Document of
The World Bank

Report No: PAD1543

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US$40 MILLION

TO

GEORGIA

FOR A

NATIONAL INNOVATION ECOSYSYEM (GENIE) PROJECT

FEBRUARY 19, 2016

Trade & Competitiveness Global Practice
Transport & ICT Global Practice
Europe and Central Asia Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective February 12, 2016)
Currency Unit = Georgian Lari (GEL)
GEL 2.5 = US$1

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

BfD	Broadband-for-development Program
CICs	Community innovation centers
CIIP	Competitive Industries and Innovation Program
CPS	Country Partnership Strategy
DPO	Development Policy Operation
ECA	Europe and Central Asia
EMP	Environmental Management Plan
ESMF	Environmental and Social Management Framework
FDI	Foreign direct investment
FM	Financial management
FY	Fiscal year (World Bank)
GDP	Gross domestic product
GEL	Georgian Lari
GENIE	Georgia National Innovation Ecosystem (Project)
GITA	Georgia Innovation and Technology Agency
GLI	Global Libraries Initiative of the Bill and Melinda Gates Foundation
GNAS	Georgia National Academy of Sciences
GNCC	Georgian National Communication Commission
GoG	Government of Georgia
ICT	Information and communication technologies
IFC	International Finance Corporation
IFR	Interim Financial Report
IP	Intellectual property
ISP	Internet service provider
IT	Information technology
M&E	Monitoring and Evaluation
MoES	Ministry of Education and Science
MoESD	Ministry of Economy and Sustainable Development
MoU	Memorandum of Understanding
MSME	Micro, small, and medium enterprises
NGO	Non-governmental organization
NIE	National innovation ecosystem
NPV	Net present value
PD	Project Director
PDO	Project development objective

PFI	Participating Financial Institution
PFS	Project financial statements
POM	Project Operations Manual
PV	Present value
R&D	Research and development
RIC	Research and Innovation Council
RIHs	Regional innovation hubs
SDS	Socioeconomic Development Strategy (of the GoG)
SMEs	Small and medium enterprises
SOE	Statement of expenditures
TA	Technical assistance
TTO	Technology transfer office
UNDP	United Nations Development Programme
VET	Vocational Education and Training
WB	World Bank
WBG	World Bank Group
WBI	World Bank Institute

Regional Vice President:	Cyril Muller
Country Director:	Mercy Tembon
Senior Global Practice Director:	Anabel Gonzalez
Practice Manager:	Javier Suarez
Task Team Leader:	Thomas Haven, Siddhartha Raja

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Georgia National Innovation Ecosystem (GENIE) Project

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Georgia National Innovation Ecosystem (GENIE) Project (P152441)

PROJECT APPRAISAL DOCUMENT

EUROPE AND CENTRAL ASIA

Trade & Competitiveness; Transport & ICT

Report No.: PAD1543

Basic Information		
Project ID P152441	EA Category B - Partial Assessment	Team Leader(s) Thomas Edward Haven, Siddhartha Raja
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [ ]	
Project Implementation Start Date 16-Mar-2016	Project Implementation End Date 30-Apr-2021	
Expected Effectiveness Date 01-May-2016	Expected Closing Date 30-Apr-2021	
Joint IFC No		

Practice Manager/Manager	Senior Global Practice Director	Country Director	Regional Vice President
Javier Suarez	Anabel Gonzalez	Mercy Miyang Tembon	Cyril E Muller

Borrower: Georgia					
Responsible Agency: Georgia's Innovation and Technology Agency					
Contact:	Irakli Kashibadze		Title:	Chairman	
Telephone No.:	995-32-292-2120		Email:	info@gita.gov.ge	

Project Financing Data(in USD Million)					
[X] Loan	[ ] IDA Grant	[ ] Guarantee			
[ ] Credit	[ ] Grant	[ ] Other			
Total Project Cost:	42.00		Total Bank Financing:	40.00	
Financing Gap:	0.00				

Financing Source	Amount
Borrower	0.00
International Bank for Reconstruction and Development	40.00
Local Beneficiaries	2.00
Total	42.00

Expected Disbursements (in USD Million)

Fiscal Year	2016	2017	2018	2019	2020	2021				
Annual	0.80	5.90	8.50	9.20	9.40	6.20				
Cumulative	0.80	6.70	15.20	24.40	33.80	40.00				

Institutional Data

Practice Area (Lead)

Trade & Competitiveness

Contributing Practice Areas

Transport & ICT

Cross Cutting Topics

[ ] Climate Change
[ ] Fragile, Conflict & Violence
[X] Gender
[X] Jobs
[ ] Public Private Partnership

Sectors / Climate Change

Sector (Maximum 5 and total % must equal 100)

Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Information and communications	General information and communications sector	30		
Industry and trade	Other industry	50		
Industry and trade	General industry and trade sector	20		
Total		100		

☑ I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.

Themes

Theme (Maximum 5 and total % must equal 100)		
Major theme	Theme	%
Financial and private sector development	Infrastructure services for private sector development	20
Financial and private sector development	Micro, Small and Medium Enterprise support	20
Trade and integration	Export development and competitiveness	20
Trade and integration	Technology diffusion	20
Human development	Education for the knowledge economy	20
Total		100

Proposed Development Objective(s)

The PDO is to increase innovative activities of firms and individuals in the Borrower's territory and their participation in the digital economy.

Components

Component Name	**Cost (USD Millions)**
Innovation Infrastructure	14.7
Innovation Services	13.4
Innovation Financing	9.0
Project Implementation Support	2.8

Systematic Operations Risk- Rating Tool (SORT)

Risk Category	**Rating**
1. Political and Governance	Moderate
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Moderate
7. Environment and Social	Low
8. Stakeholders	Low
9. Other	–
OVERALL	Substantial

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes [ ] No [X]

Does the project require any waivers of Bank policies?	Yes [ ] No [X]
Have these been approved by Bank management?	Yes [ ] No [ ]
Is approval for any policy waiver sought from the Board?	Yes [ ] No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X] No [ ]

Safeguard Policies Triggered by the Project	**Yes**	**No**
Environmental Assessment OP/BP 4.01	**X**	
Natural Habitats OP/BP 4.04		**X**
Forests OP/BP 4.36		**X**
Pest Management OP 4.09		**X**
Physical Cultural Resources OP/BP 4.11	**X**	
Indigenous Peoples OP/BP 4.10		**X**
Involuntary Resettlement OP/BP 4.12		X
Safety of Dams OP/BP 4.37		**X**
Projects on International Waterways OP/BP 7.50		**X**
Projects in Disputed Areas OP/BP 7.60		**X**

Legal Covenants

Name	**Recurrent**	**Due Date**	**Frequency**

Conditions

Source Of Fund	**Name**	**Type**
IBRD	Project implementation staff	Effectiveness

Description of Condition

GITA has selected a project coordinator, procurement specialist, financial management specialist, and safeguards specialist, all with terms of reference and in a manner satisfactory to the Bank.

Source Of Fund	**Name**	**Type**
IBRD	Project Operations Manual	Effectiveness

Description of Condition

The Project Operations Manual has been adopted by the Borrower, through GITA, in a manner acceptable to the Bank.

Source Of Fund	**Name**	**Type**
IBRD	Accounting software	Effectiveness

Description of Condition

GITA has modified its accounting system software to support Project accounting and reporting, in a manner acceptable to the Bank.

Source Of Fund	Name	Type
IBRD	Broadband-for-Development Manual	Disbursement

Description of Condition

The Borrower has prepared and adopted the Broadband-for-Development Program Manual in a manner acceptable to the Bank.

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit
Thomas Edward Haven	Team Leader (ADM Responsible)	Senior Private Sector Development Specialist		GTCDR
Siddhartha Raja	Co-TTL	Senior ICT Policy Specialist		GPSJB
Nikola Kojucharov	Team Member	Economist	Innovation	GTCDR
Natalija Gelvanovska	Team Member	Senior ICT Policy Specialist	Telecommunications	GTIDR
Sandro Nozadze	Procurement Specialist	Procurement Specialist		GGODR
Galina Alagardova	Financial Management Specialist	Financial Management Specialist		GGODR
Darejan Kapanadze	Safeguards Specialist	Senior Environmental Specialist	Environment	GENDR
Jose C. Janeiro	Finance Officer	Senior Finance Officer	Disbursement	WFALA
Justin Piers William Hill	Peer Reviewer	Senior Private Sector Development Specialist	Innovation	GTCDR
Khatuna Didbaridze	Team Member	Temporary		ECCGE
Lela Shatirishvili	Team Member	Consultant	Social safeguards	GSURR
Maja Andjelkovic	Peer Reviewer	Projects Officer	QER stage	GTCID
Mark Andrew Dutz	Peer Reviewer	Lead Economist	Innovation	GTCDR
Michelle P. Rebosio Calderon	Safeguards Specialist	Social Development Specialist	Social	GSURR
Natasha Kapil	Peer Reviewer	Senior Private Sector Development	QER stage	GTCDR

		Specialist		
Iwona Borowik	Team Member	Consultant	Innovation	GTCDR
Peter Lindholm	Team Member	Consultant		GTCDR
Ramiro Ignacio Jauregui-Zabalaga	Counsel	Senior Counsel		LEGLE
Sandra Sargent	Peer Reviewer	Senior Operations Officer	QER stage	GTIDR
Smita Kuriakose	Peer Reviewer	Senior Economist	QER stage	GTCDR
Timothy John Charles Kelly	Peer Reviewer	Lead ICT Policy Specialist	ICT	DECWD
Yulia Vnukovo	Team Member	Consultant	Innovation, Fab Labs	GTCDR

Extended Team

Name	**Title**	**Office Phone**	**Location**

I. STRATEGIC CONTEXT

A. Country Context

1. **Since the early 2000s, Georgia has been implementing far-reaching reforms to improve the business environment, spur investment, and shake off the lingering rigidities of a centrally planned economy.** After the fall of the Soviet Union and through the early 2000s, Georgia was among the poorest-performing transition economies in the region mainly due to conflict and governance issues, and GDP by 2003 had barely recovered to 40 percent of its 1989 level. Starting in 2004, reforms undertaken to strengthen public finances, deregulate markets, fight pervasive corruption, liberalize trade, and upgrade infrastructure helped attract record foreign direct investment (FDI) inflows (peaking at 16.5 percent of GDP in 2007) and brought the country global recognition as a top reformer. In the process, Georgia's *Doing Business* ranking improved from 112th in 2005 to 15th in 2015 and its World Economic Forum *Global Competitiveness Index* ranking improved from 90th place in 2008–2009 to 66th in 2015–16.

2. **These reforms have helped to kick start GDP growth, but the economy has still not fully returned to its pre-transition size and unemployment remains a significant public policy concern.** Georgia remains one of the only countries in Europe and Central Asia (ECA) that has not yet caught up to its 1990 level of real GDP. Although significant new employment was created during the transition period, especially in the service sector, the combination of labor shedding in the public sector and economic transformation in some of the older sectors meant little net job creation. Unemployment has stayed stubbornly high in the 12–13 percent range, with a stronger incidence among women; and wages have remained stagnant.

3. **The sustainability of this growth in the medium term is tenuous, amidst slowing productivity growth, depressed external demand, and declining export competitiveness.** GDP growth between 2004 and 2014 was powered largely by non-tradable sectors such as services and construction, and, since the 2009 crisis, by the rapid expansion in public investment, which now stands at a record 8 percent of GDP, well above ECA averages. GDP growth also benefited from a spurt in productivity growth—11.5 percent, on average, between 2004 and 2008—which typically follows reforms in transition economies. However, this productivity growth was concentrated in non-tradable sectors (where the bulk of FDI was channeled), and it has slowed to an average rate of 3.6 percent since 2010. Meanwhile, manufacturing exports have stagnated as a share of GDP and total exports have remained under 40 percent of GDP, well below the average for developing Asia and non-oil ECA countries. With the recent contraction in the Russian economy and slowdown in other key trading partners, the likelihood of any near-term term revival in export growth is low, and balance of payments pressures are mounting. The composition and dynamics of Georgia's export basket also reveal significant weaknesses and loss of competitiveness: (a) declining market share in key markets and products; (b) stagnant and low product sophistication and quality given Georgia's level of development; (c) lack of product diversification, with scrap metal, re-export of used cars, wine and processed food, water, and

tourism still dominating; and (d) low survival of export firms compared to the rest of the region.[1]

4. **Prospects for resurgence in productivity growth and exports are constrained by low levels of innovation, human capital development, and entrepreneurship.** Innovation and entrepreneurship are key drivers of job creation and productivity growth.[2] However, Georgia lags its regional (ECA) peers and other low-and-middle income countries on various global indicators of these dimensions: (1) in the 2015–2016 Global Competitiveness Index, Georgia's lowest score of all 12 pillars of the index is on innovation (ranking 123 out of 140)[3]; (2) in the 2015 WIPO-INSEAD-Cornell Global Innovation Index, it is in the category of "inefficient innovators" ranked at 73 out of 143 countries[4]; (3) in the Global Technology Index, it is 88th out of 142 due to low information and communication technologies (ICT) use and sophistication; (4) in the WBI Knowledge Economy Index it has significantly lower levels of innovation than the ECA average; and (5) in the World Economic Forum's Network Readiness Index, it is ranked 60 out of 148.[5] Low levels of entrepreneurship are evidenced by the fact that only 4 percent of Georgians own businesses compared to 15 percent in other developing countries.[6] Furthermore, the pool of potential entrepreneurs known as "latent entrepreneurs"—those who are not actual entrepreneurs but want to be—is also relatively small. Only about 12 percent of the labor force and about 10 percent of the wage-employed in Georgia can be considered latent entrepreneurs, far below the ECA average of 27 percent of the labor force and 22 percent of those wage-employed.[7]

5. **The rural economy is also lagging behind, trapped by low productivity in agriculture.** Low productivity levels in agriculture have contributed to high rural poverty, and many of the poor and those in the bottom 40 percent are likely to live in the rural areas of Georgia. Many rural residents have limited access to markets and resources, and do not participate in innovative activities, which are currently concentrated in the major cities and especially in Tbilisi. Investment in regional development is critical to increasing inclusion, and Georgia is focusing on developing the potential sources of growth for each region. Efforts will also be needed to increase the productivity of businesses in rural areas, and to facilitate the movement of labor into higher productivity activities. Including more people from areas outside of Tbilisi in innovation- and knowledge-economy activities would help spur productivity growth.[8]

6. **The Government seeks to promote inclusive growth and develop an innovation-**

[1] The survival of Georgian firms in export markets is slightly more than 1 year on average (similar to Armenia), while countries of similar size and development are at 3-4 years (Czech Republic, Slovakia, Lithuania). For more information, see World Bank (2013), Georgia Trade Competitiveness Diagnostic.
[2] Criscuolo, C., P. N. Gal, and C. Menon (2014). "The Dynamics of Employment Growth: New Evidence from 18 Countries", OECD Science, Technology and Industry Policy Papers, No. 14, OECD Publishing; Haltiwanger, J., R.S. Jarmin, and J. Miranda (2013), "Who Creates Jobs? Small Versus Large Versus Young", The Review of Economics and Statistics 95(2) 347-361.
[3] http://reports.weforum.org/global-competitiveness-report-2015-2016/
[4] https://www.globalinnovationindex.org/content/page/GII-Home
[5] Schwab, Klaus. "Global Competitiveness Report 2014-2015", World Economic Forum; Dutta, S., B. Lanvin, S. Wunsch-Vincent, Eds. Global Innovation Index 2014. INSEAD.
[6] Gallup World Poll 2011, as cited in World Bank (2013), Fostering Entrepreneurship in Georgia.
[7] World Bank (2013), Fostering Entrepreneurship in Georgia, based on data from Atasoy and others.
[8] Based on World Bank Country Partnership Strategy for FY14-17

driven and knowledge-based economy. The Government's inclusive growth agenda—defined in the Government's Socioeconomic Development Strategy 2020 (SDS)—foresees the need to strengthen human capital, improve private sector competitiveness and productivity through a focus on MSMEs, increase access to finance, and strengthen the investment climate. These improvements would help reduce the economy's recent reliance on public investment as the main source of growth. The Government is keen to develop the capacity, services, and infrastructure for Georgia to develop itself as an innovative, knowledge-based economy, while reducing the perception among individuals' and businesses' of the risks associated with innovation. For this, it is necessary to unlock key legal, regulatory, and institutional constraints for private sector growth and innovation, provide infrastructure and services to facilitate growth of innovative enterprises, and strengthen skills to ensure that workers are globally competitive.

B. Sectoral and Institutional Context

Sector Context

7. **Weak performance of micro, small, and medium enterprises (MSMEs) is at the root of Georgia's innovation, productivity, and competitiveness challenges.** MSMEs in Georgia represent 94 percent of registered businesses and more than 47 percent of formal jobs. But they account for less than 20 percent of GDP as compared to global averages of 40–50 percent and 60 percent in the ECA region.[9] Most of this is due to their poor productivity, which is three times lower than that of large enterprises,[10] and to their low rates of innovation. Only 7 percent of Georgian MSMEs surveyed indicated that they had introduced a new or substantially improved product or service in the previous three years (compared to 67 percent in Armenia).[11] Many MSMEs struggle with survival during the first year of operations and still do not have access to external finance in the 4th or 5th year after inception. Hence, few MSMEs in Georgia survive more than five years, and most stay micro and small, with less than 12 employees on average (versus 24 in Armenia and 44 in Azerbaijan). Specialized support to Georgian MSMEs to facilitate market, business, and export development is also very limited. **Annex 4** provides additional detail on Georgia's cross-country standing on innovation activity, inputs, and outcomes, as well as export sophistication.[12]

8. **The capacity of these MSMEs to innovate and move up the value chain is constrained by four key interrelated factors:**

(a) Low "innovation-readiness" of workforce and firms: Entrepreneurial education is non-existent, and the educational system is not building a pool of talent needed for sustained innovative research and development (R&D). Coaching, mentoring, and specialized training opportunities for innovative entrepreneurs is extremely limited.

[9] Papiashvli, Tatiana (2012), "The Role of SME Sector in Georgian Economy".
[10] National Statistics Office of Georgia, annual publication: Entrepreneurship in Georgia, 2013.
[11] World Bank, Fostering Entrepreneurship in Georgia, 2013
[12] Annex 4 includes more information on the Georgian national innovation system, a comparison of Georgian innovation performance with other ECA countries, a beneficiary demand assessment survey undertaken during Project preparation, and an analysis of rural broadband constraints and needs.

Employers report that workforce education is a severe problem.[13] There is only a limited supply of highly qualified graduates for innovative firms, which will constrain the growth of the economy over the longer term. For Georgia to grow as an innovation and knowledge-based economy, it will need a substantial talent pool.

(b) Underdeveloped innovation infrastructure: There are few incubators, accelerators, and technology transfer offices (TTOs). Those that exist have limited capacity, funding, and staff expertise. There are few innovation-based competitions and "makerspaces" for prototyping,[14] and few dedicated facilities hosting ICT startups. This leads to limited technology innovation among businesses, and limited creation of innovative startups. This scarcity of innovation infrastructure is particularly acute outside Tbilisi and rural areas, where access to public and private information on world technology trends is particularly limited.

(c) Limited access to finance for innovation: According to the World Bank's 2013 Enterprise Survey, firms in Georgia consider access to finance to be one of the top two business environment constraints. Only 12 percent of MSMEs have a loan and 15 percent have access to credit, with the remainder financing their investments internally. Around 94 percent of this credit to MSMEs is provided by private commercial banks, but with high collateral requirements usually in the form of real estate and reaching 220 percent of the loan amount. Alternative financing sources, such as angel, seed, and venture capital, matching grants and leasing/factoring are largely unavailable.

(d) Low uptake of ICT: Despite some innovation success stories by Georgian companies adopting state-of-the-art ICT through imports and FDI, overall use of ICT in industry is still limited and its competitive benefits are not properly understood by many firms, particularly MSMEs. Only half of businesses surveyed in 2013 had their own Web site (versus 66 percent in Tunisia and 84 percent in Poland).[15] While mobile broadband subscriptions are at about 24 percent of the population, subscription to fixed broadband (high-speed Internet) services is only at about 15 percent of population, mostly in the main cities.[16] There is a significant gap in personal computer ownership and Internet subscriptions across the poor and non-poor, with the rural poor far behind in digital access.[17] ICTs can serve as a key enabler of innovation and a driver of jobs and exports, including through e-commerce.

Institutional Context

[13] Workforce Skills in the Eyes of the Employers, World Bank, 2013

[14] "Makerspaces" are physical locations where people gather to share resources and knowledge, work on projects, network, and build. Makerspaces provide the tools, equipment, supplies and space for users to experiment, develop hardware, code, and prototype.

[15] World Bank, Enterprise Surveys

[16] Data for June 2015 from GNCC

[17] Only 6 percent of the rural poor are connected to the Internet, compared with 15 percent of the rural non-poor, and 50 percent nationally. GeoStat, Integrated Household Survey, 2013 data

9. **Georgia's national innovation ecosystem (NIE) can be conceptualized as a network of organizations, rules, and mechanisms that affect how the country generates, disseminates, and uses knowledge and technology.** NIEs are generally complex and interactive with many independent agents whose actions need to be coordinated and aligned with strong reinforcing incentives if they are to work well together. A stylized model of NIEs highlights the interplay of six major enablers in an innovation and entrepreneurship driven economy: strategy, policy, infrastructure, linkages, financing, and talent (see **Annex 2**). Recognizing the importance of a stronger NIE for promoting innovation and boosting the economy's competitiveness and growth, the Georgian government has already launched initiatives in several of the core NIE dimensions. These include:

(a) Strategy: The Government is preparing a National Innovation Strategy 2020, with the proposed overarching vision as "maximize Georgia's growth potential by creating an entrepreneurial, knowledge-based economy, where innovation-led growth will foster increased economic productivity and growth." The Government has also defined ambitious goals for the development of the ICT sector by 2020.

(b) Policy: The Research and Innovation Council (RIC) was established in February 2015 as a strategic coordinator of the country's innovation policies. The Council helps reduce inconsistences in policymaking generated by the political cycle and the subsequent short-term horizon of many policy decisions, and supports a "second generation" of reforms aimed at fostering innovation and entrepreneurship. These measures should help Georgia move beyond de jure first-generation business environment reforms and towards stronger export competitiveness and a more sustainable growth model based on a larger share of high value-added goods and services.

(c) Linkages: Georgia's Innovation and Technology Agency (GITA) was created in March 2014 under the Ministry of Economy and Sustainable Development (MoESD), to develop and coordinate the innovation ecosystem. GITA will also implement measures supporting innovation, particularly programs advancing private and public sector knowledge, innovation, commercialization of research, and promoting innovative entrepreneurship.[18]

(d) Skills: The reform of tertiary teaching and public research is being undertaken by the State Commission on Education and Science Reforms. The Ministry of Education and Science (MoES) and MoESD have also committed to cooperate on better alignment of education policy to market needs and international best practices, and in raising the overall quality of the Georgian educational system. GITA has already sponsored the training of 60 IT specialist trainers, who are set to open 30 of their own training facilities in 2015–2016 and help equip around 2,400 junior-level students with the relevant skills for emerging jobs in the ICT field.

[18] In addition, Enterprise Georgia was established in April 2014 under the MoESD. Enterprise Georgia's objective is to support SME development, promote entrepreneurship and development of an entrepreneurial culture, and nurture growth and sustainability of export products and services. GITA and Enterprise Georgia are currently working to improve coordination.

(e) Financing: In late 2014, GITA launched a small grant program for technology innovation open to individuals, NGOs, research organizations and universities. Grants of up to GEL 50,000 (about US$22,000) were awarded to proposals aimed at establishing and/or further developing the commercial viability of a new technology-based product, process or service and finding new applications for existing technologies. The competition was well-received and generated significant interest: 150 applications across a variety of technological fields were received out of which 17 projects were approved for financing. While the program was a strong initial start, additional financing mechanisms on a larger scale will be needed to address constraints to financing faced by innovative firms. The program also revealed some weaknesses in the capacity of many applicants to prepare and present grant proposals.

(f) Infrastructure: GITA inaugurated a Technology Park in Tbilisi in January 2016 that anchors a proposed national network of innovation centers aimed at stimulating innovative activities and promoting awareness of the benefits of innovation. It is also in the process of partnering with the Georgian National Academy of Sciences (GNAS) to establish a bio-technology center that will help Georgia realize its market potential in innovative applications of indigenous bacteria, enzymes, and phages. Furthermore, GITA has piloted two fabrication labs (Fab Labs) and three innovation labs (iLabs) in Tbilisi—some in collaboration with the private sector. In collaboration with the Georgian National Communication Commission (GNCC), GITA has launched the "OpenNet"[19] initiative to construct a national broadband network that will provide broadband Internet connectivity to about 2,000 villages across Georgia with at least 200 inhabitants and that are currently not (and unlikely to be) connected by commercial Internet Service Providers (ISPs). Though a capital investment of about US$150 million the initiative aims to extend broadband internet coverage about 90 percent of the population. "OpenNet" seeks to trigger private investments into rural infrastructure via lowering the market entry barrier for rural ISPs.[20]

C. Rationale for World Bank Involvement

10. As a long-term strategic partner in Georgia's national innovation ecosystem development, the World Bank is well positioned to complement and advance these initial efforts by the Government. The Government has sought World Bank involvement for three main reasons: (a) the ability of the Bank to mobilize and bring international best practices and expertise to bear on the development of the nascent innovation ecosystem; (b) the need for long-term, strategic, and stable financing to implement a range of integrated programs; and (c) the capacity of the Bank to leverage a range of instruments to support development of the ecosystem.

11. The World Bank's proposed loan—the Georgia National Innovation Ecosystem (GENIE)

[19] More information about the initiative could be found here www.opennet.ge

[20] In order to achieve that end, "OpenNet" will deploy access points in each village and provide wholesale Internet transit service to rural ISPs that in turn are expected to invest in the last mile infrastructure and provide retail broadband Internet access service to the end user.

Project—will complement recent and ongoing World Bank Group (WBG) activities in Georgia in the areas of competitiveness, innovation, and ICT. GENIE supplements CIIP technical assistance (TA) (2014–2017) under which the WBG supports Georgia's efforts to develop and implement a competitiveness strategy and advance innovation-led growth. The Project also builds on WBG analytical work on ICT and employment (2014–2015) and on ICT to support innovation and employment (2013–2014). Furthermore, this Project will finance the development of elements of the national innovation ecosystem that complement the policy, strategic, and institutional aspects supported through the World Bank's Competitiveness Development Policy Operation (DPO program).

D. Higher Level Objectives to which the Project Contributes

12. **The Project will help to increase jobs, productivity growth, and export competitiveness in Georgia.** The Project is a core element of the latest Country Partnership Strategy (CPS, FY2014–17), and contributes to the CPS goal of enabling private sector-led job creation through improved competitiveness (CPS Area of Focus 2).[21] The Project also focuses on inclusion as a means to boost shared prosperity. The Project will include a number of activities to mobilize more rural inhabitants and businesses to participate in the innovation- and knowledge-based economy by developing their skills and expanding their access to innovation infrastructure, services, and financing.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

13. The project development objective (PDO) is to increase innovative activities of firms and individuals in the Borrower's territory and their participation in the digital economy.

Project Beneficiaries

14. **The Project is expected to benefit, both directly and indirectly, a range of Georgian individuals and businesses.** Key beneficiaries include: (a) latent innovators, inventors, startups/entrepreneurs, and innovative SMEs through access to infrastructure, services, and financing for innovation; (b) the general population (primarily outside of Tbilisi) and in particular students (both male and female) through access to community innovation centers and skills development programs—with the aim of helping them become part of the innovation and knowledge economy; and (c) households (primarily outside of Tbilisi) through broadband Internet expansion initiatives. The Project will also build the capacity and service portfolio of Government entities engaged in supporting innovative MSMEs, including the MoESD and GITA. Firms and individuals not directly engaging with the Project's offerings also stand to benefit indirectly through various channels, for example by integrating the product and process innovations of direct Project beneficiaries into their own economic activities or leveraging them to generate new innovations, being employed by one or more startup firms nurtured by the

[21] While job creation is a higher-level objective of the Project, it is not a project indicator given that it depends on a number of factors outside of the control of the Project, including overall economic conditions, global and regional political and economic conditions, and the business environment, and thus is difficult to predict accurately.

Project, or drawing inspiration from the innovation and entrepreneurship success stories of the Project to pursue similar initiatives.

PDO Level Results Indicators

15. **Proposed PDO-level outcome indicators include:**

(a) Number of new/improved products or services introduced to new or existing markets by Project beneficiaries

(b) Number of start-ups launched by Project beneficiaries

(c) Access to broadband Internet (number of subscribers per 100 people)

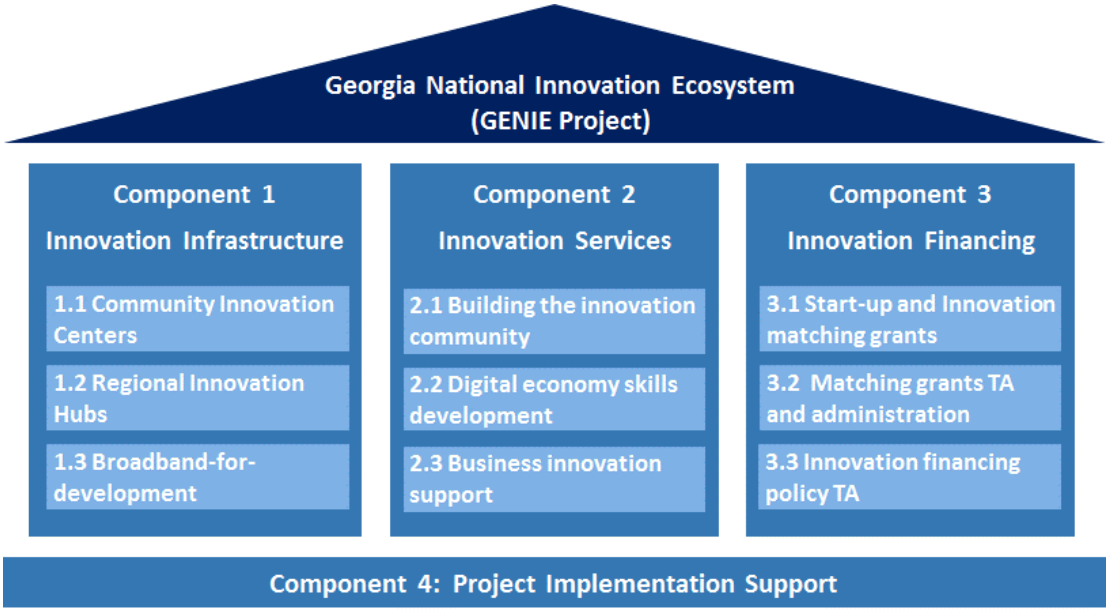
(d) Number of beneficiary MSMEs selling via e-commerce platforms

III. PROJECT DESCRIPTION

A. Project Components

16. **The Project will enhance Georgia's national innovation ecosystem through an integrated approach across three components, plus project implementation support.** Addressing different gaps in the innovation ecosystem, each component will leverage the inputs and outputs of other components, as well as those of complementary projects, to ensure that the development objective of the Project is realized in an integrated fashion. The components focus on the most critical areas of the ecosystem and constraints described in the Sectoral and Institutional Context section above. The overall Project structure is summarized in Figure 1. The activities will support *inclusion*—connecting more people and businesses outside of Tbilisi to the innovation and digital economy—and *promoting innovative start-ups and SMEs*—offering enterprises access to infrastructure, services, and financing to help them innovate and grow.

Figure 1. GENIE Project Structure

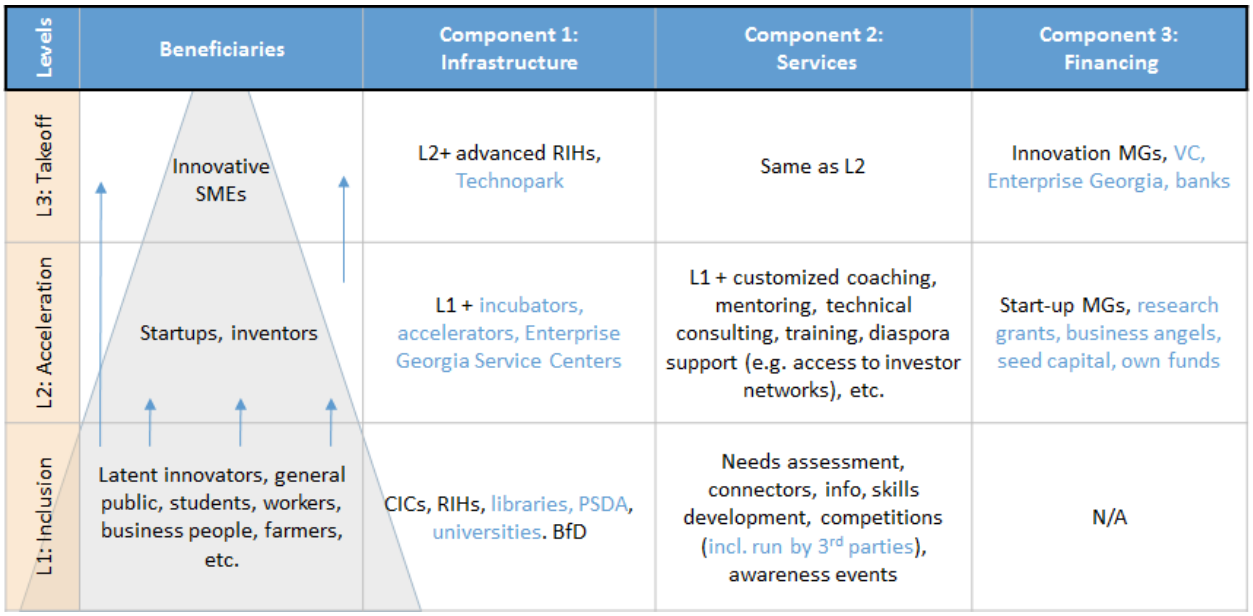


17. **Collectively, these activities will create an innovation acceleration framework** to bring more people—especially in rural areas and smaller towns—into the innovation ecosystem, and provide customized infrastructure, services, and financing support for different categories of beneficiaries. This framework of Project support is built around a tiered "pyramid" structure of ecosystem beneficiaries, with each level/category of beneficiaries requiring progressively more sophisticated and customized infrastructure, services and financing support from the GENIE Project (Figure 2). The various levels broadly correspond to three stages of the innovation process: inclusion, acceleration, and "take off." GENIE Project interventions are not all-encompassing, but rather designed to complement other infrastructure, services, and financing instruments in the innovation ecosystem (these are denoted in blue text in Figure 2).

18. **Many Project activities are innovative in their design as well, and hence, will be implemented with piloting, monitoring, and feedback mechanisms**. An IT-based beneficiary management system will be developed to allow GITA to track who enters the system, at which stage, how they are supported, and results achieved, as well as to collect user feedback. This will complement and inform assessments of selected Project instruments by independent experts every 6 months during the first 2.5 years of the Project.

Figure 2. Innovation Acceleration Framework

New products, processes and services → Increased growth, competitiveness and jobs



Note: Elements in blue are those not directly financed by the GENIE project.
BfD = Broadband for Development; MGs = Matching Grants; RIHs = Regional Innovation Hubs; CICs = Community Innovation Centers; PSDA = Public Service Development Agency; VC = Venture Capital

19. **The infrastructure and service offerings are expected to evolve based on what is learned from the pilot activities in the first two years of the Project**. User demand and feedback, as well as results on the ground, will inform how the Project is rolled out over its lifetime. For that reason, the structure is relatively flexible, allowing higher performing activities to be scaled up and others scaled down.

Component 1: Innovation Infrastructure (US$14.7 million)

20. The component will: (a) develop a network of Innovation Hubs and Innovation Centers in selected cities, towns and villages of the Borrower, as set forth in the Project Operations Manual; (b) design a Broadband-for-Development (BfD) program to support the increase in adoption and use of broadband internet services and advanced information technology by eligible households and eligible MSMEs, with a focus on rural areas, inter alia, by providing BfD Payments and related training, and preparation of the Broadband-for-Development program manual; and (c) pilot, and, as applicable, implement the Broadband-for-Development program, and provide BfD Payments and related training.

21. In the pilot phase (roughly the first year of the Project), three Regional Innovation Hubs (RIHs) and ten Community Innovation Centers (CICs) will be established, offering an opportunity to test out the concepts and make improvements in design as needed. Financing will extend to the second phase based on specific success criteria being met (these are defined in **Annex 2**). The locations will be selected based on criteria defined in the Project Operations Manual. Short appraisal reports (for CICs) and mini-feasibility studies (for RIHs) will be done before each CIC/RIH is created to provide a business case. In cases where GITA will partner with local authorities to develop a CIC or RIH, a Memorandum of Understanding (MoU) or

similar agreement between GITA and the local government partner should be signed, specifying the governance structure of the center, its legal status, and the sharing of financial responsibilities. Follow-up assessments will be done for each CIC/RIH every quarter during the first year of operation, then each semester thereafter to gauge performance and adjust the operating models as needed.

22. Each CIC will consist of basic infrastructure, including a small classroom with 6–8 computers, a multi-purpose conference/training room, basic technology equipment, and basic services provided by the staff, such as digital literacy training and needs assessments to identify latent innovators. The RIHs will provide larger classrooms with 15–20 computer workstations, conference/training facilities, fabrication lab prototyping equipment, and other specialized lab equipment. They will also serve as a delivery platform for the more structured services described under Component 2, including training and skills development and the hosting of innovation competitions (e.g. hack-a-thons and make-a-thons). Different management models of RIHs are expected to be tested, and RIH and CIC managers will receive training and mentoring to boost capacity.

23. Through the BfD subcomponent the Project will assist about 30,000 eligible households and 3,000 MSMEs outside of Tbilisi to connect to broadband Internet services, access training, and for some, acquire information technology (US$9 million). Training for households will focus on basic digital literacy. For MSMEs, training will focus on engaging in e-commerce.

Component 2: Innovation Services (US$13.4 million)

24. **This component will deliver services, many in coordination with the CICs and RIHs, tailored to Project beneficiaries at various stages/levels of the innovation ecosystem**. The component will carry out outreach and communication activities, and provide training and technical assistance in support of: (a) building the innovation community of the Borrower, and organizing and carrying out innovation competitions (US$3.9 million); (b) carrying out periodic skills needs assessments of firms and developing digital economy skills of individuals (US$5.1 million); and (c) developing the innovation capacity of individuals and firms (US$4.4 million).

25. As part of building the innovation community, one of the key tools to bring new actors into the innovation ecosystem is competitions, such as hack-a-thons and make-a-thons, which GITA has successfully piloted over the last year.[22] For digital economy skills development, structured training programs will help ensure the supply of talent and skills for an innovation and ICT-enabled economy. Training programs will be defined based on a skills needs assessment, including consultations with potential employers, and focus primarily on ‘digital economy skills’ including computer programming, software development, networking, and related fields. In

[22] Take competitions, for example, several of which GITA has organized in recent months. These have taken the form of 2-day hack-a-thons, make-a-thons, and create-a-thons where students, programmers, and potential entrepreneurs come together to develop innovative apps, products, and ideas in a fun, fast-paced environment. Results to date have been promising and include increased awareness and enthusiasm around innovation, creation of informal networks amongst participants, and in a few cases, the creation of start-ups (e.g. new gaming companies from the hack-a-thons and start-ups selling small consumer products initially developed using laser cutters in a fab lab during the make-a-thons).

particular, the component will finance specialized and reputed training institutes or providers to design and deliver a dedicated ICT training program to about 3,000 individuals in at least two cities, including a training of trainers program to promote sustainability.

