East (Tbilisi/Rustavi)	East (Tbilisi/Rustavi)	East (Tbilisi/Rustavi)

Figure 1: Existing locations 'wholesale (grower's) markets'

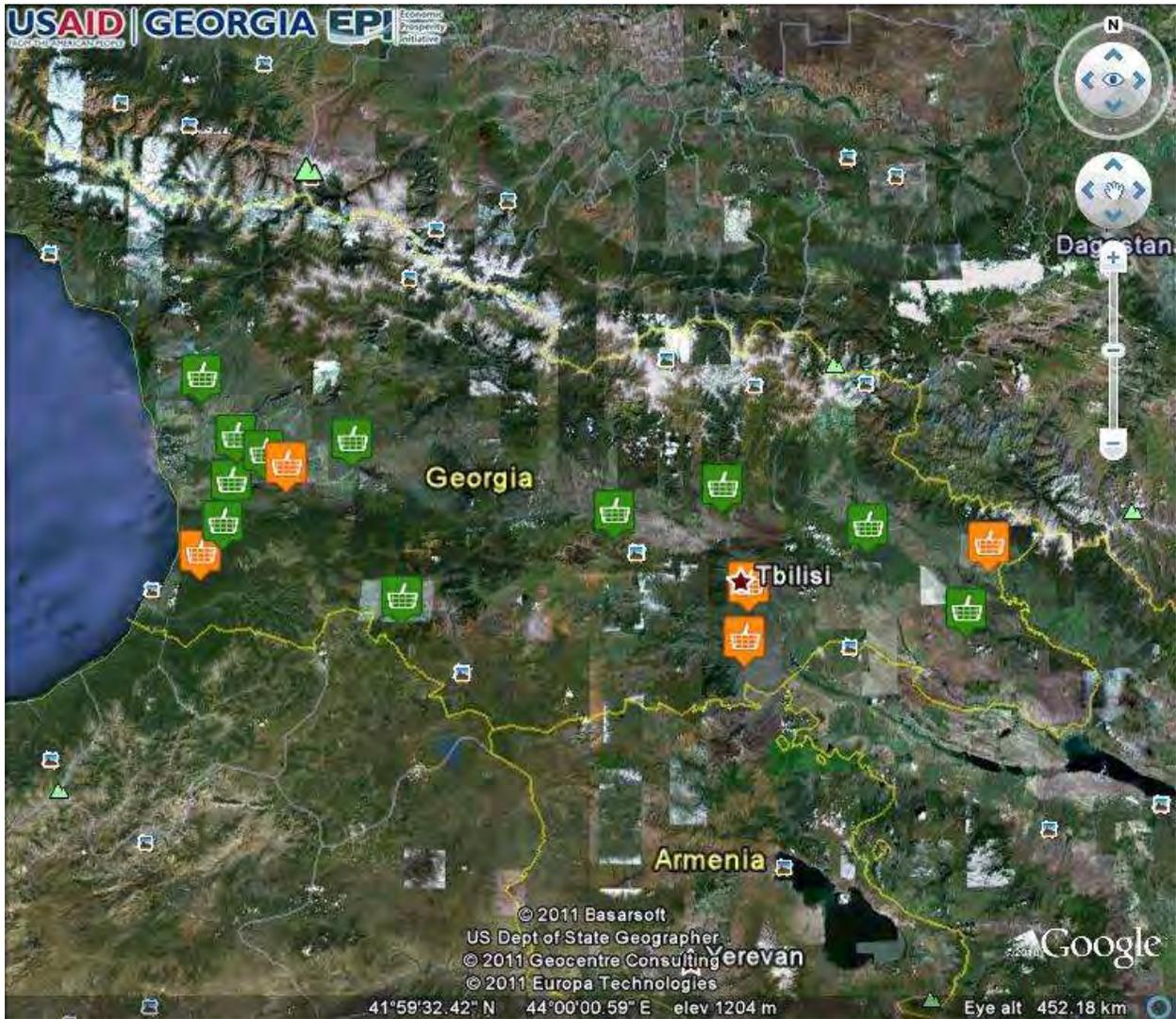


Figure 2: Fruit and Vegetable Supply Chain Maps



Figure 3: Vegetable Supply Chain Map



## **CURRENT TRANSPORT AND LOGISTICS SYSTEMS – OUTLINE COSTS AND ROUTES**

According to the survey results, a major part of the transport, cargo-handling, and distribution is located in three main regions/cities of Georgia: Tbilisi, Samegrelo-Zemo Svaneti (with Poti as its center), and Adjara region (with Batumi as its center).

Different types of transportation services are available in Georgia: truck/road, rail, sea, and air. Companies transport an average of 18,800 tons of goods/freight in one year. The cost of transporting goods 1 kilometer with one truck within the territory of Georgia is USD 1.88 on average, and similarly the cost of transporting freight for one kilometer with one freight car (rail) within the territory of Georgia is USD 2.56 on average.

Average times (as measured by GPS) that trucks require for travel between several destinations are: 17.8 hours for Poti-Sadakhlo, 12.5 hours for Tbilisi-Poti /Poti -Tbilisi, and 13.8 hours for Tbilisi-Batumi.

Warehousing companies operating in Georgia use various types of storages (dry, cold-frozen, bulk) for keeping goods. The average price of storing goods is USD 2.30 (1 ton/day) in dry storage, USD 6.70 (1 ton/day) for cold-frozen storage, and USD 0.40 (1 m<sup>3</sup>/day) for bulk storage. Based on the survey results, the full-potential capacity of all warehousing companies in Georgia is 1,477,690 tons. The average capacity of a single company is 3,307 tons (the average number does not include data for the Poti sea port).

Port and airport handlers provide loading/unloading services. On average the loading/unloading time for one truck is two hours and the cost for liquid, bulk, and general cargo is USD 13, USD 9, and USD 12, respectively.

## **SUMMARY ANALYSIS FRESH PRODUCE PRODUCTION FLOW, THE EXISTING FRESH PRODUCE SUPPLY CHAIN SYSTEM AND VALUE ADDED FINDINGS (EXPORTS AND WASTE)**

An analysis of the above statistics and performance tables yields the following conclusions regarding the 'real' gaps, limiters, lost opportunity and opportunity cost of the current fresh produce supply chain system:

### **FRESH PRODUCE SUPPLY CHAIN SYSTEM (GAPS/LIMITERS)**

The current fresh produce supply chain system has the following gaps and limitations:

- At the basic transportation level, the method and mode of transport from farm gate to growers market will result in high levels of spoilage and waste.
- From a minimum food safety point of view, the grower and retailing environment is unacceptable and consumers have to ensure that produce is washed before consumption. There is also a growing concern about the impact of residue levels (MRL's) of pesticide where producers not fully educated in the use of pesticides have mismanaged their application.

- There are no systems for temperature control and/or storage to provide a food safe environment or to elongate the life cycle of the produce and the season of domestic produce for consumers.
- There are very few examples of operating standards in weight, package sizes, and pricing, which results in short selling to the consumer.
- There are very few examples of operating standards relating to bulk or consolidating of loads into pallets that would allow produce to be stored and transported more efficiently or as a composite load with other food products.

## ECONOMIC IMPACT

The economic impact of the current fresh produce supply chain system is to 'suck in' imports, 'create high levels of waste,' and restrict the increase in production for domestic consumption or export.

The ability to elongate produce life (through temperature-controlled storage) would most likely substitute imports, but it could also enable the waste produce to become a viable export commodity.

Further and similar production (substitution or export) values could be gained from the increased vegetable production to meet full domestic consumption or produce export product.

## CROSS-CUTTING/SIDEWAYS IMPACT – WASTE

The perceived volume of fresh produce waste (at 30%) has not been validated, but in a cross-cutting theme and sideways analysis the urban waste composition has been validated.

Through this validation, 71.4% of the urban waste composition is organic. This is clear evidence of 'at least' the 30% level of waste assumption.

Anecdotal evidence also supports this assumption; producers send waste to landfills or attempt to dig produce back into the field due to a lack of temperature-controlled storage.

## HOW DO WE RESOLVE THIS?

To enable Georgia to address the gaps and limiters in the existing fresh produce supply chain system and move toward a modern food economy that realizes value, addresses the waste situation, underpins the requirements of the Deep and Comprehensive Free Trade Agreement (DCFTA), and creates other cultural benefits, the construction of two agricultural food and logistics platforms in Tbilisi and Batumi is recommended.

Under the feasibility work program, a more detailed market analysis of the fruit and vegetable sector has been conducted to enable a greater definition and understanding of the requirements of Agricultural Food and Logistics Platforms.

## INDUSTRY DESCRIPTION/MARKET OVERVIEW

Historically, Georgia's economy has been based on agricultural production, especially in fresh and processed vegetables.

Production volumes during the Soviet era were very high – as much as 2.95 times higher than current volumes. Although Georgia was a major food exporter during this period, production decreased sharply in 1985-1990; vegetable and potato production decreased by 26.7% and 25.4%, respectively. After the dissolution of the Soviet Union, the central market economy collapsed; *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 markets were broken. These factors combined with the energy crisis in the early 2000s, which led to the degradation of irrigation systems throughout the country, causing a significant decrease in domestic production. 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; vegetable and potato production volumes decreased by an additional 59.4% and 42.5%, respectively. Thus, Georgians came to rely heavily on imported food products.

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

From 2006-2009, average yields per hectare for vegetable production remained relatively flat at 3% growth. Potato production saw a 55.4% increase in yields for the same time period.

Over the last five years, fruit producers and exporters have been relatively successful in exporting to other Commonwealth of Independent States (CIS) countries that have a historic connection to Georgian fruit production. However, the fruit sector is experiencing significant challenges, not only in production, but also in market access and competitiveness. There are no economies of scale, high input costs and no investments in the appropriate food safety certifications, such as Global GAP, that would allow Georgian producers to enter higher-value markets like the EU. Moreover, Georgian producers are facing increasing regional competition from other CIS and Eastern European countries.

## SIZE AND SCOPE OF INDUSTRY, MARKET/MARKET SEGMENTS

Georgian agricultural output in 2010 was GEL 2.32 billion (USD 1.39 billion) with 9.95% of its turnover originating in vegetable production and 12.7% of its output from fruit, nuts, and beverages. With more than 59,000 hectares of production, vegetables constitute GEL 230.9 million (USD 138.3 million) of output. Agriculture (including hunting, fishing, and forestry) is the fifth largest industrial sector and contributed to 8.4% of GDP in 2010.

The absence of a critical mass of post-harvest handling facilities – such as collection centers, cold storage, food packagers, and processors – 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. Of these, only 0.38% (486 farms) are registered enterprises.

Since the 2006 Russian embargo was imposed, 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 have 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.

In 2005, GeoStat conducted a comprehensive survey of farms in Georgia, by number, region, crops produced, and size in hectares. Fruit production is highly concentrated in only a few crops. Apples dominate production by total area of sown hectares, which making up 37.6% of all fruit production (see Table 4). Tangerines are second-highest produced crop (26.2%) and peaches are the third-highest (10.7%). The remaining 25.3% consists of 16 other crops.

Most producers are very small in size. Only about 18-20% of these own plantations larger than one hectare. The majority of farmers harvesting both apples and fruits plant between 0.4-1 ha of each crop. Likewise, tangerines are grown by nearly 40,000 small farmers. The average size of their orchards is approximately 0.3 hectares, and farms over two hectares are considered large-scale.

## YIELDS

In Georgia, low yields continue to be a problem. Yields for fruit orchards have decreased from 2006 to 2009 and for 7 out of the past 11 years. The greatest growth in yield has been in apples and quinces while the greatest decrease has been in sour plums and pears.

These volatile yield figures demonstrate the weaknesses of the fruit sector. When comparing the average yields to international competitors, the need to increase the Georgian fruit sector's competitiveness is evident.

With only 9,640 MT of cold storage capacity for fruits (and vegetables) across the nation, most producers will not be capable of storing their produce for extended periods. Therefore, they have to market and sell their produce quickly, often accepting low prices.

Likewise, most of the country's tangerines are Satsuma (the Japanese Unshui) and are harvested from late October to late November. Similarly, with no viable options for storage in most areas, tangerine producers have to rapidly market and sell their output.

## SUPPLY & DEMAND ANALYSIS

From 2006 to 2009, overall fruit production output increased from 178,100 MT to 244,400 MT (an absolute increase of 37.2%), which is equivalent to a three year compound growth rate of 11.13%. The highest three year compound growth rates were realized in peaches (49.2%), apples (35.0%), quinces (26.0%), and tangerines (23.2%). The largest declines in production were in sour plums (-34.3%), apricots (-26.3%), plums (-21.1%), and pears (-21.0%). While this data demonstrates significant weaknesses among producers in various crops, it also demonstrates significant gains in production in other crops, mirroring gains in yields per hectare.

## DOMESTIC PRODUCTION

In 2010, domestic production decreased sharply due to inclement weather conditions. According to the January-March 2011 newsletter from the joint "European Commission/Food and Agricultural Organization of the United Nations Programme on Linking Information and Decision Making to Improve Food Security", the production of most perennial crops decreased dramatically while others increased slightly.

*According to 2010 preliminary estimates, the production of wheat, corn and potato declined from 2009 levels by 16%, 59% and 47% respectively. The output of perennial crops also dropped by 35% compared to 2009. Significant decline was observed in the production of apples, grapes, citrus, peaches and walnuts while the production of berries, pears, and hazelnuts slightly increased.*

This 35% decrease of crops in 2010 led to higher domestic prices, lower export volumes and higher import volumes in 2010.