26. The third level of services is to develop innovation capacity—also largely delivered via the RIHs—through business innovation support. This includes: (a) specialized technical training to be developed depending on the needs of RIH users, e.g. 3D modelling for prototype development; (b) individualized coaching for entrepreneurs; (c) mentoring for entrepreneurs, leveraging the Georgian diaspora; and (d) innovation management and related business training. The innovation management and related business training is expected to be administered by a reputable training provider and take into account international good practice in MSME training.[23] Project financing will cover the hiring of trainers, coaches, and consultants, and development and facilitation of the mentor network. In most cases, firms will be expected to pay a share of the costs. Coaches and mentors will be identified through engagement with various professional networks, international experts, business associations, and the Georgian diaspora (in coordination with the Office of the State Minister of Georgia for Diaspora Issues).

Component 3: Innovation Financing (US$9.0 million)

27. This component supports the: (a) provision of matching grants[24], selection of eligible MSMEs for receipt of matching grants, and supervision of matching grants; (b) provision of technical assistance to eligible MSMEs to prepare and implement sub-projects (with the matching grants); and (c) provision of technical assistance to stimulate alternative forms of innovation financing and investment in the digital economy.

28. Two windows for matching grants are foreseen: "Start-up" and "Innovation". Table 2.3 in Annex 2 contains a comparison of the characteristics of each window. A Matching Grants Manual will be prepared that details the grant objectives, beneficiary eligibility criteria, maximum size of grants, eligible costs, project selection and evaluation process, reporting, and procurement techniques, among others, for each instrument.

29. The Project will also support costs of administration of the matching grants program, performed by a dedicated unit within GITA, and training and coaching to grant applicants and winners. Such support is needed as many participants will have limited experience with matching grant applications and the technology commercialization process. Seminars and training during the grant application process will help ensure that high-quality applications are received. An estimated 10 days of coaching per year by a combination of local and international experts is expected to be provided to each grant awardee. The training and coaching will be provided by a network of experts coordinated by GITA, leveraging the services developed under Component 2. Finally, the component will also finance technical assistance to improve the policy and regulatory environment affecting domestic and foreign financing for innovation and digital

[23] One example of an international good practice is using a training design and delivery methodology that incorporates principles of experiential learning with emphasis on workplace application of learned skills. See IFC's Business Edge training program for more examples.

[24] Under current Georgian legislation, matching grants are considered to be a form of subsidies to private enterprises.

economy development in Georgia.

Component 4: Project Implementation Support (US$2.8 million)

30. **This component will aim to ensure efficient and effective implementation of all Project components.** The component includes the provision of support for Project management and fiduciary oversight, monitoring and evaluation, and impact evaluation activities. This will include financing consultants to support project management, component technical implementation, procurement, safeguards, financial management, monitoring and evaluation (M&E), and an expert advisory body. The component will also finance the design and implementation of: (a) tools to monitor the results framework; (b) M&E studies/surveys to establish baselines for Project results indicators and measure their evolution during Project implementation; (c) impact evaluation for selected Project activities.

B. Project Financing

31. The lending instrument is Investment Project Financing.

Project Cost and Financing

Project Components	Project Cost (US$, millions)	IBRD Financing (US$, millions)	% Financing
1. Innovation Infrastructure	14.70	14.70	100
2. Innovation Services	13.40	13.40	100
3. Innovation Financing	9.00	9.00	100
4. Project Implementation Support	2.80	2.80	100
Total Project Costs	**39.90**	**39.90**	**100**
Front-End Fees	0.10	0.10	100
Total Public Financing Required	40.00	40.00	100
Private Financing Contributions*	2.00	0.00	0
Total Project Financing	**42.00**	**40.00**	**95**

*Note:** Contributions of local beneficiaries of Project's matching grants

32. **Retroactive Financing**. The Government has allocated resources from its own budget for GITA to pilot and prepare some activities in advance of Board approval. The Government may request up to 10 percent of the loan amount as retroactive financing to allow GITA to contract staff, undertake feasibility studies, start implementation, avoid possible delays to the activities, and accelerate disbursements under the loan. Withdrawals up to US$2 million may be arranged for Borrower expenditures made up to 12 months prior to the signing date of the Loan Agreement, for eligible expenditures under the Project. To be eligible, (a) activities to be financed by the retroactive financing must be included in the Project description; (b) the payments must be for items procured in accordance with applicable Bank procurement procedures; and (c) activities must comply with relevant safeguards policies.

C. Lessons Learned and Reflected in the Project Design

33. **This Project's design benefits from previous World Bank projects in innovation and ICT**. The overarching principles used in the design include: (1) ensuring rapid disbursements through advance preparation of activities; (2) pilots to test out new ideas and designs prior to large-scale implementation; (3) simplified design and implementation arrangements, with a focus

on capacity building and support for Project management; (4) using rigorous monitoring and evaluation procedures to verify that outcomes are reached; and (5) investing in mobilization, communication, and awareness building to ensure a strong pool of Project beneficiaries.

34. The Project builds on a number of Bank innovation projects, including in Serbia, Croatia, Armenia, Poland, Mexico, and Colombia. For instance, the best practices on innovation financing from the Serbia Innovation Project are incorporated in the Project design. For the matching grants, key practices relate to the selection process, namely involving a network of international peer reviewers and the final decision being made by an independent "Investment Committee" composed entirely of leaders from the business and scientific community. These procedures ensure that the best proposals are selected through a transparent, unbiased, and non-political process. Also important for the success of the matching grants is a robust outreach and awareness raising mechanism to ensure the largest possible pool of high-quality applications.

35. **The RIHs and CICs do not have an exact corollary in other Bank projects, so in that sense something new is being piloted in Georgia.** Nevertheless, some of the components of the RIHs and CICs include elements, such as fab labs, that are becoming increasingly widely used in Europe and the US. Good practices on fab lab development, for instance as elaborated by MIT's Fab Foundation and discussed at the recent 11th Fab Lab Conference and Symposium (which GITA attended in Boston in August 2015), will be applied. Early lessons from the pilot fab labs in Tbilisi are also incorporated, such as the need to hold "make-a-thons" competitions to create excitement and bring users into the fab labs. See also **Annex 4**, Section V for more details on fab labs. The RIHs and CICs will also benefit from lessons learned from infoDev's support for digital innovators, for example, through "mLabs" and "mHubs". Examples of lessons include the importance of location, choice of manager, governance structure, outreach to women, and allowing adequate time to achieve sustainability (e.g. 7–10 years).

36. For the CICs, lessons have been drawn from the Global Libraries Initiative (GLI) of the Bill and Melinda Gates' Foundation. The global experience of GLI has demonstrated that public libraries (and similar facilities) can evolve beyond their basic functions to become engines of social development for local communities. They can not only provide a physical space for potential innovators and entrepreneurs to gather, but also: (a) offer public Internet access, (b) build community awareness of the possibilities of innovation, (c) disseminate knowledge, and (d) provide structured training. (See **Annex 4**, Section IV for more details on the GLI experience.)

37. **With regard to the activities related to ICT sector development, this Project benefits from the lessons learnt from skills development in South Asia, Latin America, and Africa.** The BfD program benefits from ideas used in and the lessons of a 'computers-for-all' program in Armenia, implemented with World Bank support, and an EBRD-supported program in Georgia to encourage households and businesses to purchase energy-efficient appliances. The Project also benefits from the findings of the World Development Report 2016, on 'Digital Dividends,' which significantly informed the design of the program to connect households and MSMEs. Specifically, the Internet expands economic opportunities, but digital literacy and skills development is critical for individuals to benefit from those opportunities. It also finds that MSMEs can benefit from their use of ICTs (and e-commerce) by becoming more productive and increasing exports, if firms have the required skills and management capacity.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

38. **The Project will be implemented by Georgia's Innovation & Technology Agency (GITA).** GITA will be responsible for all project implementation, procurement, safeguards, financial management and disbursements. The Government established GITA through Resolution No. 172, dated February 19, 2014. Through this mandate, GITA is in charge of innovation policy implementation, including addressing supply-side market failures that limit the quantity and quality of research and innovation in Georgia, including in early-stage finance and innovation infrastructure. GITA will also address demand-side constraints related to the lack of innovative efforts by domestic firms.

39. As a newly established agency, GITA will require significant support and capacity building to ensure high-quality fiduciary and safeguards compliance, and for timely procurement and disbursement under various Project activities. Consequently, GITA will designate a qualified staff at the level of Chairman or Deputy Chairman, acceptable to the Bank, as Project Director ("PD"). In addition, GITA will hire, using Project proceeds, qualified and experienced staff, acceptable to the Bank, to fill specific operational advisory, fiduciary, and technical roles, as identified in the Project Operations Manual, and per Annex 3.

40. **MoESD will provide Project oversight and coordination.** Oversight will include providing guidance on Project implementation and reviewing and approving annual work programs, budgets, and reports. Coordination will entail facilitating Project activities and cooperation across Government and state agencies, and with donors and other relevant development initiatives.

41. **The overall oversight of the innovation agenda will be led by the Research and Innovation Council.** The Council is under the Prime Minister and includes key ministers and stakeholders. Its function is to coordinate innovation policymaking to ensure coherence in prioritizing policy actions, allocate resources, and assign clear responsibilities for detailed design of instruments. For this Project, the Council will serve as an overall strategic body, providing high-level guidance and inter-agency coordination.

42. **The Project will be implemented in accordance with the Project Operations Manual** (POM). The POM will include: (a) a detailed description of Project components and their implementation arrangements; (b) detailed Project cost estimates; (c) financial management arrangements; (d) roles and responsibilities of staff working on the Project; and (e) the Matching Grants Manual. The POM will be amended periodically to incorporate adjustments during Project implementation, in agreement with the Bank. Other integral project documents include the Broadband-for-Development Program Manual, Procurement Plan, and Environmental and Social Management Framework (ESMF).

B. Results Monitoring and Evaluation

43. **GITA will be in charge of all Project M&E**. A beneficiary management and data collection system will be developed to register all project beneficiaries, e.g. CIC and RIH users, and track the services they receive and results achieved (to the extent possible). The system will

also track the performance of matching grant recipients. An impact evaluation is included in Component 4, the details of which are to be determined. Finally, given the pilot nature of the CICs and RIHs, quarterly assessments of their performance will be done by independent experts (financed by the Project budget) during the first year, followed by semi-annual assessments thereafter.

C. Sustainability

44. Sustainability has been evaluated for the five largest (by costs of financing) activities. These are (a) CICs and RIHs; (b) BfD; (c) skills development; and (d) matching grants. If specific design considerations are maintained, the likelihood of sustainability of these activities following Project completion is substantial.

45. **CICs and RIHs**. The underlying objective of the CICs is inclusion, and sustainability will be based on the Government's commitment and support—at the central and local levels—to have an efficient structure, learn from lessons of pilots, and scale-up the program with design flexibility. Moreover, the CICs and RIHs will be designed to be a delivery channel for other parts of the Project, ensuring a minimum level of use. A financial analysis conducted for the RIHs and CICs suggests that the RIHs can operate in a financially sustainable manner as long as they charge user fees and maintain a moderate level of user demand (see **Annex 5,** section II). (Equipment replacement costs are included in the Project budget as well as in the financial sustainability analysis in outer years.) The CICs will likely require ongoing public subsidies given the lower estimated ability-to-pay of their poorer and more rural users. More will be known about the financial sustainability prospects following the pilots. That said, the most important period for the CICs and RIHs will be during the five-year life of the Project. After that time, the needs of the country will hopefully have evolved such that some services, e.g. basic digital literacy training, are no longer needed. If GITA and other stakeholders deem that the RIHs and CICs should continue operating, resources outside of the Project may be needed to help them evolve and meet emerging demands.

46. **Broadband-for-Development**. The BfD program will focus on specific groups of users (households, MSMEs with e-commerce potential) that will benefit from connecting to the broadband Internet and having access to IT. This is to help in defining a specific value proposition for beneficiaries, leading to economic benefits, to increase the likelihood of use of the funds and increase chances of beneficiaries continuing with these services. Second, the program includes capacity building (basic digital literacy for households, e-commerce training for MSMEs), which has been recognized as a key factor in the success of such demand-facilitation programs, and increases the chances of long-term sustainability as users benefit from the program.

47. **Digital economy skills development**. World Bank analytical work has found that there are no independent local training organizations that can fill—at scale and sustainably—the gap between formal education and on-the-job training. Absent such training, Georgia will not be able to prepare its workforce for an innovation- and knowledge-based economy. Yet, Government support to skills development cannot be indefinite. Over time, the program should prove to various stakeholders (especially employers and jobseekers) that the program benefits them, opening the possibility of their contributing to continue the program. With an assumption of four

years' of support (under this Project) there is sufficient time for the program to prove its value provided it is well managed with clear targets. Moreover, the 'training of trainers' will create a cohort of trainers that will be able to continue skills development into the future.

48. **Matching grants**. The benefits of the matching grants will be sustained by the beneficiary firms beyond the life of the Project in terms of start-ups and new products developed and innovation capacity built. To have additional matching grants calls for proposals beyond the life of the Project, new sources of funding would have to be identified.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

49. **Overall implementation risk is deemed to be substantial.** Key risks stem from the following key areas:

(a) **Institutional Capacity for Implementation and Sustainability.** GITA is a relatively young agency. While GITA has successfully organized several events and competitions and opened some labs, its ability to coordinate these and other activities on the larger scale demanded by the GENIE Project has yet to be fully tested. At the same time, the GITA team is particularly eager to succeed and demonstrate results. A robust capacity-building program for the people in GITA responsible for Project implementation will be included to mitigate this risk. Further mitigation will be provided by consultants financed by the Project to boost implementation capacity and an expert advisory body.

(b) **Technical Design of Project.** Low usage of CICs and RIHs is a design risk. Lackluster demand for the equipment and services provided by these innovations centers would constrain their ability to promote innovative and entrepreneurial mindsets and activities and contribute to the Project's development objectives. Low demand would also reduce revenues generated from user fees and potentially undermine the financial sustainability of the centers. This risk will be mitigated by: (a) the large-scale promotional campaign under Component 2; (b) the appraisal and mini-feasibility reports to be prepared before investing in the centers; and (c) a phased rollout process, based on results from the pilots and input from the quarterly and semi-annual evaluations by independent experts. Other design risks include lack of interest in the BfD program, digital economy skills development program, or the matching grants. Widespread awareness raising campaigns (leveraging the RIHs and CICs as well) will be used to increase the probability of success. As these interventions have to be validated to ensure they help attain the desired outcome of spurring increased activity among innovative firms or startups, the Project design includes pilots, scaling up on specific success criteria being met, and built-in modularity to ensure that facilities can adapt based on progress.

VI. APPRAISAL SUMMARY

A. Economic Analysis

50. **Market failures**. The Project components address a range of market failures that lead to underinvestment in innovation, skills development, and connectivity. These are described in detail in **Annex 5**.

51. **Economic cost-benefit model.** A cost-benefit model for the various interventions is developed in detail in **Annex 5**, which estimates that the overall GENIE Project is expected to achieve a positive net present value (NPV) over a 20-year analysis horizon and an economic rate of return (ERR) well above the assumed social discount rate. This result reflects separate appraisals of the innovation center components (Components 1.1, 1.2 and 2), matching grants facility (Component 3), and broadband-for-development program (Component 1.3). A bottom-up approach is employed to estimate the flow of expected incremental benefits (relative to a no-project counterfactual scenario) in each set of components. The highest estimated NPV and ERR of Project investments is for the BfD component, followed by the innovation centers and their services. The overall NPV is estimated at US$53.1 million, and the ERR at 18.9 percent.

Table 1. Summary of GENIE Project Economic Analysis (Baseline Scenario)

*Present value (million USD)**	Innovation centers	Matching grants	Broadband-for-development	TOTAL PROJECT
Benefits	62.2	14.6	33.1	109.9
Costs	39.0	10.2	7.5	56.7
Net benefits (NPV)	**23.3**	**4.3**	**25.5**	**53.1**
Economic rate of return	16.5%	11.1%	33.6%	18.9%

* Estimated over 20-year projection horizon at a 7 percent real social discount rate.

52. **The project return estimates are robust under various downside scenarios**. Furthermore, the estimates represent a lower bound on the potential magnitude and range of project impacts as they cannot fully capture positive externalities associated with increased innovation. In the case of the GENIE project, possible positive spillovers include other firms copying the innovations of RIH and CIC users and matching grant recipients, success stories inspiring more innovation and entrepreneurship, possible exponential growth of one or more startup firms nurtured by the Project, etc. Hence, the full economic impact of project interventions is likely to be greater than the baseline model estimates suggest.

B. Technical

53. The GENIE Project addresses important gaps in the national innovation ecosystem. While some activities replicate and apply successful examples from other World Bank projects (e.g. skills development, matching grants), others build on successful programs from other donors or governments (e.g. broadband connectivity, awareness raising). Some of the activities are newer in their design, picking up from innovative interventions in the developed world (e.g. the fab labs in the RIHs).

54. The Project has been designed to be strategic—providing an overall innovation and inclusion acceleration framework—while also being phased and flexible to allow testing of concepts, learning through experience, and improvement during implementation to maximize the positive outcomes for some of the newer types of activities. Project preparation has included consultations with various stakeholders, increasing buy-in for the Project activities, and informing the design of various components.

55. **Readiness**. The GITA is currently in the process of preparing TORs for project implementation support consultants. They are expected to be contracted in early 2016 using retroactive financing. Before effectiveness, GITA will need to have contracted the key implementation support consultants and prepared the Project Operations Manual. GITA is also expected to prepare the studies, designs, and bidding documents for the pilot RIHs and CICs.

C. Financial Management

56. A financial management (FM) assessment was conducted to determine whether the FM arrangements for the Project meet the World Bank's minimum requirements. GITA will be responsible for FM arrangements, including flow of funds, auditing, accounting, reporting, budgeting and staffing. The assessment of the FM arrangements for the Project found that GITA does not have relevant experience in FM of Bank projects. Hence, a time-bound action plan (Annex 3) aimed at building the financial management capacity at GITA has been elaborated and agreed with the client.

57. GITA will recruit a full-time financial consultant to support the FM team of GITA to manage the Project-related financial management and disbursement work. GITA will modify ORIS accounting system software to support Project accounting and reporting. The system shall have the functionality of automatic generation of reports for the government as well as statements of expenditures (SOEs) and Interim Financial Reports (IFRs) required for reporting to the Borrower and the World Bank. The system shall have adequate security safeguards for reliable reporting and data integrity. All FM staff of GITA will receive focused training when the Project launches and hands-on training during implementation. The FM Manual, which is part of the Project Operations Manual, will be elaborated to describe budgeting, audit arrangements, internal control and accounting policies, and procedures to be followed for the Project.

D. Procurement

58. The Project will finance procurement of different type of goods required for the CICs and RIHs, as well as minor refurbishing works for their facilities. The Project also includes a cashback for the cost of setting up a physical internet connection and IT purchases for eligible households and SMEs. The cashback mechanism will be operated through a locally operating and competitively-selected bank, to assist in administration.

59. Technical assistance and capacity building will include consulting services for provision of surveys, monitoring and evaluation as well as provision of training to GITA as well as to those companies participating in matching grant component of the project. It is envisaged that matching grants provided to such private companies will be of two types: Startup Up as well as Innovation Matching Grants. Detailed procedures of selection criteria as well as disbursement of

funds against the winning proposals will be elaborated further in the Grants Operations Manual to be developed by GITA. More detail on the procurement arrangements are included in Annex 3.

60. The draft Procurement Plan (PP) has been prepared by GITA and cleared by the Bank. A detailed procurement capacity assessment was undertaken. GITA will be responsible for all procurement related aspects. Based on the procurement assessment, GITA currently does not possess any capacity to undertake procurement activities under the Project due to lack of exposure to any donor-funded projects. To this end, certain risks have been identified with respective mitigation measures as outlined in Annex 3.

E. Social and Environment (including Safeguards)

61. **Environment.** The Project will finance rehabilitation of premises for CICs and RIHs. Because the Project carries a physical investment component involving rehabilitation of buildings, the OP/BP 4.01 Environmental Assessment is triggered, as is OP/BP 4.11 Physical Cultural Resources. The envisaged civil works will have modest local environmental and social impacts, which would be easy to mitigate by ensuring that works providers adhere to the conventional good construction and environmental practices. Therefore, the Project is classified as environmental Category B. The Borrower has prepared and disclosed an Environmental and Social Management Framework (ESMF) to guide site-specific environmental and social work under individual investments.

62. For the start-up and innovation matching grants, major civil works will not be eligible for financing. Initiatives related to the production of arms, spirits, tobacco, and hazardous substances will be excluded from support through the Project. The ESMF will cover these and other safeguard aspects of matching grant schemes, establishing rules for environmental and social screening, approval and monitoring of grant applications and of the grant financed activities.

63. **Social.** Overall, the Project is expected to have positive social impacts. Many of the interventions are targeted at expanding opportunities for firms and individuals in less developed regions outside of Tbilisi, including through CICs, RIHs, training, and access to broadband internet. For example, the broadband-for-development program will include awareness building among poorer and socially vulnerable households to encourage their participation.

64. **Inclusion of women** will be mainstreamed throughout the Project, addressing some societal norms that prevent women from participating in innovation and technology through education campaigns, by creating an inclusive environment (and including activities that are of more interest to women) in CICs and RIHs, and by ensuring that subsidies and digital literacy training are provided directly to women when appropriate. For example, the CICs or RIHs could have women-only events, and female entrepreneurs could be invited to present success stories. Information on women's interests and obstacles to participation in innovations and technology is limited, so women attending CICs and RIHs will be asked about these issues. This information will be used to understand what activities would further promote the involvement of women.

65. The Project will also actively seek **beneficiary feedback** in each component, resulting in strong **citizen engagement**. Local communities will be consulted in the feasibility assessments

of potential CIC and RIH locations and their input and specific needs reflected in the design of the centers' activities and offerings. Once the CICs and RIHs are operational, their users will provide feedback on the quality of training and other services. Households and MSMEs connected to broadband will be invited to provide feedback on the quality of service and help to improve it by reporting system outages and connectivity problems. In some cases, those receiving training, grants, or technical assistance through other components could also be asked to provide feedback about the usefulness of activities and ease of processes. The Project will ensure that those giving feedback understand how and whether their feedback informed Project activities. This will be done by posting feedback and responses online.

66. The Project does not trigger OP 4.12 Involuntary Resettlement, since all activities requiring land acquisition or impacting negatively on livelihoods of formal or informal users of land will be screened out. RIHs and CICs will be established only in existing buildings and will not require land acquisition. The mechanisms for screening out investments with negative social impacts is described in the Project's Environmental and Social Management Framework.

F. World Bank Grievance Redress

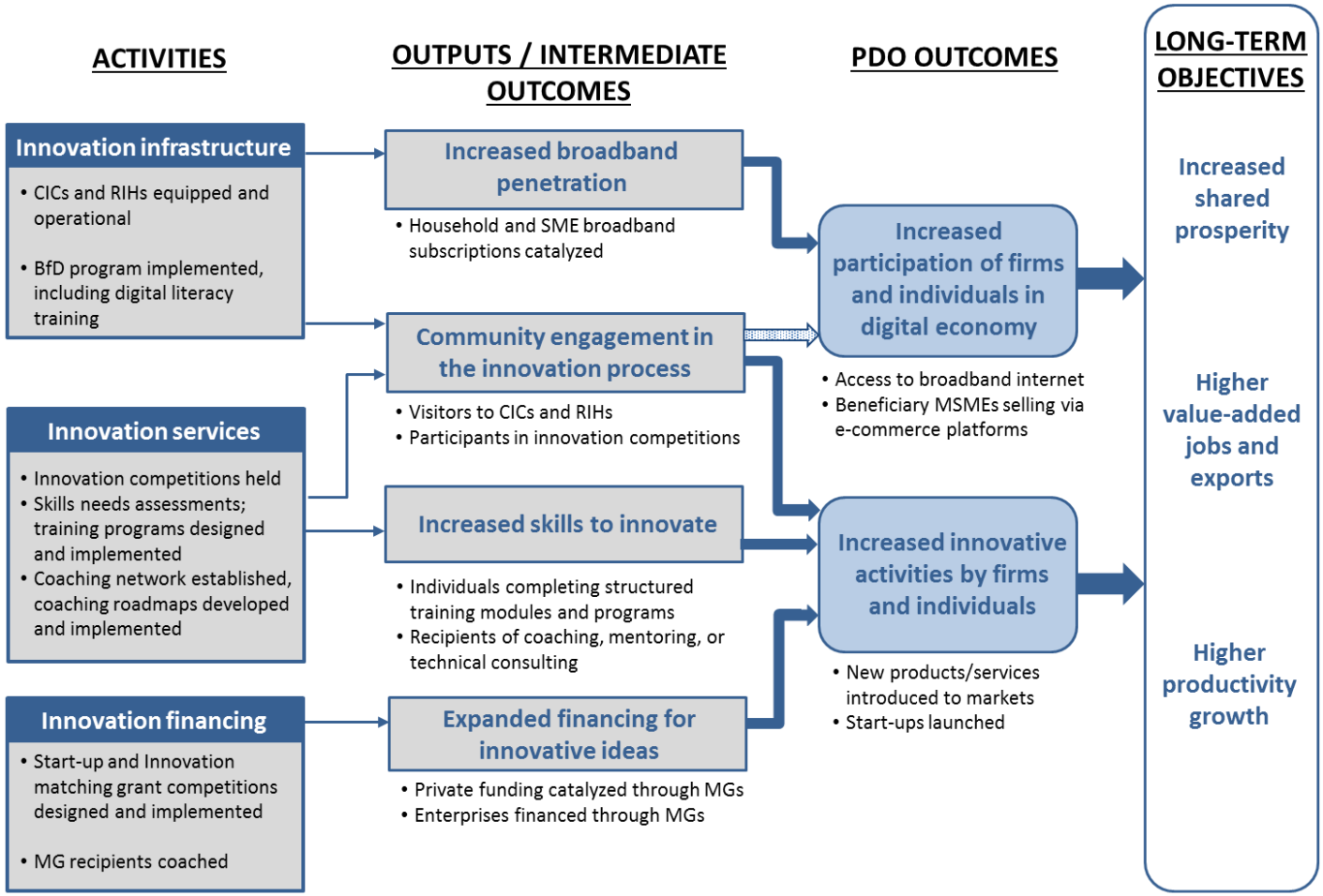
67. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported Project may submit complaints to existing Project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address Project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate GRS, please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank Inspection Panel, please visit http://www.inspectionpanel.org.

Annex 1: Results Framework and Monitoring

GEORGIA: National Innovation Ecosystem (GENIE) Project (P152441)

This annex presents: (a) the summary results chain for the project; (b) PDO and Intermediate Results Indicators; (c) indicator descriptions (for b).

Figure 1.1. Project Results Chain



Results Framework

Project Development Objectives

PDO Statement

The project development objective is to increase innovative activities of firms and individuals in the Borrower's territory and their participation in the digital economy.

These results are at	Project Level

Project Development Objective Indicators

Indicator Name	Baseline	Cumulative Target Values				
		YR1	YR2	YR3	YR4	End Target
New/improved products or services introduced to new or existing markets by Project beneficiaries (Number)	0	0	30	70	130	200
Start-ups launched by Project beneficiaries (Number)	0	0	60	140	240	340
Access to broadband Internet (number of subscribers per 100 people) (Number)	39	40	41	43	46	50
Beneficiary MSMEs selling via e-commerce platforms (Number)	0	50	100	200	300	400

Intermediate Results Indicators

Indicator Name	Baseline	Cumulative Target Values				
		YR1	YR2	YR3	YR4	End Target
Direct project beneficiaries (Number) – (Core)	0	2,500	11,900	25,600	44,500	64,000
Female beneficiaries (Percentage - Sub-Type: Supplemental) - Core	n.a.	15	15	15	20	20
Component 1: Innovation Infrastructure						

RIHs established, equipped, and operational (Number)	0	3	5	6	7	8
CICs established, equipped, and operational (Number)	0	10	20	30	40	50
Visitors to CICs and RIHs (Number)	0	0	12,500	40,000	85,000	150,000
Female visitors to CICs and RIHs (Percent of total - Sub-Type: Breakdown)	n.a.	n.a.	15	15	20	20
New household and MSME broadband subscriptions catalyzed (Number)	0	1,800	7,200	14,400	25,200	33,000
Component 2: Innovation Services						
Innovation competitions and exhibitions supported by Project (Number)	0	25	65	125	200	275
Participants in innovation competitions and exhibitions supported by the Project (Number)	0	350	850	1,900	3,000	4,400
Recipients of basic digital literacy training (Number)	0	1,500	6,500	14,000	25,000	30,000
Individuals completing structured training modules and programs (Number)	0	400	1,700	3,900	6,800	10,000
Females completing structured training modules and programs (Percent of total - Sub-type: Breakdown)	n.a.	15	15	15	20	20
Beneficiaries of coaching, mentoring, and technical consulting (Number)	0	20	60	100	140	180
Component 3: Innovation Financing						
Private financing mobilized through matching grant programs (US$)	0	0	650,000	1,300,000	1,950,000	1,950,000
Enterprises and start-ups financed through matching grants (Number)	0	0	52	104	156	156
Component 4: Project Implementation Support						

Government and associated professionals/staff receiving capacity building through trainings, workshops, study visits, etc. (Number)	0	15	30	45	60	75
Citizen engagement: user feedback collected from Project beneficiaries (Number)	0	100	500	2,000	3,500	5,000

Indicator Description

Project Development Objective Indicators

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
New/improved products or services introduced to new or existing markets by Project beneficiaries	A product innovation is the market introduction of a new or significantly improved good or service with respect to its capabilities, user friendliness, components or sub-systems. Process innovation, meaning the implementation of a new or significantly improved production process, distribution method, or supporting activity, will also be counted here if it impacts a product or service on the market.	Semi-annual	GITA monitoring system	GITA
Start-ups launched by Project beneficiaries	Number of start-up firms that were created or grew from a nascent stage by beneficiaries of Project services or matching grants.	Semi-annual	GITA monitoring system	GITA
Access to broadband Internet (number of subscribers per 100 people)	Number of people who pay for access to the broadband Internet per 100 people in a given country.	Quarterly	GNCC	GITA
Beneficiary MSMEs selling via e-commerce platforms	Number of MSMEs receiving Project support that sell at least GEL 2,500 worth of goods or services online, through any e-commerce platform.	Annual	GITA monitoring system	GITA

Intermediate Results Indicators

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Direct Project beneficiaries	Includes recipients of broadband connections under component 1.3; participants in innovation competitions; participants in structured training modules; recipients of digital literacy training (excluding those through component 1.3), beneficiaries of coaching, mentoring, and technical consulting; enterprises and individuals financed through the	Semi-annual	GITA monitoring system	GITA

	Project's matching grants program; and government and GITA staff receiving Project training/capacity building. It excludes general visitors to RIHs and CICs.			
Female beneficiaries	Percentage of the direct project beneficiaries that are female.	Semi-annual	GITA monitoring system	GITA
Component 1: Innovation Infrastructure				
CICs and RIHs established, equipped, and operational	Number of Community Innovation Centers and Regional Innovation Hubs supported directly by the Project that are established, equipped, and operational.	Semi-annual	GITA monitoring system	GITA
Visitors to CICs and RIHs	Number of visitors to CICs and RIHs supported by the Project. This refers to the number of entries into CICs and RIHs, rather than distinct individuals. For instance, if the same person users a CIC or RIH on 5 separate occasions, this is counted as 5 visitors. The number includes visitors coming to receive training and participate in innovation competitions.	Semi-annual	GITA monitoring system	GITA
Female visitors to CICs and RIHs	Percentage of total visitors that are female.	Semi-annual	GITA monitoring system	GITA
New households and MSME broadband subscriptions catalyzed	Subscriptions directly resulting from use of installation and training voucher financed through GITA's BfD program.	Semi-annual	GITA monitoring system	GITA
Component 2: Innovation Services				
Innovation competitions and exhibitions supported by the Project	This includes competitions such as hack-a-thons, make-a-thons, and create-a-thons, as well as exhibitions hosted by GITA to connect businesses with innovators.	Semi-annual	GITA monitoring system	GITA
Participants in innovation competitions and exhibitions supported by the Project	If a person participates in multiples competitions or exhibitions, this is counted multiple times.	Semi-annual	GITA monitoring system	GITA
Recipients of digital literacy training	This includes those who receive training (predominantly at the RIHs and CICs) using their voucher from the purchase of broadband internet (Component 1.3) and those who are trained at the RIHs and CICs independently of the BfD program.	Semi-annual	GITA monitoring system	GITA
Individuals completing structured training modules and programs (Number)	This includes participants in the longer-term dedicated ICT training program, shorter on-demand training classes at the innovation centers, e-learning modules, and e-commerce training delivered through the	Semi-annual	GITA monitoring system	GITA

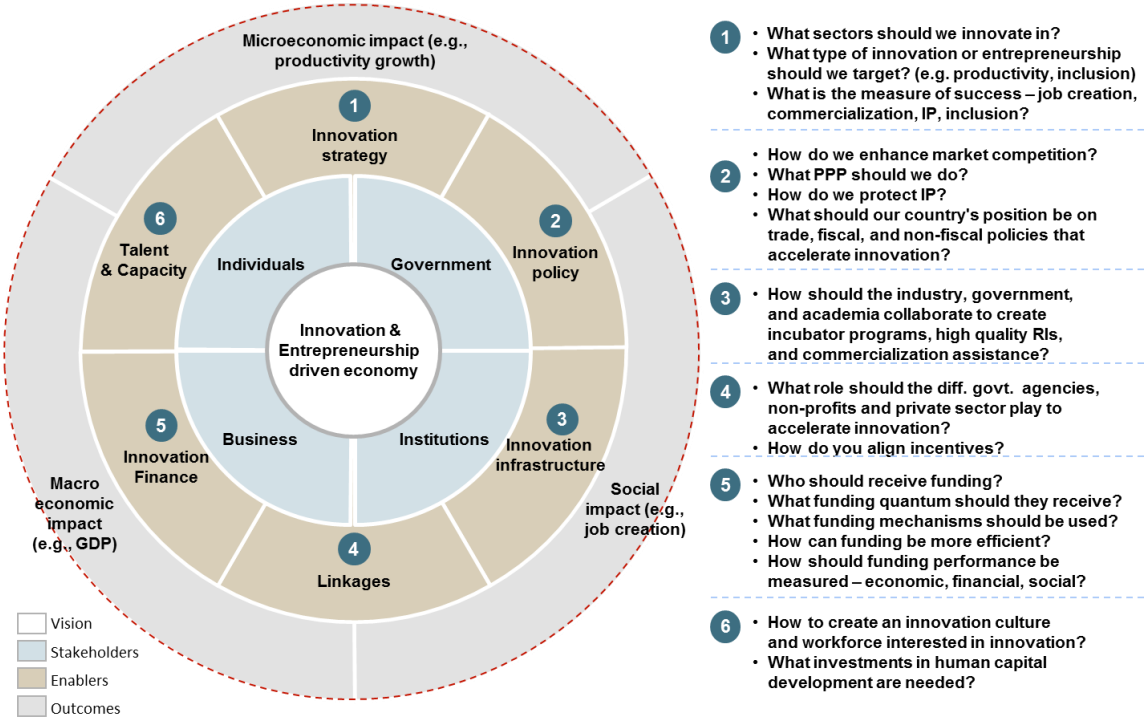
	BfD program. If the same person participates in multiple training courses or modules, this is counted multiple times.			
Females completing structured training modules and programs (Percent of total - Sub-type: Breakdown)	Female percentage of total individuals completing structured training programs and modules.	Semi-annual	GITA monitoring system	GITA
Beneficiaries of coaching, mentoring, or technical consulting	Each coaching, mentoring, or technical consulting arrangement is counted once, even if multiple sessions are involved.	Semi-annual	GITA monitoring system	GITA
Component 3: Innovation Financing				
Private financing catalyzed through matching grant programs	Private financing committed by participants in the start-up and innovation matching grant programs operated by GITA.	Semi-annual	GITA monitoring system	GITA
Enterprises and start-ups financed through matching grants	Number of enterprises and start-ups financed by GITA's Start-up and Innovation matching grants programs.	Semi-annual	GITA monitoring system	GITA
Component 4: Project Implementation Support				
Government and associated professionals/staff receiving capacity building through trainings, workshops, study visits, etc.	This refers to capacity building events organized by GITA. If the same individual participates in multiple trainings, workshops, etc., this is counted multiple times.	Semi-annual	GITA monitoring system	GITA
Citizen engagement: user feedback collected from Project beneficiaries	Number of user feedback forms completed by CIC and RIH users, training recipients, participants in innovation competitions, and matching grants beneficiaries.	Semi-annual	GITA monitoring system	GITA

Annex 2: Detailed Project Description

GEORGIA: National Innovation Ecosystem Project

1. The Project aims to increase innovative activities of firms and individuals, and their participation in the digital economy through an integrated approach across three components of the stylized national innovation ecosystem (Figure 2.1). Addressing different gaps in the innovation ecosystem, each component will leverage the inputs and outputs of other Project components, as well as those of complementary projects, to ensure that the development objective of the Project is realized in an integrated fashion.

Figure 2.1. Framework for the Innovation and Entrepreneurship Ecosystem



Source: Authors' adaptation from Boston Consulting Group.

2. Each of the Project components focuses on a critical aspect of the overall ecosystem, with a view to relieve the key constraints to innovation-led enterprise growth in Georgia: (a) low "innovation-readiness" of the workforce; (b) underdeveloped innovation infrastructure; (c) poor access to finance for innovation; and (d) limited integration of ICT in the economy. The components will form the basis of an innovation acceleration framework to raise general public awareness of innovation, include more people—especially in rural areas and smaller towns—into the innovation ecosystem, and provide customized infrastructure, services and financing support for different categories of beneficiaries. This framework of Project support is built around a tiered "pyramid" structure of ecosystem beneficiaries, with each level/category of beneficiaries requiring progressively more sophisticated and customized infrastructure, services and financing support from the GENIE Project (Figure 2).

3. The various levels broadly correspond to three key stages of the innovation and entrepreneurship process: (a) the inclusion phase, where members of the general public (e.g. students, firms, workers, farmers) initially gain awareness of the possibilities of innovation and entrepreneurship and seek to engage in the ecosystem; (b) the acceleration phase, where these promising latent innovators and entrepreneurs receive targeted support to develop their ideas and startup companies; and (c) the "take off" phase, where the startups and innovative SMEs seek to expand their capital base, customer network, and quality and sophistication of product and service offerings to achieve rapid growth. While the GENIE Project is designed to provide support at each of these phases and be able to elevate any single beneficiary from the lower levels of the "pyramid", firms and entrepreneurs already at more advanced stages in the process can also access Project support at any level to best suit their specific needs. Moreover, the Project interventions are not all-encompassing, but rather designed to complement other infrastructure, services, and financing instruments in the innovation ecosystem (these are denoted in blue text in Figure 2).

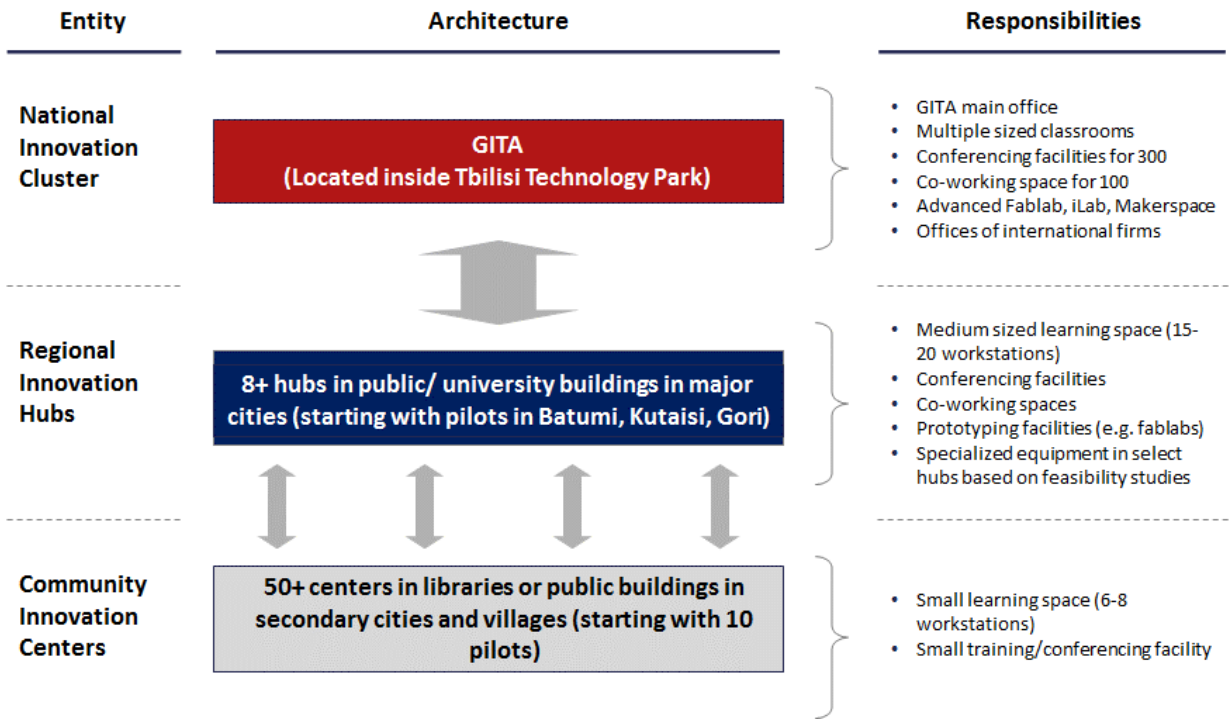
4. Piloting, monitoring, and feedback mechanisms will be a key part of the Project. An IT-based beneficiary management system will be developed to allow GITA to track who enters the system, at which stage, how they are supported, and results achieved, as well as to collect user feedback. This will complement and inform assessments of selected Project instruments by independent experts every quarter during the first year of the Project and every semester thereafter (at least for the first 2.5 years of the Project). The assessments will focus particularly on how the CICs and RIHs are functioning and if/how the infrastructure and services they provide need to be adjusted to improve performance. These assessments will also inform how the CICs and RIHs will be rolled out beyond the initial pilots.

5. The infrastructure and service offerings are expected to evolve based on what is learned from the pilot activities in the first two years of the Project. User demand and feedback, as well as results on the ground, will inform how the Project is rolled out over its lifetime. For that reason, the structure is relatively flexible, allowing higher performing activities to be scaled up and others scaled down.

Component 1: Innovation Infrastructure (US$14.7 million)

6. This component will support the development of GITA's envisioned hub-and-spoke network of innovation centers across Georgia, as well as increase the use of broadband Internet services among rural households and MSMEs. Collectively, this innovation and broadband infrastructure will provide the connectivity, physical space and equipment for beneficiaries to access the broadband internet, CIC and RIH services provided by the Project and connect to the innovation ecosystem. This is expected to both stimulate entrepreneurship and new product development and reduce the digital divide.

Figure 2.2. Government's Envisioned National Innovation Center Network



7. A schematic outlining the role, responsibilities and interactions for this national network of innovation centers is provided in Figure 2.2. The national innovation cluster in Tbilisi (featuring the Techno Park) is being financed out of GITA's budget. Project funds will focus on establishing Regional Innovation Hubs (RIHs) in other major cities and smaller Community Innovation Centers (CICs) in second-tier towns and village. The RIHs and CICs will be set up in existing buildings, meaning new construction will not be required. The RIHs will be overseen directly by GITA, and different management models, e.g. contracting management to NGO or private sector operators, will be piloted. The CICs will be operated in conjunction with local partners, such as municipalities and/or libraries. The local partners are expected to provide the physical space, as well as contribute to upgrading of the space (if necessary). These innovation centers will be modular and differ in size, content, and function, responding to specific local needs. The centers will serve as a delivery platform for other key activities and programming in other Project components, including training and skills development and the hosting of innovation competitions. They will also support the promotional efforts to raise awareness of the benefits of innovation and to help instill entrepreneurial mindsets.

8. The rollout of these RIHs and CICs will be gradually phased, subject to the satisfaction of specific criteria for success (defined below), and build on lessons learned from pilots. The pilots will include: (1) three RIHs in high-priority and high-potential cities (likely Batumi, Kutaisi, and Gori) in the first year of the Project;[25] and (2) ten CICs in villages, with some paired with the

[25] The pre-selection of these three locations was based on field work that showed high-levels of willingness, readiness, and ability to start the RIH as pilots. A positive attitude towards the dissemination of lessons learnt was also taken into account.

RIHs.[26]

9. As the RIHs and CICs are a new concept in Georgia, their success based on the initial design is not guaranteed. For that reason, their scaling up will be informed by lessons learned, user demand, and satisfaction of pre-defined success criteria. About five more RIHs could be added later in the Project implementation period, with those locations selected based on mini-feasibility studies, and approved by the Bank. Similarly, up to 40 additional CICs nationwide could be financed by the Project, based on the satisfaction of pre-defined success criteria. The Government has plans to rollout up to 200 CICs nationwide, and may seek additional financing from the Bank or other donors in the future for this program.

10. The intention is for both the RIHs and CICs to be as self-sustaining as possible. Hence, the Project will cover the administrative and operating expenses of the centers during their start-up phase and assist in developing an appropriate financial model to enable the transition. In due course, users will contribute through subscription fees and tuition for trainings.

11. Component 1 will also assist eligible rural households and MSMEs in rural areas in acquiring information technology, connect to broadband Internet, and access training. Training for rural households will focus on basic digital literacy, while for MSMEs, it will focus on assisting them to engage in e-commerce.

Subcomponent 1.1: Community Innovation Centers (CIC) (US$1.9 million)

12. The Project will finance a total of about 50 CICs; 10 in a pilot phase, and 40 additional CICs in a follow-up phase (subject to the success of the pilots). The CICs are intended to be the primary mechanism for inclusion of beneficiaries in rural communities and smaller cities into the innovation ecosystem. They will be limited to a single classroom (with 6–8 computer workstations connected to broadband Internet of at least 10 Mbps), basic technology equipment, and a training room with conferencing and possibly co-working facilities. One of the functions of the CICs will be to identify and mobilize latent innovators and then connect them to the appropriate infrastructure, services, and financing opportunities within the innovation ecosystem. They will thus aim to channel high-potential users to the RIHs while at the same time operating as the delivery units for activities coordinated by the hubs. Examples of activities include periodic trainings, seminar, and webinars on entrepreneurship and innovation, as well as innovation competitions and outreach activities developed under Component 2.

13. The CICs will be established in existing public libraries or other facilities owned and maintained by local municipalities, who are also expected to contribute to upgrading expenses. In the pilot phase, the CICs will be linked with the RIHs (with an estimated 3 CICs per RIH), and their locations will be selected based on criteria defined in the Project Operations Manual, such as local population, building readiness, interest of local government, and availability of a fiber optic connection. The criteria and justification for selection will be described in a short appraisal report for each CIC. In cases where GITA will partner with local authorities to develop a CIC, a Memorandum of Understanding (MoU) or similar agreement between GITA and the

[26] The timeline for establishing the three initial RIHs could potentially be brought forward to late 2015 if the government requests retroactive financing for this purpose, subject to Bank approval.

local government partner should be signed, specifying the governance structure of the center, its legal status, and the sharing of financial responsibilities. At this time, local governments are expected to support ongoing operational costs, including stationery, electricity, etc. GITA has begun piloting the CIC model in three locations, and the results of this effort will be taken into account for Project-financed activities.

14. For each CIC, the Project will finance about US$40,000 (equivalent) to cover the local staff (and associated training), furniture, equipment, related services (e.g. Internet connectivity), and if necessary, part of upgrading needed to operationalize CICs as spaces for learning and connectivity in smaller cities and villages across the country. Operating expenses of the centers such as utilities and maintenance—with the exception of personnel covered in Component 2—could also potentially be covered.

15. The pilot phase financed through the Project will be for US$300,000 to rollout about 10 CICs, with the target of attaining success within the first year of operation of the pilot CICs. An additional 40 CICs will be financed by the Project, following a successful pilot phase (see Figure 2.3). With a focus on the inclusion objectives of the Project, success is defined in Table 2.1. Meeting these criteria for at least 10 CICs will be a condition to access the remaining US$1.6 million for the full rollout. In case the results of the pilot do not meet these criteria, the design of this activity will be evaluated and restructured as needed.

Table 2.1. CIC Success Criteria

Indicator	Locations with Population < 300	Locations with Population > 300
% of population (aged 15–64 years) trained in digital literacy	35	20
% of population (aged 15–64 years) who pay the annual CIC subscription fee (est. US$5)	25	15
% of CIC subscribers who visit an RIH at least once	10	5

16. Over time, CICs are expected to increase the range of services offered based on local demand. However, no major increase in the infrastructure and facilities are foreseen in the current model. The CICs' future will be determined based on the performance, and the willingness-to-pay of the users and beneficiaries, and their ability to raise funding either from local governments or from donors. GITA plans to rollout 200 CICs across the country by 2019, and may seek additional financial support from the Bank or from other donors in the future.

Subcomponent 1.2: Regional Innovation Hubs (RIHs) (US$3.8 million)

17. The RIHs will offer infrastructure and services to the range of beneficiaries shown in Figure 2. They will also coordinate a program of interventions and activities in the network of CICs in surrounding regions (including trainings, competitions, etc.), and aim to leverage comparative advantage or specialization of their regions to promote the clustering of knowledge, firms, and economic activities. Each of the regional hubs will consist of state-of-the-art classrooms (each with 15–20 workstations, along with high speed Internet connectivity of at least 100 Mbps), co-working spaces for use by new and existing entrepreneurs, and meeting and conferencing facilities. They could also include one or more product prototyping facilities such as fabrication labs (fab labs) or innovation labs (iLabs). See Annex 4 for details on the fab lab concept.

18. Some of the hubs may be defined as advanced RIHs with a sector specific focus and specialized equipment that would serve the needs of particular industries/clusters. In some cases, these advanced RIHs could also evolve to respond to specific research commercialization objectives, for instance in biotechnology, advanced manufacturing, etc. A site-specific, feasibility study would have to be prepared for each advanced RIH to determine any sector-specific infrastructure or service offerings; this would build on ongoing and completed analyses done by the State Chancellery and a team of researchers already contracted by GITA. Design of the RIHs will also evolve based on the results of rolling out pilot fab labs (one opened in Tbilisi in early 2015, and two more are planned for inauguration in late 2015).

19. This subcomponent will finance the physical capital needed to establish and equip about eight regional hubs, as well as the core staff for their operation. Training and mentoring will also be covered for management. Various operating costs, with the exception of personnel covered in Component 2, will also potentially be covered depending on the arrangement with the local municipalities. Altogether the three pilot RIHs are expected to test innovation acceleration services to firms developed in Component 2—e.g. coaching, mentoring, technical consulting, skills development, and possibly other to-be-determined assistance with market research, certifications, IP assessments, accessing networks, etc.—especially if the target audience envisions becoming export-oriented.

20. The rollout will be conducted in two phases: a pilot phase of three RIHs, and following successful completion of the pilot, rollout of another 3–5 RIHs (see Figure 2.3). The pilot phase will target success within the first year of operation of the hubs. With a focus on the Project's objective to support growth of innovative SMEs, success is defined as each pilot RIH developing a total of at least 20 start-ups and products/services, of which at least 20 percent are high-tech.[27] The Project will initially cover costs of up to US$2.1 million to cover the pilot phase. Disbursements of the remaining US$1.7 million will be conditional on meeting the success criteria defined herein. In case the results of the pilot do not meet this criteria, the design of this activity will be evaluated and restructured as needed.

Table 2.2. RIH Success Criteria

Indicator	Per Pilot Hub
A. Number of start-ups created and operating by RIH users	20 (combined total from A and B)
B. Number of new products and services developed by RIH users	
C. Number of start-ups (A) and new products and services (B) that are high-tech	4

Note: The same firm cannot be counted twice for both A and B.

21. **Operating models.** As mentioned above, GITA aims to pilot the management models for the RIHs. Two initial options proposed by GITA are described below. Under each option, GITA would own the RIH and its equipment and the RIH would report to GITA. Generated income would go to GITA's account and be spent on the sustainability of the RIH. GITA staff would be assigned to coordinate the RIH network. Support would ideally be provided by the local municipality in the form of identification of the venue, renovations, outreach to the community,

[27] Using the definition from high-tech exports, this refers to products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery.

and possibly tax and other incentives. The management models could be subject to change and will be further elaborated in the POM.

(a) **Management of RIH outsourced** (preferred option). GITA hires a management company for each RIH though a competitive selection process. The management company gets a service fee for managing the RIH and reports to GITA on a quarterly basis. A 3 year contract is signed between GITA and the management company, which includes specific responsibilities and indicators. The contract could be extended based on the fulfillment of the obligations and success indicators.

(b) **Components of RIH outsourced.** GITA, in collaboration with the local municipality, competitively selects a manager who reports to GITA and is responsible for the success and effectiveness of the RIH. Different components of the RIH (co-working, training room, etc.) could be outsourced to different operators.

22. **RIH and CIC performance assessments.** As noted above, the performance of each RIH and CIC will be assessed each quarter during the first year of operations and then each semester thereafter. If a CIC or RIH is found to be seriously underperforming, then it will be put on a "performance improvement plan", e.g. for one year. If performance does not adequately improve during that time, then a decision will be made by GITA, in conjunction with local authorities, whether the center should be closed.

23. The RIHs and CICs will also benefit from lessons learned from InfoDev's support for digital innovators, e.g. through "mLabs" and "mHubs". Examples of lessons include the importance of location (meaning accessible and affordable in terms of time and travel costs), choice of manager[28], outreach to women, and allowing adequate time to achieve sustainability.

24. Subcomponents 1.1 and 1.2 would finance trained personnel in the CICs and RIHs to manage the centers, provide information about available resources, assess needs of users, and deliver basic digital literacy trainings. Available resources refers to the infrastructure (computer/Internet access, meeting and conferencing facilities, and co-working spaces developed through Component 1), services such as training, coaching, and mentoring (developed as part of Component 2), and financing (Component 3). In some cases, CIC and RIH staff could be provided by local partners, e.g. municipalities, libraries, or universities. In such cases, the staff will be trained on the services that the CIC and RIHs can provide, as well as other elements of the innovation ecosystem, so they can serve as the first—and in the case of CICs, likely only—point of contact for a user who walks in the door or contacts the center. Reference materials for CIC and RIH users will also be developed. In cases where staff costs are not covered by local partners, this component would finance and train consultants to operate the centers (particularly in the case of RIHs, which will be operated directly by GITA).

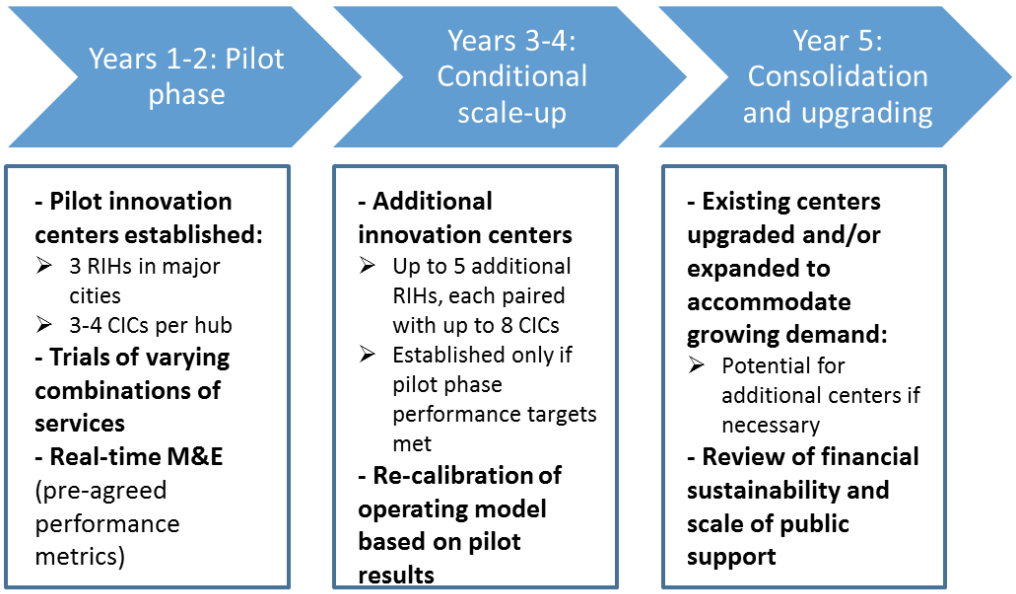
25. As mentioned above, a key function of both the CICs and RIHs is to draw users into the

[28] Managers of the RIHs should reach out to all relevant stakeholders and communicate the value of the centers. It is helpful if managers are entrepreneurs themselves, and/or have established relationships with investors and industry players. They also need to inspire the trust of the communities they serve, be passionate about building successful enterprises, understand social inclusion and development goals, and keep abreast of developments in the market.

innovation acceleration framework shown in Figure 2. Trained personnel would facilitate this first through a brief screening providing basic information about the CIC/RIH's services to raise awareness and identify the user's initial interests. Users who express interest could then undergo a "needs assessment" (Level 1 in Figure 2). The assessment would be designed to identify latent or existing innovators and direct them to the infrastructure, services, and/or financing (Levels 2–3, offered by GITA or other partners) that best meets their needs and interests. A needs assessment template/ methodology would be developed for this purpose, and one or more staff in each CIC and RIH would be trained in applying it. User-friendly materials on available resources would also be prepared. For that part of the public that is not likely to become part of the innovation acceleration framework, the initial screening could be used to direct them to more basic services, such as digital literacy training modules on center computers. Throughout, the interactions of users with the RIHs and CICs will be tracked using an IT-based beneficiary and content management system developed through the Project.

26. To facilitate the timely roll-out of the CIC and RIH pilots, retroactive financing is expected to be used for the preparatory studies (appraisal reports and mini-feasibility studies), preparation of procurement documents, and potentially the contracting of minor works. CIC and RIH managers are also expected to receive training before the opening of the pilot centers.

Figure 2.3. Indicative Timeline of CIC and RIH Rollout



Subcomponent 1.3: Broadband-for-development (BfD) (US$9.0 million)

27. Widespread access to and use of affordable and high-quality broadband Internet connectivity is an essential requirement for an innovation- and knowledge-driven economy. High-speed or broadband Internet connectivity enables individuals and businesses to connect with markets and resources more efficiently and transparently, improving the possibility to trade and to access knowledge across borders. Recognizing this potential, and the role of the broadband Internet as an enabler of innovation, the Government seeks to improve Internet infrastructure and usage across the country, with a specific focus on rural and underserved areas,

and on people who might be at risk of being "left behind" in the digital economy. This subcomponent will help to include more households and MSMEs in the innovation- and knowledge-driven digital economy by supporting their adoption of advanced ICTs.

28. The Georgian Internet access market is competitive, with five larger private telecommunications companies rolling out a mix of wireless and wireline Internet networks across the country. There are also a large number of smaller ISPs that have regional or even community-level networks. At present, there are 132 small rural ISPs that collectively have 54,000 subscribers (about 406 per operator, on average). Together, these companies have rolled out multiple cable and/or fiber optic 'backbone' and access networks, and widespread wireless networks that connect cities, regions, and smaller communities where the commercial case is viable. However, the Georgian National Communication Commission (GNCC) has identified that about 2,000 villages (with populations of more than 200 people) across the country do not have access to broadband Internet connectivity, as they do not pose a commercially viable case and hence the private sector has not yet and is unlikely to invest in connecting them. Those identified geographical territories fail to attract sufficient private investments and therefore represent the market failure caused by the high unit cost for broadband internet infrastructure deployment.

29. To address this market failure and with a view to bridge the digital divide and to include these territories, and their businesses and residents into the innovation economy, the Government (specifically GITA) in collaboration with the GNCC, has launched the "OpenNet" initiative that will provide broadband backbone and backhaul connectivity to 1,963 villages across Georgia. The overall network will be constructed in phases, and the Government estimates that the total program will cost about US$150 million, funding for which is being provided by a private foundation.

30. This subcomponent of the Project will support ongoing efforts of the GoG to address the mentioned above market failure and digital divide through the BfD program, which will facilitate demand for broadband internet access and services, including those benefitting from the "OpenNet" initiative. The aim of these activities is to increase the adoption and use of broadband Internet services and advanced IT, with a focus on rural areas. It will include two activities: (a) support for households, and (b) support for e-commerce adoption by MSMEs.[29] Technical implementation of those activities will be outlined in the BfD Program Manual.

(a) Support for rural households (US$4.5 million)

31. This activity will support increased adoption of broadband services among rural households to ensure their participation in the digital economy. The focus on rural households is driven by the existing digital divide that exists in their ownership of personal computers and access to the Internet. Data of 2013 from the Integrated Household Survey, conducted yearly by Geostat, finds that among rural households only 10 percent have Internet connections, while 21 percent have computers. This is very low when compared with Tbilisi, for example, where the

[29] The design of this program benefits from the initial findings of the World Bank's World Development Report 2016, on Digital Dividends. See http://www.worldbank.org/en/publication/wdr2016

corresponding figures are 74 percent and 79 percent, respectively.[30]

32. Aside from the market failure on the supply side articulated above, this gap may also be attributed to three obstacles on the demand side, even where network infrastructure exists (or will exist in the future, supported by the Government's network rollout program). These are: low affordability of devices such as computers or smart phones; significant one-time expense to install Internet services; and low levels of digital literacy. Consultations with rural ISPs have clarified that most rural households that do not subscribe to broadband Internet services are unable to afford the 'installation fees' that are associated with starting service. Such fees are typically about GEL 150–200, and include the cost of setting up the physical connection to a household. These consultations also exposed the lack of knowledge among rural households about the uses of the broadband Internet beyond simpler social networking or basic communication (e.g. use of Skype).

33. Hence, given the GoG efforts to address market failure on the supply side, Project financing will focus on two aspects that are supporting and complimenting GoG efforts on the demand side: (1) providing a cash-back incentive to eligible households to acquire an eligible device, and (2) offering them a voucher to cover broadband internet access service installation costs and to provide basic digital literacy training. The devices selected will be entry-level (e.g. priced up to GEL 800), intending to address the gaps in rural access and use of ICT. Rural households that already own computers or similar devices will also be able to access the voucher alone, once they complete the digital literacy training. The value of the cash-back incentive (10 to 20 percent of the value of the device) and the voucher is estimated to be about GEL 360. This program will cover about 30,000 households.

34. The target beneficiaries that will be eligible for the program would include those households and individuals who live in rural areas. Special attention will be provided to build awareness among poorer and socially vulnerable households and in designing criteria to enable their access to this program. It is also expected that this subcomponent will result in increased digital inclusion of vulnerable groups, facilitating connections with public services, employment opportunities, and knowledge, and an overall positive economic impact from increased connectivity speed and ICT usage.

(b) Support for MSMEs (US$3.6 million)

35. The adoption of information technology by MSMEs can help them become more productive, connect to markets, services, information, and resources outside of their local geographies, and hence, to engage in more innovative activities. Specific opportunities are created by the growth of e-commerce internationally.

36. E-commerce marketplaces such as Alibaba.com in China or India's Flipkart.com have created thousands of jobs in SMEs that sell their products on these marketplaces, apart from creating jobs for delivery personnel and for others in the involved value chains. In China, village economies have changed and begun to create jobs outside of agriculture because SMEs could sell

[30] Geostat, Integrated Household Survey data, 2013

other products such as furniture or handicrafts through Taobao, the consumer-to-consumer arm of Alibaba.[31] eBay, an online marketplace originally started in the U.S., now has over 25 million sellers—many of them SMEs—and 155 million buyers, and works in 190 countries.[32] Now, 90 percent of commercial sellers on eBay export to other countries; the share is less than 25 percent among traditional small businesses.[33]

37. Development of e-commerce in Georgia can provide a much-needed boost to trade. At present, about half of firms surveyed in Georgia in the Enterprise Survey of 2013 have their own website, and more than three in four use "e-mail to interact with clients/suppliers."[34] However, numbers are lower for firms located outside of Tbilisi, indicating a digital divide. The result is relatively lower levels of exports. Only 7.4 percent of surveyed firms export directly or indirectly (at least 1 percent of sales), much lower than the average in ECA countries (at 19.4 percent). Again, the share is lower outside of Tbilisi.[35] This can be improved through the use of e-commerce, which will need firms to adopt IT and broadband Internet services. Research also suggests that apart from acquisition of digital tools (e.g. computers, Internet), firms that productively engage in e-commerce require some level of capacity development and reorganization.

38. Consequently, this activity will support increased adoption of IT and broadband services among MSMEs to ensure their participation in the digital and knowledge economy, specifically through e-commerce.

39. Similar to the foregoing activity, Project financing here will focus on two aspects: providing a cash-back incentive (10–20 percent of IT costs, potentially up to GEL 5,000) to eligible MSMEs to finance acquisition of eligible IT, and a voucher for broadband service installation costs and training on e-commerce development. A voucher-only option would be available to MSMEs that already have the necessary IT, and who otherwise qualify for the training. The value of the benefits will be about GEL 3,200 per SME (for the full bundle), and the program will cover about 3,000 MSMEs. A qualified and reputed firm will provide the training on e-commerce.

40. The target beneficiaries that will be eligible for the program would MSMEs that have potential to benefit from e-commerce (e.g. produce tradable goods or services, have less than a pre-defined level of exports), and that have no tax or legal liabilities outstanding. The Project will also include rigorous evaluations—under Component 4—to maximize the impact of this support.

(c) Implementation of demand facilitation programs (US$0.9 million)

[31] http://www.economist.com/news/china/21602755-one-small-hamlet-teaching-people-how-sell-online-cash-cow-taobao; http://www.npr.org/blogs/goatsandsoda/2014/09/11/347481629/alibaba-and-taobao-how-china-s-ebay-transformed-a-rural-village
[32] http://www.ebayinc.com/sites/default/files/MP%20Factsheet%20Q4%202014.pdf
[33] McKinsey Global Institute, Global flows in a digital world, 2014
[34] http://www.enterprisesurveys.org/data/exploreeconomies/2013/georgia#innovation-and-technology--location
[35] http://www.enterprisesurveys.org/data/exploreeconomies/2013/georgia#trade--location

41. The Project will also cover the administrative costs of the demand facilitation programs, including establishing and advertising the voucher and cash back schemes, developing and delivering the digital literacy training, and paying processing fees to the financial institution that manages the cash back program.

42. In both cases, for households and MSMEs, the proposed program mechanism will be a first-come-first-served program, implemented in partnership with local electronics stores, IT device manufacturers, ISPs, and training providers. Participating electronics stores (there are about 190 such stores across the country) will be the point-of-sale for the devices, and they and CICs and RIHs will provide information to the beneficiaries on how they can access the incentives, plus provide the voucher to beneficiaries. The program will be administered by GITA, with a local financial institution assisting in processing the cash-back requests and payments to the ISPs for connecting beneficiaries. While the stores, ISPs, and device manufacturers will join this program in an open-ended manner (to maximize coverage and choice), GITA will select the cash back manager and training providers competitively.

43. Following publicity of this program, the customer will visit a store where eligible devices are available. The customer will make their purchase using their own funds, or using a loan or installment program, all of which are widely available. The store will validate customer eligibility and provide the customer information on how to apply for the cash-back, along with a voucher for broadband internet connectivity and training. The customer will then contact a participating ISP to set up their connection, take the training online (for households) or in person (for MSMEs), and then apply for the cash-back, providing the evidence needed to validate their completion of all relevant steps, potentially online or via post. Once the evidence is validated, the bank (cash-back administrator) will release funds to the customer via their bank account or other appropriate mechanism established in the BfD Manual. The use of a local financial institution ensures a clear auditing mechanism without putting pressure on GITA with the need to process a large volume of applications on its own. In the case of the voucher-only option, beneficiaries will receive the voucher (at a store or CIC/RIH) after completion of the training program.

44. The Project will first pilot this scheme with about 5000 households and 1000 MSMEs, potentially in one or two regions of the country. Based on the results of this pilot, in terms of the success of the training program, uptake of the program, efficiency of the process, and any specific technology requirements that emerge, the program design will be refined and scaled up to cover the rest of the rural regions of the country. Digital literacy training will be available online, through a program portal, to cover those households that might only want training. The training provider for the e-Commerce training will be selected separately, given the longer-term and specific needs for content development and potential for participation of existing platforms in the process.

Component 2: Innovation Services (US$13.4 million)

45. **This component will deliver services, many in coordination with the CICs and RIHs, tailored to Project beneficiaries at various stages/levels of the innovation ecosystem**. It will finance: (a) building the innovation community through events (innovation competitions, exhibitions, conferences), publicity and media, and the Informatics Olympics (including coaches and travel) (US$3.9 million); (b) digital economy skills development for jobs (US$5.1 million);

and (c) business innovation support through specialized training, coaching, mentoring, and technical consulting (consultant services and travel) (US$4.4 million).

Subcomponent 2.1: Building the innovation community (US$3.9 million)

46. This subcomponent supports all of the other Project activities by drawing more Georgians into the innovation ecosystem—that is, building the innovation community—through awareness raising, promotion, and competitions**.** Given the novelty of the instruments supported by the Project, as well as the traditional absence of innovative and entrepreneurial mentalities in Georgia, a dedicated and widespread **outreach and awareness campaign** will be needed to promote user uptake. This subcomponent will finance marketing methods (e.g. TV, radio and newspaper ads, door-to-door visits, school events, social media, etc.) with the aim of reducing the "stigma" of entrepreneurship (a legacy from the days of a centrally-planned economy), promoting GITA programs and services, raising awareness of the benefits and possibilities of innovation, and increasing the visibility of "innovation economy" jobs in the regions. Activities will also promote the global "branding" of Georgia as a new regional hub for knowledge and innovation through support for various marketing events and conferences. Exhibitions could also be supported, such as events where innovators (including grant recipients) are able to present their products to the public or where scientists are able to pitch their ideas to potential investors and business partners.

47. The subcomponent will also support **innovation competitions** for Georgians throughout the country to develop ideas in a competitive atmosphere. Financing could be used for grants to third parties to run the competitions, for instance in the form of hack-a-thons, make-a-thons, and create-a-thons. GITA has run successful competitions in each of these forms, which are normally 2-day events where students, programmers, and potential entrepreneurs come together to develop innovative apps, products, and ideas in a fun, fast-paced environment. GITA aims to support dozens of these events each year in Tbilisi and cities with RIHs. The grants to the third parties can be used for expenses related to event organization (facilities, food, experts, promotion and marketing, etc.) as well as prizes. Prizes could also include free access to training and services provided by GITA and the RIHs. The results of the competitions held to date have been promising and include increased awareness and enthusiasm around innovation, creation of informal networks amongst participants, and in a few cases, the creation of start-ups (e.g. new gaming companies from the hack-a-thons and start-ups selling small consumer products initially developed using laser cutters in a fab lab during the make-a-thons). The competitions are expected to draw latent innovators into the innovation acceleration framework and help develop a pipeline of potential users of the infrastructure, services and financing opportunities supported by the Project.

48. The subcomponent also supports Georgia's participation in the **International Olympiad in Informatics**, which is one of the five international science olympiads (the others being in math, physics, chemistry, and biology). The Informatics Olympiad aims to stimulate interest in informatics (computing science) and information technology among secondary students. The subcomponent will finance training for trainers (i.e. the coaches who will work with the student competitors), salaries for the trainers, organization of the intra-Georgia competitions, and travel costs for participation in the regional, national, and international competitions.

Subcomponent 2.2: Digital economy skills development for jobs (US$5.1 million)

49. To develop itself as an innovation-driven economy, Georgia will need the human capital apart from infrastructure, financial, and organizational features of the innovation ecosystem. This component addresses this challenge, and aims to build up the limited talent pool in Georgia. At present, many employers complain about the lack of skilled workers; one of every five firms sees this as a major or severe problem that constrains their growth. World Bank analysis has found that there is only a limited supply of highly qualified graduates for innovative firms, which will have a constraining effect on the sustainable growth of the economy over the longer term. Moreover, there is strong demand for workers with ICT-related skills.[36] But more needs to be done to develop workers' skills in line with employers' demands.

50. These skills gaps are exacerbated by structural issues: limited innovation and adoption of technology by SMEs in the economy, which hold back demand for labor, especially for high-skilled work. Analysis shows that firms in Georgia's ICT sector, for example, have limited forecasting ability, but are interested in having access to skilled workers. However, there is a lack of local training capacity to deliver global-standard training at scale, and there is weak interaction between employers and educators to define demand-oriented training.

51. Consequently, this activity will support training aimed at improving technical and business skills among young people, both to increase their employability and to improve their productivity and competitiveness as existing employees. Throughout, participation of employers is an integral part of each component, meant to ensure alignment of the program to demand. In the best case, these skills development programs will seek commitments from employers to hire outright or to provide at least some preference to students trained by this program (e.g. automatic shortlisting for interviews, or apprenticeships).

52. Technical skills would focus primarily on 'digital economy skills' including computer programming, software development, networking, and related fields. Business skills would include entrepreneurship training—including business plan development, accessing early-stage finance, and basic business administration. The Project would finance specialized and reputed training institutes or providers to design and deliver the training programs to about 3,000 individuals. A pilot program to train 500 students will be organized, with the scaling up done based on the lessons learnt in organization of the pilot. The program will also include training of 250 trainers, to ensure sustainability of the skills development agenda over time. For this, technical training will be supplemented by a 'training or trainers' program.

53. Keeping in mind the focus on aligning with employers' needs, this program will include the following components: (1) Mobilization of participants; (2) Initial testing; (3) Training and assessment; (4) Final testing (if possible, aligned with globally recognized certification programs); and (5) Job placement support. Two types of beneficiaries are planned for: young people (specifically TVET and university students) and employees of SMEs. Training recipients from SMEs are expected to contribute part of the training cost. Training will be delivered through blended methods—online and in person—and the selected training organizations could

[36] World Bank, Georgia New Economy Skills Development, June 2015

leverage the facilities of RIHs and other educational institutions (e.g. TVETs/universities). Training will also be offered in two cities, e.g. Tbilisi and Batumi, to ensure wider geographical coverage for the program.

Subcomponent 2.3: Business innovation support (US$4.4 million)

54. Business innovation support in this subcomponent includes: (a) specialized technical training to be developed depending on the needs of RIH users, e.g. 3D modelling for prototype development; (b) individualized coaching for entrepreneurs; (c) mentoring for entrepreneurs, leveraging the Georgian diaspora; and (d) innovation management and related business training. Project financing will cover salaries for the coaches, technical consultants, trainers, and development of the mentor network. In most cases, the beneficiary firms will be expected to pay a share of the costs.

55. **Specialized technical training**. The RIHs would develop a network of experts to advise firms on specific technical issues, such as 3D modeling and digital fabrication of their new product ideas. The firms would be expected to pay a fee for these services, of which part could be subsidized by the Project. Depending on levels of demand, the training could either be for individual firms or groups of firm representatives; the technical experts could be staffed full-time in the RIHs or available by appointment.

56. **Coaching for innovators.** Coaching refers generally to the acquisition of specific competencies by an individual, so that it helps fill technical, functional, or business gaps that are identified at the beginning of the coaching period. A preliminary session will help agree on a "coaching roadmap" between the beneficiary and the coach. Examples of possible areas for coaching include market research, certifications, IP assessments, internationalization, etc. Coaches will be engaged on an on-demand basis, based either in Georgia or abroad. Each coach would be expected to be an expert in several fields, have a broad knowledge of business development issues, and know what (external) resource or needed expertise to call on. The coach would be a paid resource, likely financed by a combination of resources from the beneficiary and the Project. As such, there is a client-type relationship between the coach and the beneficiary. Coaching services would mainly be coordinated through each RIH, and delivered through individually agreed-upon roadmaps. An estimated 40 innovators would be coached annually. Initially, it is envisioned that each would receive 5 days of coaching from an international expert, paired with 5 days from a local expert. This model could be adjusted depending on the results from the initial coaching experiences. In addition to paying the coaches' fees, the subcomponent would also cover the development of a database of potential coaches, training for the coaches, and the development of reference materials, e.g. a map of available business support services (outside of the Project) that firms could be referred to (such as to obtain quality certifications) by the coaches.

57. **Mentoring for firms.** This activity would set up a network of mentors and link eligible firms to them in a structured manner. The Project will cover the costs of organizing the mentor network, and pay select travel costs for external mentors to periodically travel to Georgia to build and maintain strong relationships with the mentees. A key source of mentors could be the Georgian diaspora, which is well-organized by the Office of the State Minister of Georgia for Diaspora Issues. One of the fundamental principles of mentoring is that it is a reciprocal choice.

The firm would choose a candidate from a list of potential mentors, and then the mentor would accept or not to work with the firm. Ideally, the mentor should be a former or present entrepreneur, and he/she may also belong to the corporate world. He/she should have no prior interest in the mentee's business, and is not paid by anyone for his/her involvement, which is on a voluntary basis. However, a mentor may eventually become a business partner, customer, investor, or even take a management position, as a consequence of the mentoring activity when it is over.

58. The mentee can expect a good mentor to:

- Bring and shares all his/her business experience and wisdom to help address mentee's issues, in relation with the business.
- Accelerate mentee's learning curve and empower him/her to solve problems and anticipate critical situations.
- Morally support mentee through the hard times of entrepreneurship.
- Give access to all kinds of resources and networks, useful to help fill the gaps of mentee's business knowledge and competencies.
- Give feedback to mentee on his/her progresses (mentoring is about the person).

59. This requires time, effort, trust, motivation, respect and commitment from both parties. Practically, the overall task of the mentor will be to act as a "sounding board" by challenging the entrepreneur's assumptions, while not judging their business ideas, but rather guide them through a validation process through repetitive interactions. They will act as "brokers" drawing from their social networks to make appropriate introductions. They are educators, through learning by doing and finally, they give some psychosocial support: value systems, self-worth, personal advice and interpersonal relationships.

60. The **innovation management and related business training** is expected to be delivered by a reputable training provider and take into account international good practice in SME training. One example of an international good practice is using a training design and delivery methodology that incorporates principles of experiential learning with emphasis on workplace application of learned skills.[37]

61. **Additional services** to be offered by the RIHs could potentially be supported through this subcomponent in the future, depending on how user demand evolves. For instance, if there is a critical mass of firms or a specific industry that could benefit from specialized services, such as market intelligence or internationalization assistance, these could be developed as well. In such cases, a brief needs assessment would have to be undertaken before piloting the services. More basic types of training—both online and in-person—to be offered through the CIC network would also be developed under this subcomponent. This could include digital literacy, Microsoft

[37] See IFC's Business Edge training program for more examples.

Office tools, Facebook and social media for businesses, access to Government e-services, etc. The CIC training modules would likely be coordinated through their parent RIHs.

Component 3: Innovation Financing (US$9.0 million)

62. This component will finance: (a) Provision of matching grants to eligible MSMEs for the carrying out of sub-projects; (b) provision of technical assistance to Eligible MSMEs to prepare and implement sub-projects, including the carrying out of carry out administration activities in connection with the selection and supervision of sub-projects; and (c) provision of technical assistance to stimulate alternative forms of innovation financing and investment in the digital economy.