**Table 4: Total Production of Permanent Crops in Georgia**

in MT '000	2006	2007	2008	2009	3-Year Compound Growth
Peaches	5.30	8.20	13.70	17.60	49.19%
Apples	32.80	101.30	41.50	80.70	35.00%
Quinces	1.10	1.50	1.20	2.20	25.99%
Tangerines	48.40	93.60	51.60	90.50	23.20%
Subtropical Fruit	21.20	22.10	23.70	21.40	0.31%
Lemons	1.90	1.60	1.70	1.60	-5.57%
Cherries	4.80	5.50	4.00	4.00	-5.90%
Oranges	1.90	3.70	1.90	1.50	-7.58%
Berries	0.60	1.10	0.90	0.40	-12.64%
Pears	22.50	19.60	16.40	11.10	-20.98%
Plums	12.80	16.30	12.60	6.30	-21.05%
Apricots	0.50	0.30	0.70	0.20	-26.32%
Sour Plums	24.30	18.60	18.00	6.90	-34.27%
<b>Total</b>	<b>178.10</b>	<b>293.40</b>	<b>187.90</b>	<b>244.40</b>	<b>11.13%</b>

Source: GeoStat 2010.

## IMPORTS

In addition to domestically produced fruits, Georgia imported more than GEL 42 million in 2010, representing 27,773 MT. The table below breaks down the import of “fresh fruits” and “non-fresh fruits” (frozen, preserved, or dried) by origin, volume, and value.

**Table 5: 2010 Fresh and Non-Fresh Fruit Imports by Origin and Volume**

	Fresh Fruits		Non-Fresh Fruits		Fresh Fruits		Non-Fresh Fruits	
	In Metric Tons				In USD '000			
Argentina	199.22	0.7%	-	-	173.69	0.7%	-	-
Armenia	9.26	0.0%	-	-	2.41	0.0%	-	-

	Fresh Fruits	Non-Fresh Fruits			Fresh Fruits	Non-Fresh Fruits		
	In Metric Tons				In USD '000			
Azerbaijan	701.87	2.5%	-	-	685.00	2.8%	-	-
British Virgin Islands	7.00	0.0%	-	-	3.50	0.0%	-	-
Chile	128.86	0.5%	-	-	175.52	0.7%	-	-
China	17.00	0.1%	-	-	15.04	0.1%	-	-
Colombia	325.65	1.2%	-	-	362.81	1.5%	-	-
Costa Rica	480.93	1.7%	-	-	301.64	1.2%	-	-
Ecuador	12,179.96	44.1%	-	-	11,855.66	47.9%	-	-
Egypt	205.07	0.7%	-	-	134.39	0.5%	-	-
France	21.84	0.1%	-	-	21.00	0.1%	-	-
Germany	2.03	0.0%	13.33	7.3%	9.22	0.0%	66.43	11.9%
Greece	394.56	1.4%	-	-	330.51	1.3%	-	-
Iran	1,415.98	5.1%	0.20	0.1%	1,407.79	5.7%	1.04	0.2%
Israel	96.04	0.3%	-	-	81.01	0.3%	-	-
Italy	23.42	0.1%	-	-	20.79	0.1%	-	-
Latvia	2.80	0.0%	4.99	2.7%	9.15	0.0%	16.06	2.9%
Luxembourg	-	-	0.14	0.1%	-	-	1.56	0.3%
Moldova	79.60	0.3%	1.00	0.6%	27.67	0.1%	3.25	0.6%
Netherlands	762.65	2.8%	-	-	896.12	3.6%	-	-

	Fresh Fruits		Non-Fresh Fruits		Fresh Fruits		Non-Fresh Fruits	
	In Metric Tons				In USD '000			
Panama	241.77	0.9%	-	-	149.87	0.6%	-	-
Poland	19.50	0.1%	-	-	5.85	0.0%	-	-
South Africa	467.26	1.7%	-	-	391.20	1.6%	-	-
Swaziland	2.37	0.0%	-	-	2.20	0.0%	-	-
Syria	24.38	0.1%	-	-	10.08	0.0%	-	-
Turkey	9,546.46	34.6%	135.80	74.8%	7,573.82	30.6%	453.69	81.4%
Ukraine	171.59	0.6%	-	-	81.81	0.3%	-	-
Uzbekistan	61.44	0.2%	26.03	14.3%	36.58	0.1%	15.13	2.7%
<b>SUBTOTAL</b>	27,588.50		181.49		24,764.32		557.16	
<b>TOTAL</b>	27,770.00				25,321.48			
<b>ADJUSTMENT*</b>	2.88				10.36			
<b>MT TOTAL</b>	<b>27,772.88</b>							
<b>USD TOTAL</b>					<b>25,331.84</b>			
<b>GEL TOTAL</b>					<b>42,314.96</b>			

Source: Ministry of Finance, 2011

To better understand import demand in the Georgian market, the table below identifies the “Top 10 Imports” by both volume and value. The differing positions in the charts delineate the higher-value crops versus the lower-value crops.

**Table 6: Top 10 Imports by Volume and Value**

Top 10 Imports by Volume	%	MT	Top 10 Imports by Value	%	USD '000
Bananas	55%	15,257	Bananas	56%	14,250

Top 10 Imports by Volume	%	MT	Top 10 Imports by Value	%	USD '000
Oranges	18%	5,051	Oranges	14%	3,649
Apples	5%	1,317	Dried Grapes	5%	1,311
Lemons	5%	1,265	Other Fresh Fruit	4%	1,036
Watermelons	3%	915	Apples	4%	1,012
Dried Grapes	3%	883	Lemons	4%	985
Other Fresh Fruit	3%	830	Watermelons	3%	688
Kiwi	2%	579	Kiwi	2%	482
Pineapples	1%	358	Dried Apricots	2%	462
Grapefruit	1%	334	Pineapples	2%	442

Ministry of Finance, 2011

## DOMESTIC CONSUMPTION

While official statistics for domestic consumption of fruit are not readily available, domestic consumption for 2010 is approximately 223,361 MT annually (18,613 MT monthly). With very short harvest and distribution periods for more than 63.8% of Georgia's fruit harvest (apples and tangerines) and no viable current option for large-scale cold storage, Georgia is heavily dependent on imports. While some fruits are consumed throughout the year, the majority of the population consumes the high-value crops only during the height of production when the price is lowest. This consumption trend indicates that if producers introduce new varieties with different harvest periods, consumption demand would increase as there would be more than one period of high production.

## FRUIT PROCESSING

In 1990, Georgia's 58 canneries produced approximately 760 million cans of food every year. With little to no investment or updates to machinery, however, this sector quickly decreased in production outputs. By 2003, total output had dropped to only 1 million cans. Currently, there are several commercial fruit processors (canneries) operating in Georgia today, including Kula, HiPP, Campa, Sante, Aromaproduct, Samegobro, and Kvarkheti. Although this sector is growing rapidly, their ability to expand is limited by the lack of cold storage facilities.

Because Georgian farmers do not produce year-round, processors operate only four months per year (June to October), which results an asset utilization rate of 33%.

If farmers could provide a stable supply of fruits in the off-season, processors could extend production into the winter and spring. Likewise, if cold storage was available, processors could purchase fruits during harvest, store them until November and process them in the off-season. 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.

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.

It is important to note that only 9.4% of processed food was fruit made for fruit juices and canned fruit, as outlined by the chart below. While the trend is for this figure to increase, it highlights a major gap for Georgian processed fruits.

**Table 7: 2006-2010 Fruit Processing Statistics**

	Unit	2006	2007	2008	2009	2010*
<i>Fruit Juices</i>	MT	2,835.0	8,920.2	2,771.8	1,547.6	2,491.8
	GEL '000	5,808.6	2,0311.5	6,288.5	4,165.4	6,237.2
<i>Canned Fruit</i>	MT	439.8	1,023.0	852.7	549.4	293.4
	GEL '000	337.2	707.5	1,478.2	1,035.8	823.5

Source: GeoStat, 2011

## EXPORTS

In 2010, Georgian fruit exports were more than GEL 28.8 million, representing approximately 46,027 MT. The table below breaks out the import of “Fresh Fruits” and “Non-Fresh Fruits” by origin and volume.

**Table 8: 2010 Fresh & Non-Fresh Fruit Exports by Origin and Volume**

	Fresh Fruits		Non-Fresh Fruits		Fresh Fruits		Non-Fresh Fruits	
	In Metric Tons				In USD '000			
Armenia	295.12	0.64%	-	-	204.18	1.22%	-	-
Azerbaijan	12,169.63	26.57%	-	-	3,991.52	23.77%	-	-
Belarus	1,243.16	2.71%	-	-	930.63	5.54%	-	-
Bulgaria	-	-	10.00	4.5%	-	-	20.27	4.0%
China	-	-	14.65	6.6%	-	-	37.36	7.5%
Egypt	10.29	0.02%	-	-	4.63	0.03%	-	-
Germany	-	-	84.90	38.2%	-	-	158.01	31.6%
Iraq	95.39	0.21%	-	-	20.32	0.12%	-	-
Italy	-	-	40.00	18.0%	-	-	99.73	19.9%
Kazakhstan	1,113.44	2.43%	-	-	323.42	1.93%	-	-
Latvia	-	-	40.00	18.0%	-	-	108.39	21.7%
Moldova	363.16	0.79%	-	-	175.04	1.04%	-	-
Turkey	18.67	0.04%	10.04	4.5%	5.60	0.03%	36.18	7.2%

	Fresh Fruits		Non-Fresh Fruits		Fresh Fruits		Non-Fresh Fruits	
Turkmenistan	18.00	0.04%	-	-	2.56	0.02%	-	-
Ukraine	30,416.58	66.41%	22.39	10.1%	11,105.11	66.13%	40.54	8.1%
Uzbekistan	59.88	0.13%	-	-	29.23	0.17%	-	-
SUBTOTAL	45,803.32		221.98		16,792.24		500.48	
TOTAL	46,025.30				17,292.72			
ADJUSTMENT*	1.39				3.15			
<b>MT TOTAL</b>	<b>46,026.69</b>							
<b>USD TOTAL</b>					<b>17,295.88</b>			
<b>GEL TOTAL</b>					<b>28,891.48</b>			

Source, Ministry of Finance, 2011

To better understand international demand for Georgian exports, the table below identifies the “Top 10 Exports” by both volume and value. The differing positions in the charts delineate the higher-value crops versus the lower-value crops.

**Table 9: Top 10 Exports by Volume and Value**

Top 10 Exports by Volume	%	MT	Top 10 Exports by Value	%	USD '000
Mandarins	73.86%	12,043.29	Mandarins	76.35%	35,141.39
Other Fresh Fruit	17.94%	2,925.35	Other Fresh Fruit	14.94%	6,875.96
Apples	3.80%	620.07	Apples	5.30%	2,438.23
Frozen - Other Fruit	1.51%	245.47	Peaches	0.44%	204.42
Dried Apples	0.97%	158.01	Frozen - Other Fruit	0.21%	94.65
Peaches	0.50%	82.32	Lemons	0.20%	89.99
Dried - Other Fruit	0.37%	60.81	Dried Apples	0.18%	84.90
Lemons	0.36%	59.16	Oranges	0.12%	53.71
Oranges	0.25%	40.48	Cherries	0.07%	34.00
Dried Apricots	0.22%	36.18	Dried - Other Fruit	0.07%	32.39

Source, Ministry of Finance, 2011

## TRADE SUMMARY

The 2010 export figures presented above are significantly different than those of imported fruits. With 2010 imports at GEL 42 million for 27,773 MT, Georgia’s exported fruit volumes are 165.7% of the import volumes, but only 68.3% of the imported value.

The overall average price for one imported kg of fruit is GEL 0.91 while the price for one exported kilo of fruit is only GEL 0.38. This difference is even more pronounced when

comparing prices for crops that both imported and exported. Of the fresh fruit produced in Georgia, there are eight crops that are imported and exported at dramatically different prices.

As can be seen in the table below, Georgia generates a positive trade balance on its orange and kiwi exports, while the remaining crops demonstrate very negative trade balances. For example, plums and dried grapes are exported at four times the price received for exports.

**Table 10: Average Prices for Fruits that are Exported and Imported**

In USD per KG	Exports	Imports	% of Difference
Oranges	0.75	0.72	4%
Dried Grapes	0.3	1.49	-397%
Apples	0.25	0.77	-208%
Pears & Quinces	0.33	0.71	-115%
Cherries	0.34	1.02	-200%
Peaches	0.4	0.98	-145%
Plums	0.21	1.03	-390%
Kiwi	1.35	0.83	39%

Source: Ministry of Finance, 2011.

While some of these products are at relatively low volumes, the opportunity for Georgian produce to substitute imported fruits is evident. However, in order to do just this, Georgian producers need access to increased cold storage capacity. Rather than exporting plums at USD 0.21 per kg, producers and/or distributors can store them and sell them in the off-season to the Georgian market for at least the current import price of USD 1.03 for an arbitrage profit of USD 0.82 per kg minus storage costs.

These opportunities are further strengthened by the fact that the production of many fruit crops decreased by approximately 35% on average. This decrease in production was due to inclement weather conditions and diseases and is not expected to persist. Therefore, when production returns to its normal levels, these opportunities will be even more evident.

## THE LIFE CYCLE AND FUTURE DIRECTION OF THE INDUSTRY

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 key developments over the past five years that have added capacity and potential to the market. Recent developments – such as better inputs, newer technologies, and the introduction of the farm service centers (FSC) and machine service centers (MSC) network and the elimination of significant market risks, such as the distribution of chemicals of unknown origin and composition being sold as legitimate fertilizers and pesticides – have helped the industry.

Despite these gains, 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 post-harvest handling systems;
- Limited access to credit for operations and capital investments;
- Limited access to production inputs and technical training services;
- Poor harvest and post-harvest 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 producers. With more than 99% of all producers farming plots smaller than 2 hectares, it is difficult to realize cost efficiency measures and profitability unless a form of consolidation occurs.

## COMPETITIVENESS AND SECTOR TRENDS

### SECTOR TRENDS

#### Vegetables:

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 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.

Of the vegetables that are imported, most are staple crops, such as 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.

Throughout the Soviet period, 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 seven percent of its overall domestic agricultural production and imported only 8.7%.

In 2009, vegetable and potato imports made up 25.2% and 9.2%, respectively, of domestic consumption in Georgia. For the same period, exports of vegetables and potatoes were 2.1% and 0.5%, respectively, of domestic consumption. Compared to import and export volumes during the Soviet period, Georgia's balance between imported and exported products has evolved into a form of dependence on imports with very little export activity.

There is high dependence on imports. For example, 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.

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.

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 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.

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 storage, 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.

## 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, such as 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.

**Table 11: 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

## COMPETITION

### Imports:

**Table 12: 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
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

	Fresh Vegetables	Non-Fresh Vegetables	Fresh Vegetables	Non-Fresh Vegetables
Ukraine	4,897	536	483	178
Uzbekistan		268		166
TOTAL	62,296	7,797	15,317	4,077
SUBTOTAL	70,093		19,394	
ADJUSTMENT	217		136	
<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

## Exports:

**Table 13: Vegetable Exports from Georgia by Volume, Value and Origin**

	All Exported Vegetables	
	in Metric Tons	in 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

	<b>All Exported Vegetables</b>	
	<b>in Metric Tons</b>	<b>in USD '000</b>
Romania	73.86	9.64
Russia	277.80	178.42
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

Although 99.8% of all farms are considered “family holdings” only 0.2% are considered “agricultural enterprises,” and about six percent of all sown areas are held by agricultural enterprises. For vegetable and potato sown areas, only two percent are owned by agricultural enterprises.

The level of fragmentation within the vegetable market is very high. 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.

Despite the high number of vegetable and potato farms present in Georgia, the vast majority are classified as subsistence farms 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.

**Table 14: Breakdown of Farms by Region and Size (Cumulative)**

Farms (in ha)	100 +	50 +	20 +	10 +	5 +	4 +	3 +	2 +	Est. Sown Area
Vegetables	5	8	26	84	169	195	242	326	2,428
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 & 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
Potatoes	1	11	40	100	204	243	345	586	3,244
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 & 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

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 prices set by their competition or the wholesale markets. (Domestic wholesale still acts as the price setting mechanism)

Depending on the product, the domestically produced vegetables can be significantly differentiated from imported products. 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.

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.

Georgian farmers face significant challenges in producing export-quality crops, as international and domestic markets are quite competitive. In order to compete with international producers, farmers have to master new skills in order to be able to produce large, crisp, well-colored, flavorful fruit and to keep them in cold storage for distribution at higher sales prices during the off-season.

Another weakness that must be addressed is the complete lack of food safety standards required by major export markets, such as the Global GAP certification required by EU markets. While Georgian producers are exporting to undeveloped and unstable CIS countries, the prices obtained in these markets are well below those in the EU. International wholesalers in the EU have demonstrated interest in several Georgian fruits and vegetables, but they require Global GAP before making purchases.

## **ANTICIPATED DEMAND/SALES PROJECTIONS, INCLUDING ASSUMPTIONS**

While there are many gaps in the fruit and vegetable market value chain that need to be addressed and resolved to increase the sector's productivity, profitability, and competitiveness, there are several that are more structurally significant and will form the main demand and productivity enablers for the sector.

These are as follows:

- A requirement for cold chain and distribution infrastructure
  - Meeting the current high demand for cold storage from producers, processors, and wholesale distributors, will stimulate increased primary production, expand processing seasons, and extend the domestic vegetable sales period.
  - By introducing affordable vegetable packaging, produce will be better preserved and protected in all post-harvest handling processes. This is particularly important for exports, where profitability depends on product survivability.
- Workforce Enhancement

- Training on inputs and technologies: training producers on using inputs and technologies properly
- Crop Information System: providing daily market information to producers, will create the environment for better crop management, financial forecasting, and enhanced creditworthiness.
- Market Access
  - Collection facilities and transportation routes: developing mechanisms for rural farmers to collect production, creating linkages between these facilities with wholesalers and facilitating new transportation routes, will enable producers to sell their produce in higher-priced markets to generate higher revenues.
- Certifications & Standards
  - Global GAP & HACCP: promoting Global GAP among producers and Hazard Analysis and Critical Control Points (HACCP) among processors and post-harvest handling facilities, 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 Global GAP: promoting the Smallholder Global GAP designation, will not only improve access to markets for numerous small producers, but will also stimulate much-needed profitability gains.
  - Commodity Grading System: 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.
- Post-Harvest
  - Sorting produce according to size and quality
  - Cleaning and packaging
  - Drying and processing
  - Storing produce in cold storage and other facilities

The general short and long-term outlook for the fruit and 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, as outlined above.

The absence of a critical mass of post-harvest handling facilities – such as collection and consolidation centers, cold storage, food packagers, and processors – means that it is possible that any increases in productivity could 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 Global GAP certifications, it will be 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 Global GAP.

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. Since 2006, in cooperation with the Ministry of Education and Science, 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 fruit and 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 - US 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 & CARE International
- UNHCR – United Nations High Commissioner for Refugees

To promote production in Georgia and to increase investment into Georgian 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, Norway
- Preferential Regime (GSP+) – with EU (> 7,200 items) since 2005
- Possibility of Free Trade Agreement (FTA) with EU in nearest future

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 VAT on export
- Simplified export and import procedures

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 the European Neighborhood Policy Action Plan and one of the integral parts of the upcoming DCFTA with the EU. This strategy focuses on consumer protection and on harmonization of Georgia's food safety policies with EU legislation.

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.

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.
- 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 FS.
- Responsibility to ensure food safety lies with the private sector.

## SUMMARY

The gaps and challenges to sustainable competitiveness are summarized below:

- Georgian producers are not properly educated on proper farm management, chemical application, export processing, and the use of high-quality inputs and technology;
- The overall quality of Georgian fruits is relatively low compared to international and regional competitors' quality standards;
- There is an insufficient amount of cold storage space available in Georgia;
- There is an insufficient number of market actors within the post-harvest handling infrastructure – including collection, sorting/grading, packaging, and distribution;
- The majority of Georgian producers have no information about export market buyers, prices or requirements, which creates obstacles to exportation;
- Food safety standards are generally not practiced or enforced throughout the entire production and distribution value chain;
- There is no standardized system for fruit classification or grading;
- There is no marketing or branding campaign to promote Georgian fruit products;
- Most producers are unable to access credit facilities, because banks consider these projects to have excessive risk, because the banks have no reliable information about the risks related to production and many producers have limited operating experience.

## VALUE PROPOSITION

It is clear that there are three key areas of development that would underpin the transformation and growth potential of the Georgian fruit and vegetable sector:

- The provision of cold storage, wholesale, and distribution infrastructure
- The implementation of systems to control food safety and food accreditation standards
- The implementation of systems to inform of pricing and pricing differential for domestic and export markets

The development of new infrastructure in the form of an Agricultural Food and Logistics platform is critical to the delivery of this and would deliver value in the following way:

- Import substitution
- Export growth
- Pricing stability/off-season price bonus
- Less waste
- Food safety controls
- Added-value production
- Crop/production management

- Added-value services
- New customers – supermarkets
- New jobs
- New trade access
- New adjacencies – processing/packaging/importers/exporters/ business support/technical support/tourism/possible residential enabler/non-food logistics investment

# C. DESIGN AND TECHNICAL FEASIBILITY

## FACILITY NEEDS AND FUNCTIONALITY

The pre-feasibility assessment concluded the characteristics of the AGFLH as follows:

- Temperature controlled storage that would enable perishable produce to be stored and therefore shelf life and the produce season to be elongated, resulting in the reduction of waste, more produce available for domestic consumption (therefore import substitution), and produce available for export.
- A market center where producers could bring their produce and for appropriate weights, measures, quality grading, food safety certification, packing labeling, and storage to be applied.
- A market center where fresh produce retail markets can come together as one buyers' environment and buyers can visit to view and purchase the produce in food safe conditions. Furthermore the retail market operators should be able to offer a distribution service from this center.
- A market center that influences and monitors the food safety requirements of the whole fresh produce supply chain and operates to European food safety standards and global logistics accreditations.
- A market center that monitors and determines daily prices, monitors production levels, and creates a system of information flow to producers to enable them to develop more accurate crop quantity, crop quality, and crop innovation based on consumer and market requirements.
- A market center that has an external trade platform and supporting trade zone and customs facilities.

The pre-feasibility also suggested that there are minimum requirements that should be met to ensure that the existing supply chain system is not displaced and that the new supply chain can function effectively. These are as follows:

1. The AGFLH should be no more than 10km away from the center of Tbilisi and the existing growers and retail market sites.
2. The AGFLH should be close to rail and air links for future container based trans-shipment and high value premium produce shipment by air.
3. The land plot should be sufficient to site a facility of 37,800 m<sup>2</sup> with circulation space of 38,200 m<sup>2</sup>
4. The building should have a range of unit sizes starting from a small 100 m<sup>2</sup> up to 500 m<sup>2</sup>.
5. The building should be fully temperature controlled with centralized plant and units should be fitted as standard to a food-safe compliant lining

6. The building and units would be supplied with a range of sealed door or dock loading systems either ramped up or down depending on ground conditions
7. The building should be energy efficient and look to the use of renewable technologies to minimize carbon emissions and provide for a 'green' logistics environment.
8. The building should have integrated functions for meeting and business support in the form of traders cafes/restaurants and a business center
9. The building should have cross/docking facility to enable containerized loads to be off-loaded and transferred quickly to the sales retail area of the AGFLH
10. The building should have a formalized security and control point system and buyers and or visitors to the site should have to be registered and pay a gate fee

The site should have the expansion capacity to expand into other AGFLH components such as a fish and seafood center, a red meat center and dairy and poultry center, and possible flowers and plant center.

A desirable but not essential feature could be a public face of this new food environment that included tourism and leisure experiences around wine and food and a hotel and office complex.

## **FOOD LEGISLATION REQUIREMENTS**

The pre-feasibility assessment recommends that as part of the design standards and built out food safety operating standards that the following accreditation systems are incorporated into the project.

- EFSA – Global GAP
- HACCP/BRC Global Certification for Transport and Logistics

In addition, the development should integrate with the Food Safety Strategy and Food Safety Service for Georgia that has been adopted by the Prime Minister's Office to ensure the DCFTA, part of the European Neighborhood Policy Action Plan.

This will ensure over time that Georgian food safety systems are aligned with EU legislation.

## **OUTLINE – FOOD 'CITY' CONTEXT – TBILISI/BATUMI – POTENTIAL OF AGFLH TO INTEGRATE WITH SUSTAINABILITY/LIVEABILITY AND TOURISM**

The pre-feasibility also suggested that although the AGFLH is primarily concerned with the efficient consolidation, distribution, and storage of fresh produce it can also become a central feature of Tbilisi's and Batumi's Sustainability/Livability and Tourism Strategy.

Cities around the world have adopted the development of a 'food' theme to attract visitors and influence the design of districts, streets, and communities. This is well known to us as it is a key part of our developments in London (New Covent Garden), Amsterdam (Food Center Amsterdam), and Paris (Rungis International – A Food City).

With Tbilisi and Batumi there seems to be two additional ‘food’ anchors. In Tbilisi it is the opportunity to bring into play the wine experience and in Batumi it is very much about the markets as a visitor attraction and cultural destination.

It may be desirable to make food logistics more than just a commodity shipment process. Within Georgia the tradition of the ‘growers’ market (and the food theater it creates) may be a desirable attraction and front face to the AGFLH while protecting the smaller producer and the indigenous variety of the produce.

## **FACILITY PHASING AND DESIGN**

The feasibility work program has extended the desired characteristics to include the critical issue of functionality, particularly when related to the existing consolidation, distribution and assembly systems of the growers and/or producers and the way the fresh produce system operates.

The program has also considered the transitional nature of the project and how flexibility and phasing may be appropriate to mitigate project risk attributable to the transfer of the existing domestic supply chain system, particularly the existing grower’s market structures.

The phasing plan adopts the natural order of events when looking to secure and modernize the domestic system as a driver of economic growth first and to follow this by providing an environment for export (and import) of product to develop new markets.

The following diagrams demonstrate how this transitional project could work in a phased approach (within the chosen site location, Tbilisi) and are replicated within the proposed site in Batumi.

The main theme of the approach is to secure the development of a new cool chain system for domestic produce and to provide chill storage to extend produce life through a daily, weekly, and monthly cycle.

The extended theme is to create co-adjacencies with the import and export supply chain, so that produce stored can be transferred easily into an export environment. By the same respect a close relationship with imported produce should allow for exchange between domestic and import produce where there are gaps in variety or season. This is likely to open more significant trade to the composite supermarket sector.

The transfer, modernization, and development plan is as below.