Subcomponent 3.1: Matching Grants (US$7.0 million)

63. **This subcomponent will finance matching grants to private enterprises to develop innovative products, process, and services.** Matching grants are the most common funding instruments across both developed and developing economies used in fostering innovation. Evaluation studies[38] have shown that R&D grants can have positive impacts on innovation. In line with international trends, the rationale for such programs in Georgia is that enterprises lack access to finance for risky innovation projects due to a series of market failures (see Economic Analysis section).

64. A Matching Grants Manual will be prepared that details the grant objectives, beneficiary eligibility criteria, maximum size of grants, eligible costs, project selection and evaluation process, reporting, and procurement techniques, among others, for each instrument. Two windows for matching grants are planned: "Start-up Matching Grants" and "Innovation Matching Grants". Table 2.3 contains a comparison of the two windows.

Table 2.3. Comparison of Start-up and Innovation Matching Grants

	Start-up Matching Grants	Innovation Matching Grants
Objective	Stimulate development of new innovative start-up/early-stage enterprises.	Promote product, technological or business process innovations, as well

[38] For instance, a recent study using New Zealand data found that receiving an R&D grant almost doubles the probability that a firm introduces goods and services that are new to the world (Jaffe, Adam and Trinh Le, 2015, The "Impact of R&D Subsidy on Innovation: a Study of New Zealand Firms", NBER Working Paper No. 21479). Another examples is an impact evaluation study of a matching grant scheme in Flanders, where firms can apply for subsidies to basic research, prototype research, and mixed research, found that an additional €1 of support will result in €1.34 of private R&D, rejecting full crowding-out effects (Aerts and Czarnitzki 2006). A review of a number of studies of Israel's R&D grant programs suggested that there is evidence of a positive relationship between the grant programs and productivity in R&D-intensive industries (Trajtenberg, Manuel. 2001. "R&D Policy in Israel: An Overview and assessment", In Maryann P. Feldman and Albert N. Link (eds.) Innovation Policy in the Knowledge-Based Economy. Boston: Kluwer Academic Publishers). Further, research support of commercial firms in Israel increased the firms' total R&D expenditure by USD 1.41 for every dollar of public research expenditure (Lach, Saul. 2002. "Do R&D Subsidies Stimulate or Displace Private R&D? Evidence from Israel." Journal of Industrial Economics, 50 (4): 369–90). Also, it has been demonstrated that the increase of public funding in Finland did not lead to a crowding out of private R&D funding (Ali-Yrkkö, Jyrki. 2004. "Impact of Public R&D Financing on Private R&D—Does Financial Constraint Matter?" ETLA Discussion Papers 943. Research Institute of the Finnish Economy, Helsinki).

		as technology adoption.
Recipient	Early-stage, private, micro- and small-enterprises, less than 2 years old.	MSMEs; consortia of firms. Program targets both young and established enterprises.
Grant size	Up to US$30,000 for projects that will be completed within 1 year.	Up to US$250,000 for projects that will be completed within 2 years.
Private sector co-financing (financial contribution)	10% of eligible project costs in pilot call for proposals (CFP). Potential increase of co-financing 15% in the following CFPs based on demand.*	30–40% of eligible project costs.*

Note: * The private sector financing contributions could be subject to change, depending on the demand response seen through pilot rounds of calls for proposals.

(a) Start-up Matching Grants

65. Start-up Matching Grants are defined as small matching grants to early-stage, private, micro- and small- enterprises, incorporated in Georgia within the last two years with majority Georgian ownership that are in the proof of concept stage or have a technological innovation with potential for creation of a new intellectual property (IP) or new know-how, and market potential.

66. The financing to be awarded under the Start-Up program could cover a maximum of 90 percent up to US$30,000 of the total approved project budget for a 1 year project. The minimum of 10 percent of the project budget would be secured in cash by the applicant from other, preferably private sector sources. A higher share of private sector co-financing may be required in the subsequent calls for proposals, depending on the interest in the program and the quality of project proposals submitted in the pilot phase. To ease the financial pressure on the applicants, the private sector contribution will be required according to the schedule of grant tranches. The tranches will likely be quarterly and aligned with the expenditure plan prepared as part of the grant application. The financial and technical progress will be verified by GITA each quarter before the subsequent quarterly payment is made to ensure productive and transparent use of the funds. If the project progress deviates substantially from the proposal, then GITA, in consultation with the investment committee, will decide whether to accept a revised implementation proposal or terminate the project.

67. Eligible costs to be financed by the Start-up window would be: prototyping, proof of concept, business development, intellectual property (IP) applications and fees, R&D services and subcontracts, testing and piloting of developed innovations, business plan preparation for further capital mobilization, commercialization, and others.

68. The rationale for the Start-up grants is that new technology-based start-up firms are especially vulnerable and require financial support, because they have a significant lag time during the R&D stage in being able to generate revenues to sustain their operations. These firms do not have demonstrable cash flow to obtain conventional sources of debt finance. Also, much of their value is in their intangible assets, like IP, which is difficult to appraise in the abstract. Such high-growth innovative firms typically require specialized financing, often from public sources, in their early years to support the up-front R&D to prove the technical, and then the commercial, viability of their ideas. Accordingly, the Start-up grants program is designed to support early stage innovation as well as stimulate the evolution of an entrepreneurial mind-set

among the Georgian community by providing incentives for enterprises to innovate and transfer technologies into the market. As part of the development of a full innovation financing ecosystem, firms that receive Start-up grants could subsequently be eligible to compete for the larger Innovation grants (although duplicate payments for the same expenditures will be prohibited).

(b) Innovation Matching Grants

69. Innovation Matching Grants are defined as grants to private micro, small and medium sized enterprises incorporated in Georgia that anticipate a product, technological or business process innovation or technology adoption that is new to the firm and has market potential (as evaluated by peer reviewers and the independent investment committee. Preference will be given to proposals with innovations that are new to Georgia, or potentially even the world. The matching grant could cover a maximum of 70 percent and up to US$250,000 of the total approved project budget for a 2 year project. The minimum of 30–40 percent of the budget—to be defined in each call for proposals—is to be secured in cash contribution by the applicant from other sources, such as private sector industry, private investors/ venture capital/ private equity funds or the applicant's own internal resources. Consortia comprising more than one firm would also be eligible to apply.

70. **Eligible costs to be financed by the innovation grant program would be:** technology development and design, technology adoption/adaptation, prototyping, proof of concept, business development, IP application and fees, patents purchased or licensed from external sources, testing and piloting, certificates, R&D services and subcontracts, business plan preparation, sales and marketing costs, and others. The program will not cover acquisition of equipment or machinery for operative (production) purposes or works. Eligible and non-eligible expenditures will be defined further in the Matching Grants Manual. The private sector contribution will be required according to the schedule of grant tranches. The tranches will likely be quarterly and aligned with the expenditure plan prepared as part of the grant application. The financial and technical progress will be verified by GITA each quarter before the subsequent quarterly payment is made to ensure productive and transparent use of the funds.

71. **Compulsory training.** The grant awardees under both windows will be required to allocate an amount of the project budget for training tailored to the company's needs. Experience in ECA countries implementing innovation grants (e.g. Serbia, Montenegro) demonstrated that grant awardees lack experience in commercialization processes, thus additional training could be a valuable source for gaining new market skills and knowledge. Such training may encompass technology-specific workshops, business management and financial accounting educational programs, certification training, subject-matter conferences, business development, and fundraising.

72. **Early termination of failed projects**. A mechanism will be developed in the Matching Grants Manual to identify failed projects and stop funding them, allowing undisbursed resources to be allocated to future calls for proposals. The mechanism could function as follows. First, the quarterly progress financial and technical progress reports, as well as potentially the coach assigned to each project (see Component 3.2), should indicate to GITA if a project is failing and is unlikely to benefit from being restructured. GITA will then commission an independent expert

to review the project's performance and prepare a recommendation. If the recommendation is to terminate funding, then the grant recipient will be given one opportunity to challenge the expert's findings.

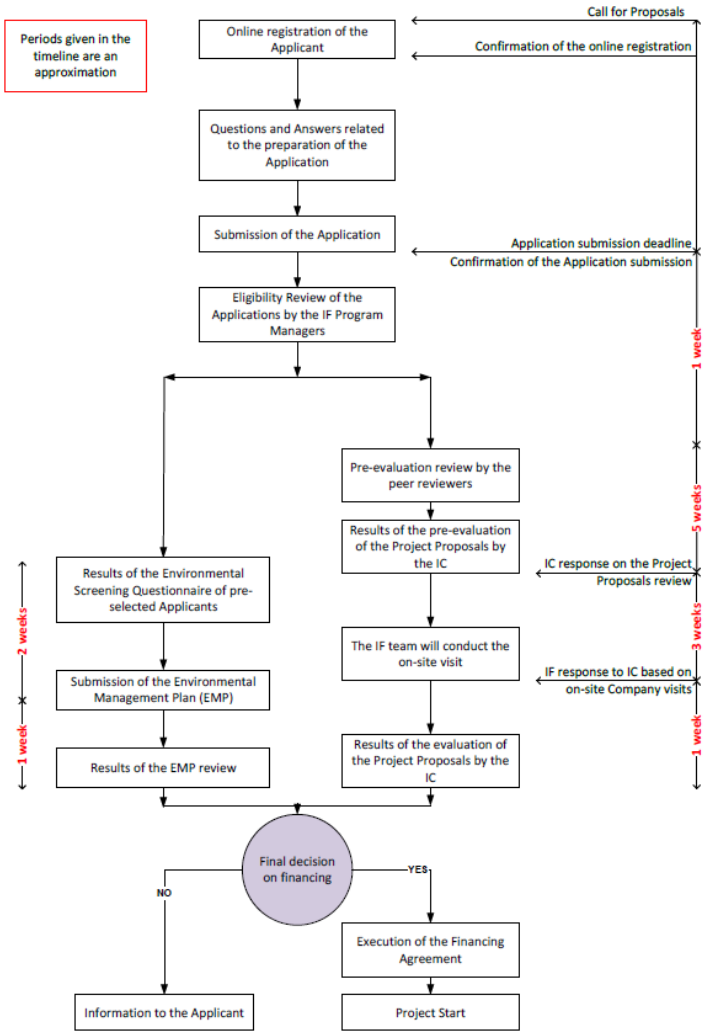
Subcomponent 3.2: Matching grants TA and administration (US$1.6 million)

73. This subcomponent will cover the administration of the matching grants program, including training and technical assistance to grant winners. Administration of the matching grants will be performed by a dedicated unit within GITA. Their responsibilities will include preparation of the Grants Operational Manual, development of a Web portal for the application process, announcement and awareness raising for the calls for proposals, training to prospective applicants on preparing proposals, management of the selection process and peer reviewer network, execution of the financing agreements with beneficiaries, and follow-up with the beneficiaries on quarterly reporting, match contributions, procurement, and safeguards.

74. The Project selection process will be based on international best practice including competitive calls for proposals and the involvement of international experts, both as part of the peer review process and the investment committee. The Project selection and evaluation process will be composed of several stages, among others: (1) compliance with administrative eligibility; (2) scientific/ technical peer review, including an assessment of innovation and market potential; (3) pitch sessions/ interviews with short-listed applicants; and (4) final evaluation and selection of beneficiaries by an independent Investment Committee (IC). The IC should be composed entirely of international experts from the business and research sectors. One or more of the IC members could come from the Georgian diaspora network, and they should receive a stipend to compensate for the time spent reviewing proposals and participating in periodic IC meetings. The independent investment committee design is critical for the transparency and legitimacy of the instrument. Similarly, the peer reviewers should also be international experts. An example of a matching grant selection process from the Serbia Innovation Fund is shown in Figure 2.4 below.

Figure 2.4. Sample Matching Grants Selection Process[39]

[39] Source: Serbia Innovation Fund matching grants manual



75. **Training and TA to grant applicants and winners.** Recognizing that many participants will have limited experience with matching grant applications and the technology commercialization process, this activity aims to ensure high-quality applications are received by financing training and TA at three key stages of the grant selection process. In the pre-application period, the component will include instruction on matching grant procedures and assistance with application preparation, as well as training on positioning of innovation for markets (e.g. business plan development, market potential assessments, etc.). This will be followed by training during the review process on pitching and presenting proposals, and finally by structured post-program coaching for the ultimate winners of the grants. For those that do not win, the learning during the application process should nevertheless enhance the quality of their future proposals and capacity to commercialize their innovative ideas, thus feeding the demand for future grant programs and other financing instruments for innovation.

76. **Costs.** The seminars and training to help firms prepare applications are estimated to cost US$60,000. The coaching for the grant winners is estimated to cost about US$770,000, which is based on 4 days of coaching from an international coach and 5 days from a local coach per project per year. The project evaluation and selection process is estimated to cost about

US$440,000, taking into account compensation for the peer reviewers' time and travel costs for the Investment Committee. The matching grants web portal is expected to cost about US$110,000, including software, hardware, and maintenance. Finally, a periodic external audit of grant recipient expenditures and financial statements is estimated to cost US$200,000.

*Subcomponent 3.3: Innovation financing policy technical assistance (US$0.4 million***)**

77. This subcomponent aims to improve the policy and regulatory environment affecting domestic and international financing for innovation and entrepreneurship, since matching grants are only part of the solution to the shortage of innovation financing instruments in Georgia. Activities will initially focus on angel investment and improving the broader regulatory framework through the hiring of expert consultants and organizing events. Recommendations to reform other innovation policy areas could be prepared in the future.

78. **Georgian Business Angels network.** GITA has started identifying potential business angels and in June 2015 held a first meeting with a group of business investors. GITA has also started collaborating with Angel Labs, an angel investing group based in San Francisco with expertise in development of business angel networks around the globe and experience in providing trainings for business angels. In the following months, GITA plans to focus on: (a) outreach activities with an objective to expand contacts with the business investors; (b) training activities for business investors; (c) awareness raising events in the area of business angel investment and overall risk capital; and (d) involvement of selected business angels into GITA's initiatives promoting start-ups (for instance start-up competitions). To complement these actions, the Project would finance experts to advise on international good practice applicable to Georgia, and, in collaboration with Georgian business angels, prepare an action plan to develop a Georgian Business Angels Network.

79. **Regulatory framework for innovation financing.** The subcomponent could support, among other things:

- Development of regulations and bylaws to implement the expected new innovation law.
- Development of regulation related to venture capital.
- Formation of expert working groups to review banking and other financial regulations related to innovation and high-tech entrepreneurship with a focus on venture capital, business angels, private equity, mezzanine funding and funds-of-funds; as well as crowd-funding for traditional and new innovative businesses.
- Organization of dialogue events to engage relevant parties and build consensus on the design and implementation of the recommendations and the development of an "action plan" with clear recommendations for potential reforms.
- Benchmarking of Georgia's policy structure with comparator economies, to identify opportunities to increase investment (especially foreign) into innovation and the digital economy.

Component 4: Project Implementation Support (US$2.8 million)

80. This component will aim to ensure efficient and effective implementation of all Project components. Support will be provided to GITA to strengthen its capacity and increase human resources available to implement the Project. An additional US$1.0 million is allocated as a contingency for unforeseen TA and implementation support needs.

Subcomponent 4.1: Project management (US$1.5 million)

81. This subcomponent aims to support the operation of all critical Project management functions, to support the Project Director (at this time, identified as the Director of GITA) and to support the day-to-day Project implementation activities, including operations advisory, procurement, disbursement, safeguards, and financial management functions. World Bank financing would be provided for technical consultants employed by GITA, as well as for on- and off-site training to all Project staff (including GITA staff), Project audits, office equipment and incremental operating costs. This subcomponent would also cover consulting fees and travel expenses for an expert advisory body to support GITA and implementation of the Project.

Subcomponent 4.2: Monitoring and Evaluation (US$0.3 million)

82. A strong M&E system will be crucial in assessing the real-time impact and effectiveness of Project activities and implementing mid-course corrections. This subcomponent would finance the design and implementation of: (a) tools to monitor the results framework; (b) M&E studies/surveys to establish baselines for Project results indicators and measure their evolution during Project implementation; (c) impact evaluation for selected Project activities. Technical assistance and training will also be provided to GITA and innovation center staff engaged in M&E functions. In particular, a robust randomized control trial is envisioned for the BfD program (1.3) and the matching grant program (3). This component will fund core aspects of the proposed impact evaluation.

Annex 3: Implementation Arrangements

GEORGIA: National Innovation Ecosystem Project

Project Institutional and Implementation Arrangements

1. The Project will be implemented by Georgia's Innovation & Technology Agency (GITA). GITA will be responsible for all project implementation, procurement, safeguards, financial management and disbursements. The Government established GITA through Resolution No. 172, dated February 19, 2014. As a newly established Agency, GITA will require significant support and capacity building to ensure high-quality fiduciary and safeguards compliance, and for timely procurement and disbursement under various Project activities.

2. GITA will designate a qualified staff at the level of Chairman or Deputy Chairman, acceptable to the Bank, as Project Director ("PD"). GITA shall provide the PD with adequate resources and competent staff (acceptable to the Bank) to handle all fiduciary and technical roles, as defined in the Project Operational Manual. For instance, GITA will hire—through Project proceeds—at least one experienced Project Coordinator who will serve as a senior consultant to advise the PD and GITA staff on all operational aspects of the Project, and to provide capacity building and implementation support. GITA will also hire a procurement specialist, a financial specialist, and M&E specialist. The selection for all of these positions will be prior reviewed by the Bank. GITA will also contract adequate construction supervision expertise to oversee the renovation/ rehabilitation work to be done under Component 1.

3. MoESD will provide Project oversight and facilitate coordination of Project activities and cooperation across Government and state agencies, and with donors and other development initiatives. This will help with implementation of activities under Component 1.3 (on rural Internet access), which will be undertaken in consultation and partnership with the Georgian National Communications Commission (GNCC), the telecommunications industry regulator. Activities under Component 2.2—on new economy skills development—will be undertaken in consultation with the Ministry of Education and Science.

4. The overall oversight of this program will be by the Research and Innovation Council of Georgia. The Government set up the Council through Resolution No. 32, dated February 3, 2015. The Council is under the Prime Minister. The Council, comprising of key ministers and stakeholders, has the function of coordinating innovation policymaking to ensure coherence in prioritizing policy actions, allocating resources, and assigning clear responsibilities for detailed design of instruments. For this Project, the Council will serve as an overall strategic body, providing high level guidance and inter-agency coordination. The Council has been meeting regularly in 2015, under the chairmanship of the Prime Minister. The meetings have repeatedly underscored the high priority accorded to the innovation agenda by senior Government officials.

5. To ensure the viability of RIHs financed using Project proceeds, GITA will prepare feasibility studies for all advanced RIHs, mini-feasibility studies for all other RIHs, and summary reports CICs. The reports would include feasibility and safeguards issues, and analyze the availability of funds for Operation and Maintenance of the assets and services to ensure sustainability (over at least a 3-year period following operationalization). All feasibility studies

and summary reports are to be approved by the Bank prior to the start of associated procurement processes.

6. The Project will be implemented in accordance with the Project Operations Manual. The POM will include: (a) a detailed description of Project components and their implementation arrangements; (b) detailed Project cost estimates; (c) financial management arrangements; (d) roles and responsibilities of staff working on the Project; and (e) the Matching Grants Manual other areas. The POM will be amended periodically to incorporate adjustments during Project implementation, in agreement with the Bank. Other integral project documents include the Broadband-for-Development Program Manual, Procurement Plan, and Environmental and Social Management Framework (ESMF).

Financial Management, Disbursements and Procurement

Financial Management and Disbursements

7. **Country Issues:** Georgia has made substantial progress since 2003 in addressing widespread system corruption issues. Georgia's performance in the annual Doing Business surveys has also been impressive. At the same time, financial management and accountability systems still require improvement.

8. The 2013 Public Expenditure and Financial Accountability assessment in Georgia revealed significant improvements in policy orientation of the budget and planning process in Georgia. Significant progress was observed in terms of improving the scope and nature of external audits. The following areas of public financial management still requiring improvement include legislative scrutiny of external audit reports, internal audit and quality of financial reporting. Since 2013 the government has undertaken several measures to improve its systems of financial management. The revenue accounting was transferred from the National Bank of Georgia (NBG) to the Treasury, and a system for cash management has been introduced. The severe cash shortages of the past few years have been addressed. From January 2006 a Single Treasury Account was introduced. In addition, the Bank's financial management team has reviewed the Treasury system and assessed it as satisfactory for holding the Bank-financed Projects' designated account (DA). Therefore, the Treasury Service will be used for holding the Project's DA. The country budget system will also be used for this Project. For all the other FM elements GITA's respective systems will be used for this Project.

9. Specific procedures have been developed by the Project to secure proper financial accountability of this Project and to minimize Project financial management risks. Additional financial management arrangements in the Project will include the audit of Project financial statements by an independent auditor acceptable to the Bank, in accordance with term of reference acceptable to the Bank.

10. **Implementing Entity:** GITA will be responsible for the financial management function under the proposed Project, including budgeting, accounting, funds flow and financial reporting. GITA does not have prior experience in implementing the Bank-financed Projects.

- **Strengths:** GITA operates the Treasury System that will be used during the Project

implementation.

- **Weaknesses:** The main weaknesses are: (a) GITA lacks prior experience in the Bank-financed Projects; (b) there is no existing FM Manual that clearly describes financial reporting, accounting and internal control policies and procedures, budgeting and planning mechanisms to be followed by GITA for Bank projects; and (c) GITA FM staff have no prior experience in accounting and financial reporting in relation to Bank projects.

11. The adequacy of FM arrangements will be continuously monitored during Project supervision and adjustments made when necessary to ensure fiduciary compliance. In addition, an FM specialist will review the annual audit report and the semi-annual IFRs, including a monthly reconciliation of accounts, and perform at least one complete supervision mission per nine-month period, which could be complemented by other supervisions as necessary.

12. The following **Action Plan** has been agreed to be implemented to ensure existence of satisfactory financial management arrangements that meet Bank requirements:

Table 3.1. Action to be Implemented

Actions for Capacity Building	Responsible Party	Completion Date
Modify existing ORIS automated accounting system utilized by GITA for Project accounting, budgeting and reporting. The accounting system shall have functionality of automatic generation of Statement of Expenditures (SOEs) and IFRs for the Project, with built-in controls to ensure data security, integrity and reliability.	GITA	By effectiveness
Organize training on the World Bank FM and disbursement policies and procedures for the GITA FM staff.	GITA and the World Bank	By May 31, 2016
Develop the FM chapter of the POM to reflect the Project related internal control, budgeting, external auditing, financial reporting and accounting policies and procedures	GITA	By effectiveness
Recruit the financial specialist with relevant experience for GITA.	GITA	By effectiveness

13. **Budgeting and Planning:** GITA will be responsible for the preparation of the annual budget under the Project that will be prepared in detail, and will be based on the final Procurement Plan approved by the World Bank.

14. **Accounting and Maintaining of Accounting Records:** GITA will use modified cash basis for accounting purposes and cash basis International Public Sector Accounting Standards (IPSAS) for Project reporting purposes. For the Project accounting, budgeting and reporting, GITA will modify the existing ORIS accounting system that will have functionality of automatic generation of SOEs and IFRs for the Project, and with built-in controls to ensure data security, integrity and reliability. GITA will hire a qualified FM specialist to support the existing FM staff of GITA responsible for overall FM arrangements of the Project, including maintenance of accounting records, preparation of SOEs and withdrawal applications, financial reporting,

budgeting and planning, and etc.

15. **Internal Controls:** There is an adequate overall internal control system in place at GITA. GITA will appoint an experienced Financial Specialist who will be dedicated to Project related duties. Expenditures incurred under the Project will be authorized by the GITA Chairman and verified for eligibility and accuracy by the GITA Financial Specialist. The reconciliation of the Project accounting records with the World Bank disbursement data will be performed monthly via WB Client Connection. There is no internal audit function at GITA given the small size of the team.

16. **Specific internal control activities of the Project will be described in the Financial Management chapter of the POM including:** procedures over cash transactions including maximum allowed daily cash operations (if any), expenditure authorization, invoices approval and payments processing procedures; data backup arrangements; reconciliation procedures of Project records with Client Connection, safeguards of assets, including cash, etc.

17. **Financial Reporting and Audit:** GITA will produce a full set of the Project consolidated IFRs every calendar semester throughout the life of the Project to minimize the financial reporting risk. The format of IFRs has been agreed during the assessment, and includes: (a) Project Sources and Uses of Funds, (b) Uses of Funds by Implementing Entities, (c) Designated Account Statements, and (d) SOE Withdrawal Schedule. IFRs will be produced by the accounting software and will be submitted to the World Bank within 45 days of the end of each semester. The first semester IFRs will be submitted after the end of the first full semester following the initial disbursement.

18. For the **matching grants**, GITA will hire a Grants Financial Specialist (GFS) who will be ultimately responsible for ensuring that the grants amounts are spent by beneficiaries for the intended purposes. The GFS will be involved in the matching grants issuance process from the early stage, providing support to beneficiaries by reviewing the individual grant budgets and assisting beneficiaries in modification/elaboration of those budgets. Grants to beneficiaries will be issued in tranches. The first tranche will flow to beneficiary's designated bank account as an advance and all further tranches will be provided on the basis of SOEs. Those SOEs will be reviewed and cleared by the GFS before the next tranche is disbursed by GITA. GFS will be responsible for preparation of the consolidated information on the matching grants to be provided to the GITA FM for further reporting.

19. Additionally, for the matching grants, actual expenditures made by beneficiaries will be monitored on a quarterly basis by an outsourced financial company/audit firm. Each beneficiary will open a designated bank account only to be used for the purposes of the sub-project, and the disbursements from GITA as well as the match from the firm will be deposited in this account. The bank statement from the firm's designated account, as well as copies of the relevant receipts and invoices, will be submitted for review on a quarterly basis to the GFS and financial management / audit firm to be contracted by GITA. The GFS will coordinate and oversee the auditors' performance. (The beneficiary firms will also submit quarterly technical progress reports, which will be reviewed in parallel by GITA technical staff.) The IFRs and SOEs submitted to the Bank for disbursement purposes will include the funds disbursed by GITA to the beneficiary firms, but not the actual expenditures made by the beneficiary firms with the

grant monies.

20. **The audit of the Project financial statements** will be conducted (a) by independent private auditors acceptable to the Bank, on terms of reference (TOR) acceptable to the Bank, and (b) according to the International Standards on Auditing (ISA) issued by the International Auditing and Assurance Standards Board of the International Federation of Accountants (IFAC).

21. The sample audit TORs agreed with the Bank will be attached to the FM Manual, and the annual audited Project financial statements will be provided to the Bank within six months of the end of each fiscal year, and for the Project also at the closing of the Project. If the period from the date of effectiveness of the loan to the end of the Recipient's/Borrower's fiscal year is no more than six months, the first audit report may cover financial statements for the period from effectiveness to the end of the second fiscal year. The following table identifies the audit reports that will be required to be submitted to the Bank together with the due date for submission.

Table 3.2. Audit Reports to be Submitted to Bank

Audit Report	Due Date
Project financial statements (PFS). The cash receipts and payments of the Project during the year [or period] ended [MONTH DATE, YEAR], showing the World Bank, Project funds from other donors, and counterpart funds separately; Accounting policies and explanatory notes[40] (including additional accounting policies and disclosures), covering a Summary of Summary Reports or SOEs used as the basis for the submission of withdrawal applications in the notes, as appropriate; A Statement of Designated Account in the notes, as appropriate; A Statement of Financial Position showing Accumulated Funds of the Project, bank balances, other assets of the Project, and liabilities, if any; and When the entity makes publicly available it's approved budget, a comparison of budget and actual amounts either as a separate additional financial statement or as a budget column in the statement of cash receipts and payments.	Within six months of the end of each fiscal year. For the PFS also at the closing of the Project.

22. In addition, the State Audit Office, the country's supreme audit institution, performs external audits of GITA and the projects it implements. The audited financial statements will be publicly disclosed in a manner acceptable to the World Bank and, following the World Bank's formal receipt of these statements from the Borrower, the World Bank makes them available to the public in accordance with the World Bank Policy on Access to Information.

23. **Flow of Funds and Disbursement arrangements:** GITA will open the Designated Account (DA) in the Treasury's foreign currency account at the NBG (where almost all DAs for ongoing Bank-financed projects in Georgia are held), and on terms and conditions acceptable to the Bank.

24. Disbursements from the Loan account will follow the transaction-based method, i.e.,

[40] The explanatory notes should include reconciliation between the amounts shown as "received by the Project from the World Bank" and that disbursed by the Bank and a summary of movements on the Project's Designated Account.

traditional Bank procedures. These will include advances to the designated account, direct payments, special commitments, and reimbursement (with full documentation and against SOEs). For payments above the minimum application size, as specified in the Disbursement Letter, GITA may submit withdrawal applications to the Bank for payments to suppliers and consultants directly from the Loan Account.

25. Project funds will flow from (a) the Bank, either: (i) via the DA to be maintained in the Treasury, which will be replenished on the basis of SOEs or full documentation; or (ii) on the basis of direct payment withdrawal applications and/or special commitments, received from the GITA; and (b) the government, via the Treasury through normal budget allocation procedures initiated by the implementing agency in accordance with standard Georgian Treasury and Budget execution regulations. Those funds will be used to finance eligible expenditures under the Project. Withdrawal applications documenting funds utilized from the DA will be sent to the Bank at least every three months.

26. The following **disbursement methods** may be used under the Project: Reimbursement, Advance, Direct Payment, and Special Commitment. The DAs ceiling will be reflected in the Disbursement Letter, where the detailed instructions on withdrawal of the Project proceeds are provided.

Procurement

27. **Country- and sector-level risks**. The latest country-level risk assessment for public procurement was carried out during the preparation of the Country Procurement Assessment Report (CPAR) in 2009. It was conducted on the basis of the OECD-DAC/World Bank four pillars for public procurement. The conclusion was that all four Pillars needed improvements in order for the system to meet the international standards and best practices. A three year action plan was prepared and Georgia is making progress towards fulfilling the proposed actions. One important completed step was the introduction and implementation of an electronic procurement system of Georgia for all government contracts. The Bank's team has recently completed an assessment of the Georgian E-Government Procurement (Ge-GP) system, which is currently used under the Bank's projects. The assessment identified those improvements and modifications required to the e-procurement system to meet the multilateral development banks' requirements for procurement of civil works and goods. The State Procurement Agency of Georgia undertook these modifications and currently the Ge-GP is used under the Bank's projects using National Competitive Bidding method with estimated contract prices below US$10 million equivalent for civil works and US$1 million equivalent for goods. In the Ge-GP, procurement of simple goods and simple works following shopping procedures can be used when the estimated contract price is below US$100,000 and US$200,000 equivalent respectively. Therefore any contract with an estimated contract price and method indicated above will be procured using Ge-GP.

28. **Implementation arrangements**. GITA will be responsible for all procurement functions under the project. The Bank team concluded that the core GITA staff does not possess adequate experience for conducting procurement activities. Overall management responsibilities rests with GITA's Chairman and Deputy Chairman who supervise activities of three separate departments: (a) International Relations, (b) Innovation and (c) Strategic Development. Currently GITA has 12 staff members, with several positions to be advertised and positions to be filled shortly.

29. **Procurement Capacity Assessment.** A detailed procurement assessment was undertaken following review of the draft Procurement Plan prepared by GITA (and cleared by the Bank on February 5, 2016). GITA will be responsible for all procurement related aspects. The Implementing Agency Risk Rating is "high" before mitigation measures and "substantial" subject to mitigation measures proposed below. The risk rating will be reassessed once mitigation measures are put in place and subject to satisfactory performance might be downgraded to "Moderate". Considerable risks still remain and mitigation measures proposed are as follows:

Table 3.3. Risks and Mitigation Measures

Risks	Mitigation Measures
(a) Risk – GITA does not possess any related procurement experience required under the Project.	A procurement specialist with solid procurement experience in the World Bank financed projects shall be recruited. In addition to customary transactions, the procurement specialist will provide on the job training of relevant procurement staff of GITA. The Bank's procurement specialist based in Tbilisi will also provide a full day training to get GITA's procurement staff acquainted with the Bank's procurement procedures
(b)There is no technical capacity in GITA to undertake technical review of specifications, BOQs, detailed drawing and design etc.	(b) GITA shall develop a qualified pool of individual experts which is essential for putting in place effective review capacity of technical documentation. Without such mitigation measures, there is a risk of frequent changes in scope, variations etc. and adverse quality of works.

30. **Procurement.** Procurement for the project will be carried out according to the World Bank's "Guidelines: Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants, January 2011, Revised July 2014" the "Guidelines: Selection and Employment of Consultants under IBRD Loans & IDA Credits & Grants by World Bank Borrowers, January 2011, revised July 2014 and the provisions stipulated in the Loan Agreement.

31. The Bank's anti-corruption norms ("Guidelines on Preventing and Combating Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants") of October 15, 2006 revised January 2011 will be applied.

32. **Procurement Plan and Arrangements.** GITA has developed a draft procurement plan. The procurement plan will be updated annually, in agreement with the Bank, or as required to reflect actual project implementation needs and improvements in institutional capacity. Contracts not subject to Bank prior review will be reviewed afterwards by the Bank's procurement specialist together with officials from the State Audit Office as part of a capacity building process. Such reviews will be made annually. A General Procurement Notice (GPN) has not yet been published by GITA and the same shall be processed as soon as applicable, as no specific procurement notice shall be published prior to the issuance of the GPN.

33. **Documents.** GITA will maintain complete records for each activity, which will include all procurement documents for each contract, including bidding documents, RFPs, advertisements, bids received, bid evaluations, no objections, letters of acceptance, contract

agreements, bid securities, advance payment guarantees, performance securities, photocopies of invoices and payments, and related correspondence. Contract award information will be promptly recorded and contract rosters maintained.

34. **Procurement of goods and non-consulting services.** Goods and non-consulting services estimated to cost US$1 million equivalent and more will be procured through international competitive bidding (ICB). Goods, and non-consulting services estimated to cost less than US$1 million may be procured through national competitive bidding (NCB), and less than US$100,000 through shopping (SH). (NCB and SH using Georgian E-Government Procurement System.) For the matching grants, commercial practices will be used in line with the Procurement in Loans to Financial Intermediary Institutions and Entities method. For the BfD voucher/cash back program, procurement will follow the "Community Participation in Procurement" method to be further elaborated in the Project Operations Manual.

35. **Procurement of works.** Works contracts estimated to cost more than US$10 million equivalent will be procured through ICB. Those estimated to cost US$10 million or less may be procured though NCB, and less than US$200,000 through shopping. (NCB and SH using Georgian E-Government Procurement System.)

36. **Selection of consultants.** Consulting services will be procured according to the Bank's Consultant Guidelines mentioned above. The Bank's Standard RFP (revised in October 2011) will be used to select all consulting firms. Consultant selection methods will include Quality- and Cost-Based Selections (QCBS), Fixed-Budget Selection (FBS), Consultant Qualifications (CQS), Least-Cost Selection (LCS), Selection of Consultants in Loans to Financial Intermediary Institutions and Entities (meaning commercial practices for the matching grants recipients), Single-Source Selection (SSS), and Individual Consultants (IC). The latter will be selected according to Section V of the Consultant Guidelines. This method will require comparing at least three qualified and available candidates.

37. **Short lists composed entirely of national consultants.** Short lists of consultants for services estimated to cost less than US$300,000 equivalent per contract may be composed entirely of national consultants, according to the provisions of paragraph 2.7 of the Consultant Guidelines.

Table 3.4. Prior Review Threshold for Goods and Works and Services other than Consulting Services

Expenditure Category	Method	Prior Review Thresholds
1. Goods	ICB	All contracts
-"-	NCB	As agreed in PP
-"-	SH	As agreed in PP
-"-	DC	As agreed in PP and justified per Procurement Guidelines para 3.7 (a)–(f)
2. Works	ICB	All contracts
-"-	NCB	As agreed in PP
-"-	SH	As agreed in PP
-"-	DC	As agreed in PP

Table 3.5. Prior Review Thresholds for Consulting Services

Expenditure Category	Method	Procurement Method Thresholds	Prior Review Thresholds
3. Cons. Services firms	QCBS	–	As agreed in PP
	FBS	–	As agreed in PP
	QBS	–	As agreed in PP
	LCS	–	As agreed in PP
	CQS	≤ US$300 K	As agreed in PP
	SSS	–	As agreed in PP
4. Cons. Services individuals	IC	–	As agreed in PP
	SSS	–	As agreed in PP and justified per Consultants Guidelines para 3.9 (a)–(d)

38. Incremental Operating Costs, or operation costs are reasonable and necessary incremental expenses towards recurrent expenditure, incurred by the Recipient with respect to Project implementation, management and monitoring, including the costs of staff salaries (excluding salaries of the Recipient's civil service staff), communication, editing, printing and publication, translation, vehicle operation and maintenance, bank charges, local travel costs and field trip expenses, office rentals, utilities, equipment and supplies.

39. **Project Operational Manual:** GITA shall prepare the POM, which shall be provided for the Bank's review prior to effectiveness.

Environmental and Social (including safeguards)

40. **Environment.** The Project will finance rehabilitation of premises for CICs and RIHs. Because the Project carries physical investment component involving rehabilitation of buildings, the OP/BP 4.01 Environmental Assessment is triggered. The envisaged civil works will have modest local environmental and social impacts, which would be easy to mitigate by ensuring that works providers adhere to the conventional good construction and environmental practices. Therefore, the Project is classified as environmental Category B.

41. Due to the nature of the Project design, most individual investments are not identified upfront, however their character and scope are well known, and so are potential environmental and social implications of the activities to be financed. The Borrower will prepare an Environmental and Social Management Framework (ESMF) to guide site-specific environmental and social work under individual investments. This will imply environmental and social screening of the proposed physical works and their classification by environmental categories. No Category A activities will be eligible for funding. For environmental category B activities, simple Environmental Management Plans will be developed using a checklist template offered by the Bank for small scale construction and rehabilitation works. The draft ESMF will be shared with the Bank, disclosed in Georgian and English languages, consulted with relevant stakeholders and finalized after incorporation of public feedback. The ESMF with the minutes of public consultation process will be re-disclosed in-country and through the Bank's electronic database. Site-specific EMPs will also be disclosed in draft, shared with local communities for feedback, and finalized afterwards. EMPs will be included into bidding documents for works and will then be attached to contracts for the provision of works thus becoming binding for

adherence by contractors.

42. For the start-up and innovation matching grants, civil works will not be eligible for financing. Initiatives related to the production of arms, spirits, tobacco, and hazardous substances will be excluded from support through the Project. The ESMF will cover these and other safeguard aspects of matching grant schemes, establishing rules for environmental and social screening, approval and monitoring of grant applications and of the grant financed activities.

43. GITA is the Project Implementing Entity. It is a young institution with no prior exposure to the World Bank's safeguard policies. GITA has appointed a staff member to handle safeguard compliance under the GENIE Project. Although this person has no background in environmental or social science, such an arrangement is found to be satisfactory because of the modest environmental and social risks implied by the Project. The staff member charged with responsibility for safeguards management will receive on-the-job training by the Bank team in the course of Project implementation. The hiring of a specialized safeguards professional may be considered later, if issues start to emerge in the course of the implementation.

44. **Social.** Overall, the project is expected to have positive social impacts. In Georgia, residents of remote mountain areas, the elderly (and especially elderly women), internally displaced persons (IDPs), and households with more than 5 children are among the most vulnerable. The Project is expected to promote inclusion of several of these groups by connecting up to 5,000 rural households to broadband Internet services, by providing digital literacy training these rural households, and by providing innovation and skills to residents of areas outside of Tbilisi.

45. **Inclusion of women** will be mainstreamed throughout the project. To achieve this, the project will address some of the societal norms that prevent women from participating in innovation and technology through education campaigns, by creating an inclusive environment (and including activities that are of more interest to women) in CICs and RIHs, and by ensuring that subsidies and digital literacy training are provided directly to women when appropriate.

46. The project will also actively seek **beneficiary feedback** in each component. Users of CICs and RIHs will be asked to provide feedback on the quality of training. Households that are newly connected to broadband will be able to provide feedback on the quality of service and help to improve it by reporting system outages and connectivity problems. In some cases, those receiving training, grants, or technical assistance through other components could also be asked to provide feedback about the usefulness of activities and ease of processes.

47. The project does not trigger OP 4.12 Involuntary Resettlement, since potential CIC and RIH locations that could require resettlement will not be eligible for financing of renovations/ rehabilitation.

Monitoring & Evaluation

48. GITA will be in charge of all Project M&E. To facilitate this, a beneficiary management and data collection system will be developed to register all project beneficiaries, e.g. CIC and RIH users, and track the services they receive and results achieved (to the extent possible). A complementary system would also be developed to track the performance of matching grant

recipients. An impact evaluation is included in Component 4, the details of which are to be determined. Finally, given the pilot nature of the CICs and RIHs, a semi-annual assessment of their performance would be undertaken by independent experts, at least in the first 2–3 years of the project.

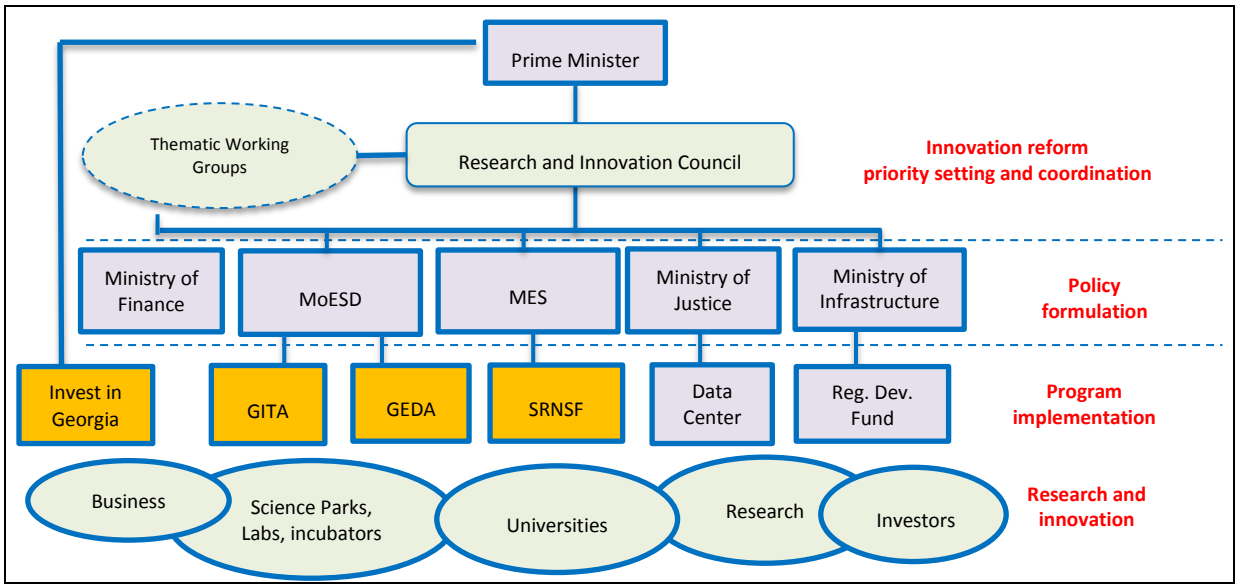
Annex 4: Additional Sectoral and Institutional Context

GEORGIA: National Innovation Ecosystem Project

1. This annex contains background information on the following six areas: (a) overview of the Georgian national innovation system; (b) the innovation and entrepreneurship landscape in Georgia vis-à-vis comparator countries; (c) a beneficiary demand assessment survey undertaken during Project preparation; (d) international experience on using libraries for CIC-type activities; (e) fab lab definition and best practices; and (f) broadband-for-development program.

Overview of the Georgian National Innovation System

Figure 4.1. Structure of the Georgian National Innovation System



Key Entities Responsible for the Innovation Policy Formulation

- **Georgian Parliament and Government**

- **Research and Innovation Council** - a counselling body of the Government of Georgia established for the purpose of facilitating science development, research and innovation. Objectives and functions of the Council are: (a) Drafting recommendations for ensuring economic development; (b) Facilitating development of the strategy Innovative Georgia 2020; (c) Facilitating allocation of funds from the budget, and other sources; (d) Coordinating planned targeted programs and inter-agency projects for development of high speed internet in the country and increasing efficiency of internet application; (e) Facilitating participation of the private sector in state IT projects for development of export oriented innovations and technologies, innovative information technology products and services including export programming; and (f) Supporting the best scientists. Currently the Council has four working groups in the following areas: regulatory framework, strategy and information, science and education, and infrastructure for innovation.

- **Ministry of Education and Science (MES)** - responsible for science and education policy and funding of academic and research institutions operations, researcher's salaries, etc.

- **Ministry of Economy and Sustainable Development (MoESD)** - responsible for funding companies performing R&D for commercialization and GITA, as the central government agency responsible for coordination of the innovation ecosystem in Georgia.

Agencies Responsible for the Policy Implementation

- **Georgian Innovation and Technology Agency (GITA):** subordinated to the Ministry of Economy and Sustainable Development (MoESD), with the primary objectives of coordination of Georgia's innovation ecosystem and implementation of measures supporting innovation, particularly programs advancing private and public sector knowledge, innovation, commercialization of research, and promoting innovative entrepreneurship. Its annual budget is around GEL 6.3 million (equivalent to US$2.7 million).

- **Shota Rustaveli National Science Foundation (SRNSF):** funded by the MES, serves as the main channel for financing public R&D (mostly basic research) in Georgia, with budget of approximately GEL 24 million in 2013 (equivalent to US$10 million or around 0.1 percent of GDP). It is the main source of competitive research funds and plays a critical role in designing and evaluating research funding.

- **Invest in Georgia (the Georgian National Investment Agency):** subordinated to the Prime Minister, plays the role of a moderator between foreign investors and the Government of Georgia, ensuring that investors gets the right information and have effective communication with Government bodies.

- **Georgian Entrepreneurship Development Agency (GEDA, a.k.a. Enterprise Georgia):** subordinated to the MoESD, with the objective to support SME development, promote entrepreneurship and development of an entrepreneurial culture, and nurture growth and sustainability of export products and services. GEDA provides support mechanisms tailored to the specific stages of development and financial needs of a business. It provides (1) access to finance (provision of access to credit and leasing for enterprises); (2) Micro and small business support for new or existing enterprises in the areas of business idea contests, business plan development training and business plan contests; (3) Export promotion and development programs; and (4) Training and consulting. Its annual budget is around GEL 22 million (equivalent to US$9.3 million).

Innovation Policy Infrastructure[41]

2. **Technology Transfer Offices:** Currently, no university in Georgia has a fully functioning, traditional technology transfer office (TTO) or a well-developed innovation and intellectual property (IP) policy. The most advanced facility is the Technology Transfer Center of Georgia (TTGC) established in 2012 with the support of the Patent Office Sakpatenti and GIZ. However, the technical and financial support provided to TTGC has not been sufficient to build TTCG's capacity to deliver an adequate set of services. Donor programs facilitated the recent creation of TTOs at the Tbilisi State University and Georgia Technical University, which currently face challenges in capacity building and delivering tech transfer services.

3. **Business incubators:** There are five business and IT incubators in Georgia, three of which were created only 4–5 years ago and are housed, at the Free University, Ilia University, and Georgia Technical University. There is also a Batumi Business Incubator (in operation since 2009) that has developed into one of the main business service providers in the Ajara Region; as well as IT Garage Incubator created in March 2014 under the management of the Patent Office Sakpatenti with a focus on ICT.

4. **Recent developments:** Overall research infrastructure and proof-of-concept facilities in Georgia have significant room for improvement. However, there have been positive developments that demonstrate the possibilities in Georgia, such as the Lugar Research Center, which has been transferred to Georgian control. Also since the creation of GITA, new innovation infrastructure has been established such as fabrication laboratories (fablabs) and "i-labs" supporting innovation among students and entrepreneurs.

Access to Finance

5. Limited access to finance is one of the top constraints for enterprise development in Georgia (2013–2014 Global Competitiveness Report). Out of 133,802 MSMEs, only 12 percent have a loan and 15 percent have access to credit. 94 percent of financing to MSMEs is provided by private commercial banks, while non-bank financial institutions do not exist. Banking products do not seem to address the needs of MSMEs—nearly 76 percent of firms finance their investments internally[42]. Banks are reluctant to provide loans for innovative projects due to higher risks and lack of understanding of innovative projects. Also, private equity and venture capital markets are underdeveloped with lack of market infrastructure and business practices for equity and venture capital financing.

6. **Recent developments.** Facilitating access to finance has been among the government's priorities. Access to finance for enterprise development has been promoted by the Georgian Entrepreneurship Development Agency, while financing innovation has been promoted by GITA. In terms of advancing the presence of risk capital, in 2015 GITA initiated development of the Georgian Business Angels network. Additionally, the Programmatic Private Sector Competitiveness Development Policy Operation (DPO) was signed between the World Bank and

[41] The World Bank (June 2014) "Georgia 2020 Innovation Strategy. Comments and recommendations". Competitive Industries and Innovation Project (P146270)
[42] Source: World Bank Group, Financial and Private Sector Development, 2014.

the Government of Georgia in February 2015. Among others, the DPO's reforms support measures to deepen and diversify the financial sector, including capital market reforms.

Education System and Skills Development[43]

7. Georgia has made significant progress in reforming its education system over the past decade, implementing reforms targeted at transforming the Post-Soviet education system into a new system more consistent with a rapidly changing world with complex technical requirements and increased international competitiveness. Nonetheless, Georgia lags in both education and tertiary education and produces a low level of graduates in science and engineering. There has been also a drop in enrolment of students in vocational education and training. Moreover, Georgia's education policy has not been aligned with the demands of modern industrial development or to prepare graduates for working in private business.

8. **Recent developments.** The reform of tertiary teaching and public research is being targeted by a State Commission on Education and Science Reforms. MES and MoESD are committed to cooperate on better alignment of education policy to market needs and international best practices, and in raising the overall quality of the Georgian educational system. A new Strategy and Law for Science and Education is being developed by the MES.

9. In 2013, an agreement was signed with the U.S. Millennium Challenge Corporation (MCC), through which the Georgian government initiated educational and research reforms. Through MCC, three projects are financed in the education sector for an overall budget of US$140 million for a period of five years:

(a) **Improving General Education Quality Project (US$76.5 million)** seeks to improve general education quality in Georgia through infrastructure enhancements to the physical learning environment, training for educators and school managers, and support to education assessments.

(b) **Industry-Led Skills and Workforce Development Project (US$16 million)** aims to improve the linkage between market-demanded skills and the supply of Georgians with technical skills relevant to the local economy.

(c) **STEM Higher Education Project (US$30 million)** proposes to attract one or more international university partners to support the Government of Georgia's effort to modernize STEM (science, technology, engineering, and math) education by delivering high-quality STEM degree programs that boost productivity and growth, and increase employment opportunities. The project aims to offer high-quality

[43] Sources: (a) The World Bank Group (2013) „Skills Mismatch and Unemployment Labor Market Challenges in Georgia". Human Development Sector Unit South Caucasus Country Department, ECA; (b) The World Bank (2014) Georgia: Technical Assistance to Support Preparation of Education Sector Strategy (P148580); (c) Millennium Challenge Corporation, MCC (2011) Tracer Survey of Graduate from Vocational Training Centers, Community Colleges, and College Level Diploma Programs at Higher Education Institutions. Georgia; (d) Millennium Challenge Corporation Congressional Notification August 8, 2013; (e) The World Bank (June 2014) "Georgia 2020 Innovation Strategy. Comments and recommendations". Competitive Industries and Innovation Project (P146270).

international standard STEM degrees and/or U.S. accreditation of Georgian public university degree programs, something not done before in Georgia.

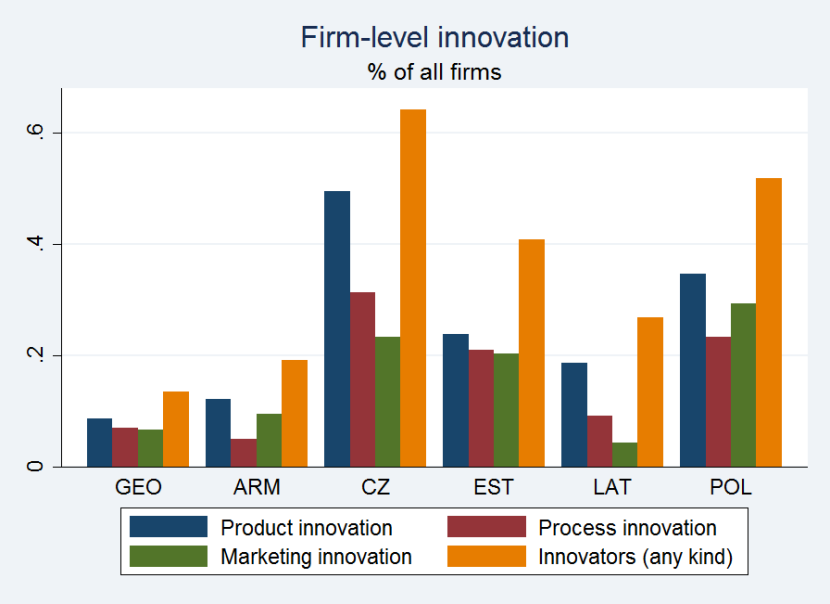
Innovation and Entrepreneurship Landscape in Georgia

10. This section analyzes the state of firm-level innovation in Georgia based on the results of the EBRD-World Bank Enterprise Surveys[44] conducted in Georgia during 2012–2013. It analyses the key innovation characteristics derived from the survey raw data in two modules: the core and innovation modules. The comparator set of countries are Armenia, Czech Republic, Estonia, Latvia, and Poland.

Innovation Activity

11. Among the comparator countries, Georgia has the lowest number of the interviewed firms (13 percent) involved in either of the following: product, process, organizational or marketing innovation (Figure 4.2). The peer group of countries is led by Czech Republic that has 64 percent innovating firms, followed by Poland (52 percent), Estonia (41 percent), Latvia (27 percent) and Armenia (19 percent). Per each specific type of innovation, Georgia mainly lags behind its peer group, however in process innovation, Georgia is second to last slightly ahead of Armenia (7 percent and 5 percent respectively), and in marketing innovation it is ahead of Latvia (7 percent and 4 percent respectively).

Figure 4.2. Cross-country Comparison of Firm-level Innovation Based on the ES Core Module (% of all Firms)

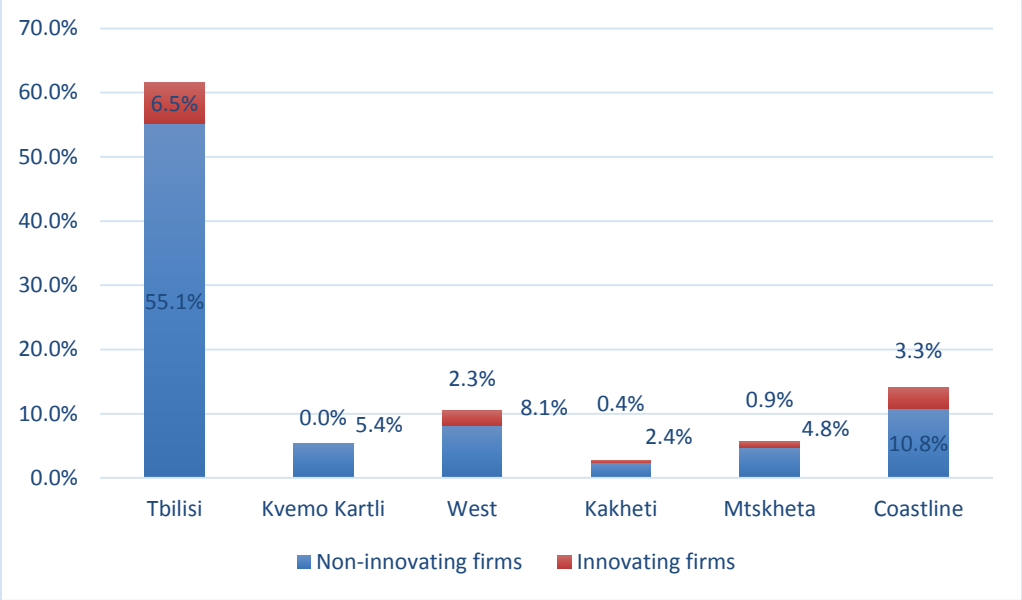


Source: Author's calculations based on the raw data downloaded from the Enterprise Survey web-site in August 2015.
Note: Innovators (any kind) comprise either product, process, marketing, or organizational firm-level innovation.

[44] The Enterprise Survey in Georgia collected information from a representative sample of the non-agricultural formal private economy, comprising three hundred sixty (360) firms.

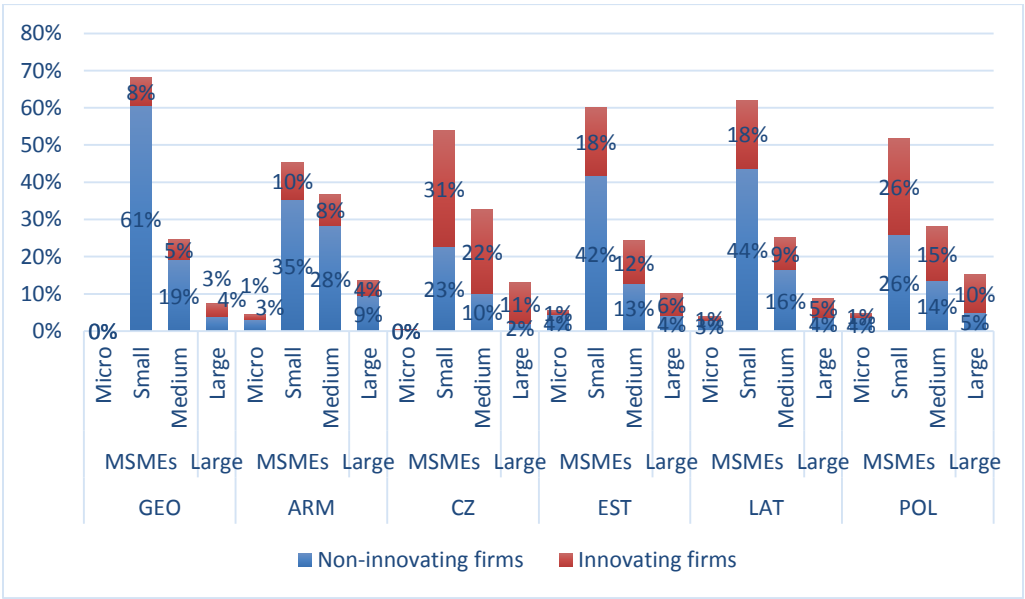
12. On average, the largest share of innovating firms is concentrated in Tbilisi (6.5 percent of all firms), followed by Coastline (3.3 percent), West (2.3 percent), Mtskheta (0.9 percent), and Kakheti (0.4 percent).

Figure 4.3. Innovating Firms by Region in Georgia (%or all Firms)



13. Among the comparator countries, Georgia has the lowest share of innovating firms in each sub-group per firm size. The relatively largest share of innovative firms in Georgia is among the small firms (on average, 8 percent of all firms).

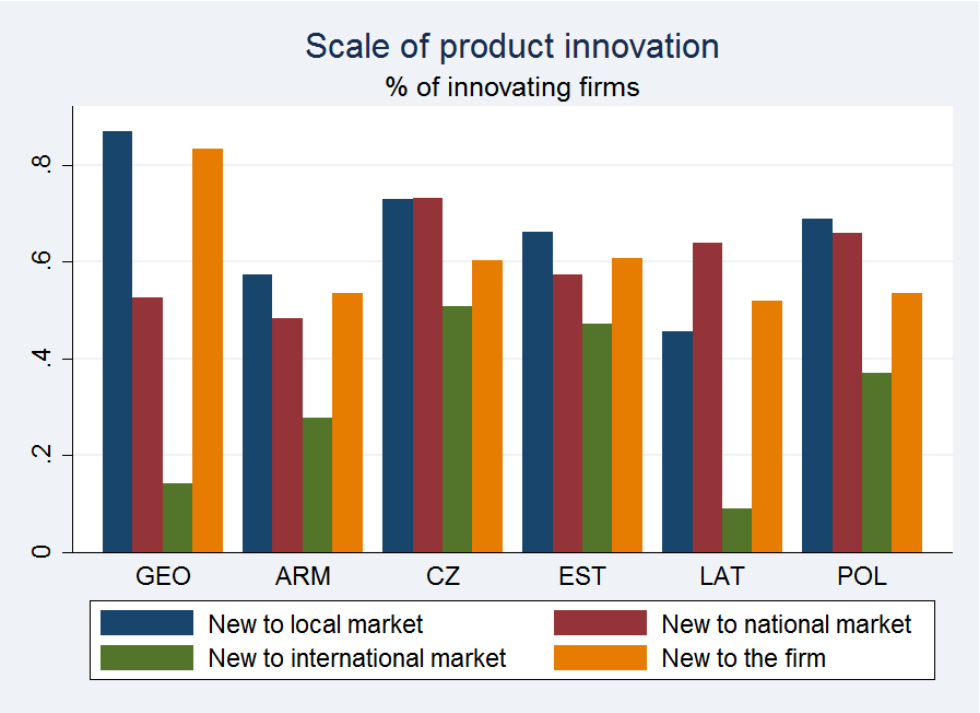
Figure 4.4. Innovators by Firm Size



Note: (a) Micro<5, Small >=5 and <=19, Medium >=20 and <=99, Large >=100; (b) innovators comprise either product, process, marketing, or organizational firm-level innovation.

14. Among the comparator group of countries, Georgia has the highest percentage of firms that innovate locally, mostly doing adaptive innovation, indicating the lack of capabilities to innovate at the international market (Figure 4.5). The majority of Georgian firms innovate only on a local scale – 87 percent of innovators reported their innovations were new to their municipality, 83 percent were new only to the firm, and 53 percent to the national market. Georgia is second to last among the peer group in terms of frontier innovation on an international scale, having 14 percent of innovating firms that reported their product innovation being new to the international market. The leaders in innovating on the international scale among the peer group are Czech Republic (51 percent of innovative firms), followed by Estonia (47 percent) and Poland (37 percent),

Figure 4.5. Cross-country Comparison of Product Innovation Characteristics

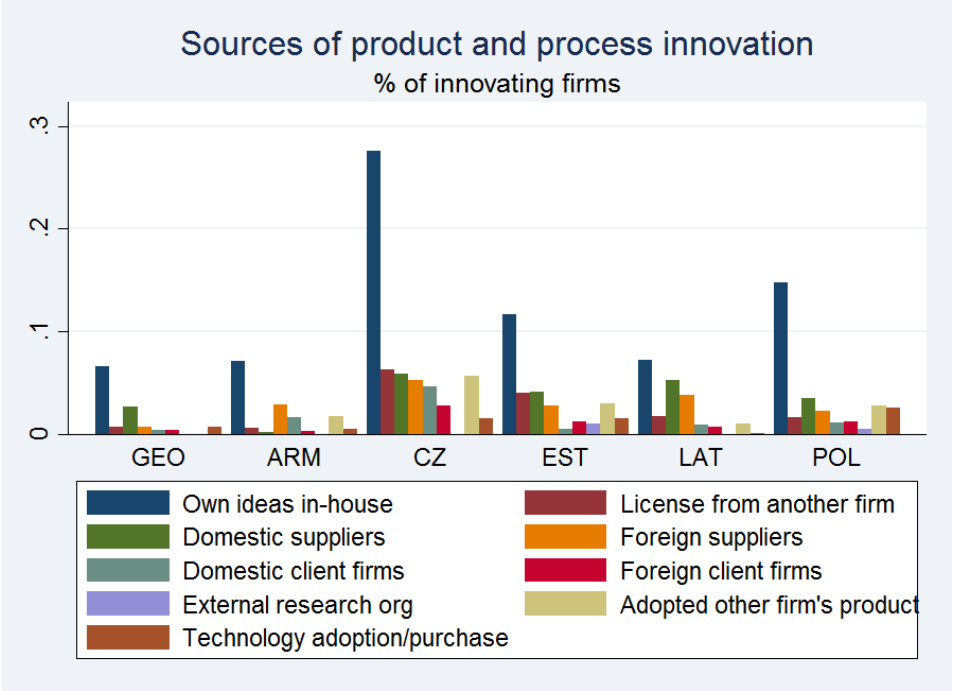


Innovation Inputs

15. The innovative firms in Georgia don't seem to be systematically tracking the source of their newly introduced or improved products. There are only 12.2 percent of innovative firms in Georgia that have responded to this question, being the last among the comparator group (Figure 4.6).

16. Georgian innovators also don't seem to see the value in cooperating with other organizations for the purpose of innovation (Figure 4.6). The top three sources of firm-level product and process innovation in Georgia are as follows: (1) only 6.5 percent of innovative firms developed or adapted the new product or process, using its own in-house ideas, (2) 2.7 percent developed in cooperation with domestic suppliers, and (3) 0.7 percent by licensing from another firm and another 0.7 percent in cooperation with foreign suppliers.

Figure 4.6. Main Sources of Product and Process Innovation



17. In terms of innovation inputs, among the comparator countries Georgia has a low share of firms that provide the training (11 percent), and allowing the time to innovate for their employees (14 percent). Meanwhile, 49 percent of Georgian firms seemed to confirm that they spent on some sort of R&D (Figure 4.7), which is surprisingly, the highest ratio among the comparator countries (which could suggest an issue with data quality given the juxtaposition with other survey question responses).

18. Meanwhile, analyzing the R&D expenditure as a share of firm's sales, Georgian firms spend the least amount among the comparator group of countries, accounting on average to 0.007 percent of sales. The leader in this category is Czech Republic, where firms invest in R&D on average 0.653 percent of sales (Figure 4.8).

Figure 4.7. Innovation Inputs

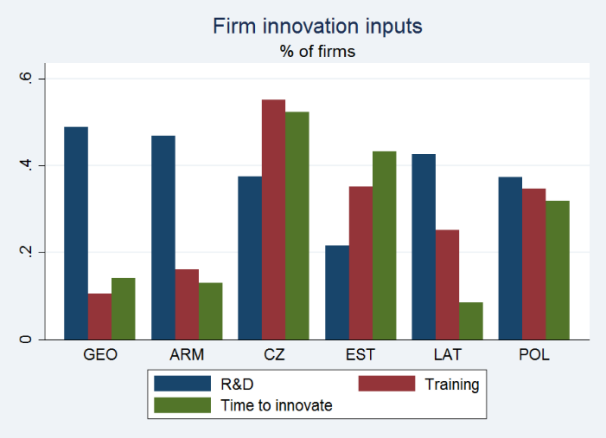
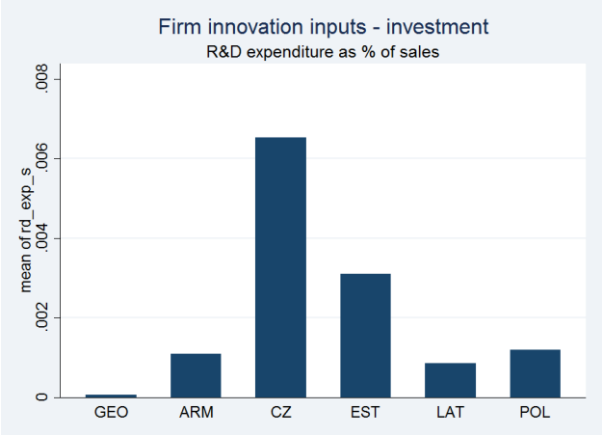


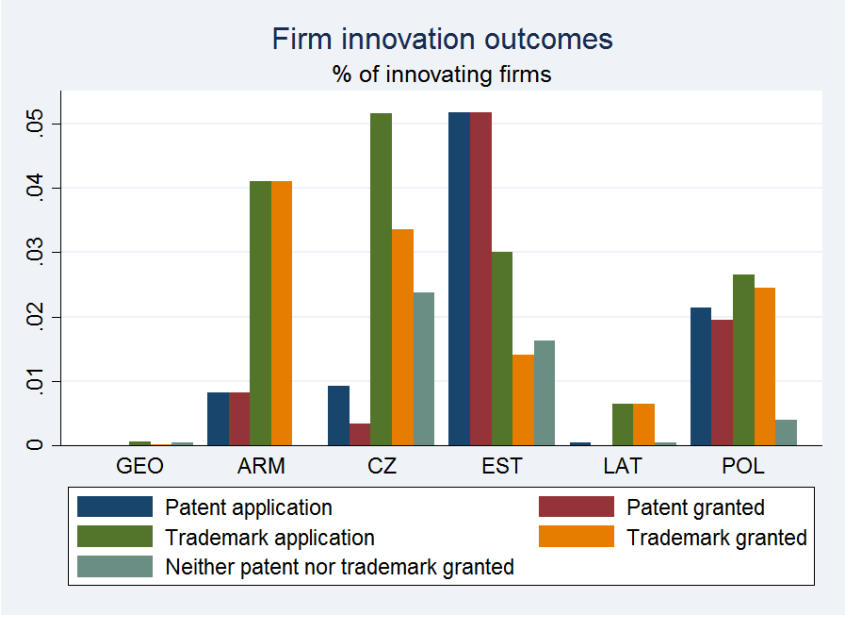
Figure 4.8. Firm Innovation Inputs - R&D Investment



Innovation Outcomes

19. In terms of innovation outcomes, Georgian firms largely do not commercialize (or at least do not seek patents or trademarks to commercialize) their innovations, leaving Georgia behind its comparator group of countries (Figure 4.9). This finding reveals the importance of further analysis regarding the causes of this behavior. Possible causes could be a lack of incentives to innovate, caused by a weak intellectual property regime (IPR), or lack of firm's basic knowledge about commercialization and the National Patent Office.

Figure 4.9. Innovation Outcomes



Georgia's Technological Classification and Sophistication of Manufacturing Sub-Sectors

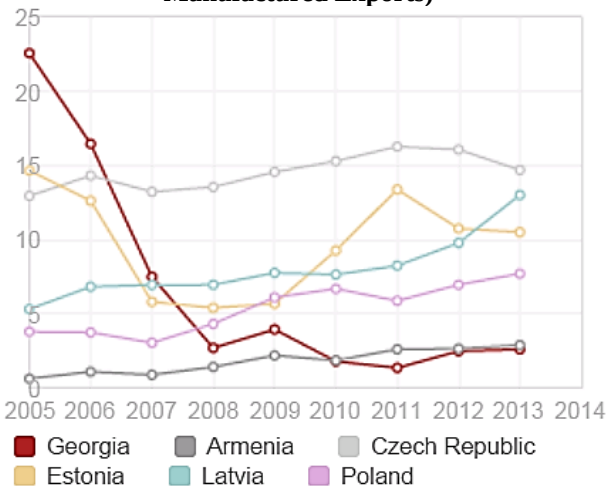
20. R&D and innovation can help strengthen the sophistication of products and shift toward high-technology and higher value-added products. In the recent years the manufacturing sector in Georgia has stagnated and experienced little high-tech innovation (likely partly as a result of the

2008 twin shocks of the war and the external downturn). Georgia has slid from its high-technology peak of 38 percent of manufactured exports in 2004 to only 2.6 percent in 2013 (Figure 4.10). During the last decade, Georgia's export basket has been in the process of shifting away resource-based. In 2013, the low-tech products were the highest group in the export basket (49 percent of total exports), and medium-tech has slid to 8 percent comparing to 44 percent in 2010 (Figure 4.11).

21. Georgia's sophistication of exports is the lowest among its peer countries, while Georgia's GDP per capita is relatively similar or even higher than Moldova and Ukraine. Countries with a more sophisticated export basket tend to have accelerated growth, while those with less sophisticated exports tend to lag behind. [45] Figure 4.12 shows the relationship between sophistication of exports (EXPY) and per-capita income for Georgia and its peer countries during 10 years (2001–2011).

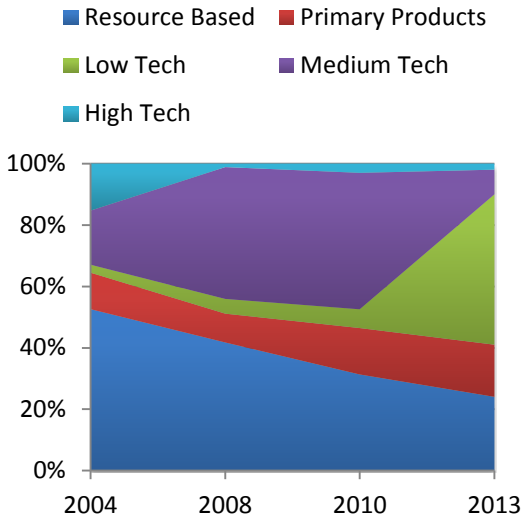
[45] Hausmann, Hwang and Rodrik (2006)

Figure 4.10. High-Technology Exports (% of Manufactured Exports)



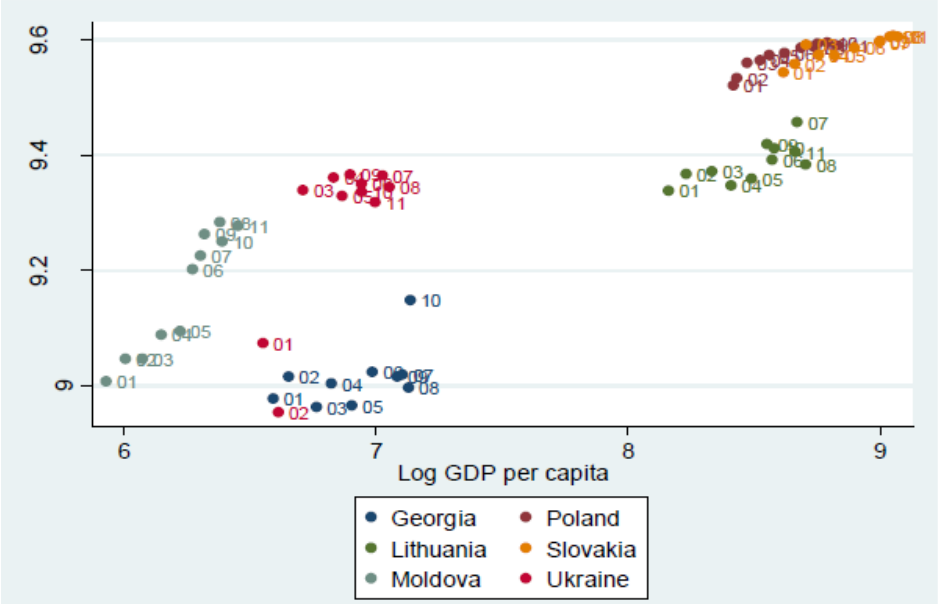
Source: WDI, based on United Nations Comtrade database.
Notes: High-technology exports are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery.

Figure 4.11. Georgia's Share of Manufactured Exports by Technological Intensity (% of Total Exports): 2004–2013



Source: Author's calculations based on United Nations Comtrade database.

Figure 4.12. Evolution of Sophistication (EXPY) of Georgia and Comparator Countries



Source: Authors' calculations based on Comtrade and WDI data.

Source: World Bank (2013). Georgia: Trade Competitiveness Diagnostic.

22. **The majority of jobs in Georgia are in sectors with low technological and skill intensity.** As seen in Figure 4.13, between 2004 and 2009 workers in the agricultural sector had a nearly 60 percent share of total employment, and productivity amounted to only about US$700 of value-added per worker. Meanwhile, the levels of EU10 (Figure 4.14) are almost reversed for

agriculture, exhibiting a 10 percent share of total employment and US$8,000 of value-added per worker.[46]

Figure 4.13. Georgia: Sectoral Employment and Productivity, 2004–09 (Value-added per Worker, in Constant Dollars and in Percent)

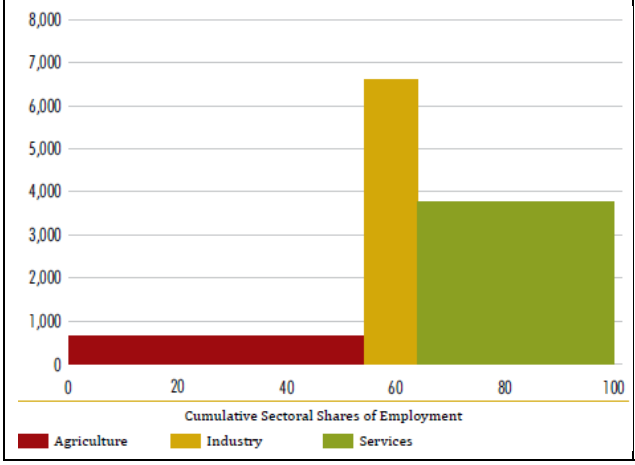
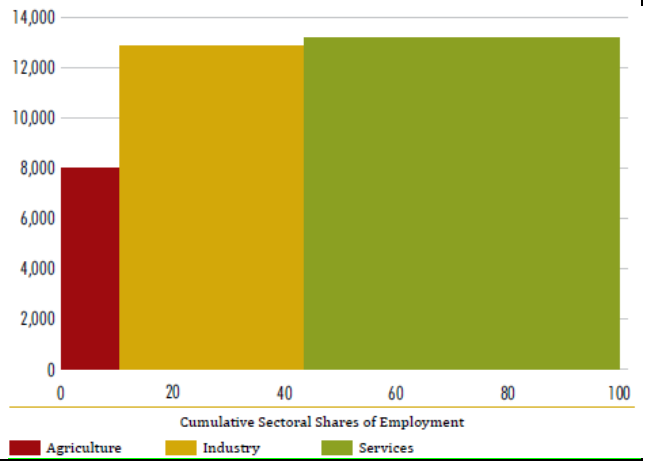


Figure 4.14. EU-10: Sectoral Employment and Productivity, 2004–09 (Value-added per Worker, in Constant Dollars and in Percent)

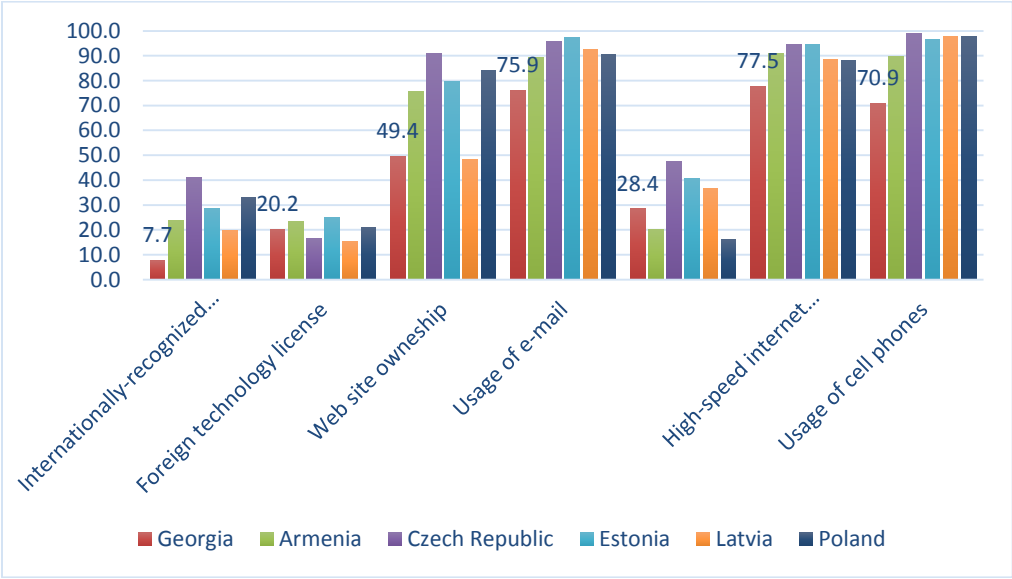


Source: Georgia County Economic Memorandum (2013)

Usage of Technology

23. According to the Enterprise Surveys, Georgia's usage of cell phones and emails to interact with the clients is the lowest among the comparator countries. The same goes for the percentage of firms that have obtained internationally recognized quality certification and high-speed internet connection.