### **DESIGN AND FACILITY PHASING DIAGRAMS**

#### **Figure 4: Securing the Domestic Supply Chain: Phase 1 (Transfer of growers market)**

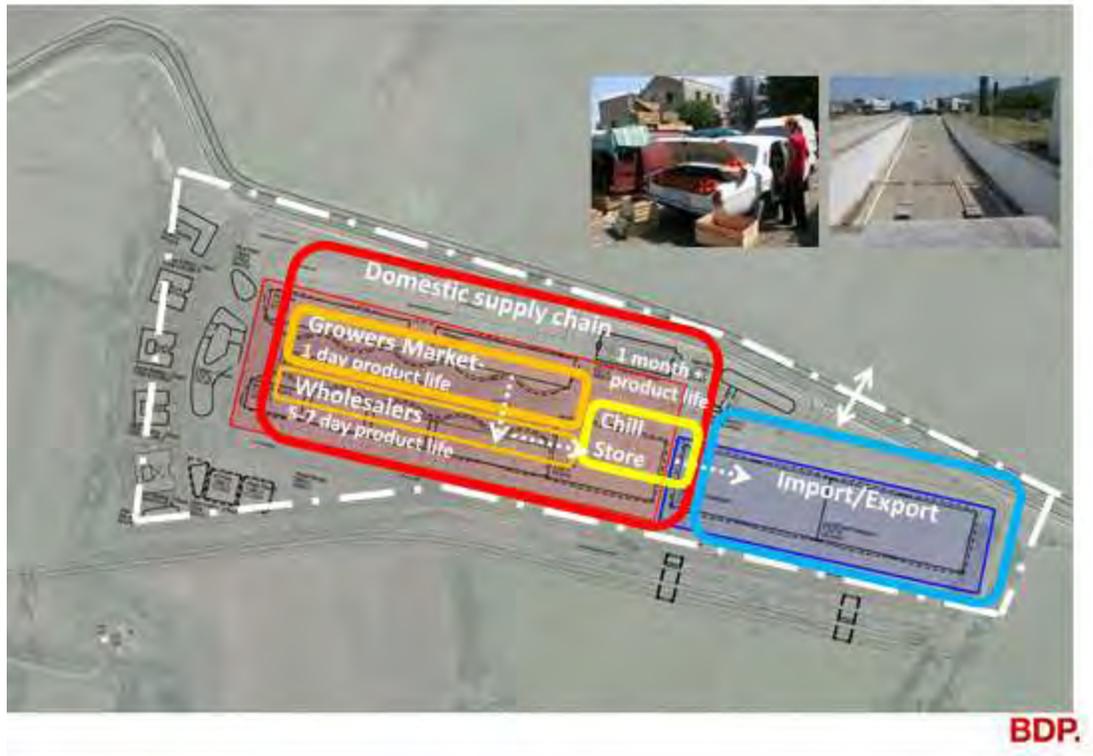
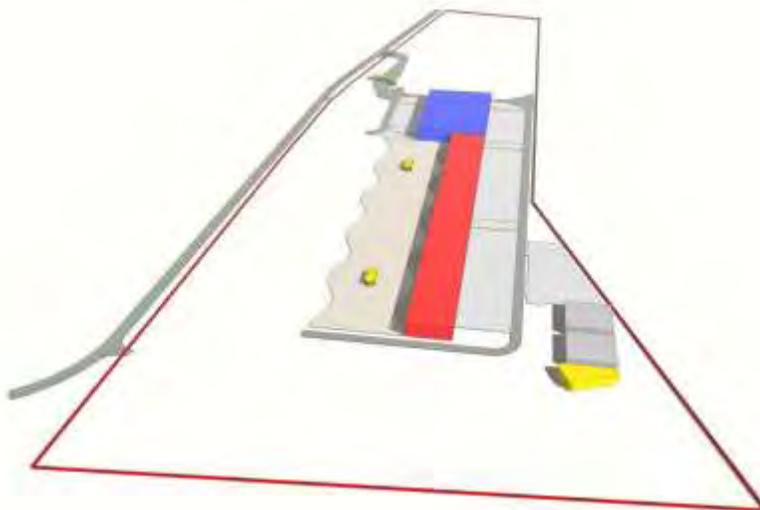
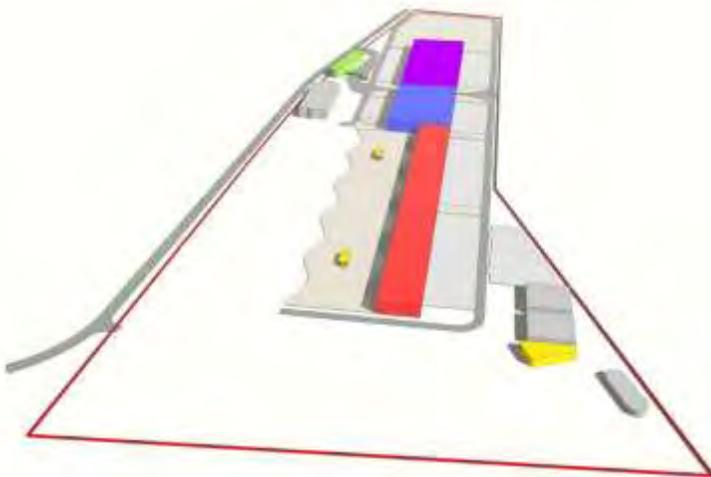


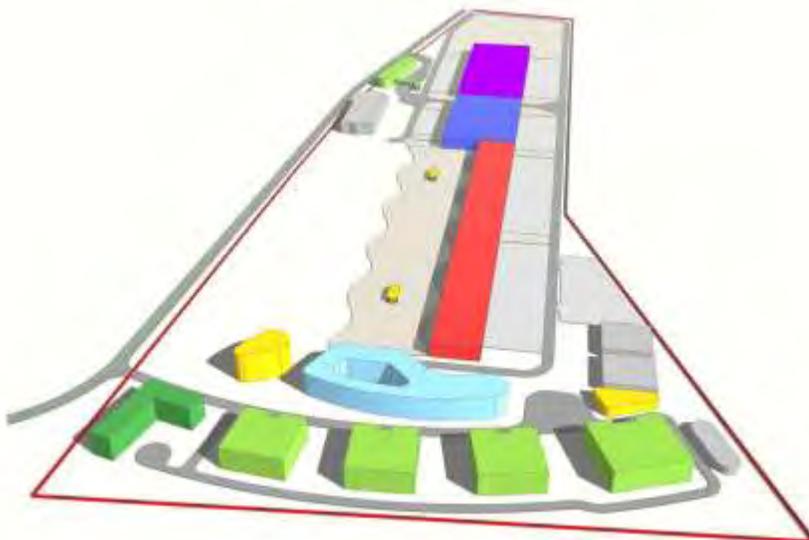
Figure 5: Securing the Domestic Supply Chain – Phase 1 (Transfer of growers market)



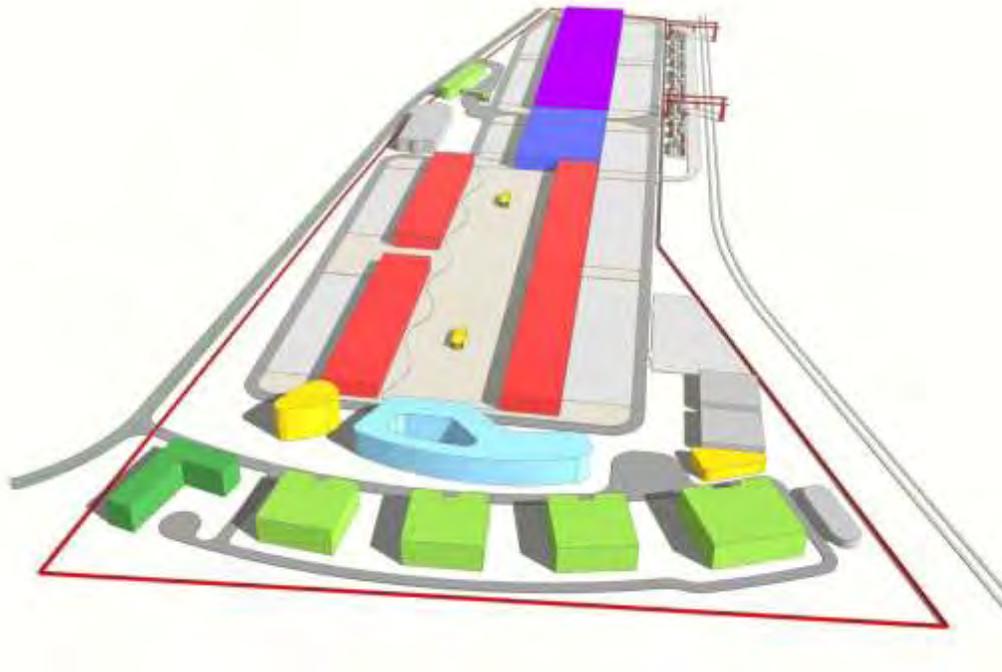
**Figure 6: Securing the Domestic Supply Chain – Phase 2 (extended chill storage, distributors)**



**Figure 7: Developing Business Support infrastructure – Phase 3**



**Figure 8: Expansion of Wholesale Market and Food Distribution and Integration with rail trans-ship facility – Phase 4**



The same approach and model would be applied to the Batumi site.

Further consideration has been given to added-value and enabling aspect of the proposed developments in the following way:

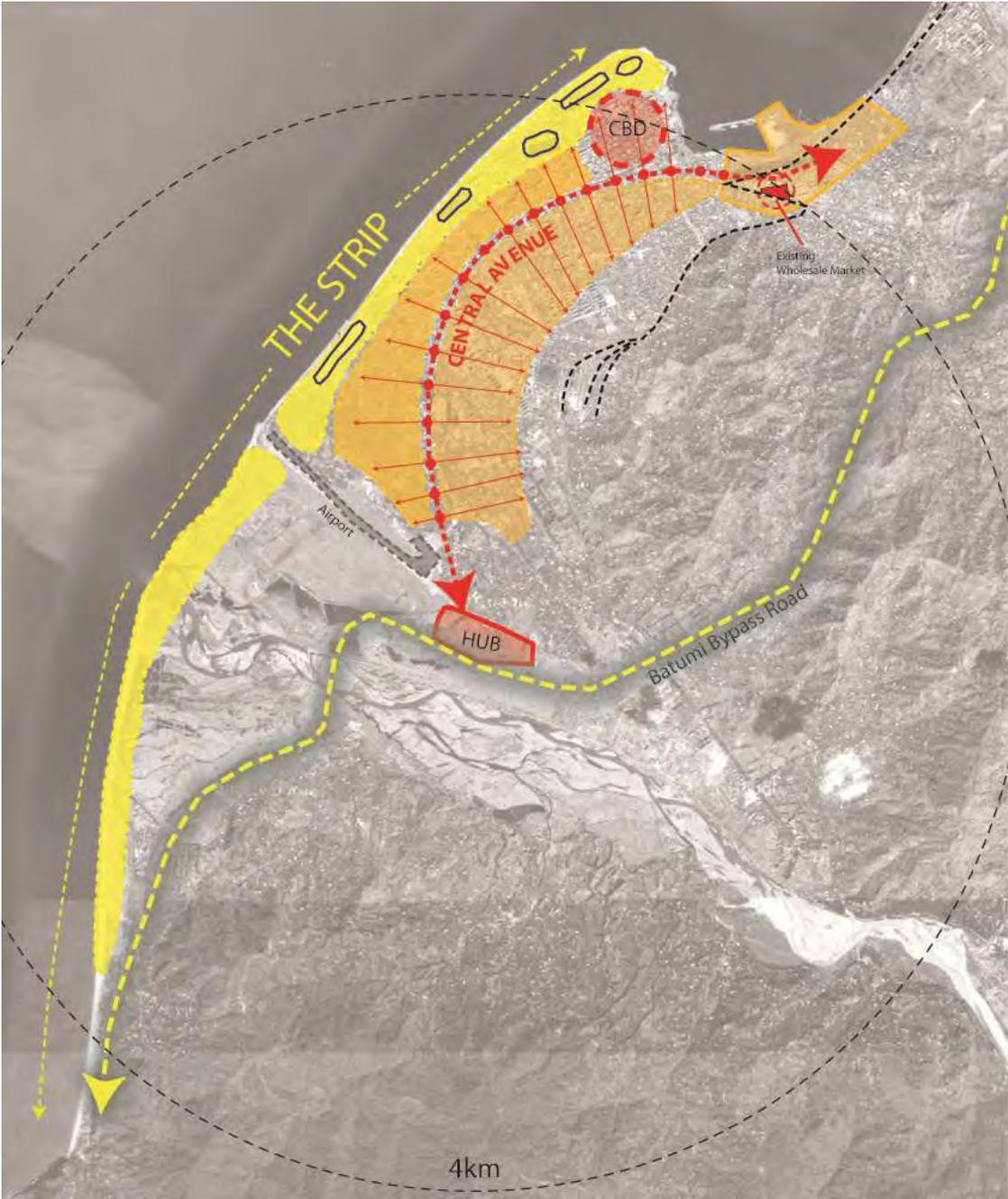
- Tbilisi – there would be natural expansion benefits for the proposed site to expand towards the main road to create frontage. Given the critical mass already developed by the AGFLH we see an opportunity to connect this with a non-agricultural business and logistics park as a phase 5 of this project. Phase 5 (see image below) is not currently part of the financial model of this feasibility study.

**Figure 9: Expansion into Non-Agricultural Business and Logistics Park – Phase 5**

- Batumi – it is suggested that the development of the AGFLH on the designated site in Batumi could have far reaching benefits in enabling the future master plan for the city. The transfer of the existing markets from the port area enables the port regeneration to begin and this affects the potential development of the tourism, residential, public realm and cross routes within Batumi.

The AGFLH within Batumi is more a part of the urban fabric of the city as it is only four kilometers away from the main tourism area ‘the strip’ – see image below. This is not part of the financial model of this feasibility study.

Figure 10: Aerial Map of Batumi for Proposed AGFLH site



**Figure 11: The Agricultural Food and Logistics HUB – Visualization on Tbilisi Site at Dawn**



## SIZE AND SCOPE OF FACILITIES

The pre-feasibility assessment estimated the size of the facility based on domestic production inputs and outputs as follows based on the data and analysis:

- Production flows of fruit and vegetables at 2009 GeoStat measures (total production 861,500 tons)
- The existing points of consolidation (see wholesale/growers market map) across East and West Georgia
- The population and consumption trends of Tbilisi (70% of consumption and a population of 2.5m in the TMA) and Batumi (including Kutaisi), (30% of consumption, a population of 0.3m, but an additional 1m+ visitors)
- Almost equal production flow and volume 'consolidation' at Tbilisi (364,600 tons) and Batumi (422,300 tons) with the difference being the transportation of potato volumes to Tbilisi.

If the above data is considered, the size and capacity required of the two HUB locations can be approximated as follows:

- Based on a standard euro pallet size of 600kg and a warehouse rotation/turnover of 15 x 45,000 pallet places, the facility would have a throughput capacity of 405,000 tons.
- The AGFLH size would be approximately 37,800 m<sup>2</sup> and require circulation space of 38,200 m<sup>2</sup> if the AGFLH structure was all at grade (i.e. no multi-level functionality).
- The total site area required is therefore approximately in the region of 14 ha for each site.

The feasibility introduces more precise spatial assessments based on comparatives (therefore helping to mitigate transfer risk of existing market facilities) and transportation data

The main comparative spatial measure was the existing Growers Market location in Tbilisi – Sadguri and a multiple of this to meet the areas provide at the other sub market locations.

A secondary comparative (and benchmark) was made against the facility size and basis of operating at Toronto Produce Terminal, Toronto. This was used because it is the only western market that operates with a growers market at its core (some 500 farmers bring produce to the market on a daily basis, this correlates with the 17.7% (419) farmers that are classed as producing for commercial sale within Georgia).

It also operates a wholesale facility of 150,000 ft<sup>2</sup> and chill/cold storage of 90,000 ft<sup>2</sup> where the farmers store their product (this is currently being expanded to 200,000 ft<sup>2</sup>)

The Toronto terminal market has 5,000 registered buyers and it is believed this correlates well with the number of buyer outlets within Tbilisi.

A secondary benchmark used was the new wholesale market in Lyon, France. This was used to calculate gate fee and buyer tariffs applicable to tonnage of 3.5 tons and over.

The final assessment was made against transportation and analysis of:

- Main distribution routes
- Vehicle types
- Vehicle loads (maximum, minimum)
- Warehouse capacity and warehouse locations
- Cold storage capacity
- Courier systems
- Head office locations

In addition an interpretation has been made for:

- Waste facilities (based on reduced volumes)
- Food distribution for import and export companies
- Business support functions

- Car parking facilities
- Wholesale market expansion areas
- Food distribution expansion areas
- Integration with a future railway terminal

The recommended master plan for the Tbilisi AGFLH is shown below with detailed accommodation schedule:

**Table 15: Agricultural Food and logistics HUB – Accommodation Schedule**

<b>AGFLH – Tbilisi</b>		
<b>Accommodation and Revenue Schedule</b>		
<b>Building Phase</b>	<b>Floors</b>	<b>Area m<sup>2</sup></b>
<b>Phase 1: Domestic Food Supply Chain/Wholesale Market - Rentals</b>		
Wholesale Block A	1	2904
Wholesale Block B	1	2904
Wholesale Block C	1	2904
Wholesale Block D	1	2904
Chill/Cold Store	1	8349
Growers Market Trading Area	grade	24967
Waste Center	grade	4997
AD Plant and Visitor center	2	1089
<b>Phase 1 Total</b>		<b>51018</b>
<b>Phase 2: Import and Export Food Supply Chain - Rentals</b>		
Food Distribution	1	11627
Data Hub	1	549
Admin Building and Gatehouse/control point	3	4223
Multi-story Car Park	4	8327
Phase 2 Totals		24726
<b>Phase 3:</b>		
Office Blocks x 4	3	16866
Hotel	4	4480

<b>AGFLH – Tbilisi</b>		
<b>Accommodation and Revenue Schedule</b>		
<b>Building Phase</b>	<b>Floors</b>	<b>Area m<sup>2</sup></b>
College	3	9787
Wine Expo	4	2478
Phase 3 Totals		33611
<b>Phase 4</b>		
Wholesale Expansion x 2	1	10626
Food Distribution Expansion x 2	1	23254
Railway Terminal	grade	0
		33880
<b>Total</b>		<b>143,235</b>



## TECHNOLOGY & EQUIPMENT

At this stage the design and feasibility has not considered the technology and equipment required for the facility.

It would be common to identify these requirements later in the design stage, as these are operational considerations. Tracking systems, automation, dock loading systems, standalone refrigeration, fork lift trucks, radio-frequency identification (RFID) stock control and distribution computer systems are usually part of a business occupier specified need.

However, one of the key determinants of financial value (viability of rental revenues) from the storage or chilled storage within the AGFLH would be the operation of at-grade chilled storage or stacked (high bay) volume-based cold storage; it would be optimal to have a combination of both types.

We believe it unlikely that farmers/producers will introduce food safety, food handling, cold storage systems, or packaging at sufficient speed to influence the performance of the fresh produce or food economy in Georgia. It is therefore necessary to develop a system within the facility that enables the above and in the long term promotes the investment in food safety, food handling, and cold storage at source.

The feasibility has therefore incorporated a plastic re-usable crate system and reverse logistics system within its facility design.

This is based on systems operating in Toronto Terminal Markets, whereby farmers (500+) bring their produce to market every day in pre-distributed and standardized plastic crates. On completion of the trading day at the growers' market, the empty crates are exchanged for new sanitized crates, or if new crates are not required, these can be exchanged for vouchers to purchase produce.

The standardized nature of the crates also allows produce to go straight into temperature controlled storage if required.

The crate system can also be used as an outward distribution system for buyers, who can use the crates to assemble orders of smaller quantities.

The system is not only the first step in food safety and hazard control, as all crates are sanitized to prevent cross-contamination issues (common with the existing farmer distribution to growers' market where old wooden boxes are used and re-used) but it also has a significant environmental impact, as there is less produce spoilage (waste) and in theory there should be little packaging waste.

## EQUIPMENT NEEDS AND COSTS

- See above.

## ENERGY-WATER-ENVIRONMENT TECHNOLOGIES AND IMPACTS

- See sustainability

### SUITABILITY OF SITES (PROJECT REQUIREMENTS VS. PROPOSED LOCATIONS)

Based on the requirements of the AGFLH, the pre-feasibility assessment identified a number of development sites within Tbilisi and potential opportunities for the wholesale market site in Batumi.

The pre-feasibility provided an outline appraisal of the suitability of these sites based on the known performance criteria and characteristics of the AGFLH as follows:

### POTENTIAL AGFLH SITES

In Tbilisi the pre-feasibility study has identified six development sites for the potential AGFLH as follows:

**Figure 13: Maps of potential sites for an Agricultural Food and Logistics HUB within the TMA (Tbilisi Metropolitan Area) at pre-feasibility stage**

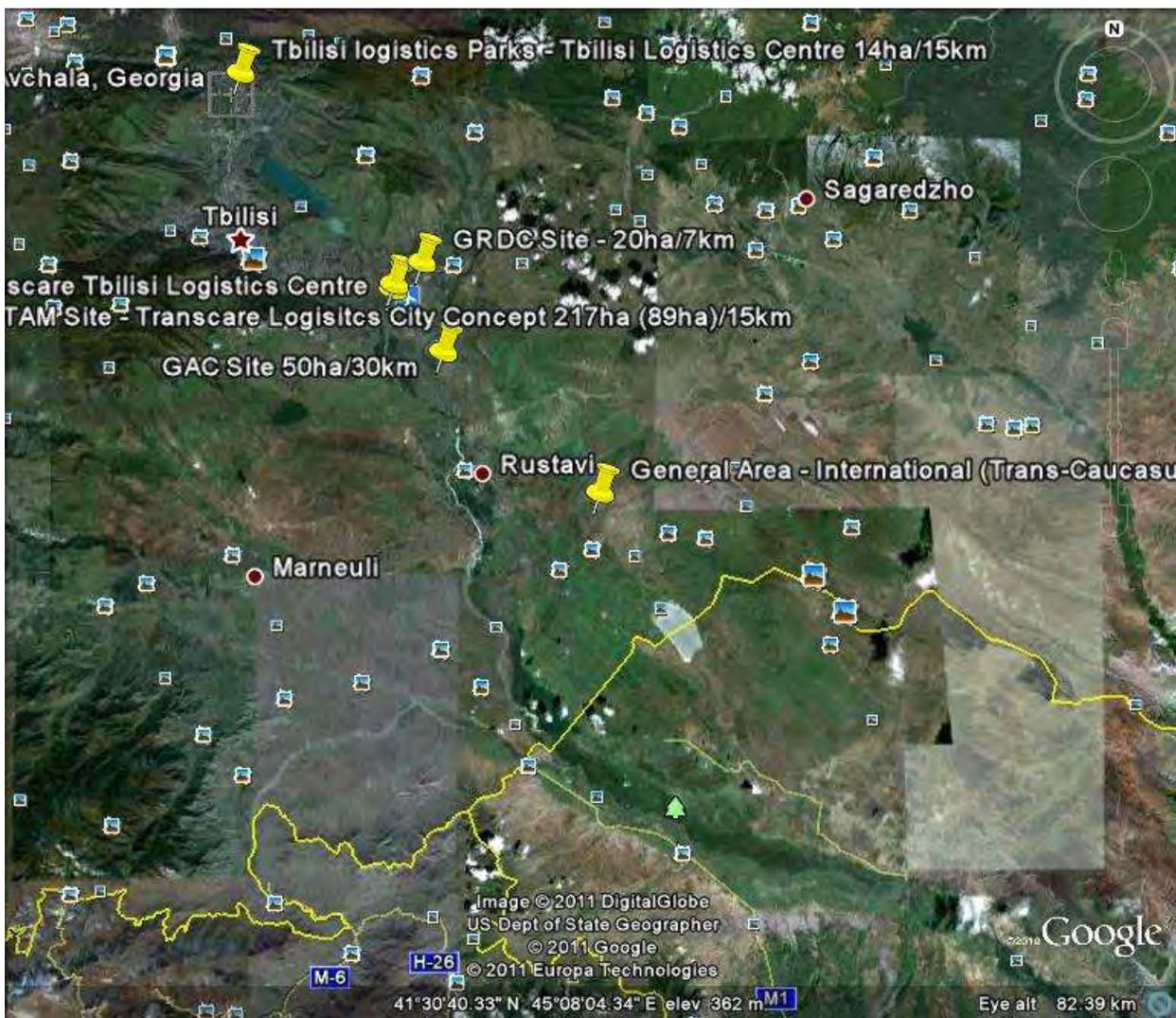
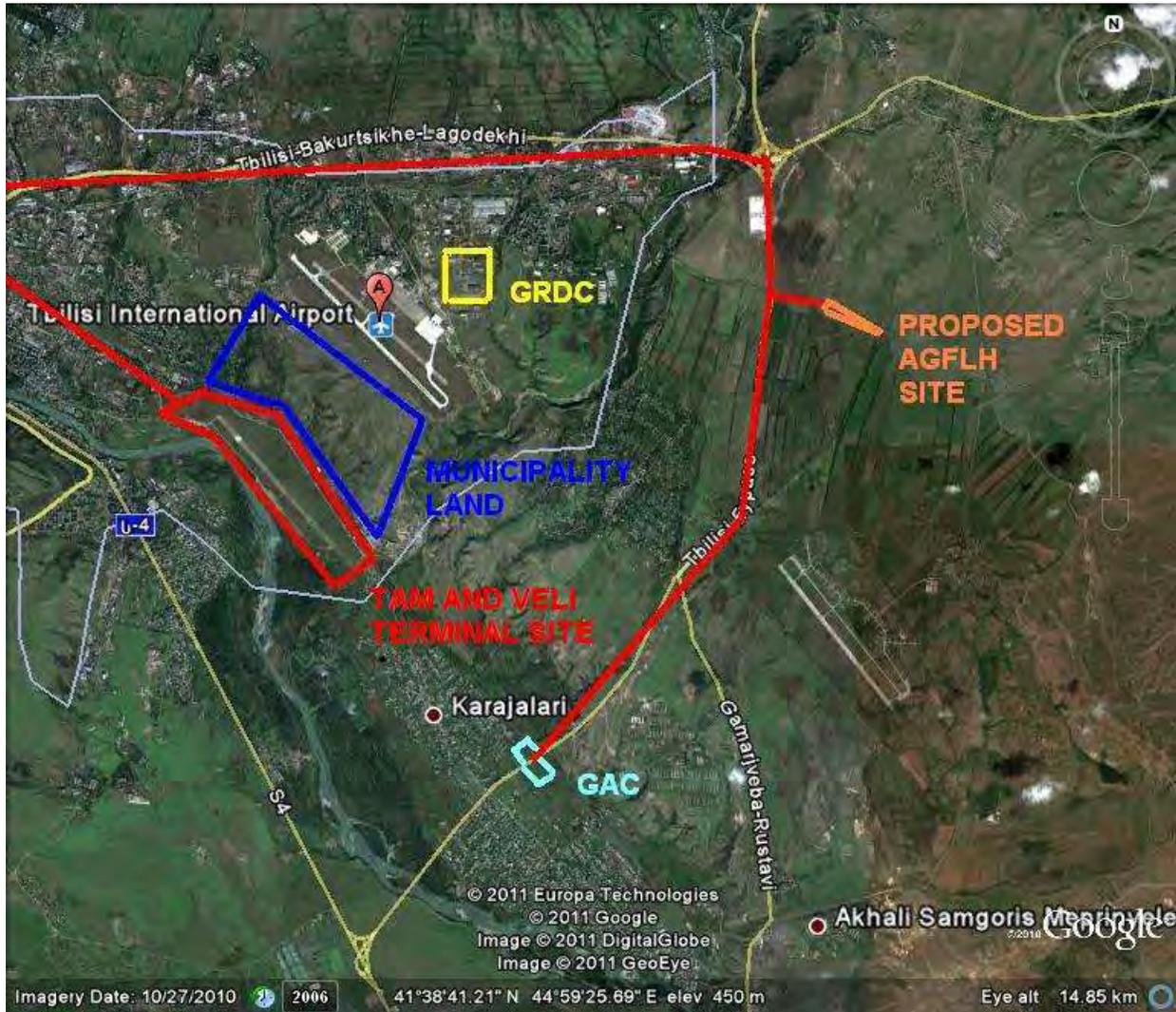


Figure 14: Detailed site locations at Feasibility stage



**Site Information and basic Appraisal/Suitability Criteria:**

The status of each site is detailed in the following table and has been updated by the feasibility study.