Figure 4.15. Usage of Technology (% of Firms)

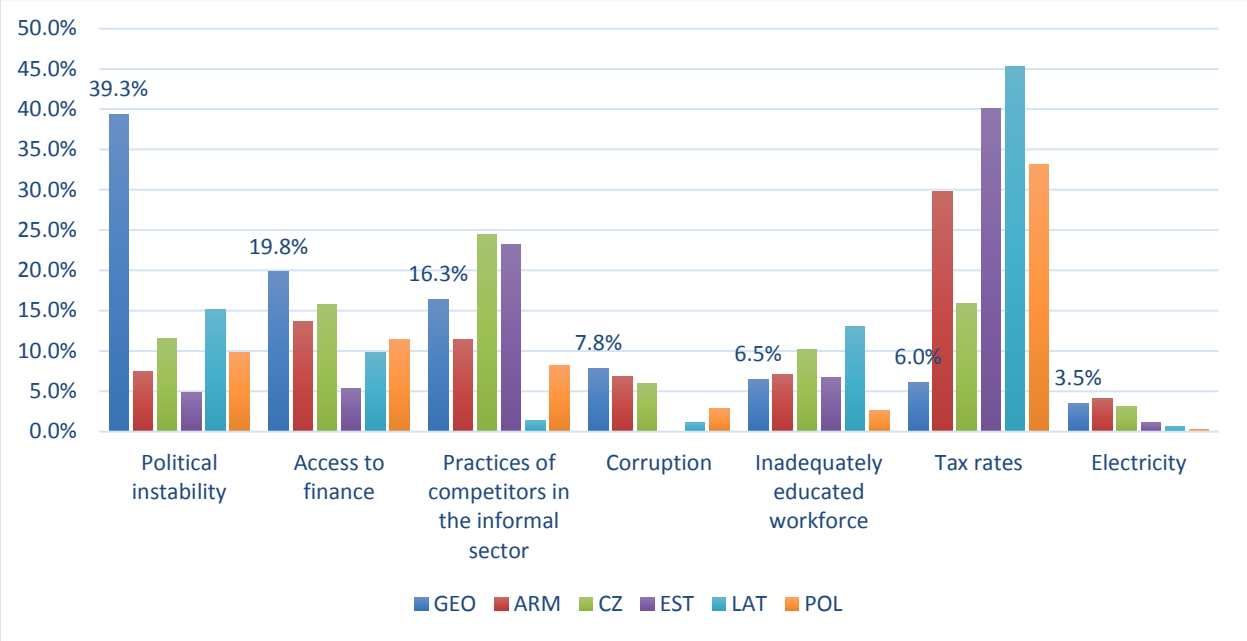


[46] CEM 2013

Biggest Obstacles for Innovating Firms

24. The Enterprise Surveys identify the top five obstacles for innovators in Georgia as political instability (for 39 percent of innovating firms), access to finance (20 percent), practices of competitors in the informal sector (16 percent), corruption (8 percent), and inadequately educated workforce (6.5 percent). While for Georgian innovators the tax rates were only sixth largest obstacle, it was the biggest obstacle for such countries as Latvia, Estonia, Poland and Armenia.

Figure 4.16. Biggest Obstacle in Business Environment for Innovators (% of Innovating Firms)



Aggregate Assessment of Innovation and Knowledge Economy in Georgia

25. According to the Global Innovation Index 2014[47], Georgia is categorized as an 'inefficient innovator', and positioned as 'innovation learner'. Georgia's innovation system was ranked 74th out of 143 economies (1 is best, 143 is worst). Meanwhile, Georgia's relative position above the convex predicted line (Figure 4.17) indicates that the country's aggregate innovation performance is above the level expected for the countries with a similar level of GDP per capita. However, it was noted that although the progress is not uniform, the group of lower-middle income economies demonstrated rising levels of innovation results.

[47] WIPO-INSEAD-Cornell Global Innovation Index (GII) 2014 is comprised of 7 main pillars and 21 sub-pillars, calculated based on 81 individual indicators.

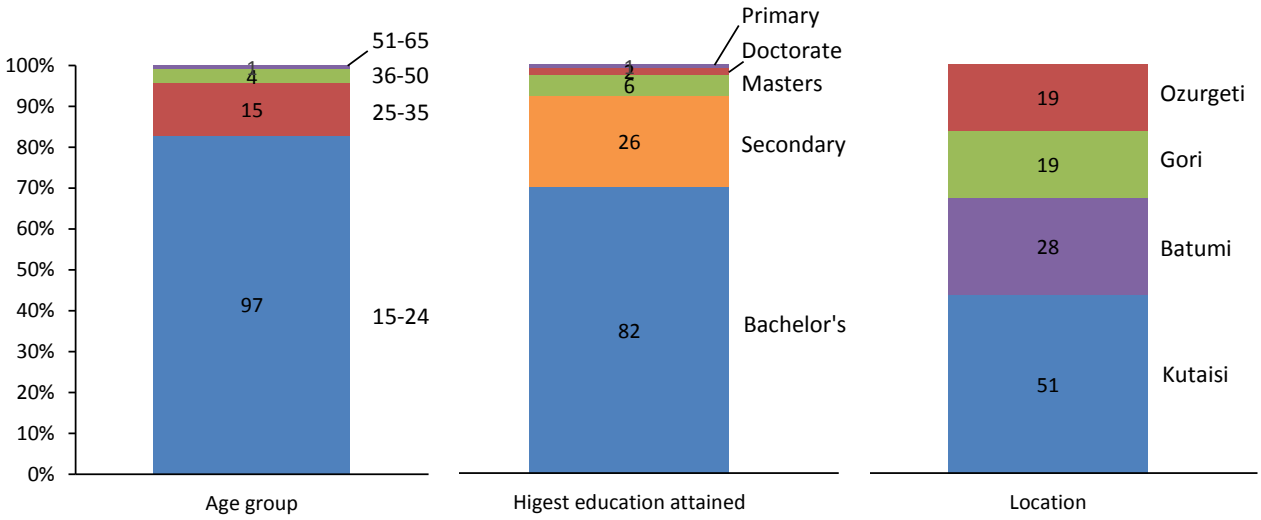
Figure 4.17. WIPO-INSEAD Global Innovation Index 2014 Scores vs. GDP Per Capita in PPP US$ (Bubbles Sized by Population)

Project Beneficiary Demand Assessment Survey

26. In designing the GENIE project, extra emphasis has been placed on tailoring the proposed infrastructure and services to the needs of the targeted populations, as low demand for these offerings could ultimately undermine the project's objectives of stimulating innovative and entrepreneurial mindsets and activities. Therefore, significant time was devoted during the project preparation missions to understanding the mentalities, constraints, needs, and capacity of potential project beneficiaries, particularly the potential users of the innovation centers.

27. As part of this demand assessment, a series of focus groups was conducted in June 2015 and a written survey administered to participants to assess their perceptions of innovation and entrepreneurship and constraints to engaging in these activities. A total of 117 people (67 men and 50 women) were surveyed across four cities where the RIHs and CICs are expected to be piloted—Batumi, Kutaisi, Gori, and Ozurgeti. The large majority of respondents (84 percent) were university students in the 15–24 age range enrolled in graduate programs (having already attained a bachelor's degree). Figure 4.18 summarizes the breakdown of respondent characteristics.

Figure 4.18. Characteristics of Survey Respondents



Note: Data labels refer to number of respondents, while vertical axis percentage of total.

28. The questions were organized around five key themes: technology access, culture and awareness of entrepreneurship, inclusion of women and marginalized groups in the digital economy, and skills and financing constraints. The questions were phrased in the form of a statement and respondents were asked to rate the extent to which they agreed or disagreed with the statement on a 1–5 scale (with 1 representing strong agreement and 5 strong disagreement). The results of this survey (detailed in Figure 4.19) revealed the following:

- **Room for improvement in internet access.** Around 25 percent of respondents stated they did not have a reliable broadband internet connection at home or in a nearby public facility, while around 30 percent felt their internet service was expensive. These figures were slightly higher for Ozurgeti in the more rural Guria region. This suggests a potential role for the GENIE project to support both improved internet access and affordability, particularly in rural areas.

- **Latent entrepreneurial spirit.** Around 60 percent of respondents agreed that one of their personal goals is to start their own business, and only 20 percent disagreed (the rest were neutral). This result was broadly consistent across the 4 cities in the survey sample, and highest in Batumi, where 90 percent of respondents declared entrepreneurial ambitions. About a third of those expressing a desire to start a business were women.

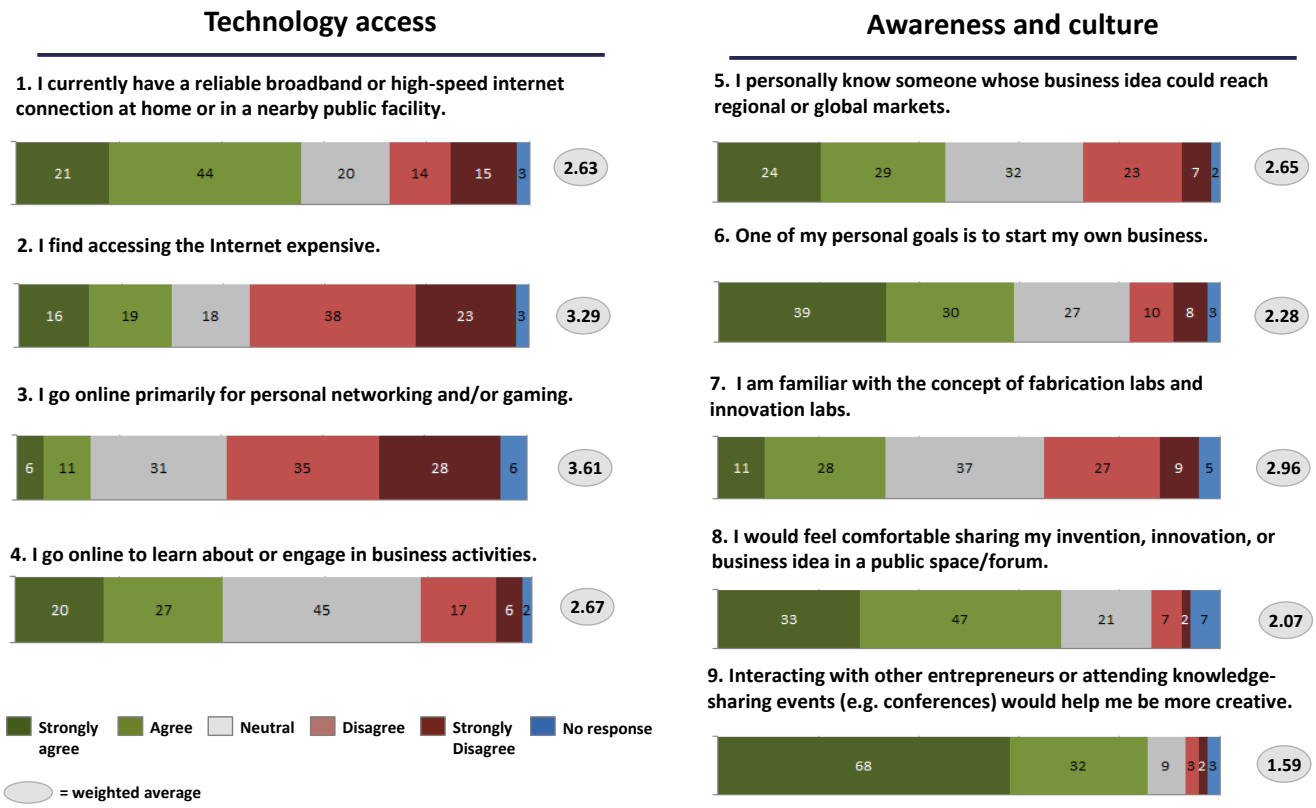
- **Perceived inclusion of women in the digital economy.** Around half of respondents agreed that women in their local community work in jobs that use digital technology and require IT skills. This percentage was similar for both male and female respondents. Only 20 percent disagreed and the rest were agnostic.

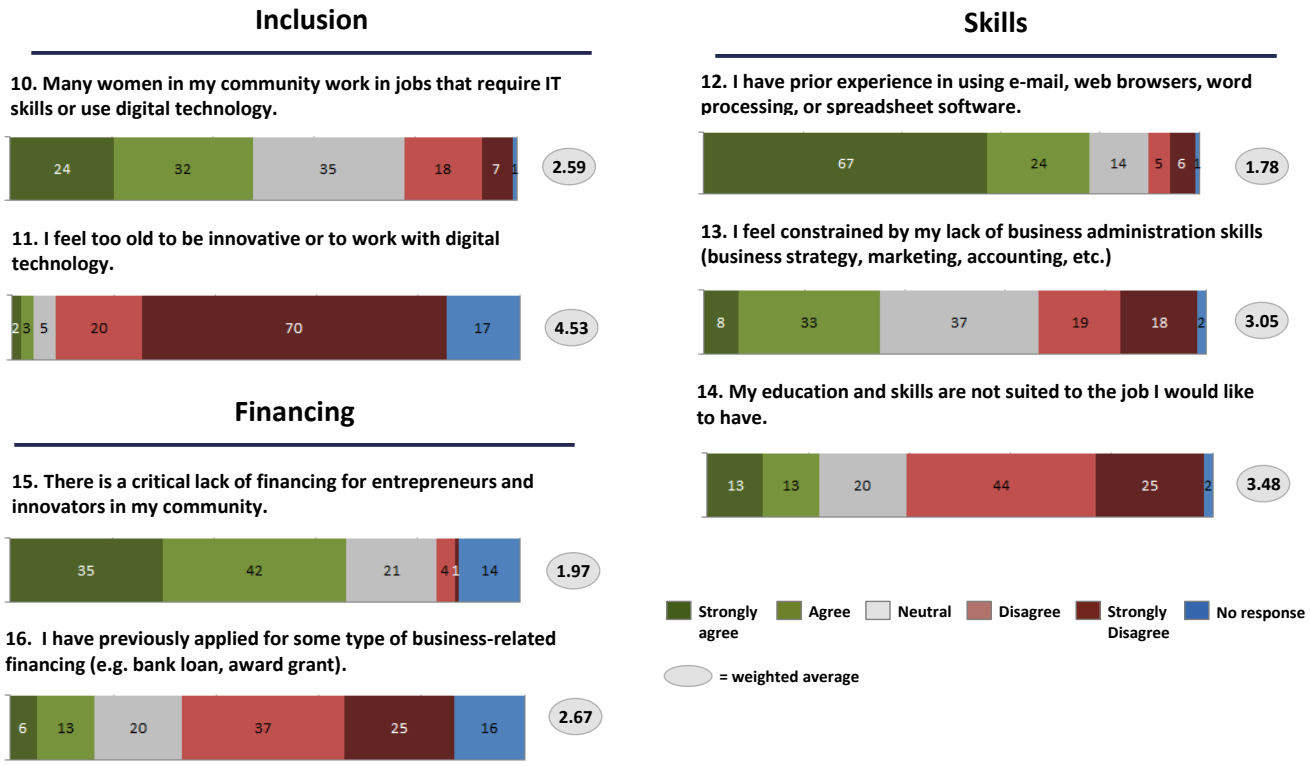
- **Moderate digital literacy but more limited business administration skills.** While 90 percent of respondents stated having prior experience using e-mail, web browsers, word processing, or spreadsheet software, more could be done to deepen

these skills, particularly in the non-university population. Furthermore, 35 percent of respondents stated they felt constrained by their lack of business administration skills, and only 30 percent did not perceive such a constraint (the rest neither agreed nor disagreed).

- **Financing constraints.** Two thirds of respondents agreed their local business environment suffered from a critical lack of financing opportunities for entrepreneurs and innovators. This constraint appeared most acute in Ozurgeti, where 84 percent of respondents agreed financing was a key constraint.

Figure 4.19. Results of Survey Questions





29. Additional focus groups with local authorities and public institutions revealed strong interest in partnering with GITA to stimulate innovation and create RIHs and CICs. In each of the 4 cities in which the survey was administered, local representatives—including university rectors, regional governors, and municipal officials—expressed interest in the innovation objectives of the project and in providing facilities to house potential RIHs and CICs. Discussions also revealed a lack of knowledge from individuals, the private sector, and university students on how to become entrepreneurs and innovate and from local authorities on how to stimulate entrepreneurship and innovation. This finding confirmed the need for the GENIE project to support awareness raising activities as well as training, coaching, and mentoring for latent innovators, startups, and firms.

Libraries as Community Innovation Centers (CICs)[48]

30. The GENIE Project plans to leverage the international best practice of the Global Libraries Initiative (GLI) created by the Bill & Melinda Gates' Foundation. The Project will aim to use existing libraries and other public facilities across Georgia to provide the basic innovation infrastructure and spaces for learning, co-working, and connectivity across the country, as well as a variety of training and capacity building activities to increase digital literacy, innovation, and enterprise development.

[48] Sources for this section: Quick, S., Prior, G., Toombs, B., Taylor, L., and Currenti R. (2013) "Users' perceptions of the benefits of ICT in public libraries in Bulgaria" available online at: http://www.glbulgaria.bg/en/node/24011. Assessment reports of the GLI in Lithuania available at: http://www.bibliotekospazangai.lt/en/.
GLI website: http://www.gatesfoundation.org/What-We-Do/Global-Development/Global-Libraries

31. The global experience of GLI has demonstrated that public libraries are able to evolve beyond their basic functions to become engines of social development for local communities. With their existing infrastructure, dedicated staff, and mission to connect individuals to information, libraries are uniquely suited not only to provide a physical space for potential innovators and entrepreneurs to gather, but also to: (a) offer public internet access, (b) build community awareness of the possibilities of innovation, (c) disseminate knowledge, and (d) provide structured training.

32. Moreover, GLI's impact evaluation methodology (referred in this note as Impact Planning and Assessment) serves as useful model for monitoring and evaluation of the CICs created under the GENIE project.

Gates Global Libraries Initiative – An Overview

33. The GLI supports efforts to supply and sustain free public access to computers and the internet around the world. GLI was launched across developed and developing economies, including Chile, Mexico, Botswana, Vietnam, Belgium, Bulgaria, Czech Republic, Germany, Denmark, Greece, Spain, Finland, France, Italy, the Netherlands, Poland, Portugal, the United Kingdom, US, Latvia, Lithuania, and Romania. GLI funds programs that evaluate local technology needs, purchase equipment, train library staff, and help libraries build public support for long-term funding.

34. GLI also helps identify strong library leaders and equip them to create high-impact libraries. Through leadership training, they can learn ways to foster a culture of innovation and risk taking, collaborate with others in the library field, create and test new service models, and engage community members and other stakeholders in the design and delivery of library services.

35. GLI works with its library and government partners to create programs that are sensitive to local and national conditions (see Box 1 for program example in Lithuania). Key characteristics include:

- Effective advocacy, especially at the national level, to ensure sustainability of this work beyond the funding period. Advocacy encompasses actions to influence decision making at the local, regional, state, national, and international level.

- Through advocacy, public libraries can also attract new users, draw attention to new services, raise visibility, highlight the power of success stories, demonstrate impact and their potential to solve community problems, attract public and private support, and forge partnerships.

Box 1. Exemplar of GLI: Libraries for Innovation in Lithuania 2008–2011

Objective: Eliminate discrepancies of urban and rural informational communication infrastructure and to provide equal opportunities to all residents to use information technologies for social and community purposes.

The scope and term of the project: 1276 public libraries, branches and subdivisions participated in the project with about 2000 libraries' staff. The libraries received technical equipment in the form of a broadband internet connection. All libraries were included in the training activities of specialists and visitors,

encouraging electronic service usage and consulting.

Budget: The total project budget was approximately US$38 million. The grant from the Gates' Foundation constitutes approximately US$12 million. Public libraries participating in the project received a donation of software from Microsoft worth about US$12 million. Another share (US$7 million) was provided by the state (co-financing) and public libraries (non-monetary input).

Project results: (1) In all promising public libraries, public internet access was installed while in libraries already providing public internet access it has been expanded and updated; (2) The informational competence of libraries' staff was strengthened, librarians are becoming active encouragers and helpers for local community, while mastering the opportunities of information technologies; (3) Residents, especially the elderly and those living in rural areas, were encouraged to use the opportunities provided by internet more often.

The significance of the results to the Lithuanian society: (1) The problem of access to a computer and internet was solved in the entire territory of the country (in both urban and rural areas); (2) A network of specialists who know how to consult and who actually consult residents on a daily basis and who help to gain or improve digital skills in public libraries was created. Approximately 2000 competent members of libraries' staff joined this continuous daily activity.

Due to successful project implementation, a second phase of the project is under implementation "Libraries for Innovation 2" with the objective to strengthen capacities of Lithuanian libraries to meet the needs of developing communities and consolidate the libraries as sustainable community institutions able to improve Lithuanian people's life quality.

*Source:*http://www.bibliotekospazangai.lt/en/

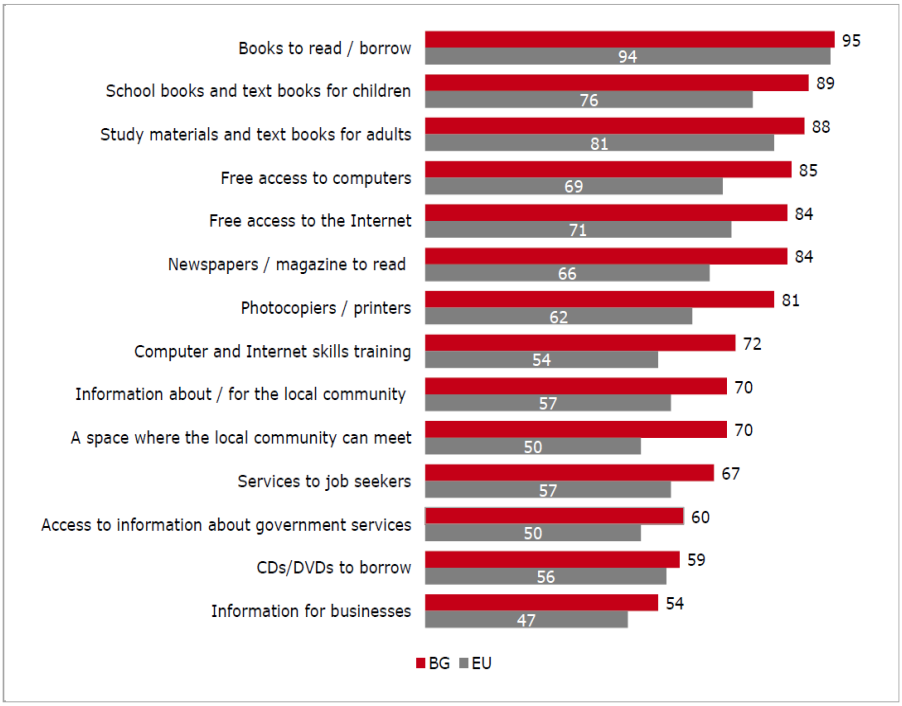
GLIs Selected Best Practices

36. Some important best practices have emerged from existing GLI initiatives in Lithuania, Bulgaria, and Romania:

- **Engaging stakeholders in program design**. To determine the way in which libraries change people's lives, it is important for libraries to design programs whose goals go beyond changing library systems, and instead aim to contribute to improvements in people's lives. This is achieved by engaging stakeholders in program design to plan activities that contribute to meeting users' needs. Examples include the creation of job search programs where employment is a primary goal, or health programs where health outcomes are sought.

- **Libraries may provide a number of services including also those related to business skills development and employment.** Among common services used by GLI users in the EU are computer and internet skills training, guidance on job search, or access to business information. Some of the libraries are working in direct cooperation with the national employment agency in order to inform users of vacancies. Figure 4.20 compares the importance of GLI services in the EU and Bulgaria.

Figure 4.20. Importance of Services Provided by Public Libraries in the EU and Bulgaria



Source: Library survey - C15 How important is this service that can be provided by public libraries.

Base: All library users - Bulgaria (1428); EU (24253)

Source: Quick, S., Prior, G., Toombs, B., Taylor, L., and Currenti R. (2013) "Users' perceptions of the benefits of ICT in public libraries in Bulgaria" available online at http://www.glbulgaria.bg/en/node/24011

- **Public library staff play an important role in assisting library users in informal learning.** The most common ways in which library staff assisted users were with the use of the computers, printing or scanning, using a browser or search engine to find information online or on the library's website.

- **GLI integrates Impact Planning and Assessment (IPA) into all aspects of its library program work.** The main differences between the GLI approach to measure program impact and the assessment efforts undertaken by most public library services are that:

  (a) The GL initiative is conducted on an international scale, with each national grantee currently joining a systematic and rigorous IPA program.

  (b) Impact planning – determining program goals and impact indicators – is driven locally by each grantee.

  (c) The IPA process can assist librarians, library managers, strategists and policy makers in defining program goals that are locally relevant, and assessing program performance toward those goals. IPA assists to: (1) determine whether the services being provided are contributing to achieving program goals; (2) gain information to guide changes in focus if necessary, in order to more effectively meet program goals; (3) gather evidence for whether services contribute to a real difference in the lives of users and/or their communities;

and, (4) use this evidence to advocate for continued development of libraries, computer use, and financial sustainability.

(d) IPA should be handled in cooperation with librarians, using easy to understand terms and processes that are simple to manage.

(e) The IPA processes map program goals to government needs/interests, and use evidence to advocate appropriately. Yet, there are the frequent cases in which library systems receive funding from multiple layers of government (municipal, state, national, etc.) and/or private funders, and each has divergent needs and interests. This creates a quandary for the library system, because it becomes very challenging to create unified program goals and measurement plans. The solution must therefore entail a mixed approach: one in which library systems implement a few overarching goals and metrics that respond to the high/national level, while maintaining independence to implement supplemental services and metrics that answer to local needs. This parallels the need to have some high-level/national advocacy activities and others targeted toward the local audience, as each has its own place and role.

(f) The focus of the IPA process is to create sustained library programs that are useful and used. Increased funding from other sources is a critical component, but this does not ensure that the funding will be sustained after the life of the grants, nor that the libraries themselves will be positioned to sustain service delivery, measurement effort and advocacy tasks.

Fabrication Laboratories (Fab Labs)[49]

Definition and the Role of Fab Labs in Promotion of Innovation

37. A Fab Lab[50] is a special type of a proof of concept lab that provides an open public access environment (industry-grade technologies, facilities, education, mentorship) for prototyping and digital fabrication of innovative ideas and products. It provides a catalytic stimulus for knowledge sharing, entrepreneurship, and research. Fab Labs mitigate the risks associated with launching new products and ideas by eliminating failures when products are launched in real life. Fab Labs today are also seen as an interconnected global community of learners, educators, technologists, researchers, makers and innovators, who have collectively created a knowledge-sharing network that spans across countries.

38. Fab Labs build on rapid advances in new disruptive technology like 3D printing, advanced robotics, and others which have made it possible to create prototypes quickly and cheaply using digital designs. These capabilities are made available to individual entrepreneurs and researchers, which make actual "fabrication" possible to create and distribute finished products. These

[49] This section is based on the World Bank (2013) "Innovation Infrastructure Flagship Projects: Pre-feasibility Study". BULGARIA Reimbursable Advisory Services Program on Innovation.
[50] Fab Lab emerged as the educational outreach component of MIT's Center for Bits and Atoms (CBA), an extension of its research into digital fabrication and computation.

innovative Fab Lab vehicles are being introduced on an accelerating basis in developed and developing countries to provide a unique environment (both facilities and services) for prototyping and digital fabrication of innovative products and ideas.

39. Fab Labs play a critical role in new innovation ecosystems through the multiplier effect. The real value of a Fab Lab is not in the profits it can generate, but in the multiplier effect of its contribution to the "public good" to generate Science, Technology, Engineering and Mathematics (STEM) skills, knowledge sharing for job creation, applied R&D, innovations and advancing manufacturing. Figure 4.21 illustrates Fab Lab's position in the innovation ecosystem while Table 4.1 presents examples of Fab Labs' multiplier effects.

Figure 4.21. Fab Lab as a Connector in the Innovation Ecosystem

Source: The World Bank (2013) "Innovation Infrastructure Flagship Projects: Pre-feasibility Study". BULGARIA Reimbursable Advisory Services Program on Innovation. Based on FAB8ZN Conference Presentation by South Africa Department of Science and Technology.

Table 4.1. Fab Labs' Multiplier Effect in Raising Competitiveness

Education, Human Capital	Innovation	Innovation- and Technology-based Business Development	Economy, Exports, Competitiveness	Job Creation and Social Development
Attract students to Science, Technology, Engineering and Mathematics (STEM) Education Attract more citizens (students, entrepreneurs, professionals) into STEM professions Shift from low-skill intensity to medium/high Mitigate 'brain drain' of STEM-focused researchers, graduates and professionals Attract diaspora Educate the community Teaching skills in computing (CAD/CAM), digital fabrication, engineering, electronics, programming, design, creative thinking	Product innovation Disruptive and design thinking Rapid prototyping Igniting early technology adoption Collaborative and distributive innovation Multi-disciplinary and applied R&D National, region, city innovation Innovation output (e.g., patents) Tap into global knowledge Increasing the stock of useful knowledge Active catalyst to creativity Capacity building to execute ideas commercially	Generating a critical mass of enterprises (SMEs) that combine engineering and entrepreneurship modalities Networks formation and multi-disciplinary collaboration (researchers, engineers, entrepreneurs, etc.) Incubation of business ideas Creative entrepreneurship Creation of new businesses, enterprises or firms Commercialization Creation of high impact start-ups International integration	Engaging broader public in innovation, stimulates new economic development **Increase of manufacturing** Shift from low-skill to medium- and high-technology intensity products Export diversity Puts a country on par with more developed nations in digital fabrication potential Strengthen competitive advantage	**Job Creation** Relevance of skills training New opportunities for employment Improving income stability New skill sets to use latest most advanced 'disruptive technologies' such as 3D printers and related equipment in new ways **Social development** Community building in the underserved or remote areas Skills building Platform for jobs and expanded employment opportunities across sectors
← Knowledge Hub, Knowledge generation and diffusion →				
← Technology adaptation, penetration →				
← Cross-sector (Manufacturing, ICT, Cultural and Creative Industries, Agriculture, etc.) →				
Fab Labs as bridges (public-private-academia partnership)				

Source: The World Bank (2013) "Innovation Infrastructure Flagship Projects: Pre-feasibility Study". BULGARIA Reimbursable Advisory Services Program on Innovation.

Best Practices in Establishing a Fab Lab

40. **Successful Fab Labs are tailored to local needs.** The most critical factor for the success of Fab Labs is their capacity to respond to economic drivers in sectors with significant potential for innovation-driven growth. Fab Labs services shall be tailored to the local needs of region, city or community. Therefore, it is recommended that local champions are involved in the process of establishment of a Fab Lab and the selection of its business model. Moreover, the physical location of the Fab Lab should be convenient for the potential users.

41. **The Fab Lab must aggressively reach out to attract users and the community it serves and to educate key publics on the benefits a Fab Lab offers.** The range of what can be accomplished in Fab Labs is slowly becoming known to potential users. Many Fab Labs offer free usage just to attract users and introduce them to the Fab Lab's capabilities. To ensure that

Fab Lab patrons will become repeat users and make more extensive use of the Fab Lab, relationships with customers must be maintained at a supportive and personal level during all the stages of deployment.

42. **The successful deployment of a Fab Lab entails setting up strong connections with local regional and international stakeholders.** First and foremost, the local community should be made to realize the existence of the Fab Lab to encourage the Lab's potential users to visit the facilities. At the local level, Fab Lab staff should be in regular contact with universities, high schools, business incubation centers, manufacturing associations, craft-making associations, industrial associations, and inventors clubs. A Fab Lab should maintain strategic connections with potential users from the industry, business incubators, entrepreneurs and national institutions that can help in the promotion of new business. In addition, connections with the global network facilitating exchange of knowledge and best practices shall be ensured e.g. by maintaining a regular communication with other Fab Labs in the region and the Fab Lab Network, organizing regional activities such as the Fab Academy[51] and organizing local "maker fairs". The Fab Lab International Association[52] is universally considered a key partner in start-up and operation of any Fab Lab; also important partners are universities and business incubators. At an advanced level of Fab Lab deployment, angel investors and venture capital firms become potential key partners.

43. **The selection of an appropriate Fab Lab structure enables its effective operation over the long-term and facilitates partnering with private sector entities,** including venture capitalists. Of foremost consideration for efficient operations and transparency should be the need to ensure that the Fab Lab is driven by commercial, market-oriented decision-making mechanisms and subject to appropriate public oversight while it is receiving public funds and fulfilling primarily a socio-economic development objective.

44. **Definition of the legal status of the Fab Lab** depends on whether the Fab Lab would be established as an independent unit (with its own separate legal structure and operations) or whether it would be connected to an existing institution, as a hosting entity. The latter, for example, might be a university, company, research center, tech park, etc. Accordingly, the Fab Lab, whether linked with a host entity or self-standing, must have its own internal governance structure. This would typically include a Board of Directors, to which the Fab Lab's Management would report and be accountable to, and a Board of Advisors, as well as other bodies, such as a Supervisory Board.

45. **The selection process for the Board of Directors or similar board is critical to ensuring the success of the Fab Lab.** The individuals chosen must be experienced professionals with a mix of relevant business and technical skills needed to oversee the direction of the Fab Lab. While some Directors might be associated with stakeholders, they have to be able to independently execute their fiduciary responsibilities to the Fab Lab.

[51] http://www.fabacademy.org

[52] The Fab Lab International Association provides critical guidance on the operation, initial deployment and potential applications of any Fab Lab

46. **Successful Fab Labs are led by professional management.** Operation of the Fab Lab must be driven by private sector management approaches, with both business and STEM professionals as directors and board members. The Fab Lab should be an independent entity, free from the influence of other institutions, but should be situated under an established entity that can contribute to its administrative and financial oversight.

47. **Fab Lab financial self-sufficiency is rather hard to achieve during the first years of operations.** The majority of Fab Labs require start-up funding from public authorities, non-market driven entities such as foundations, or donor subsidies. Fab Labs appear to be more in the nature of a "public service" broadly supporting socio-economic development. Even most privately-owned Fab Labs do not appear to be self-sustained by revenues from outside users.

48. **The performance of Fab Labs should be judged largely by their results achieved.** These entities primarily serve the public good by contributing to socio-economic objectives. They have a significant qualitative impact on individual developers, businesses, the local community's overall economic development and other related priorities. Thus, the real long-term impact achieved is immensely more important than short-term measures, such as occupancy rates or failure rates.

Rural Broadband Constraints, Needs, and Prospects

High-level Rationale

49. Through GENIE, the Government of Georgia (GoG) has decided to increase the adoption of high-speed broadband Internet across the rural territory of the country. The Government considers this ubiquitous rural connectivity of strategic importance for many reasons: Broadband contributes significantly to the increase in countries' international competitiveness; it contributes to the fight against poverty and unemployment; promotes social inclusion and territorial cohesion; and stimulates other infrastructure investments.

50. International practice has established that in each of these areas broadband could offer considerable improvements. For instance, increase in fixed broadband penetration contributes to GDP growth (from 1.38 percent to 3.2 percent in lower income economies); broadband leads to positive net employment creation (from 2.5 to 3 additional jobs per direct broadband employment).[53] The European Commission argues that increased availability of high speed broadband could significantly accelerate socio-economic impact, e.g. 2.5 times higher input-output benefit,[54] 3 times higher number of jobs created, and considerable increase in consumer

[53] http://broadbandtoolkit.org/1.3#Table1.2

[54] Input-output analysis is based on the premise that investment in one sector of economy causes growth in the other sector of economy through so-called multiplier effect.

surplus.[55] It has also been proven that availability of reliable and reasonably priced high speed broadband is a key determining factor for attracting Foreign Direct Investment (FDI).[56,57,58]

51. Georgia is well positioned to benefit from the opportunities provided by high-speed broadband. First, because the overall take-up rate of Internet services is moderate and the basic level of digital literacy are quite developed in urban areas. Second, Georgia has a robust sector specific regulatory regime in place and a strong sector regulator (GNCC) that is capable of designing and implementing ambitious sector policies. Third, the national broadband market is quite mature: the market players are numerous and technically advanced. All these factors allow Georgia to capitalize on its current achievements and fuel further market growth through strong public incentives to bridge the digital divide, i.e. bringing high speed Internet access to rural Georgia.

52. The disparity between rural and urban areas in terms of access to broadband Internet continues to increase, leaving a sizable rural population—47 percent—disconnected from digital opportunities. National average broadband households' penetration reached 37.2 percent in 2014; however rural broadband penetration in Georgia hardly reached 10 percent same year.[59] The majority of infrastructure investments target urban areas of the country, and those areas that promise a commercial rate-of-return. Rural settlements are left out. If no actions would be taken and current level of investment would be sustained by the private sector, Georgia is likely to reach the today's level of broadband households' penetration of EU (around 60 percent) only in 2020, or beyond.[60] This slowdown in private investment is apparent from the slowing growth of broadband penetration, which has dropped halfway over the past two years.[61]

53. In October 2015, GoG launched the "OpenNet"[62] initiative supporting extension of coverage (supply) of broadband Internet access in rural Georgia. However currently there is no specific initiative supporting adoption (demand) of broadband internet access. The BfD implemented though this project is supposed to fill this gap. Both supply and demand components are considered essential for successful digital economy development.

Validating Activities Included under the Subcomponent 1.3

[55] Socio-economic impact of high-speed broadband, European Commission, at http://ec.europa.eu/italy/documents/news/socioeconomicbenefits.pdf

[56] The capital spent on ICT and Internet infrastructure in 2013 was the highest recorded since FDI Markets began tracking and was supported by a 66.5% rise in project numbers to 328, The FDI Report, 2014, The Financial Times, http://ftbsites.ft.com/forms/fDi/report2014/files/The_fDi_Report_2014.pdf

[57] Farid Badran (2011) Impact of broadband on economic growth in emerging countries, available at: https://community.oecd.org/docs/DOC-32096

[58] Katz (2009) estimates that broadband has a direct impact on firm relocation decisions. Broadband influences the relocation of firms in a search of labor pool, it drives firm relocation for functions resulting from value chain decomposition, and availability of broadband can contribute to attract highly educated labor force.