**Table 16: Potential AGFLH Site Status**

Site Name/Description	Site Area/Size	Site Ownership	Distance from Tbilisi Wholesale/ Growers and Retail Markets	Site Relationships – Road/Rail/Air	Planning status	Ground Conditions	Suitability for AGFLH
<b>Site near customs Terminal - Tbilisi</b>	<b>25 ha</b>	<b>Municipality</b>	<b>15km</b>	<b>5km to airport 5km to main road Direct access to new Northern rail route</b>	<b>No planning status</b>	<b>Good, flat terrain</b>	<b>Recommended as site for Tbilisi development</b>
TAM	217ha (97.2 clear and 89 can reclaim)	TAM Private	15km	3km to airport 7km to road 150m to rail terminal	Pre-planning but acknowledged logistics use	Good	Military and site no longer available
Veli Railway Container Terminal (connected to TAM site)	14ha	TAM Private	15km	3km to airport 7km to road Direct access to rail	Pre-planning no status	Old container terminal with possible remediation issues	Military and site no longer available
Avchala	14ha	Private – Tbilisi Logistics Park LLC	15km	20km to airport 15km to major roads Direct rail access to rail	Outline Planning for Logistics use	Old industrial site not cleared with many levels. Possible remediation and construction	Location of site to West of Tbilisi does not meet needs of food transport and food supply chain routes

Site Name/Description	Site Area/Size	Site Ownership	Distance from Tbilisi Wholesale/ Growers and Retail Markets	Site Relationships – Road/Rail/Air	Planning status	Ground Conditions	Suitability for AGFLH
						issues	
GAC site	50ha	Transferred into GAC new co formed Tbilisi Logistics Center (TLC) - Public	30km	15km to airport 10km to roads 15km to rail terminal	No planning status	Old industrial site with many multi-level and uneven ground issues	Site has complicated preparation issues and is nearer to Rustavi than Tbilisi

Following this assessment it was decided to focus the feasibility design and technical program on the Tbilisi site considered to be suitable to the delivery of the AGFLH within an acceptable timeframe (i.e., three years).

The site available in Batumi and most suitable for the development of the AGFLH would be part of the planned Free Industrial Zone Area.

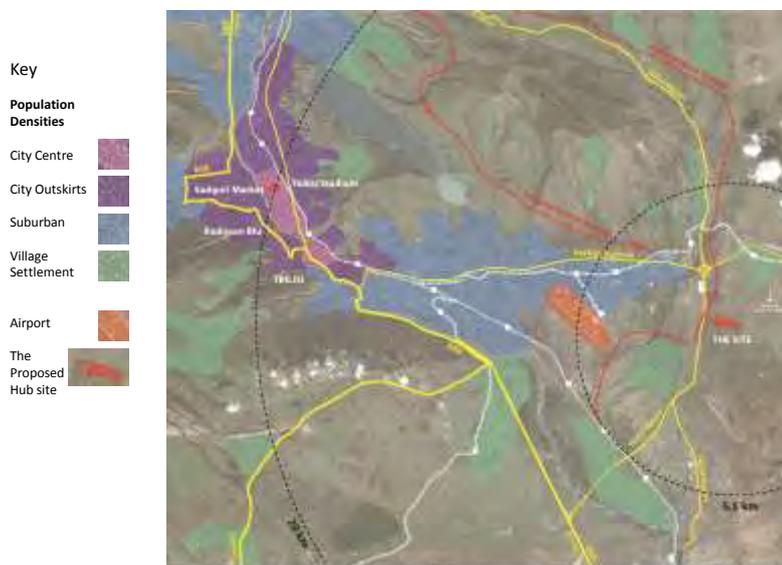
The site suitability characteristics are as follows:

**Site A – Tbilisi (near customs Terminal building)**

- Protects against displacement of the existing growers market population and food supply chain by maintaining an easy and acceptable transfer (journey time/distance) for buyers and customers operating within central Tbilisi outlets.
- Current land ownership by the public sector
- Road, future rail, and air connections are excellent
- Ground conditions appear uncomplicated
- No planning issues are anticipated
- There is unrestricted expansion area for the AGFLH
- The site has easy road access to Georgia’s main fruit and vegetable export markets, Azerbaijan and Kazakhstan

**Figure 15: Detailed location map below including population densities, landmarks and buyer and customer connectivity.**

Tbilisi Existing Market & Proposed Agricultural Food & Logistics HUB Location – Buyer/ Customer Connectivity

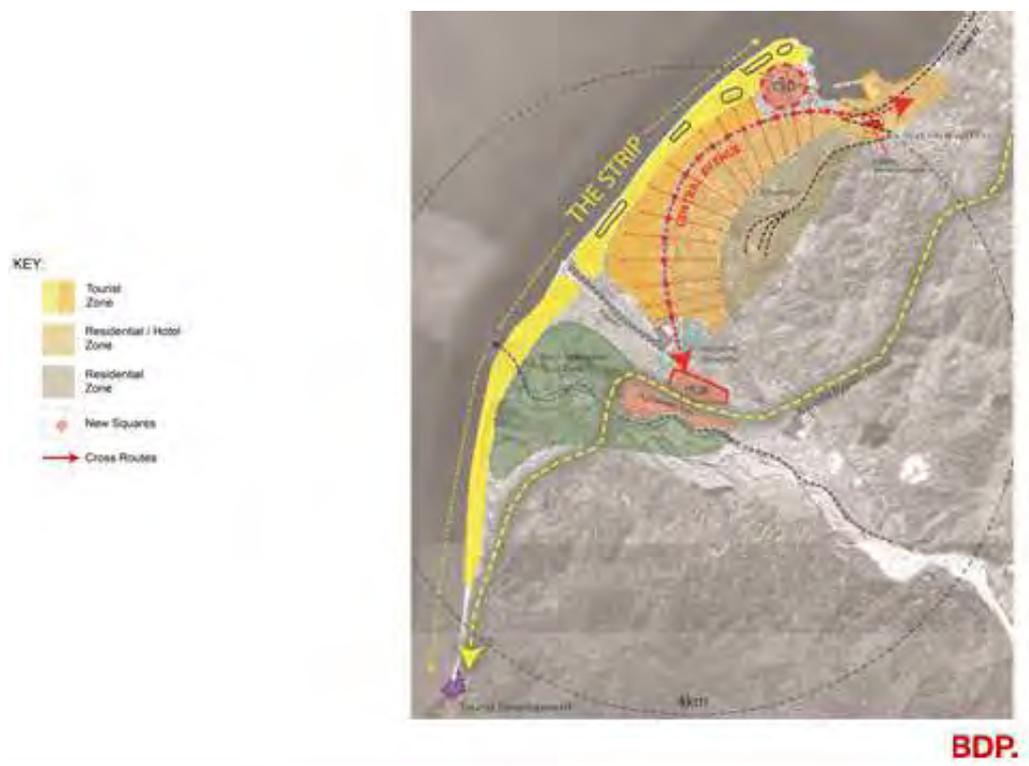


**BDP.**

**Site B – Batumi – Logistics Hub**

- Protects against displacement of the existing growers market population and food supply chain by maintaining an easy and acceptable transfer (journey time/distance) for buyers and customers operating within central Batumi and Kutaisi outlets.
- Current land ownership by the public sector
- Road and air connections are excellent with potential for future rail.
- The ground will be prepared with full services and tarmac hard standing surfaces as part of the Batumi City plan
- Planning status is in place for logistics and the site will be a designated a Free Industrial Zone (FIZ)
- There is unrestricted expansion area for the AGFLH
- The site has easy road access to Turkey (15km) and Poti (for trans-shipment eight kilometers)

**Figure 16: Detailed map of Batumi**



In addition to this detailed look at the recommended sites within Tbilisi and Batumi, the feasibility also assessed the context of the two locations against the requirements to modernize the fresh produce food supply chain and develop efficient logistics platforms.

The feasibility assessed the sites favorably on:

- Geographical Advantage

- Flow of produce (both import and export) to key trading countries
- Consolidation and assembly locations within Georgia based on the domestic food supply chain
- Key consumption centers
- Transport connectivity

The following diagrams illustrate and underpin the selection of Tbilisi and Batumi as the primary locations for the Agricultural Food and Logistics Hubs.

**Figure 17: Geographical Advantage and Food Supply Chain Import/Export Product Flow**



**Figure 18: Consolidation and Assembly Locations**

## ACCESS TO MARKETS AND END CONSUMERS

The feasibility has identified the main markets and end consumers of the AGFLH as:

- Retail food markets
- Retail food outlets (independent)
- Retail food outlets (chains, supermarkets)
- Hospitality and catering outlets – restaurants, hotels
- Hospitality and catering outlets – public sector led – hospitals, schools, prisons, police, army
- Import and export distribution companies
- Food processing
- Tourism and events

Most of these market and customer segments are already part of the food supply chain structure described in the pre-feasibility assessment. This feasibility expands the latter to identify the potential development of added-value food processing, and, furthermore, the anticipated co-location of facilities that would supply the growing supermarket supply chain exclusively.

## ACCESS TO INPUTS

The pre-feasibility assessment and feasibility have identified the significant volumes of produce transferring through the existing domestic food supply chain and the volumes of imported produce.

The feasibility has also identified the points of main consumption to be Tbilisi and Batumi and the natural consolidation of production in these two key locations.

It has been identified that the two obstacles to the fruit and vegetables sector in terms of production and economic growth are the need for small farms to establish a point of consolidation (so economies of scale can be achieved) and the need to establish significant cold storage capacity.

It is believed the AGFLHs in Tbilisi and Batumi will not only provide that (and therefore capture all domestic and import led production flow) but also help to expand production inputs.

## TRANSPORTATION AND WAREHOUSING

The pre-feasibility identified the key impact of the current food transportation and warehousing system within Georgia as follows:

According to the survey results, a major part of the transport, cargo-handling, and distribution is located in three main regions/cities of Georgia: Tbilisi, Samegrelo-Zemo Svaneti (with Poti as its center), and Adjara region (with Batumi as its center).

Different types of transportation services are available in Georgia: truck/road, rail, sea, and air. Companies transport an average of 18,800 tons of goods/freight in one year. The cost of transporting goods 1 kilometer with one truck within the territory of Georgia is USD 1.88 on average, and similarly the cost of transporting freight for one kilometer with one freight car (rail) within the territory of Georgia is USD 2.56 on average.

Average times (as measured by GPS) that trucks require for travel between several destinations are: 17.8 hours for Poti-Sadakhlo, 12.5 hours for Tbilisi-Poti /Poti -Tbilisi, and 13.8 hours for Tbilisi-Batumi.

Warehousing companies operating in Georgia use various types of storages (dry, cold-frozen, bulk) for keeping goods. The average price of storing goods is USD 2.30 (1 ton/day) in dry storage, USD 6.70 (1 ton/day) for cold-frozen storage, and USD 0.40 (1 m<sup>3</sup>/day) for bulk storage. Based on the survey results, the full-potential capacity of all warehousing companies in Georgia is 1,477,690 tons. The average capacity of a single company is 3,307 tons (the average number does not include data for the Poti sea port).

Port and airport handlers provide loading/unloading services. On average the loading/unloading time for one truck is two hours and the cost for liquid, bulk, and general cargo is USD 13, USD 9, and USD 12, respectively.

The feasibility has expanded on this to provide a more detailed requirement for food specific transport analysis as follows:

The capacity of all warehouse companies in Georgia is 1,477,690 tons and there are some 303 transport companies and 82 warehousing, courier, and handling companies operating across Georgia.

Principal locations are:

- Tbilisi
- Batumi
- Kutaisi
- Mestia

- Poti
- Khulevi
- Sarpi
- Sadakhlo
- Tsiteli Khidi

Head office locations are:

- Tbilisi (57%)
- Poti (20%)
- Batumi (9%)
- Kutaisi (2%)
- Others (12%)

Eighty-five percent of these transportation companies provide services by road and 52% of these use trucks and containers. Thirty percent of the above provide transportation by rail.

Of the 85% of transportation by road in trucks using 40ft or 20 ft standard containers (85% of container types), only 11% is refrigerated. Of the 1,477,690 tons of goods capacity transported, 48% is food and agricultural products.

If this is related to the current domestic production of fruit and vegetables of 750,000 tons it can be assumed that almost all food product is transported by this internal transport system at some point within the food supply chain.

Furthermore, the distribution of transport directions is as follows:

- Armenia – 65%
- Azerbaijan – 58%
- Turkey – 36%
- EU Countries – 32%
- Ukraine – 31%
- Baltic Countries – 18%
- Belarus – 18%
- Russia – 17%
- Kazakhstan – 15%
- China – 12%
- Turkmenistan – 12%
- Kyrgyzstan – 8%
- US – 7%
- Other – 3%

This underpins not only the location of the two AGFLH in Tbilisi and Batumi but also correlates strongly with the most important routes for export and import markets.

A different system to the above (trucks and containers) operates with the courier distribution companies in Georgia, who transport goods predominantly by car or minibus and transport goods to the end consumer rather than just the warehouse.

Couriers/distributors are located as follows:

- Adjara – 67% (Batumi)
- Tbilisi – 33%
- Samegrelo- Zemo Svaneti – 33%
- Imereti – 33%
- Kakheti – 17%
- Shida Kartli - 17%

Twenty-four percent of the products distributed by the courier/distribution companies to the end customer are food products. The courier/distribution companies are predominantly an internal transport supply chain by their distribution directions as follows:

- Tbilisi (76%)
- Imereti (76%)
- Adjara (65%) (Batumi)
- Samegrelo-Zemo Svaneti (59%)
- Kakheti (53%)
- Shida Kartli (47%)
- Mtskheta-Mtianeti (35%)
- Guria (35%)
- Racha-Lechkhumi and Kevemo Svaneti (29%)
- Kvemo Kartli (29%)
- Samtskhe-Javakheti (29%)

Another part of the transport and distribution chain is the warehousing and handling companies located in:

- Poti port (56%)
- Batumi port (38%)
- Tbilisi airport (31%)

These companies handle approximately 318,460 tons per year, of which 565 tons are agricultural products (fruits and vegetables). Their warehouses are split by the type: 78% dry, 26% cold-frozen, and 15% bulk, with the following average sizes:

- Dry – 953 m<sup>2</sup>

- Cold/frozen – 140m<sup>2</sup>
- Bulk – 1422m<sup>2</sup>

These companies likely process export produce and are potential candidates for significant space use within the AGFLH, due to the location matches in Tbilisi and Batumi.

The current transport couriers are warehousing companies, which are characterized by poor infrastructure, outdated equipment, and low service levels; these are plagued by high costs and inefficiency. Furthermore, the lack of cold storage acts as a major bottleneck to elongation of product shelf life and subsequent export opportunities.

Within the warehouses, poor tracking systems and inefficient utilization of space lead to high material handling costs, inaccurate inventory, incorrect orders, and customer dissatisfaction.

Currently, within Tbilisi, there is a high demand for Class A and Class B warehouses as well as cold chain facilities. The AGFLH will meet this demand.

## ACCESS TO LABOR

Proximity between the AGFLH and the city will give easy access to the Tbilisi and Batumi labor pools, as it still sits within the major commuting routes and near residential communities.

Unemployment rate in Tbilisi is high at 16.3% (30% of the productive workforce), and according to the Tbilisi City Development strategy, an increasing number of the labor force is well educated. Labor costs are much lower and the labor code more flexible than in neighboring countries. This is promising for the mixed low-skill and high-skill requirement of the AGFLH.

However, there is some recognition of the mismatch between the labor pool skills and the most promising sectors as detailed within the feasibility. Accordingly, Georgian higher education is focusing on the logistics market; Georgian Technical University founded a logistics department that offers masters and bachelor degrees. There is interest in establishing a logistics academy, and this has been incorporated into an educational provision within the AGFLH.

## ACCESS TO UTILITIES

In both Tbilisi and Batumi, it is assumed that the land will be gifted as part of the development with all ground works utilities and services included, up to hard standing level. This was confirmed in the Batumi discussions and it was standard for Poti FIZ, Katuasi FIZ, and the proposed Tbilisi FIZ terms.

Energy costs are a key issue for the AGFLH, with the high energy demands of chilled environments and temperature control. However, utility costs in Georgia are highly competitive against neighbor countries such as Turkey; the expansion of Georgia's hydro-power is set to continue with the added advantage of renewable energy and sustainability badges for the AGFLH distribution.

## SPECIFIC REGULATORY REQUIREMENTS

The pre-feasibility assessment identified and incorporated the food safety operating standards of the following accreditation systems:

- EFSA – Global GAP
- HACCP/BRC Global Certification for Transport and Logistics

In addition, the project would work in conjunction with the Food Safety Strategy and Food Safety Service for Georgia, which have been adopted by the Prime Minister's Office to ensure the DCFTA (part of the European Neighbourhood Policy Action Plan). It will ensure that Georgian food safety systems are aligned with EU Legislation over the long term.

The feasibility recognizes that there are significant barriers to early adoption, implementation, and accreditation of these food safety legislation requirements. It has thus adopted the approach of improving hazard control at production source (the farm) through the crate system and applied full legislation and accreditation controls at the AGFLH. This would be required for any product that went into chilled storage or was for export or re-export.

This product would be subject to:

- Consolidation
- Weighing/sorting
- Grading/sizing
- Picking
- Packing
- Palletizing
- QA
- Storage

## NON-FISCAL INCENTIVES

The feasibility recognizes the impact of special investment zones within Georgia and the potential FIZ for Tbilisi.

Georgian tax legislation provides for the following tax-free regimes in the country:

- Free Industrial Zone
- Free Warehouse Company
- International Finance Company
- Free Tourist Zone at the Black Sea Shore

Any or all of these could be available to the AGFLH developments in Tbilisi and Batumi and would merit further detailed analysis.

# D. FINANCIAL FEASIBILITY

## MAIN ASSUMPTIONS

Based on the design master plan and the structures contained in the plan, the feasibility assessment includes a financial and development model that covers three core phases over a 6-year development timeframe. Phases 1 and 2 represent the major agricultural food logistics and distribution infrastructure, and Phase 3 includes private sector investment opportunities to participate in the core activities. Phases 4 and 5 are land bank development opportunities that are not core to the medium-term financing requirements of the project.

The financial model presented assumes a phased occupancy growth for the AGFLH over the first three years of operation (30% / 30% / 40%). To verify the project feasibility and identify potential funding structures and to sources, the model has already been ‘soft tested’ with the ADB.

The financial model includes:

- Project and master plan for Tbilisi (to be replicated in Batumi to form the two centers)
- Construction cost schedule
- Revenue schedule
- Forecasted Income Statements
- Depreciation schedule
- Payback analysis for aggregate and individual phases
- Phased development model for Phases 1 and 2
- Long-term land lease revenues from Phase 3 from private sector investors

Phases 4 (Railway integration and wholesale/food distribution expansion) and 5 (non-food logistics and business park) are land development opportunities that are created by the core AGFLH facilities.

## CAPITAL REQUIREMENTS & FINANCIAL SUMMARY

Based on ADB discussions, the financial model assumes a sovereign loan structure at a concessionary finance rate. The ADB review suggests that the project is viable and an attractive project from many respects, including its social and economic reforms and social inclusivity and sustainability impact. With sovereign loan financing, the USD 128 million project (based on a cost per center of USD 64 million for Phases 1-3) is projected to achieve a 25-year payback period (including 6 years of phased construction). At a 0.9% discount rate, the project’s NPV is USD 124 million, with an IRR of 7.6%.

### Project Financial Summary<sup>1</sup>

	Project	Phase 1	Phase 2	Phase 3
<b>Timeframe</b>				

<sup>1</sup> The conclusions from the financial model are included in a separate Excel file.

	Project	Phase 1	Phase 2	Phase 3
<b>Beginning of Construction</b>	2012	2012	2015	n/a
<b>Beginning of Operations</b>	2015	2015	2018	2018
<b>25-Year Life of Project/Phase</b>	2037	2037	2040	2042
<b>Required Investment</b>				
<b>CAPEX</b>	63,972,597	39,245,696	24,726,901	-
<b>Preliminary Groundwork &amp; Infrastructure</b>	9,700,000	-	-	-
<b>Financial Measurements</b>				
<b>Undiscounted Payback Period</b>	12.97	11.47	10.53	-
<b>Discounted Payback Period</b>	13.52	11.95	10.96	-
<b>10-Year IRR</b>	-8.58%	-4.34%	-2.16%	-
<b>15-Year IRR</b>	2.00%	3.95%	5.42%	-
<b>20-Year IRR</b>	5.82%	7.14%	8.32%	-
<b>25-Year IRR</b>	7.57%	8.61%	9.67%	-
<b>NPV (in 2037)</b>	\$ 124,408,233	\$ 86,742,002	\$ 43,773,307	\$ 4,627,732
<b>EBITDA (in 2037)</b>	\$ 17,952,956	\$ 11,438,204	\$ 6,125,104	\$ 389,648
<b>Net Income (in 2037)</b>	\$ 13,373,288	\$ 9,150,563	\$ 3,911,007	\$ 311,719
<b>NPV (in Year 25)</b>	\$ 124,408,233	\$ 86,742,002	\$ 57,843,021	\$ 6,086,444
<b>EBITDA (in Year 25)</b>	\$ 17,952,956	\$ 11,438,204	\$ 6,917,566	\$ 448,095
<b>Net Income (in Year 25)</b>	\$ 13,373,288	\$ 9,150,563	\$ 4,544,977	\$ 358,476

# E. ORGANIZATIONAL/MANAGERIAL FEASIBILITY

## BUSINESS MODEL

The pre-feasibility assessment identified the operating business models as detailed below.

### BUSINESS MODEL – SINGLE MODE INVESTOR/OPERATOR

A single mode investor/operator would, in effect, control the whole fresh produce supply chain, from 'farm gate' to 'plate,' in the same manner of major retailers in the US or UK (e.g., Walmart or Tesco). This creates a composite food supply chain system that uses its own vehicles, own warehouses, and ultimately has its own farms and supplies its own retail outlets. Some businesses have expressed interest in taking over such a role (e.g., Vissol Petroleum, a Georgian fuel conglomerate).

While this business model should not be discounted, such a supply chain operating model is diametrically opposed to the 'diverse,' 'small producer,' and 'indigenous produce and variety' system that exists in Georgia at this time. For that reason a move to a single mode operator poses the following risks:

- A single mode system aims to generate a commodity volume base rather than small diverse loads;
- A single mode system would remove the all-important price-setting function of the markets (and its many growers/producers) and thus affect sub regional price variances;
- A single mode system is a high risk for food security (i.e., continuity of supply and contamination).

Advantages of the single mode system include:

- Efficiencies (process and financial) through standardization of the food supply chain platform;
- A simpler process for importing and implementing food safety legislation and quality controls, and maintaining the relevant food safety, traceability, and logistics accreditations;
- More efficient communication and transfer of customer trends/requirements and therefore crop and produce production within the farming base.

### BUSINESS MODEL – LANDLORD/MANAGEMENT COMPANY (INVESTOR/S) AND TENANT STRUCTURE (BUSINESS OCCUPIERS)

The landlord and tenant (L and T) is the traditional business model for ownership and management of fresh produce wholesale markets, food centers, and AGFLHs across the world, from London to Hong Kong and Paris to Rome. The reason this model is so prevalent is that markets have historically been formed as a function of public good. Markets serve this role the world over, particularly where there is poverty or difficult access to fresh produce for low-income consumers.

In Georgia it is believed the fresh produce supply chain is also a function of public good, but in a slightly different way – there are no ‘true’ wholesale markets, rather areas of land across the country (most privately owned) that are occupied each day by growers and producers from the area who sell produce that they grow themselves. It is similar to an ‘open air’ buyers’ walk that one would find in a permanent wholesale market structure.

In some ways, traders coming together to ‘rent’ a pitch and sell to food retailers or restaurants works for the Georgian agricultural community (47% of the country’s population) and still represents 90% of the fresh produce supply chain to independent outlets. The view, therefore, is that the L and T business model not only provides functional familiarity, it also provides financial familiarity for its occupiers.

To ensure a successful transfer of the current food supply chain system (growers markets) to the new AGFLH, this is likely to be the best model. In addition, because the landlord is likely to have a high percentage of public investment (capital for the AGFLH), it can ensure the function of public good alongside efficient pricing, food safety, and legislation compliance and de-risk occupancy and food security issues from the many occupiers.

## BUSINESS MODEL – LLP/JV PUBLIC/PRIVATE SECTOR

As the Land T model has matured, particularly in the UK and France, it has adjusted to allow occupiers with long-term interests to invest funds in the infrastructure and enjoy a more active role in the management of the wholesale market or AGFLH. The L and T model has been re-incorporated into various mechanisms; from joint ventures (JV) to limited liability partnerships (LLP), and even charitable trusts in cases where former public landlords want to transfer the management and ownership of the AGFLH or remove the operating costs from the public purse.

Because the process is in its embryonic stages, it is likely not feasible to consider this model as part of the investment structure. Delegation of public ownership to the private sector could come at a later date when values and performance are more established. Accordingly, the European Bank for Reconstruction and Development (EBRD) is a likely candidate for this type of private sector exit funding and restructuring.

## DEVELOPMENT MODELS AND RISK

Any future operator model is unlikely to be divorced from the development process or development partner, so clear considerations need to be given to how this will affect a future structure, whether that is:

- Leasehold or operator lease led;
- Joint venture (JV) led; or
- Assets (land, buildings) are disposed once construction is completed.

At this stage, the Government of Georgia has indicated their willingness to provide land and services in return for a 10% stake in the project. The preferred model needs to be developed further to identify risk apportionment and control of the project outcome. Legal and tax considerations also need to be taken into account.