[59] GeoStat

[60] WB staff calculations

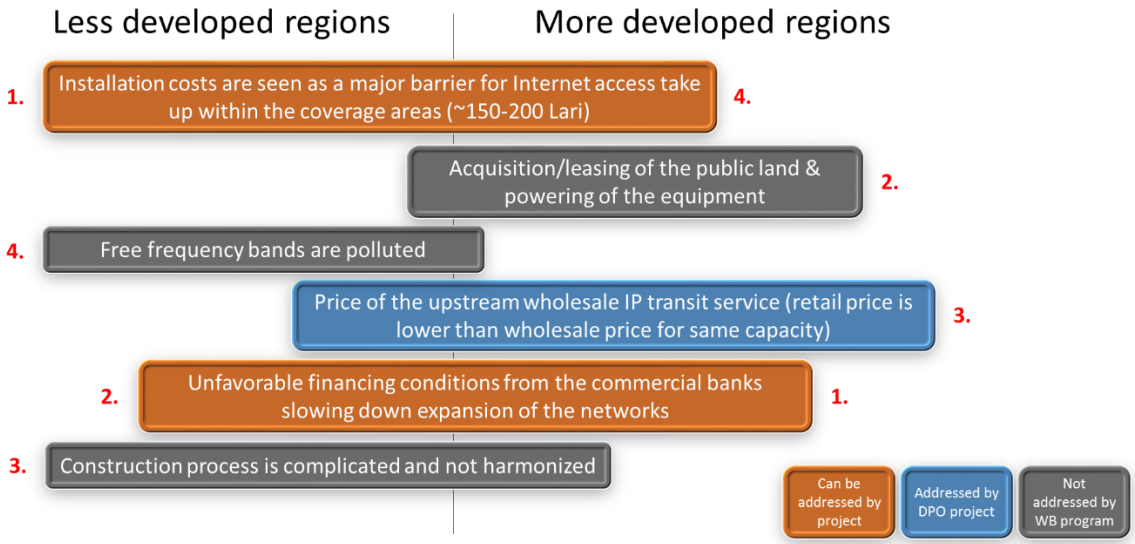
[61] WB staff calculations based on data provided by Telegeography

[62] See paragraph 9(f) of the mail document and paragraph (27) of the Annex 2 for more details about the "OpenNet" initiative;

54. During preparation, the team consulted with 15 rural ISPs (~14 percent of all ISPs) to identify constraints to Internet adoption in Georgia. In addition, the team identified recent data reflecting possession of computers and Internet connectivity among the rural population. The team also considered international best practices for policies and programs to spur Internet market development. The consultation included three meetings with rural ISPs in selected locations across the country. Two of those locations were the same as for Project beneficiary demand assessment survey, i.e. Batumi and Kutaisi, and one additional meeting was held in Telavi. During the interviews ISPs, were asked to identify and prioritize key constraints for the roll-out and adoption of the Internet access among the rural population.

55. The consultation with rural ISPs revealed that low awareness/demand and high Internet installation costs are major barriers to adoption of Internet access among rural communities; all surveyed ISPs unanimously agreed on these constraints on the demand side. Other constrains named by the ISPs ("Frequency bands are polluted", "Acquisition / leasing of the public land and powering of the equipment", "construction process is complicated and not harmonized", etc.) are related to the roll-out of the infrastructure and therefore are not addressed by GENIE (but will partly be address through the DPO program). A summary of key constrains identified by the ISPs are in the Figure 4.22 below. GENIE focuses on the bottlenecks identified as high priorities on the demand side–Internet installation costs and low awareness/demand.

Figure 4.22. Priority Constraints to Roll-out and Adoption of the Internet Access in Rural Georgia



Source: World Bank staff, based on consultations with rural ISPs.

Note: Red numbers on the sides mean the priority of constrains; please note different prioritization for less developed and more developed regions; DPO (in blue) means the ongoing Private Sector Competitiveness DPO program in Georgia.

56. For poor rural families, acquisition of personal computers is also a serious barrier for Internet adoption. On the national level, the share of poor families owning computers (30.3 percent) is half of non-poor families (58.5 percent); and in the case of rural areas, the share of rural poor families owning computers (14.8 percent) is half of the national average (Table 4.2). Internationally, demand side measures aim to ensure the availability and affordability of

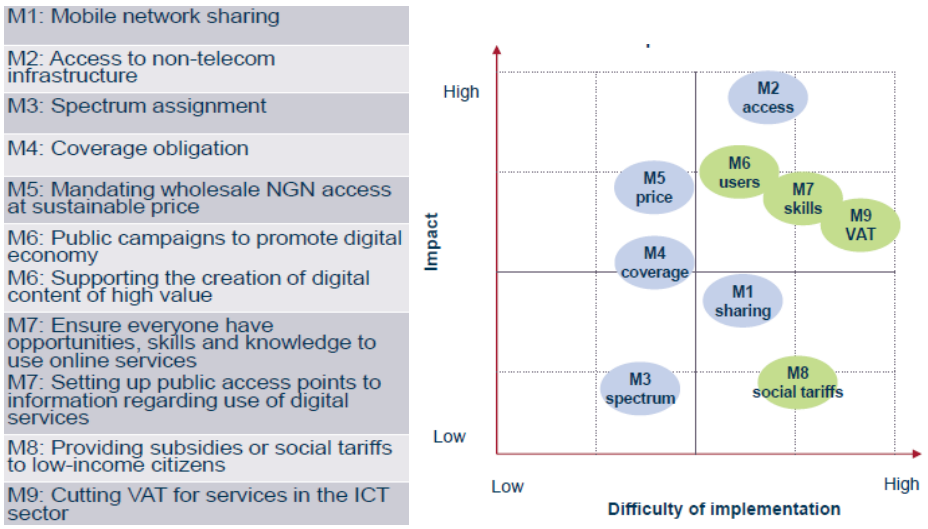
broadband-enabled devices and services for poor or otherwise vulnerable households and users. Such measures have proved to be efficient while seeking to increase Internet access adoption (See Figure 4.23 for various measures that increase use of ICT services, including cheaper equipment, measure 9). Similarly, the Government has identified computerization as one of the priorities for GENIE. From that end, GENIE will couple Internet access service with support for computer (or other eligible device, e.g. netbooks, laptops, tablets) acquisition into one package.

Table 4.2. Access to Computer per Quintile in Rural Areas and National Average, 2013

Quintile	Households with computers	
	Rural households, %	National average, %
Poorest 1	10.5	19.4
2	17.5	36.5
3	23.8	47.4
4	29.9	55.9
Richest 5	33.6	68.3
Non-poor	29.1	58.5
Poor	14.8	30.3

Note: Poverty US$2.5/day
Source: Geostat Integrated Household Survey 2014

Figure 4.23. Impact and Difficulty of Implementation of Different Demand and Supply Measure



Source: Analysys Mason for State of Broadband report, Broadband Commission for Digital Development, United Nations, 2015, at: http://www.broadbandcommission.org/documents/reports/bb-annualreport2015.pdf

Note: Blue – for Supply measures; Green – for demand measures;

57. Skills and knowledge on how to use ICT services is essential to increase the adoption of broadband services. International experience to date points to how the best results in promoting usage of ICTs are achieved by linking technical opportunities (Internet access service and

broadband-enabled device) with targeted skills development (see Figure 4.23). ICT skills are also increasingly important in day-to-day and work life; estimates are that up to 90 percent of all jobs will require some knowledge related to ICT.[63] ICT skills are also important for improving gender equality in terms of access to information and opportunities online. International Telecommunication Union's (ITU) research suggests that, in many countries, women are coming online more slowly and later than men, impacting women's ability to use the above reasoning was incorporated into the design of the GENIE that coherently links all the elements required for efficient ICT adoption and usage: Internet access, broadband-enabled device and ICT skills training program.

58. Increase of broadband adoption among rural area-based businesses and building those businesses' capacity in terms of e-commerce provides a unique opportunity for rural economic development. Despite the fact that usage of the Internet by firms in Georgia has increased over the recent years, the number of firms in rural areas (henceforth rural businesses) using the Internet is not high; connection speeds that are subscribed by rural businesses are low and usually do not allow them to conduct business activities online. Related skills are also a barrier.[64] The percentage of firms having a website and selling or buying goods or service online tends to increase with firm productivity in all country income groups. The correlation between firm productivity and e-commerce is stronger in upper middle-income countries.[65] Georgia being a lower-middle income country is likely to benefit from the e-commerce more substantially than lower income countries. Support in terms of both more robust Internet connectivity and e-commerce skills would help rural businesses access new markets and resources, and engage in more trade.

59. In both cases, for rural households and for rural businesses, the Project interventions are based on the initial findings of the draft (and forthcoming) World Development Report 2016, which explores how the Internet can be a force for development. In sum, the report highlights the disparities within and across countries in Internet access and use, among SMEs and individuals, highlighting that people (and businesses) in poorer, rural, or less-economically developed circumstances tend to lag behind in Internet adoption and use, leading to missed opportunities for productivity and growth. At the same time, the report highlights that both for SMEs and for individuals, there is a need to ensure development of skills, rules, and complementary infrastructures—creating the ecosystem within which those individuals and businesses can benefit from digital opportunity. Hence, the team considers the bundling of technology with training to be essential for sustainable and meaningful development outcomes.

[63] Broadband Commission, United Nations
[64] World Bank staff based on interviews with rural ISPs, June, 2015
[65] Cardona et al (2013), Bartelsman et al (2013)

Annex 5: Economic and Financial Analysis

GEORGIA: National Innovation Ecosystem Project

1. This annex covers (a) market failures and rationale for each of the Project interventions; and (b) a detailed economic and financial analysis, including both an economic cost-benefit model for the project's activities and financial sustainability analysis for the Project's proposed innovation centers.

Market Failures and Rationale for Project Interventions

2. Georgia's socio-economic development strategy identifies the need to spur innovation and technological development, develop innovation infrastructure, and facilitate the use of ICT in the economy. Recent public policy reforms—including those supported by the DPO program—will help remove impediments to private investment and assist in coordination. However, specific market failures remain, requiring public investments to allow Georgia to achieve its development objectives.

3. Market failures exist in both the promotion of innovation and participation in the digital economy in Georgia. The overarching failure is that the social returns from many innovation promotion and digital inclusion activities tend to be much higher than their private returns. Consequently, private investments will not flow into those activities, and some public investment or coordination is needed to initiate or sustain them. This annex summarizes these market failures and specifies how various activities in the GENIE Project will address those failures.

4. **Innovation promotion**. Economic theory identifies innovation as one of the most important drivers of long-term economic growth.[66] Innovation has attributes of a public good which, once created, can be used repetitively by multiple actors at little to no costs. However, there exist several market failures that dis-incentivize private investments in innovation and prevent its social returns from being captured: (a) partial appropriability; (b) information asymmetries; and (c) coordination failures.

5. **Partial appropriability and uncertainty:** Innovation investment returns are not fully captured by the original investor due to externalities/spillovers. Generated knowledge may be rapidly duplicated by other market actors, including competitors, at lower cost.[67] Therefore, unless compensated (e.g. by monopoly rights created by an intellectual property system and grants for undertaking innovation), the private sector does not have sufficient incentives to invest in innovation at a level that would be socially-optimal because the success of R&D efforts is uncertain.

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[66] Romer, Paul M. (1986) "Increasing Returns and Long-Run Growth." *Journal of Political Economy* 94 (5): 1002–37.
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6. **Information asymmetries and information failures:** Information asymmetries arise when one party of a transaction has access to relevant information that the other party does not. These information asymmetries may discourage agents from conducting market transactions despite the higher value that could be produced. Information asymmetry exists between lenders (investors) and firms and entrepreneurs in the seed and early stages of innovation development. This situation creates the so-called "valley-of-death" for innovative products—potential investors find it difficult to distinguish between new research, technologies, and entrepreneurs that are likely to succeed and those that are not. This helps explains the lack of funding for commercialization of research. Another type of information asymmetry occurs when individuals and firms are not able to distinguish between the quality of different types of service providers (e.g. for training), discouraging participation in such services.

7. More generally, **information failures** occur when individuals and firms do not know the potential returns from investing in skills upgrading, management capacity, and research, development, and innovation, causing them to systematically underinvest in these areas. In many cases, they do not know what they do not know. For instance, cross-country surveys show that firms typically overestimate the quality of their own management practices, unaware of what they need to learn since they mistakenly believe that they are performing above average. Another type of information failure is that entrepreneurs and firms often do not know where or how to innovate, even if they believe that it is important.

8. **Coordination (system) failures:** Innovation is usually a result of multiple actors working in a highly interdependent system, where a failure of any of the actors may impact the success of the others. Therefore, to support high-level performance, there is a need for coordination between different economic agents. Among others, coordination failures may take the form of network failures (problems in the interaction among actors in the innovation ecosystem, e.g. researchers and firms, or employers and educators), institutional failures (e.g. failure to configure public institutions, such as universities and research institutes, to work effectively), and framework failures (deficiencies in regulatory frameworks).

9. **Digital economy participation**. Broadband internet is increasingly the primary mechanism for accessing information. Information is a public good that is essential for all forms of economic activity and good governance. Three main forms of market failures—similar to those listed above—exist in the context of the digital economy aspects of the GENIE Project.

10. The first is when **investment gaps** in infrastructure remain. In the case of GENIE, the focus is on 'last mile' or downstream connectivity (the Government is already addressing a major market failure, i.e. in the private sector's supply of high quality and affordable upstream connectivity to rural areas). Participation in telecommunications networks leads to exponentially increasing benefits through positive network externalities: the more participants, the more benefits there are. Conversely, exclusion from the network implies outsized costs for excluded parties. Some parties face exclusion in spite of willingness to participate. Again, the social benefits outweigh the private benefits, leading to a market failure as costs increase. Second, **coordination failures** lead to limited technological upgrading (especially in markets dominated by a few players), amplified by the inability of firms to reduce the costs of technology (which are sourced through exports) and lack of scale in many emerging economies. Finally, **information gaps** exist where parties do not participate in a market due to limited knowledge. Corrective

action may also be needed to achieve equity objectives, especially to overcome regional disparities.

11. Table 5.1summarizes the market failures or other rationales that justify public investment in each of the Project's subcomponents. It also describes the mechanisms through which the Project's interventions are expected to address the identified market failures (and whether similar approaches have been attempted previous in Georgia), their expected impact, and their prospects for sustainability.

Table 5.1. Market Failures and Rationale for Project Interventions

Component	Market Failure/Reason for Public Intervention	Prior Experience/Track Record in Georgia	Mechanism for Addressing Market Failure	Expected Impact	Sustainability Prospects
1.1 and 1.2 CICs and RIHs	• Partial appropriability, uncertainty, and information failures → Entrepreneurs and firms don't know how to innovate and don't invest in support services due to lack of knowledge or uncertainty around returns • Coordination failures (entrepreneurs, researchers, etc. don't naturally coordinate to develop their ideas, prototype products) • Socio-economic development agenda: improve welfare and competitiveness in less developed regions of the country	• A few private incubators and accelerators founded in recent years, mostly in Tbilisi and with limited capacity and funding	• Provide physical spaces with access to equipment and targeted services to increase knowledge and reduce costs and risks around innovation • Physical spaces promote collaboration (e.g. between private sector actors, researchers), reducing coordination failures • Socio-economic agenda: provide internet access and training in less-developed regions	• Promotion of new product/service innovations • Generation of new innovative startups	• Depends on user demand and long-term willingness to pay (possible sustainable scenarios are presented in the next section of this annex)
1.3 Broadband-for-Development	• Information failures (households and firms don't know benefits of connecting to internet and/or engaging in e-commerce) • Investment gaps, resulting in a risk of exclusion and inequality: lagging development of rural (and high-cost) areas,	• No prior experience addressing information failure; OpenNet initiative will help reduce investment gaps. An EBRD-led cash-back scheme for energy efficient appliances showed that cash-back mechanism can be successful (although for a different objective)	• Reduce upfront costs for households and firms for subscribing to internet and acquiring IT devices; catalyze private investment by network operators; digital literacy and e-commerce training	• Increased household and MSME participation in the digital economy • Increased e-commerce • Increased digital literacy	• Benefits to participants sustained indefinitely • Broadband demand generated by program should elicit a supply-side response and stimulate additional private investments by ISPs, helping to further improve quality and affordability of their broadband offerings

Component	Market Failure/Reason for Public Intervention	Prior Experience/Track Record in Georgia	Mechanism for Addressing Market Failure	Expected Impact	Sustainability Prospects
	where private investment is limited				
2.1 Building the innovation community	• Information failures (individuals and firms don't know the benefits/ possibilities of innovation or a job in the digital economy; they don't know how to innovate or get trained)	• GITA's awareness raising activities have significantly raised the profile of the agency and its offerings • GITA's hack-a-thons/ make-a-thons have been successful in raising awareness and generating small-scale entrepreneurship	• Traditional (TV/radio) and more modern (social media) promotional methods, with a focus on areas outside of Tbilisi • Use competitive events to incentivize community participation in innovation ecosystem	• Reduce urban-rural innovation awareness divide; increase number of participants from across Georgia in the innovation ecosystem	• Once critical mass of awareness built, word-of-mouth and success stories should help sustain future engagement from the public
2.2 Digital economy skills development	• Information failures (lack of knowledge of benefits of skills upgrading)→ lack of individual investment in skills development and under-provision of training by private sector • Coordination failures between firms who need trained workers and education/ training providers	• Limited provision of job-relevant digital economy skills at a global standard • Lack of scale in the provision of training	• Skills needs assessment of firms • Public support to provision of skills development→ Equip participants with technical and socio-emotional skills to match needs of digital economy employers	• 3,000+ individuals and 250 trainers trained • Increased employment opportunities and earnings potential	• Benefits of skills developed will be sustained throughout the careers of beneficiaries • Built-in training-of-trainers will facilitate continuation of training beyond Project period • Demonstration effect of benefits of training expected to stimulate private training provision
2.3 Business innovation support	• Partial appropriability, uncertainty, and information failures → Firms don't know how to innovate and don't invest in support services; under-provision of support	• Little prior experience	• Public funds for coaching, mentoring, technical consulting, innovation management, and related business training	• New innovative startups • Commercialization of innovative products/ services and technologies	• Sustained benefits to economy from new start-ups and innovative products • Firms understand better the benefits of innovation support services and group of

Component	Market Failure/Reason for Public Intervention	Prior Experience/Track Record in Georgia	Mechanism for Addressing Market Failure	Expected Impact	Sustainability Prospects
	by private providers				trained consultants, coaches, and mentors → sustained demand from and supply by private sector. Continued public subsidies after Project likely to still be useful.
3. Innovation Financing	• Partial appropriability, uncertainty, and information asymmetries → Poor access to early-stage finance for innovative/ risky activities • Coordination failures → lack of research–firm collaboration	• Successful mini-grant programs to individuals run by GITA and Enterprise Georgia over past 2 years	• Catalytic, matching public funding for both innovative start-ups and established enterprises to reduce risk around innovation investments • Mobilization of Georgian diaspora and other investor networks (e.g. business angels)	• New innovative startups • Commercialization of innovative products/ services and technologies	• Sustained benefits to economy from new start-ups and innovative products • Continuing the matching grants program beyond project will require additional public resources • As success stories increase, perceived risk of funding innovative/risky ventures should decline, helping to crowd-in new sources of private financing

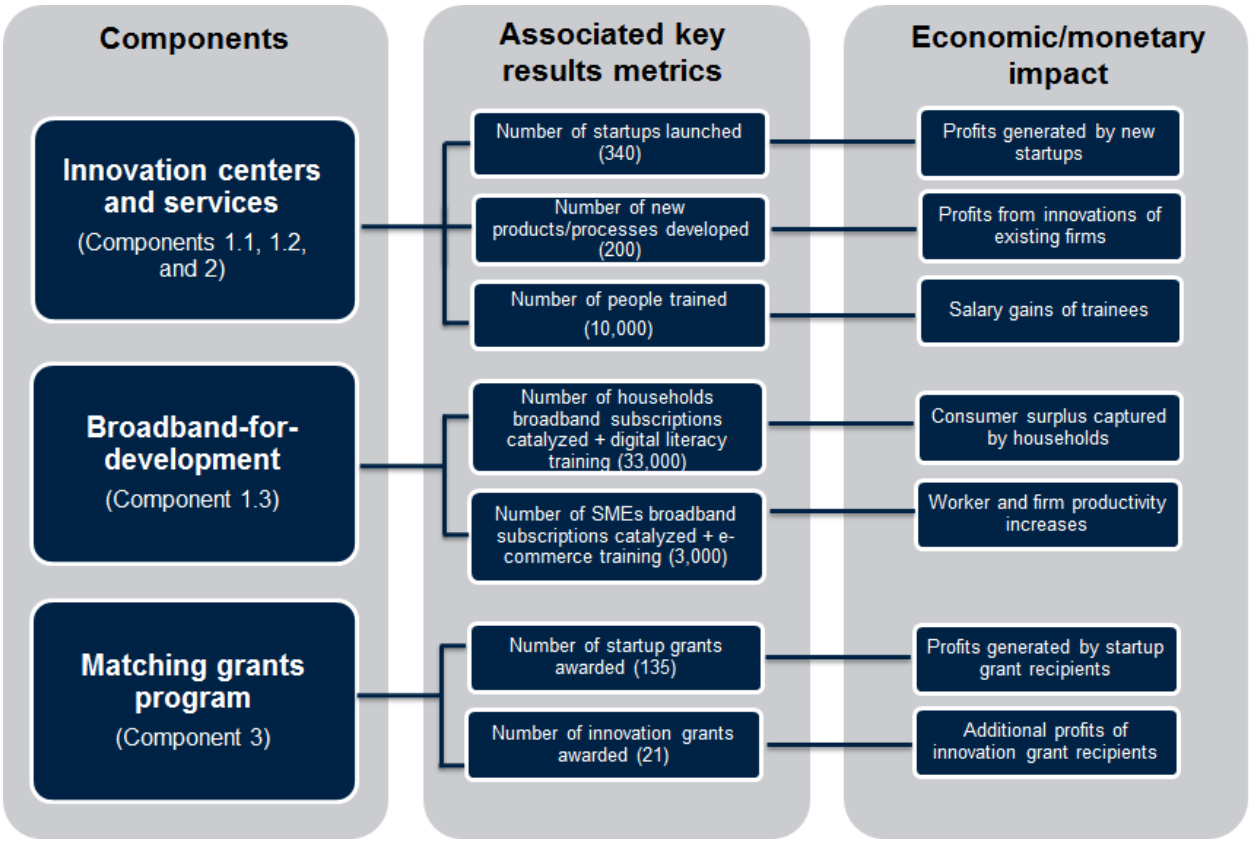
Economic and Financial Analysis

12. As a key driver of technological progress, greater innovation is generally associated with increased value added of economic activities and firms, more productive and higher-income jobs, and more competitive goods and services on global markets. These broader economic benefits of innovation stimulated by the GENIE project are critical to addressing Georgia's key current economic challenges: to boost stagnating productivity growth, improve export competitiveness, and promote higher-skilled and more ICT-oriented jobs.

13. **The economic analysis here extends a step beyond the PDO outcomes measured in the results framework, aiming to assess the project's incremental contribution (relative to a no-project counterfactual scenario) to some of these broader economic benefits of increased innovation**. In this sense, the project's key PDO outcomes (e.g. new innovations brought to market by beneficiaries, startups firms generated) serve as intermediate inputs into this framework for valuing the magnitude and cost-effectiveness of their broader economic impact (Figure 5.1). The model underpinning this valuation is presented below. The incremental benefit of the project is measured relative to a "no-project" counterfactual scenario where it is assumed that: (a) the network of innovation centers supported by the project (CICs and RIHs) would likely still be developed but only partially and to a lower standard of quality; (b) broadband connectivity would remain cost-prohibitive for most poorer households and MSMEs (especially in rural areas); and (c) the systematic program of capacity building and training services delivered through the project would not be possible to a meaningful extent due to GITA's budget constraints.

14. **Since the innovation centers (RIHs and CICs) will represent the key delivery vehicles for the project's interventions and its longer-term impacts, an assessment of their long-term financial sustainability is also of the utmost importance**. Their financial prospects and resiliency are evaluated in the section following the economic cost-benefit analysis under various fee-generating structures and scenarios for user demand.

Figure 5.1. Structure of Economic Cost-Benefit Model



Economic Cost-Benefit Analysis

Framework for the Analysis[68]

15. **This analysis employs a standard cost-benefit model to estimate the expected net present value (NPV) and economic rate of return (ERR) of the project's various interventions.** To be economically acceptable, a Bank-financed project must meet two conditions: (a) the expected NPV must be positive and/or the ERR higher than the assumed discount rate, and (b) this NPV and/or ERR must be higher than or equal to that of mutually acceptable Project alternatives. Each project component should be appraised as if it were a marginal component, and then appraised in combination. In the GENIE Project, however, this decoupling approach is complicated by the various interdependencies between components that are inherent to the integrated nature of the project's interventions. In particular, the expected benefits of the RIHs (Subcomponent 1.1) and CICs (Subcomponent 1.2) derive not only from the physical space these facilities provide for innovators but also the support services (Component 2) that they offer. For this reason, subcomponents 1.1, 1.2, and component 2 should be appraised

[68] This framework draws on the methodology for valuing R&D and innovation projects suggested in the European Commission's "Guide to Cost-Benefit Analysis of Investment Projects: Economic Appraisal Tool for Cohesion Policy 2014-2020".

jointly. Meanwhile, subcomponent 1.3 (BfD) and component 3 (innovation financing) can be viewed as more stand-alone are therefore appraised separately.

16. **Estimating the benefits and impacts of innovation in monetary terms is notoriously difficult.** This stems from a variety of measurement and attribution problems, as well as uncertainties inherent to the innovation process, not least of which are the highly-variable scope and commercial value of new products and processes (some are marginal improvements, while others global breakthroughs), their unpredictable survival rates, and the range of multiplier effects they generate for the broader economy. There are also a large number of externalities that arise from a project that, at its core, is aiming to stimulate idea generation and re-shape mentalities.[69] The monetary value of these externalities is very difficult to capture. For this reason, most economic analyses of innovation projects employ a top-down valuation approach based on the economic multipliers (estimated from various empirical studies) of spending on innovation promotion activities. However, this approach is not anchored in micro-foundations, nor is it reflective of Georgia's country context or the scope and substance of GENIE interventions.

17. **The analysis here opts for a bottom-up approach.** While this introduces a large degree of imprecision due to the multiplicity of assumptions needed, it has the advantage of allowing various input parameters to be linked to the results indicators of the project, and also allows for an assessment of the sensitivity of the estimated project NPV and ERR to variations in these parameters. Nevertheless, the estimates presented here should not instill a false sense of precision. They are based on a series of illustrative and simplifying assumptions, and because they cannot fully capture the aforementioned externalities, they should be viewed as a lower bound on the scale of potential overall project benefits. Their objective is to provide a general sense of whether the likely magnitude of direct project benefits is broadly commensurate to the project's overall costs.

18. **A 20-year projection horizon is used so as to capture the medium-to-long-term nature of benefits related to innovation, many of which will accrue beyond the GENIE project's 5-year investment and implementation period.** All monetary values are expressed in terms of real 2015 US$ or GEL. The real social discount rate used to calculate present values of cost and benefit flows is assumed to be 7 percent, derived from a Ramsey formula that uses international averages for the pure time preference and marginal utility of consumption elasticity parameters, and a Georgia-specific estimate of expected per consumption growth.[70]

[69] Some examples include the impacts of the GENIE Project's capacity building and training programs, which are likely to unlock labor market possibilities (not directly targeted by the project) or entrepreneurial mindsets that may not necessarily be innovative but nevertheless value-generating.

[70] The social discount rate reflects the opportunity cost of capital from an inter-temporal perspective for society as a whole—i.e. the social view of how future benefits and costs are to be valued against present ones. According to Ramsey (1928), under constant relative risk aversion, the real social discount (r) can be expressed as $r = \beta+\varepsilon*\sigma$, where β is the pure time preference rate, ε is the elasticity of the marginal utility of consumption, and σ is the expected growth rate of per capita consumption. Most empirical cross-country estimates suggest an average value of 1 for β, and 1.5 for ε (see Lopez 2008). The expected growth rate of per capita consumption (σ) in Georgia is set at 4 percent, equal to an average of Georgia's annual per capita GDP growth (a suitable proxy for per capita consumption) between 1994 and 2013 (4.4 percent) and projected per capita GDP growth of 3.8 percent for 2014-

2020 in the IMF's latest World Economic Outlook (October 2015). Plugging these parameters into the Ramsey formula yields a social discount rate of 7 percent (1+1.5*4).

Innovation Centers and their Services (Subcomponents 1.1 and 1.2, and Component 2)

Benefits

19. For the purposes of this economic analysis, the expected measurable benefits from the network of innovation centers (RIHs and CICs) relate to the new startup firms formed by individuals benefitting from the prototyping equipment, collaborative environment, and entrepreneurship support services of the centers, the new product or process innovations generated by existing firms using the centers, and the increased earnings potential of participants (both employed and unemployed) in the project's training programs. The economic value of these impacts is approximated with the following metrics: (a) profits expected to be generated over time by new startup firms; (b) additional profits of existing firms from the commercialization of new innovations; and (c) the life-long salary premium earned by training participants.

20. Across these various benefit categories, the underlying assumption is that 8 RIHs and 50 CICs are established through the support of the GENIE project over its 5-year period. The incremental contribution of the GENIE project is estimated relative to the counterfactual "without project" scenario where it is assumed that GITA's would only be able to finance 3 RIHs and 9 CICs (3 per hub) from its own resources over this same period, with each center offering a lower quantity of services due to budgetary constraints. Additional differences in assumptions between the "with project" baseline case and the counterfactual "without project" scenario are detailed in the sections below.

(a) Profits of startup companies stimulated by innovation centers

21. Due to the relatively low sophistication of the CICs, only the RIH's are assumed to offer latent innovators and entrepreneurs the sufficient equipment and services to stimulate the creation of startup firms. Therefore, the key assumptions needed to estimate this benefit category are the number of startups generated per RIH, the survival rates of these firms over time, and the growth path of their economic profits. In the baseline case, it is conservatively assumed that, once operational, each RIH is initially able to nurture around 5 new startups per year, rising to 15 over the longer term as both operating efficiency and mix of equipment and services in the RIH is optimized based on the results and lessons of the pilot phase.

22. Once a firm is born, its survival probability is assumed to decline exponentially over time, from 80 percent after 1 year to around 30 percent by year 10, slightly above the average long-term survival rate observed for firms in Georgia. This reflects the premise that project support to startup firms helps improve their survival probability relative to the counterfactual scenario, where the survival rate is assumed to decline more rapidly and stabilize at the Georgian firm average of 20 percent by year 10.

23. Overall, the assumed firm birth and death parameters result in a net annual startup creation rate of around 25 firms in the second year of the project (the first year of operations of the 3 pilot RIHs), rising quickly to a peak of 75 firms in year 6, before receding to a longer-term average of around 40 firms. On a cumulative basis, this leads to a stock of around 175 surviving startups by the end of the 5-year GENIE project period (2020), and 850 by year 20 (Table 5.2).

Table 5.2. Dynamics of Start-ups in Baseline Scenario

	Project year										
number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11-20***
New startups	0	30	50	72	98	120	120	120	120	120	120
Startup exits	0	6	13	22	33	45	53	61	67	73	83
Net startups created	0	24	37	50	65	75	67	60	54	48	37
Stock of startups	0	24	61	111	175	250	317	376	430	477	849

* Average annual rate for new startups, startup exits, and net startup creation; Year 20 end-value for stock of startups.

24. Given the high initial startups costs and the innovative and thus risky nature of most of these firm's business models, it is expected that they begin to generate positive profits only after the third year of operations, at an annual level of around 20,000 GEL—the average operating profit of a small firm (under 5 employees) in Georgia according to the latest business surveys. Profit levels thereafter are expected to grow at an increasing rate—peaking at 25 percent annual growth in year 7—before leveling off to a longer-term average of 5 percent, broadly in line with estimated long-term potential real GDP growth in Georgia.[71]

(b) Additional profits of existing firms from the commercialization of new innovations

25. In addition to nurturing new innovative startup firms, the project's innovation centers are also expected to stimulate the development of new products and process by existing firms, innovations that will be reflected in one of the project key PDO results indicators (i.e. the "number of new/improved products or services introduced to markets by users of innovation centers"). Estimating the actual economic contribution, rather than just the number, of these various innovations, is one of the most complex and uncertain aspects of this economic analysis. This stems from the inherent variability in the value and survival rates of new products and processes: some could represent marginal improvements with limited profit-earning potential and a short market life, while others could be regional or even global breakthroughs that transform an industry and command a high market value. Ideally, this wide range of outcomes would be captured through a probabilistic modeling approach, but this is very computationally-intensive and requires data inputs not readily available in Georgia.

26. The simplified approach used here to estimate the incremental profits earned by firms from the commercialization of a new idea therefore assumes an average value of a "representative" innovative product or service. Since no data exists for the value of past innovations in Georgia, it is instead approximated by the median economic value of patents in the EU, estimated by several recent studies to be around EUR 200,000 (or US$215,000).[72] The assumption is that this value is realized as profits by each firm in equal annual amounts spread over the market life of the new product or process, assumed to be 15 years.

27. The number of new innovations that actually produce this market value is based on the expectation that around 70 existing firms per year engage on a regular basis with *each* of the

[71] IMF World Economic Outlook, October 2015 and latest IMF country reports on Georgia.
[72] European Commission (2006), "Study on evaluating the knowledge economy, what are patents actually worth?: The value of patents for today's economy and society; PatVal EU Project (European Commission, 2005), EIB (2013).

project's RIHs and around 5 firms with each CIC. Of these users benefitting from the centers' prototyping equipment and innovation support services, around 50 percent are subsequently assumed to generate an innovative idea. Cross-country experience has shown, however, that the commercialization rate for such ideas is quite low: over 85 percent fail to make it to the market, and around one-third of those that do ultimately fail soon thereafter. Applying these same average outcomes to the ideas assumed to be generated by RIH and CIC users, the implied ultimate number of commercially-viable and profit-generating innovations over the projection horizons turns out to be fairly modest—between 10 and 30 during the first few years of the project, and around 75 per year over the long term. However, even under this conservative baseline scenario, the PV of the resulting profit stream is US$38 million over the 20-year projection horizon. This represents a significant incremental benefit of around US$30 million in PV terms compared to the counterfactual no-project scenario, where the rates of innovative idea generation, commercialization, and survival are assumed to be lower on account of the more limited quantity and quality of the established centers.

(c) Incremental salaries of participants in GENIE's training programs

28. The structured training programs delivered through the network of innovation centers fall into two main categories: (a) dedicated training for ICT-related employment, (b) more general training in advanced technical fields (e.g. 3D digital design, bioengineering techniques, etc.) and business skills related to turning innovations into startups or commercially-viable products or services. It is expected that trainees successfully completing these programs accumulate human capital which subsequently allows them to earn a higher future salary. This salary premium is assumed to be 5 percent above the average market wage[73] for their respective professions (compared to the counterfactual no-training scenario, where they continue to earn the market wage), and is earned throughout the course of their working life, implying a lifelong incremental benefit from the GENIE Project's training.[74]

29. The calculation of the magnitude of these incremental salary benefits depends on two further sets of assumptions:

- **Employment status of trainees.** For those who already have jobs, the incremental gain from training is simply the 5 percent lifelong salary premium. In contrast, those who are unemployed or outside the labor force (i.e. inactive or full-time students) and are helped by the training to find a job, the incremental benefit is the full value

[73] The value of labor income generally used in economic cost-benefit analysis is the opportunity cost of labor. In perfectly competitive markets, the market wage should reflect the true opportunity cost of labor (or shadow wage), but tends to be higher than the opportunity cost in environments with high unemployment and structural rigidities in the labor market. In these circumstances, an adjustment is typically made to the market wage using a conversion factor. In the Georgian case, there is insufficient information to estimate the appropriate factor for this adjustment, so the market wage and social opportunity cost of labor are assumed to be equal.

[74] A more rigorous modeling of the incremental lifelong salary would use the salary curve for training beneficiaries during the whole forthcoming work career, rather than just their average salary. However, data on such salary curves by years of an employee's career is not available in Georgia. Moreover, this methodology would require a multitude of assumptions about the career stage at which participants complete GENIE's training programs and the extent to which this training affects the slope (rather than just the level) of their lifetime salary curve, factors which are both very difficult to approximate *a priori*.

of their salary (including the 5 percent premium) for the duration of time they would otherwise have remained unemployed in the "without-training" counterfactual scenario. This duration is assumed to be 12 months for unemployed trainees—equivalent to average duration of unemployment in Georgia—and 2 years for students and other economically-inactive trainees. Moreover, the additional training made possible by the Project (relative to the counterfactual scenario) is also assumed to improve the job finding rates for both unemployed and student trainees by around 10 percent.

- **Sectoral composition of employment.** The average wage from which salary premiums are calculated varies depending on the sector in which trainees are employed. For already-employed participants undertaking project training, it is assumed that their ex-ante distribution reflects the average sectoral employment shares in the economy—21 percent in industry, 2 percent in agriculture, 11 percent in ICT, and 66 percent in non-ICT services. Ex-post, however, the expectation is that around 1/3rd of those completing the dedicated ICT skills training program (who are not already employed in ICT) transition to jobs in the ICT sector. For unemployed or inactive training participants, the migration into ICT jobs is assumed to be even greater due to the lower opportunity cost and risks associated with not having to leave an existing job. For recipients of the more general technical and innovation/entrepreneurship trainings, the transition to ICT is assumed to be more limited (around 5 percent of the employed training participants and 10 percent of the unemployed). In total, expected increase in the share of ex-post project trainees employed in ICT sector jobs is estimated at around 25 percentage points. This is intended to capture the GENIE project's contribution to Georgia's broader strategic initiative to boost employment in the ICT sector. The estimated incremental impact is relative to the counterfactual scenario, where only a 15 percent increase in the ex-post ICT employment share of trainees is assumed due to the more limited scale and quality of trainings and services that GITA can finance on its own without project support.

30. The flow of estimated benefits in each of three categories above under the assumed baseline parameters is summarized in Table 5.3. In total, their estimated present value (PV) over the 20-year analysis horizon is US$60 million. The bulk of this derives from the profits expected to be generated by new startup firms and existing firms bringing to market new innovations, with incremental salaries of GENIE project trainees accounting for less than 10 percent of the total PV.

Costs

31. Economic costs associated with the innovation centers are divided into: (a) one-off investment costs of the infrastructure and equipment needed to establish the centers, hire and train their staff, and design the training and services they will deliver; (b) the recurring annual operational and maintenance costs of the centers, including repairing or replacing equipment, paying staff salaries, and administering training programs and support services; and (c) the share of overall GENIE project implementation support costs (i.e. project management and M&E) costs devoted to the innovation centers and their services.

32. The investment costs amount to US$4.1 million over the 5-year project period, US$3.2 million of which relate to subcomponents 1.1 and 1.2, and the remainder to Component 2. For recurrent costs, more than 80 percent come from component 2, reflecting the high cost of continuing to deliver the center's services and awareness raising activities over the long term. For components 1.1 and 1.2, the annual maintenance costs of the facilities and equipment of the RIHs and CICs are incurred beginning in year 2, after the first round of pilot facilities have been established, cumulating gradually as more centers are built over the remainder of the project period. After the project period, they are assumed to stabilize at the average of the last 3 years of the project. Finally, since the innovation centers represent the largest component of the GENIE project, both in terms of overall budget allocation and the magnitude of the undertaking, 50 percent of the Project's total implementation support costs are estimated to be devoted to this component (or around US$1.4 million over 5 years). These various costs are summarized in Table 5.3. In total, their present value (PV) over the 20-year analysis horizon (at the assumed 7 percent real social discount rate) is estimated at US$39 million.

Results and Sensitivity Analysis

33. When the total present value of innovation center benefits is netted against the PV of expected innovation center costs, the result is a highly-positive NPV of US$23 million for this group of project components. The implied economic rate of return (ERR) is 16.5 percent, over 9 percentage points above the assumed 7 percent social discount rate.

34. The fairly high margin of return in this baseline case implies ample scope for different benefit flows to fall short of their forecasted values and still deliver a positive overall return, but the underlying sensitivities are also large. This is especially true for expected profits of startups—the largest benefit category—the PV of which varies greatly depending on the starting profit level assumed. For every GEL 10,000 difference in these initial profits, the NPV of the innovation centers changes by roughly US$12.5 million, and the ERR by around 5 percentage points. A similar magnitude of NPV and ERR sensitivity is associated with a 50 percent change in the overall number of startups expected to be generated by users of the innovation centers.