It is also unclear what is the preferred procurement mechanism for this project; this could greatly influence the risk relationship between development partner, sponsor, or JV organization.

## DEVELOPMENT AND FINANCIAL MODEL

To bring surety to the delivery of this project, the feasibility envisions the following structure:

### FINANCIAL RISK:

The feasibility minimizes risk through a phased development plan that represents each stage of the project transition. The project completes with a fully formed AGFLH and an expansion area for the non-agricultural/food logistics and business park.

### FINANCIAL STRUCTURE:

The feasibility financial structure is determined by the following:

- The transitional nature of the project;
- The fact that it is an unproven Greenfield development;
- The significant element of 'public good' (as it is part of the economic and social reforms of Georgia).

To appraise the project feasibility, inform on the potential funding structures, and to identify credibility and surety of funding routes, the feasibility has been prepared in conjunction with ADB.

The ADB appraisal has been based on the Market, Technical and Financial Assessments contained in the feasibility.

The Market and Technical Assessments were considered robust and very detailed.

The Financial Assessment was based on the attached:

- Master plan for Tbilisi (to be replicated in Batumi for the second center)
- Construction cost schedule
- Revenue schedule
- Phased financial model scenario 1 and 2 (where scenario 1 achieves 100% occupancy at day one and scenario 2 achieves 30% occupancy growth per year over 3 years, until full occupancy is achieved)
- A set of assumptions (including rental review basis)
- Phase 4 (railway integration and wholesale/food distribution expansion) and Phase 5 (non-food logistics and business park) are not included within the scope of this feasibility

The project's financial models attached are based on a sovereign loan structure at a concessionary finance rate. Private sector funding structure would be at market rates.

The ADB appraisal considered the project viable and attractive from many respects, including its social and economic reforms and social inclusivity and sustainability impacts.

It was concluded that four models/capital structures would be applicable in taking this project forward as follows (based on a capital requirement of USD 250,000 for Tbilisi and Batumi combined):

**a) Sovereign Loan:**

A loan of up to 32 years could be granted to the Ministry of Finance to on-lend to the project vehicle. This could be agreed to as part of the ADB allocation to Georgia under the Country Partnership Strategy for 2012. Pricing is concessionary and would be at sub-Libor rates.

*Potential compliance requirements and/or issues:*

There is a sovereign loan ceiling for GoG imposed by the International Monetary Fund (IMF) which would need to be considered.

ADB would need to be assured that the project is part of GoG's strategy for economic and social reforms. ADB has stringent procurement and environmental policy requirements which are geared toward ensuring the best result from the market process. ADB would need to see a world class operator within the project (we have this in Semmaris).

**b) Non-Sovereign Loan:**

A loan could be granted to the Ministry of Finance (short-term) to on-lend to the project vehicle.

As this would fall under a private sector structure there are restrictions on ADB and they could only provide 25% of the infrastructure cost. Other commercial lenders and private sector equity would need to be identified.

In this scenario, pricing would be at market rates and it would resolve the issue of IMF ceiling.

*Potential compliance requirement and/or Issues:*

The project is transitional and a Greenfield site, so it is unproven. It is unlikely that it would attract commercial lenders or private sector equity until performance is proven.

Funding at market rates would undermine the 'affordability' limits within the domestic supply chain operators at the core of the project.

**c) Unfunded – Guarantee only**

A guarantee is granted to GoG/Ministry of Finance to enable raising liquidity from commercial lenders. ADB's AAA rating would ensure that this is achievable. In this scenario, pricing would be market rates.

This would resolve the issue of the IMF ceiling as the guarantee would only be classed as a contingent liability.

*Potential compliance requirement and/or Issues:*

As Non-Sovereign Loan

**d) Other – public/private funding mix**

A short-term sovereign loan (5 – 7 years) could be granted to the Ministry of Finance and then on-lent to the project vehicle (this term falls outside of the IMF liability ceiling, so removes this potential issue) for the transitional period of the project.

At seven years, the project is a high cash generator and the projected performance is considered to be bankable by the private sector funders. A non-sovereign loan could then be granted and the project could be exited from GoG in conjunction with other commercial lenders, private equity, and specialist funding gap investors.

This structure could be facilitated by ADB at day one of the project in the form of a public-private partnership (PPP) or JV. This is also likely to further attract the private sector (world class) operator who could play a part in the exit strategy by providing equity investment. An equity investment of EUR 50,000 has been identified by Semmaris.

This model would benefit from concessionary pricing in the critical transitional period at sub-Libor rates.

Market pricing would apply after exit, but with a reduced capital requirement and should not undermine affordability.

*Potential Compliance requirement and/or issues:*

Same as those for both a) Sovereign and b) Non-Sovereign loan structures detailed above.

## **CONCLUSION FINANCIAL – CAPITAL STRUCTURE/BUSINESS MODEL**

It is suggested that for speed, surety of funding, and best fit with the transitional nature of the project, the funding be structured (initially) as a sovereign loan under the auspices of the ADB, Country Partnership Strategy allocation for 2012. ADB would only require a request from GoG to begin this process.

However, given the inference from GoG (The Partnership Fund) that there are restrictions on the above (which it is assumed are linked to the IMF sovereign loan ceiling), it is suggested that the capital structure/business model be a form of PPP.

It is suggested that the PPP structure be based on a combination of a sovereign loan that is short-term (5 – 7 years, and therefore sits outside of the presumed restrictions) and a market-based private sector package of ADB (private sector) loans and private sector equity (operator) and other commercial lending.

This would be structured to deliver the first three phases of the project and to continue the delivery of the wider project requirements identified in Phase 4 (rail integration) and Phase 5 (non-food logistics/business park) of the project.

## **FINANCIAL AND OPERATIONAL RISK**

The following key risk areas have been identified at the pre-feasibility and further feasibility stage.

**Table 21: Risk Mitigation**

<b>Risk Identified</b>	<b>Details</b>	<b>Risk Mitigation</b>
Transfer of current fresh produce supply chain system into new working practices and new	Operating base of 4 market centers in Tbilisi and 1 in Rustavi	Engage traders early and undertake effective consultation. Ensure the new way of working is transferrable

Risk Identified	Details	Risk Mitigation
infrastructure		and that traders see the benefits. Further work on 'operational' transitional strategy for project through domestic and import/export market development
Potential AGFLH site locations	Current options detailed in site options table	Confirm availability (and ownership) of preferred site
AGFLH development costs vs. revenue and capital investment model	Is the new facility likely to be affordable for the existing domestic fresh produce supply chain businesses?	Further work on: <ul style="list-style-type: none"> <li>- Design (and construction costs) including 'value engineering' and adoption of strategy for procurement of indigenous (and sustainable) materials and local workforce</li> <li>- Revenue assumptions (property rents, lease terms, gate fees, and logistics operational licenses)</li> </ul>
Food Legislation/Certification – compliance and harmonization	Is it feasible to expect the current fresh produce supply chain to adopt EFSA standards or any food safety – basic HACCP – working practices?	Develop and adopt phased plan through basic food hygiene to HACCP to full accreditation. Integrate with capacity building (multi-agency) and National Food Agency (Georgia)

## POTENTIAL JV PARTNERS OR ALLIANCES

The pre-feasibility assessment identified the following operator and/or JV partners for the AGFLH development in Tbilisi and Batumi:

Semmaris International is the operator of Rungis Fresh Produce Market in Paris (the largest food distribution center worldwide) and the Euro Delta Logistics Hub. Semmaris also has development joint ventures with the Chinese state operator of wholesale markets for six re-developments and feasibility for two wholesale markets in Ukraine.

There is further interest from a major Netherlands food logistics operator, who is also a key stakeholder in the food wholesale and logistics center in Amsterdam.

Interest is expected from Europe and Asian-based multi-national contractors. We are currently working with a number of interested parties in London and European centers.

Large contractors can easily facilitate a 'Build, Operate, Transfer' (BOT) facility that would be suitable in a PPP structure.

## F. CONCLUSIONS AND NEXT STEPS

This pre-feasibility and feasibility project has placed its emphasis on creating a route to the delivery of a successful Agricultural Food and Logistics Infrastructure in the two centers of Georgia (Tbilisi and Batumi).

It has taken a practical approach to the appraisal of the feasibility of the:

- Market (and sector) modernization/transition
- Technical requirements of the new infrastructure
- Potential operator relationships
- Investment availability and potential financial structures

In each case the appraisals have not been made in isolation, but have been made by 'soft' testing and collaborating with the different parts of this value chain.

Representatives from all parts of the Value Chain believe that the project is feasible and can deliver critical infrastructure to Georgia to enable it to compete, not only within the agri-food sector but also within the wider logistics and trans-shipment sector.

The project also creates wider economic and socioeconomic reforms for Georgia, including sustainable agriculture, trade harmonization (EU food safety), social inclusion (skills and workforce development), urban development, and can act as an enabler for urban tourism.

It can be concluded that across the entire value chain, from small local food producers to pan-European exporters, to global sector investors and world class logistics operators, there is an acknowledgment of the feasibility of this project, but even more there is the desire to take part in its ownership and delivery.

To realize these potential benefits, the next steps are to:

- Formulate and agree on a mandate to take the project forward with specific Memorandum and Articles (it is likely that this feasibility document could form a large part of the M&A) including agreement on the 'lead' stakeholders.
- Identification, agreement on and structuring of the project vehicle
- Identification of resources required for the next stage (apportionment of risk to allocation of resources), applicability of resource and funding assistance
- Agreement on key professional service appointments (subject to procurement strategy)
- Development of detailed Action Plan and Program Management Structure

A practical way forward with the above is already in place and available to the stakeholders and can be facilitated through the current working structure of GoG/The Partnership Fund and its participating Donor structure of USAID/EPI Georgia and ADB.

It is considered advantageous to structure a procurement strategy that will achieve the best combination of operator and investment options for the project and also meet the strict policy requirements set by ADB in terms of market competition and sustainability and environmental issues, as their core funding is a key enabler to market and/or investor participation.

If the ‘mandate’ to move to the next stage is given by the current partnership as above, the next steps (with timeline) could be as follows:

**Table 22: Next Steps**

<b>Project Activity</b>	<b>Description</b>	<b>Delivered by</b>	<b>Funded by</b>	<b>Timeline</b>
<b>Mandate to proceed</b>	Agree on ‘Partnership’ to deliver the project and prepare M&A	GoG/Partnership Fund/USAID/EPI Georgia	USAID/EPI	Dec/Jan 2011/12
<b>Adopt/Structure Project Vehicle</b>	Structure possible ‘New co’ mechanism	GOG/Partnership Fund/USAID/EPI Georgia	USAID/EPI	Dec/Jan 2011/12
<b>Resource Plan/Technical Assistance Funding/Risk Relationship</b>	Agree on TA (Technical Assistance) mechanism with ADB and cost indemnity for project	ADB/USAID/EPI Georgia	USAID/EPI/ADB	Jan 2012
<b>Advisory Structure ADB TAS (Transaction Advisory Service) (Professional) appointments and/or Procurement</b>	<ul style="list-style-type: none"> <li>- Appoint Professional team additional resources</li> <li>- Undertake additional work on financial model</li> <li>- Prepare revenue assumptions and socio economic impact and environmental considerations</li> </ul>	ADB TAS (in conjunction with above)	ADB TA Grant or TAS	Feb 2012 – March 2012
<b>Preparing the project for market</b>	<ul style="list-style-type: none"> <li>- Undertake detailed design and cost work</li> <li>- Determine Market and Property</li> </ul>	ADB TAS (as above)	ADB TA Grant or TAS	March – June 2012

Project Activity	Description	Delivered by	Funded by	Timeline
	positions  - Prepare Financial and Development model (structuring the PPP)			
<b>Procurement Delivery</b>	Project Competitive Procurement	ADB TAS (as above)	ADB TA Grant or TAS	June 2012 – August 2012
<b>Project/Program Delivery</b>	Project on site	Delivery Team (as above)	New Co Structure holding 'on-lent' loan and equity funds	Sept 2012 Onwards to Sept 2020+

In addition to the traditional ADB route of providing a technical assistance (TA) grant, a new facility, currently available (the Transaction Advisory Service, or TAS), could be the most appropriate delivery mechanism to give the private sector confidence and leverage other donor relationships and funding.

Although the TAS is envisioned as a service for Brownfield developments, in this case (because the project is viewed as becoming bankable in private sector terms after 5 – 7 years) it could be structured to enable the public/private sector model of the project. This could operate in the form of a PPP or JV. The TAS would manage the project to bring it to market effectively, with its appointed professional team and then through to on-the-ground delivery.

The TAS would have the same requirements for the next step activities as the TA grant above.

The TAS would take the existing feasibility as its M&A and would underwrite the costs (same as the TA grant) to bring the project to market in its public/private sector model format. If the project failed, ADB would be responsible for the costs incurred by the TAS.

## CONCLUSION: NEXT STEPS

Either the TA grant or the TAS will deliver the needs of the project, through its next step requirements and into delivery, but with the benefits of funding surety and the confidence of the private sector operator(s).

The benefit of TAS over the TA grant is that the TAS is a continuous process through the life of the project. The TA grant would only apply to the sovereign loan, and then another TA grant would have to be applied for in the future when the sovereign loan was re-structured for the private sector.

As the TAS is also structured to take the project to market, it will also have the benefits of competitive procurement. This mechanism and the partnership relationship detailed above

(GoG/The Partnership Fund/ADB/USAID) are in a strong position to deliver this project in a public/private sector form.

## **G. FINANCIAL MODEL**

Please see separate Excel file for the full financial model and conclusions.

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