35. For the expected profits from new innovations by existing firms, the key parameter shaping their PV is the average lifetime commercial value assumed for each innovation brought to market. Every GEL 100,000 deviation in this value results in a US$7.5 million change in the overall NPV of the innovation centers and a 3 percentage point shift in the ERR. Finally, for incremental salaries of training recipients, the main sensitivity relates to the assumed value of the ex-post wage premium earned by these trainees: for every 2 percentage points that this premium differs from the 5 percent assumed in the baseline case, the NPV of the innovation centers changes by roughly US$1 million, and the ERR by 0.5 percentage points.

Table 5.3. Summary of Expected Costs and Benefits on Innovation Centers (Baseline)

BENEFIT FLOWS (million USD)

Component	PV*	*Project year* 1	2	3	4	5	6-10	11-20
Profits from new startups	$27.31	0.00	0.00	0.00	0.12	0.32	8.06	67.44
Profits from innovations of existing firms	$30.45	0.00	0.13	0.36	0.72	1.19	13.65	60.32
Incremental salaries of trainees	$4.46	0.12	0.40	0.76	0.76	0.70	1.73	3.63
TOTAL BENEFITS	**$62.22**	**0.12**	**0.53**	**1.12**	**1.60**	**2.21**	**23.43**	**131.39**

COSTS (million USD)

	PV*	1	2	3	4	5	6-10	11-20
Investment costs	**$3.34**	**1.27**	**1.01**	**0.56**	**0.55**	**0.55**	**0**	**0**
Component 1.1: RIHs	**$1.67**	**0.72**	**0.48**	**0.26**	**0.25**	**0.24**	**0**	**0**
Facilities and equipment	$1.60	0.70	0.47	0.23	0.23	0.23	0	0
Staff training	$0.06	0.02	0.01	0.02	0.02	0.01	0	0
Component 1.2: CICs	**$1.02**	**0.24**	**0.24**	**0.25**	**0.25**	**0.25**	**0**	**0**
Facilities and equipment	$0.96	0.23	0.23	0.23	0.23	0.23	0	0
Staff training	$0.06	0.01	0.01	0.02	0.02	0.02	0	0
Component 2: Services	**$0.66**	**0.31**	**0.29**	**0.05**	**0.05**	**0.05**	**0**	**0**
Building the innovation community	$0.02	0.02	0.00	0.00	0.00	0.00	0	0
Digital economy skills development	$0.43	0.24	0.24	0.00	0.00	0.00	0	0
Business innovation support	$0.21	0.05	0.05	0.05	0.05	0.05	0	0
Recurring operational & maintenance costs	**$34.46**	**2.14**	**2.64**	**3.43**	**3.34**	**3.55**	**17.15**	**34.30**
Component 1.1: RIHs	**$4.13**	**0.20**	**0.34**	**0.45**	**0.33**	**0.52**	**2.05**	**4.09**
Staff salaries	$1.16	0.09	0.14	0.16	0.12	0.10	0.51	1.03
Other O&M costs	$2.97	0.12	0.20	0.28	0.22	0.42	1.53	3.07
Component 1.2: CICs	**$1.66**	**0.05**	**0.09**	**0.16**	**0.17**	**0.19**	**0.87**	**1.74**
Staff salaries	$0.96	0.03	0.07	0.10	0.10	0.10	0.50	0.99
Other O&M costs	$0.70	0.01	0.03	0.06	0.08	0.09	0.38	0.75
Component 2: Services	**$28.67**	**1.89**	**2.21**	**2.82**	**2.83**	**2.85**	**14.23**	**28.47**
Building the innovation community	$8.23	0.78	0.78	0.78	0.78	0.78	3.88	7.77
Digital economy skills development	$11.63	0.30	0.61	1.22	1.23	1.23	6.17	12.34
Business innovation support	$8.81	0.82	0.82	0.83	0.83	0.84	4.18	8.36
Implementation costs	**$1.16**	**0.29**	**0.29**	**0.28**	**0.28**	**0.28**	**0.00**	**0.00**
TOTAL COSTS	**$38.96**	**3.70**	**3.94**	**4.27**	**4.17**	**4.38**	**17.15**	**34.30**
NET BENEFITS	**$23.26**	**-3.58**	**-3.40**	**-3.14**	**-2.57**	**-2.17**	**6.28**	**97.08**
Economic rate of return (ERR)	16.5%							

* Calculated at a social discount rate of 7 percent.

36. Despite the large individual impacts of downside deviations in these various benefit categories, even in a scenario when they all materialize collectively—for instance, a 5,000 decrease in expected initial startup firms profits relative to the baseline, 100,000 GEL lower market value of new innovations, and 2 percentage points lower expected trainee wage premium, the overall estimated innovation center NPV is still a positive US$6 million and the ERR of 10 percent continues to exceed the cut-off discount factor by a comfortable margin.

Matching Grants Program (Component 3)

37. The GENIE project's matching grants facility will provide two types of grants targeted at different beneficiaries: (a) "start-up" grants for early-stage firms that are still in the proof-of-concept stage and require financing to further develop and commercialize an innovative business model; and (b) "innovation" grants to established MSMEs with a product, process, or organizational innovation new to the local or global market that needs financing to get off the ground. Start-up grants are envisioned to be a maximum of US$30,000 per grant (with an average amount of US$25,000), with a 10 percent matching requirement for beneficiaries. Innovation grants will offer a maximum of US$250,000 (the average amount is expected to be around US$175,000), each with a 30 percent matching requirement. The baseline expectation is that approximately US$7 million of these grants will be awarded in total during the 5-year project period, US$3.6 million in innovation grants to 21 beneficiary firms, and US$3.4 million in startup grants to 135 beneficiary firms.

Benefits

(a) Startup Grants

38. For grants to start-ups, the valuation of associated benefits follows the methodology used earlier to estimate the economic impact of firm creation stimulated by the network of innovation centers and their services—that is, the stream of profits generated over time by these new startup firms. Many of the underlying assumptions used to estimate this profit stream are similar in this case: start-ups supported by the matching grants do not begin generating profits until their third year of operation; their profit growth accelerates in the first few years before slowing to a more sustainable long-term rate; and the firms have a certain probability of survival that diminishes with time.[75] The principal difference here relates to the expected starting level of these profits. In the innovation center valuation, it was set at the current average of SMEs in Georgia since startups would be generated "organically" across various sectors of the economy and not necessarily be based on innovative business models with above-average profit earning potential. In this case, business proposals will be pre-screened and evaluated on the basis of their innovation content, with grants awarded only to the most promising and highest value-generating ideas. For this reason, an innovation premium is built into the expected profit path for these grant beneficiary firms, assumed to be 30 percent above the Georgian SME average.

39. The other key difference is in the assumption of the grant beneficiary survival rate, which is expected to be twice as high in the long-term compared to the average startup (40 percent versus 20 percent), reflecting both the expert-appraised "crème de la crème" status of their business ideas, as well as the dedicated program of technical assistance and mentoring they receive during both the grant competition and in the years afterwards. The improved survival rate associated with winning a matching grant also helps define the counterfactual against which the incremental contribution of the grant program is measured. In the no-project scenario, these same

[75] For the sake of conservatism, it is assumed that 1/3rd of the start-ups applying for the matching grant will also be receiving other support from the RIHs/CICs, meaning their benefit flows are already counted under the appraisal of the innovation center components. For this reason, the benefits calculated here are based on the remaining 2/3rds of startup-grant recipients.

startups would have found it significantly more difficult to secure financing to commercialize their idea, and would not have benefitted from the same quality of mentoring and technical support. Both of these factors serve to lower their assumed survival rate in the counterfactual case, and thus the expected value of their profits over time.

(b) Innovation Grants

40. Since this category of grants is awarded to established firms rather than start-ups, the incremental impact of the grant is estimated as the *increase* in beneficiary firms' profits that it helps to generate. The increase is measured relative to the expected evolution of the same firm's profits in the counterfactual scenario where it did not undertake grant-financed activities.

41. For the counterfactual case, the starting level of annual profits is set at 110,000 GEL, the average amount for medium-sized firms in Georgia, which are expected to be the main candidates for the innovation grants. Thereafter, profits are assumed to increase at the rate of real GDP growth over the projection horizon.[76] Relative to this path, activities financed by the innovation grant are assumed to boost profit growth by 30 percent per year for a period of 3 years, beginning in the third year after the grant is received to simulate the approximate time it takes for a new innovation to be commercialized and materially impact the firm's sales. Under these parameters, the present value of incremental profits generated by the 21 innovation grant beneficiary firms over the projection horizon is estimated at US$11.7 million. This does not capture any multiplier effects or other indirect impacts of the grant-financed innovations, and should thus be viewed as a lower bound on the range of potential benefits.

Costs

42. The costs of the impacts generated by the matching grants program fall into four categories: (a) investment costs, (b) operating costs, (c) implicit costs, and (d) implementation costs. Investment costs include the grant awards themselves (US$7 million over the 5-year project period) as well as the required matching contribution from the private sector, estimated at roughly US$2 million over 5 years assuming a 30 percent match rate for innovation grants and 10 percent for startup grants. Operating costs (roughly US$1.5 million over the 5-year project period) relate to the expenses of administering each call for grant proposals, including paying for expert reviewers and the panel of judges, as well as the dedicated program of technical assistance and mentoring provided to grant applicants. Implicit costs reflect the opportunity cost of the time firms have to dedicate to prepare grant proposals—assumed to be equivalent to 5 percent of the grant amount sought. Finally, 30 percent of total project implementation support costs are attributed the matching grants component, as it will require significant effort on the part of GITA to organize and execute the various calls for proposals as well as monitor the subsequent activities of grant recipients. In total, the present value of these three categories of costs is estimated at US$10.2 million.

Results and Sensitivity Analysis

[76] Real GDP growth is assumed to be 3 percent per annum in 2016 and 2017 amidst still-subdued external demand among Georgia's key trading partners, rising gradually to the estimated long-term potential growth rate of 5 percent thereafter.

43. In total, the combined present value of expected benefit flows from the innovation and startup grants is estimated at US$14.6 million over the 20-year projection horizon. When netted against the present value of US$10.2 million in costs, this results in a positive NPV of US$4.3 million for this matching grants component, and an implied ERR of 11.1 percent, above the assumed 7 percent real discount rate (Table 5.4).

Table 5.4. Summary of Cost and Benefit Flows of Matching Grants Component (Baseline Case)

BENEFIT FLOWS (million USD)

		Project year						
Component	**PV***	**1**	**2**	**3**	**4**	**5**	**6-10**	**11-20**
Additional profits of innovation grant recipients	$11.72	0.00	0.00	0.00	0.10	0.36	6.73	21.65
Profits of startup grant recipients	$2.85	0.00	0.00	0.00	0.05	0.11	1.27	5.75
TOTAL BENEFITS	**$14.57**	**0.00**	**0.00**	**0.00**	**0.15**	**0.46**	**8.00**	**27.41**
COSTS (million USD)								
	PV*	**1**	**2**	**3**	**4**	**5**	**6-10**	**11-20**
Investment costs	**$7.71**	**0.38**	**3.00**	**3.00**	**3.00**	**0.00**	**0**	**0**
Public grant awards	$5.76	0.00	2.35	2.35	2.35	0.00	0	0
Private matching contribution	$1.59	0.00	0.65	0.65	0.65	0.00	0	0
TA for innovation financing policy reforms	$0.36	0.38	0.00	0.00	0.00	0.00	0	0
Operating costs	**$1.54**	**0.24**	**0.37**	**0.37**	**0.37**	**0.21**	**0.19**	**0.39**
Administrative costs	$0.61	0.07	0.21	0.21	0.21	0.06	0	0
TA for grant participants	$0.93	0.17	0.17	0.17	0.17	0.15	0.19	0.39
Implicit costs	**$0.29**	**0.00**	**0.12**	**0.12**	**0.12**	**0.00**	**0**	**0**
Management burden of preparing grant proposals	$0.29	0.00	0.12	0.12	0.12	0.00	0	0
Implementation costs	**$0.70**	**0.17**	**0.17**	**0.17**	**0.17**	**0.17**	**0**	**0**
TOTAL COSTS	**$10.24**	**0.79**	**3.66**	**3.66**	**3.66**	**0.38**	**0.19**	**0.39**
NET BENEFITS	**$4.33**	**-0.79**	**-3.66**	**-3.66**	**-3.51**	**0.08**	**7.81**	**27.02**
Economic rate of return (ERR)	11.1%							

* Calculated at a social discount rate of 7 percent.

44. The main sensitivity of this NPV estimate is to the assumption on the starting level of profits of beneficiary firms in the counterfactual no-project scenario and the percentage boost received from grant-financed activities, particularly for innovation grants which account for the bulk of the present value of expected benefits from the matching grants component. For every GEL10,000 (US$4,500) decrease in the starting level of profits assumed to generated by a firm before receiving an innovation grant, the NPV of the matching grants component falls by roughly US$1 million and the ERR by 1 percentage point. Similarly, for every 5 percentage point reduction in the profit boost assumed to result from the implementation of innovation grant-financed activities, the NPV declines by US$2.2 million and the ERR by around 2 percentage points. Thus, since the NPV of this component is only modestly positive in the baseline case, a moderate deviation from the assumed parameters could push the NPV into negative territory—the switching values are a GEL 40,000 reduction in assumed starting profits for innovation grant recipients, or a 10 percentage point reduction in their assumed profit growth boost (both of which are plausible). On the other hand, these estimates do not take into account possible positive spillovers in terms of other firms copying the innovations of grant recipients, success stories inspiring more innovation and entrepreneurship, possible exponential growth of

one or more outliers, etc. Hence, the full economic impact could be even greater.

Broadband-for-development (BfD) Program (Component 1.3)

45. The GENIE project will engage exclusively in demand-side broadband interventions (i.e. voucher and cash-back programs) to complement the expansion of physical broadband infrastructure (e.g. fiber optic cables) to currently unconnected villages in Georgia, which is being financed separately through the government's OpenNet program.[77] As such, the incremental contribution of the GENIE project is connecting households and MSMEs who would have otherwise found it *cost prohibitive* to subscribe to broadband internet, even in areas where such broadband coverage is already available. This is a critical assumption, as it implies that the full benefits of broadband access accruing to households and MSMEs can be attributed directly to the GENIE project, even if the underlying infrastructure to enable the broadband connection was financed outside of the Project. Beyond this direct impact on affordability, the GENIE project's broadband demand promotion would, over time, presumably elicit a supply-side response and stimulate additional private investments by ISPs to improve the speed and quality of their broadband offerings. This potential second-order impact, however, is not captured in the cost-benefit estimates presented here.

Benefits

(a) MSMEs

46. The benefit to MSMEs from receiving broadband access and e-commerce training is modeled as the rise in worker productivity (defined as GVA per employee) that results from the increased use of ICT in firm operations—e.g. reduction in transport costs, improved ability to reach more distant customers, transactional efficiencies from selling on e-commerce platforms, etc.). This increase in per worker GVA is assumed to be a cumulative 6 percent, realized gradually over a period 3 years, and is based on empirical estimates of labor productivity gains from broadband uptake in a sample of countries with similar income levels to Georgia's.[78] The calculation assumes a starting annual GVA per worker of GEL 10,000—the average for a Georgian MSME with 2–3 employees. The productivity gain is relative to a counterfactual scenario where GVA per worker for the beneficiary MSME grows at 1 percent per annum, in line with assumed economy-wide labor productivity growth.

47. For MSMEs who also opt to purchase new IT equipment through the program (claiming the cash-back benefit in the process)—either because they do not own any IT equipment or because they wish to upgrade their existing equipment—GVA per worker is assumed to rise an additional 1 percentage point. This reflects the notion that more modern and higher-end IT equipment allows beneficiary firms to more fully realize the benefits associated with broadband access and e-commerce.

[77] The government's OpenNet program aims to construct broadband backbone infrastructure that will connect around 2,000 villages throughout Georgia at an estimated cost of USD 100 million.
[78] Ericsson, Arthur D. Little, and Chalmers University of Technology, "Analyzing the effects of Broadband on GDP," 2011, estimates the productivity impact in a sample of 33 OECD countries.

48. These productivity benefits are offset in part by the private costs not covered by the Project's vouchers that MSMEs incur to acquire and maintain broadband access and IT equipment (Table 4.2).[79] These include: (a) the annual broadband subscription costs of approximately GEL 600; (b) the residual cost of IT equipment net of the 20 percent cash back (around GEL 4000); (c) the implicit opportunity cost of time spent on the set-up of the broadband connection, procurement of IT equipment, and participation in e-commerce training (assumed at 5 percent of total outlays on these items, or around GEL 360); and (d) the annual cost of maintaining purchased IT equipment (5 percent of its purchase price).[80]

49. The target number of MSMEs under this BfD program is around 3,000. Uptake is assumed to be slow at first as the program is rolled out and advertised, with only 5 percent of total targeted firms participating in the first year, but rising steadily to a rate of 30 percent in the final two years of the program. Two-thirds of participating MSMEs are assumed to elect the new IT equipment purchase option, with the remaining one-third preferring to stick with their current IT equipment. Under these parameters, the PV of MSME broadband benefits (net of the aforementioned private direct and indirect costs) is estimated at US$8.2 million over the 20-year projection horizon. Note that, in aggregate, MSME benefit flows are actually slightly negative in the first few years as the frontloaded costs of purchasing IT equipment outweigh the gradually-accumulating productivity benefits (Table 5.5).

(b) Households

50. For households, the valuation of broadband benefits is based on the premise that consumer's willingness-to-pay (WTP) for broadband access exceeds the market price actually paid due to perceived productivity gains of being connected to the digital economy—e.g. improved access to e-services (e-commerce, e-banking), better access to information, development of new professional opportunities for skilled residents (e.g. teleworking), etc. This difference between the household's WTP and the cost of a broadband subscription—known as consumer surplus—can be thought of as the net benefit to the household of being connected. By lowering the up-front broadband connection costs through its voucher and cash back programs, the GENIE project helps households who would otherwise have been unable to afford a broadband connection to capture this consumer surplus.

51. Since a broadband WTP estimate for households is not readily available for Georgia, it is set at US$19 (or GEL 45), which implies a monthly consumer surplus of US$10 (GEL 25) once monthly subscription costs of GEL 20 are factored in—the average consumer surplus level for countries of similar GDP per capita according to a recent cross-country study.[81]

52. The target number of households is 30,000 and the schedule of annual program uptake is

[79] The project vouchers and cash-back finance only the initial installation costs of broadband a connection (GEL 200 for a SME subscription), the e-commerce training (GEL 1000), and 10% of the estimated IT equipment cost of GEL 5000 (paid in installments over 2 years).

[80] Note that MSMEs electing not to purchase IT equipment will not receive the cash-back benefit but will also not incur the equipment maintenance cost.

[81] Nottebahm et. al, "Online and upcoming: The Internet's impact on aspiring countries," McKinsey High Tech Practice report, January 2012.

assumed to be identical to that of MSMEs—5 percent of the total in the first year, 15 percent in year 2, 20 percent in year 3, and 30 percent in years 4 and 5. All households participating in the program are expected to have a personal IT device (e.g. computer, netbook) to reap the benefits of their broadband connection and digital literacy training. However, recent household survey data suggests that the number of households in rural areas (the primary target group of the BfD program) with computers actually exceeds those with internet access by around 20 percent. On this basis, it assumed that only 80 percent of households participating in the BfD program will elect the IT equipment purchase option.

53. After factoring in the various additional up-front private costs incurred by households (residual price of a computer after cash-back, opportunity cost of time spent on training, etc.), the PV of net consumer surplus captured by households over the 20-year projection period is estimated at US$25 million.

Table 5.5. Beneficiary Cost of Participation of BfD Program

	Up-front costs		Recurring annual costs	
GEL (per beneficiary)	**MSMEs**	**Households**	**MSMEs**	**Households**
Private costs incurred	**6160**	**1290**	**850**	**280**
Installation cost	200	200	0	0
Annual subscription cost	600	240	600	240
IT equipment purchase	5000	800	0	0
Time cost of procurement, set-up, training	360	50	0	0
Equipment maintenance costs	0	0	250	40
Public subsidies	**3200**	**360**	**0**	**0**
Installation cost voucher	200	200	0	0
Training cost voucher*	2000	0	0	0
Cash back for IT equipment	1000	160	0	0
NET COSTS	**2960**	**930**	**850**	**280**

* For households, digital literacy training is packaged as part of broadband installation voucher.

Costs

54. The Project costs of the broadband demand-promotion schemes include the expenditures on vouchers for broadband installation and beneficiary training, as well as on the cash back for IT equipment purchases. Collectively, these amount to US$3.6 million for the 3,000 targeted MSMEs, and US$4.5 million for the 33,000 targeted households (assuming full program uptake). An additional US$900,000 is expected to be spent on administering the program, including costs related to establishing and advertising the voucher and cash back schemes, and processing fees to the private banks managing the payments to beneficiaries. Finally, 20 percent of total GENIE project implementation support costs are expected to relate to GITA's management and monitoring and evaluation of this BfD program. In total, the PV of these various cost is estimated at US$7.5 million.

Results and Sensitivity Analysis

55. Combining the various household, MSME and project costs described above with the expected benefits yields an estimated NPV of 25.5 million for this broadband demand promotion component of the GENIE project. The implied ERR is 33.6 percent, significantly above the

assumed 7 percent social discount rate (Table 5.6).

Table 5.6. Summary of Cost and Benefit Flows of BfD Component (Baseline Case)

BENEFIT FLOWS (million USD)

		Project year						
Component	**PV***	**1**	**2**	**3**	**4**	**5**	**6-10**	**11-20**
Business benefits	$8.16	0.02	-0.02	-0.12	0.02	0.10	5.43	14.35
Household benefits	$24.92	0.02	0.02	0.15	0.71	1.38	17.25	37.16
TOTAL BENEFITS	**$33.08**	**0.04**	**-0.01**	**0.03**	**0.73**	**1.47**	**22.68**	**51.51**

COSTS (million USD)

	PV*	**1**	**2**	**3**	**4**	**5**	**6-10**	**11-20**
Investment costs	**$6.34**	**0.40**	**1.21**	**1.62**	**2.42**	**2.42**	**0**	**0**
SME support	$2.81	0.18	0.54	0.72	1.08	1.08	0	0
Household support	$3.53	0.22	0.67	0.90	1.35	1.35	0	0
Operating costs	**$0.74**	**0.22**	**0.17**	**0.17**	**0.17**	**0.17**	**0**	**0**
Administrative costs	$0.74	0.22	0.17	0.17	0.17	0.17	0	0
Implementation costs	**$0.46**	**0.12**	**0.12**	**0.11**	**0.11**	**0.11**	**0**	**0**
TOTAL COSTS	**$7.54**	**0.74**	**1.50**	**1.90**	**2.71**	**2.71**	**0.00**	**0.00**
NET BENEFITS	**$25.53**	**-0.70**	**-1.50**	**-1.87**	**-1.98**	**-1.23**	**22.68**	**51.51**
Economic rate of return (ERR)	33.6%							

* Calculated at a social discount rate of 7 percent.

56. As might be expected, the key sensitivity of this estimate relates to the assumptions about the size of the productivity gains for beneficiary MSME and the assumed WTP for broadband of beneficiary households. For every percentage point shift in the assumed MSME productivity increase, the NPV of this Project component changes by around US$2.5 million and the ERR by 2.5 percentage points. Similarly, for every 5 GEL change in the assumed household WTP for broadband, the NPV of this component changes by US$7 million and the ERR by around 8 percentage points. The breakeven parameter values that would result in a zero NPV are a 4 percent cumulative productivity *decline* for beneficiary MSMEs (highly unrealistic), or a household WTP of only GEL 25 per month, which would imply broadband benefits are valued at only slightly above their market cost (i.e. consumer surplus is nearly zero).

Overall Project

57. Under the baseline input parameters for each component appraised, the overall project delivers a positive NPV of US$53.1 million and an ERR of 18.9 percent, with most of the net benefits materializing after the 5-year project period, consistent with the notion that these types of innovation-related investments deliver noticeable returns primarily in the medium-to-long term (Table 5.7).

58. The broadband demand promotion component has both the highest estimated ERR of all the appraised component groupings and the largest contribution (48 percent) to the overall project NPV. This is followed by the innovation centers component, with a 44 percent contribution to total project NPV. The matching grants component makes the smallest relative contribution.

Table 5.7. Summary of Overall Project Cost and Benefits

BENEFIT FLOWS (million USD)

		Project year						
Component	**PV***	**1**	**2**	**3**	**4**	**5**	**6-10**	**11-20**
Innovation centers (Components 1.1, 1.2 & 2)	$62.22	0.12	0.53	1.12	1.60	2.21	23.43	131.39
Matching grants program (Component 3)	$14.57	0.00	0.00	0.00	0.15	0.46	8.00	27.41
Broadband support (Component 1.3)	$33.08	0.04	-0.01	0.03	0.73	1.47	22.68	51.51
TOTAL BENEFITS	**$109.87**	**0.16**	**0.53**	**1.16**	**2.48**	**4.15**	**54.12**	**210.30**
COSTS (million USD)								
Component	**PV***	**1**	**2**	**3**	**4**	**5**	**6-10**	**11-20**
Innovation centers (Components 1.1, 1.2 & 2)	$38.96	3.70	3.94	4.27	4.17	4.38	17.15	34.30
Matching grants program (Component 3)	$10.24	0.79	3.66	3.66	3.66	0.38	0.19	0.39
Broadband support (Component 1.3)	$7.54	0.74	1.50	1.90	2.71	2.71	0.0	0.0
TOTAL COSTS	**$56.75**	**5.23**	**9.10**	**9.82**	**10.54**	**7.47**	**17.34**	**34.69**
NET BENEFITS (NPV)	**$53.12**	**-5.08**	**-8.57**	**-8.67**	**-8.06**	**-3.32**	**36.77**	**175.61**
Economic rate of return	18.9%							

* Calculated at a social discount rate of 7 percent.

Innovation Centers Financial Sustainability Analysis

59. While the GENIE project will support startup costs for the RIHs and CICs, the ultimate goal is for these centers to be financially self-sustaining beyond the project period. This financial sustainability will hinge on several key factors: (a) the strength of user demand; (b) the willingness of users to pay for access to the centers and their equipment and services; (c) the level of fees the centers elect to charge; and (d) the capacity of GITA and other public entities sponsoring the centers (e.g. local governments or universities) to provide financial support to the centers in future instances when financial strains may emerge. To assess the implications of these various factors, this section presents simulations of the financial performance of a representative RIH and CIC under different scenarios. In reality, there will be heterogeneity in the financial prospects of different centers due to region-specific demand and operating environments, but the results of this "unit center" analysis should nevertheless indicate the broad parameters under which the centers could be deemed financially sustainable.

Regional Innovation Hubs (RIHs)

Features and Operating Structure

60. As currently envisaged, a representative RIH will consist of some combination of the following: a medium-sized computer lab (with 15–20 workstations) for users to access the Internet and GITA's online network of information and resources, a more advanced computer lab for digital design and programming (a so-called innovation lab, or iLab, with 5–10 higher-end computers), a fabrication lab (fab lab) with prototyping equipment, co-working spaces for users to collaborate and develop business ideas, and a variety of classrooms for the delivery of training and support services. The RIH will also serve as a venue for hosting regional innovation competitions (around 6–8 per year) to incentivize latent innovators and entrepreneurs to publicly

present their ideas and business proposals. Each RIH will be staffed by around 6 full-time employees—a combination of an information specialist responsible for educating visitors about the RIH's offerings and connecting them to relevant online resources, technicians and managers for the computer and fabrication laboratories, and general maintenance staff (facility cleaning, security, etc.). The RIH will also bring in expert consultants to provide more specialized trainings and mentoring services. The RIH will operate year-round except for Sundays and national holidays, and keep normal working hours (i.e. 9:00am–6:00pm, or 9 hours a day).

Revenues

61. Each of the RIH offerings described above (as well as general entry into the center) represents an opportunity for the RIH to earn revenue by charging users. In the spirit of having the centers be a public good, GITA's preference is to minimize such user fees and keep most services free, although this will clearly weigh on the long-term financial viability of the centers. Potential supplementary sources of revenue include the sale of advertising rights to private companies who wish to set up spaces in the RIH to sell products and services related to the innovation and entrepreneurship process (e.g. commercial banks offering financing products, mobile telephone companies offering subscription packages, etc.).

Table 14: Indicative RIH investment and operating costs (in year 1)

GEL	Number	Unit cost	Total cost
INVESTMENT COSTS			**420,124**
Furniture			34,510
Conference tables	2	8,330	16,660
Chairs, desks and other	—	—	17,850
Computers and media			71,454
High-end computers	10	3,094	30,940
Projector	1	1,125	1125
2D printers, telephones and other	—	—	2,023
Other (occulus, tablets, smartphones, etc.)			17,731
Fabrication equipment	—	—	314,160
Laser cutters	1	85,680	85,680
3D printers	2	39,270	78,540
CNC Machine	1	1	52,360
Other (maker bot, vaccuum former, etc.)	—	—	97,580
OPERATING COSTS			**369,283**
Fixed			**272,840**
Staff salaries			51,900
General manager	1	10,500	10,500
Lab managers	2	10,500	21,000
Lab technicians	2	9,000	18,000
Maintenance workers	1	2,400	2,400
Staff training	5	2,000	10,000
Software	—	—	4,000
Basic (e.g. Microsoft Office)	—	—	4,000
Advanced	—	—	1,000
Utilities	—	—	34,800
Electricity	—	—	18,000
Water/gas	—	—	14,400
Internet/telephone	—	—	2,400
Building rent	—	—	0
Promotion and advertising	—	—	50,000
Facility renovation	—	—	100,000
Maintenance and equipment replacement	—	—	22,140
Variable			**96,443**
Trainings (per training)	22	659	14,500
Innovation/entrepreneurship boot camps	12	375	4,500
Advanced technical (iLabs)	10	1,000	10,000
Innovation competitions (per event)	6	517	3,100
Seminars and meet-ups (per event)	15	308	4,625
Fabrication input materials (per user)	940	79	74,218

Table 5.8. Indicative RIH Investment and Operating Costs (in year 1)

Costs

62. The costs considered here are only those specific to a representative RIH, and exclude systemic expenses for the innovation center network (e.g. technical design of trainings, the network-wide content management system, training of trainers, etc.) which will be incurred centrally by GITA and the GENIE project. The RIH-specific costs fall into two broad categories: (a) initial investment costs related to renovating the facility hosting the RIH and equipping it with furniture, electronics, and other essential supplies; and (b) recurring annual

operating costs, split between *fixed* costs such as staff salaries, overhead expenses (utilities and facility rent[82]), software licenses, general facility and equipment maintenance, and promotion/ awareness raising expenses, and *variable* costs of conducting training programs, running the innovation Olympiads, and supplying input materials for the fab labs. The assumptions for these various costs are summarized in Table 5.8, and are based on GITA's experience with its existing pilot fabrication and innovation labs and its estimates of local market prices for different categories of equipment, labor, and other inputs.

[82] For the purposes of this analysis, it is assumed that the local government will provide the RIH with facility space free of charge, although alternative arrangements are also possible, including the local government leasing the facility space to the RIH at an annual rent cost, or granting the RIH a rent waiver but levying a small property tax instead. These arrangements have yet to be decided.

Financing

63. GITA (with the financial support of the GENIE project) will finance the purchase of all initial furniture and equipment for the RIHs. For accounting purposes, this is treated as a one-time capital gift/donation.[83] The local authorities providing the facility for the RIH are also assumed to cover around 75 percent of any necessary renovation or upgrading costs. All other expenses are assumed to be self-funded through the RIH's operating revenues. Any residual expenses (on a cash basis) not covered by these inflows will need to be financed either through borrowing or public subsidies. The GITA subsidy arrangements may vary on a case-by-case basis, but for the purposes of this analysis, it assumed that for the first three years of the RIH's operations, GITA commits to cover cost of staff salaries and training, fabrication input materials, and equipment maintenance and replacement. From year 4 onwards, the RIH is assumed to be financially-independent from GITA, generating either a cash surplus, receiving subsidies from its local government, or finding private creditors willing to finance its cash deficits.

Financial Performance Scenarios

64. Under the general revenue, cost, and financing parameters laid out above, simulating the financial performance of a typical RIH requires a further set of assumptions regarding the evolution of user demand for the centers and the pricing scheme the center elects to capture or influence this demand. Once the path of key financial metrics is generated, financial sustainability is then assessed on the basis of whether the RIH is generating and sustaining positive net income and cash flows over the medium to long term.

(a) Minimal Fee Scenario

65. As a starting point, the financial dynamics of an RIH are assessed under GITA's preferred minimal fee structure where entry into the RIH and use of its equipment and services is predominantly free, with the exception of: (a) the fab labs, which employ the pricing model of the current pilot fab lab at Ilia State University—free use for all visitors 2 days per week (except raw materials costs for the machines), and a fixed charges per minute or per gram of materials used during paid business days (0.5 GEL per minute for laser cutters and vacuum formers, 1 GEL per minute for CNC machines, and 1.5 GEL on average per gram of input materials for 3D printers); and (b) the RIH's training programs, which are assumed to be priced at only 10 percent of their supply cost (i.e. at a loss and thus subsidized). In addition, any advertising rights sold to private businesses are assumed to be charged at 2,000 GEL per ad or license.

66. Under this pricing scheme, initial demand—estimated bottom-up on a per hour and per day basis for each of the different RIH offerings—is expected at around 4,000 visitors and 9,000 user hours annually, rising gradually to an annual long-term average of around 12,000 visitors and 32,000 user hours as the RIH gains visibility in the local community and optimizes its capacity to accommodate more users (Figure 5.2). In addition, around 20 structured multi-week training courses are assumed to be delivered annually over the first few years in the areas of computer programming, digital design, business fundamentals for start-ups and innovation, and

[83] Replacement or upgrading of this equipment in the future, however, is a capital expense assumed to be financed directly by the RIH through the sale of depreciated equipment and other cash flow sources.

other advanced technical skills, increasing to roughly 35 in the longer-term. In addition, an average of 200 people per year are assumed to be trained in basic digital literacy by the RIH's staff. Finally, 6–8 innovation competitions per year are assumed to be held in the center, with 10–15 participants per competition.

67. As can been in Figure 5.2, the financial performance of the RIH under this scenario is quite poor. Apart from the first year of operation when the RIH is receiving equipment donations from GITA and subsidies for its cash financing gaps, the center is generating negative net income in all subsequent projection years. These losses are even more pronounced on a cash basis due in part to the large and lumpy outflows for the periodic replacement of depreciated equipment.[84] They also lead to large borrowing requirements for which the RIH is unlikely to find financiers given its loss-making status, meaning it will need to rely heavily on local government subsidies. On these grounds, **it appears that a minimal fee pricing model for the RIH is clearly not financially sustainable.**

(b) Baseline (Moderate Fee) Scenario

68. A more financially viable scenario is one where user fees for other RIH services besides the fab labs and training programs are gradually phased in, starting with a 2–3 year teaser period during which they remain free so as to raise awareness and attract a critical mass of users, followed by an increasing schedule of fees. Fees for training courses could also be raised to a less loss-making level (e.g. around 40 percent of their cost of provision) while still remaining relatively affordable, and the fab lab could charge a fixed annual membership fee to firms and individuals in addition to its usage-dependent variable fees (perhaps offering a discount on the latter as part of the membership benefits). The RIH could also consider charging a small entrance fee to all visitors to generate additional revenue. In the long run, such an arrangement where most or all of the access to RIH's offerings is charged represents a more viable and market-driven way to promote more strategic use of the centers (by those willing to pay)—helping to avoid overcrowding and forced/arbitrary rejection of high-potential users—and to minimize wear and tear on the RIH's equipment and facilities (thus reducing maintenance and replacement costs). Moreover, having users pay entitles them to expect a reasonable standard of service, thus holding the RIH managers more accountable for the quality of services offered.

69. A reasonable schedule of user fees for this scenario is presented in Table 5.9, along with the downgraded projections for demand (Table 5.10) since services which were formerly free are now charged. The pro-forma income statement, cash flow statement, and balance sheet for the RIH under these parameters are shown in Table 5.12. Under this scenario, the financial prospects of the RIH appear significantly more robust—after the first 3 years during which the RIH is still in need of GITA subsidies, it is able to begin generating consistently positive net income over the remainder of the projection horizon. With the exception of one year where multiple equipment replacement needs are concentrated, it is also able to comfortably cover all its cash needs from its retained earnings, and the present value of it net cash flows from years 4–10 (i.e.

[84] The key depreciation assumptions are as follows: a 20-year useful live for furniture a residual value equivalent to 20 percent of the purchase cost; a 3-year useful life and 30 percent residual value for computers; and a 5-year useful life and 40 percent residual value for fabrication equipment.

after the GITA subsidy period) is a positive GEL 140,000.[85] **On this basis, it can be deemed financially sustainable with fairly high probability.** As a result, this scenario represents an appropriate baseline against which other scenarios involving variations to the RIH pricing scheme and user demand can be assessed.

(c) Low Demand/Uptake Scenario

70. A potential shortfall in expected usage of the facilities is one of the major risks to both their financial sustainability and to the overall success of the GENIE project. Two scenarios for such a shortfall are considered to get a more complete sense of the range of financial implications.

71. This first considers a situation where demand for the RIH's various services (computer labs, fab labs, co-working spaces, training programs, etc.) is 75 percent of the amount assumed in the baseline case, both in terms of the number of users and user hours. The user fee structure is assumed to be the same as in the baseline. **The result is a stream of net income and net cash flows that are slightly negative throughout the projection period** (Figure 5.2). However, this can be remedied through a small increase in various combinations of user fees—for example by doubling (from year 3 onwards) fab lab equipment user fees. Another option would be to increase training course charges and co-working space and iLab fees by around 50 percent and to introduce a facility entrance fee of 6 GEL for all users. All these different options would put net income back on a positive trajectory and allow the RIH to generate positive net cash flows in present value terms in the years after it loses GITA subsidy support (i.e. after year 3), thus rendering the center financially sustainable. However, the local government would nevertheless need to provide an additional 100,000 GEL in cumulative subsidies compared to the baseline case in order to financially support the RIH during its first 3–5 years.

72. The second scenario is a more severe demand shortfall of 50 percent relative to the baseline. **In this case, financial sustainability would be untenable** barring significant increases in user fees across the board to levels that would likely further depress demand and also undermine the RIH's ability to serve as an *inclusive* center for innovation. In such a scenario, ongoing public subsidies or donations would be needed.

[85] This valuation uses a 13.5 percent real financial discount rate, equal to the average nominal yield on Georgian 10-year government bonds over the past year (11.5 percent), minus average projected inflation (3 percent), plus a 500bp risk premium to reflect the inherent riskiness of an innovation-oriented project of this nature.

Table 5.9. Pricing Scheme for RIH Offerings (Baseline Scenario)

FEE CATEGORIES	*Years since start of operations*										
GEL	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11-20**
Entrance fee											
per visitor	0	0	0	0	0	0	0	0	0	0	0
Fabrication labs											
Individual membership fee	50	50	50	50	50	50	50	50	50	50	50
Firm membership fee	250	250	250	250	250	250	250	250	250	250	250
Laser cutter/vacuum former per hour fee	30	30	30	60	60	60	60	60	60	60	60
CNC machine per hour fee	60	60	60	90	90	90	90	90	90	90	90
3D printer per grams of materials	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Advanced computing labs (iLabs)											
Per hour fee	0	0	0	8	8	8	8	8	8	8	8
Co-working space											
Per hour fee	0	0	0	8	8	8	8	8	8	8	8
Structured trainings (per training)											
Innovation & entrepeneruship boot camps	38	56	94	150	150	150	150	150	150	150	150
Advanced technical (iLab)	100	150	250	400	400	400	400	400	400	400	400
Innovation Competitions registration fee	50	50	50	75	100	100	100	100	100	100	100
Advertising fees (per ad)	2,000	2,000	2,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000

Figure 5.2. RIH financial performance scenarios

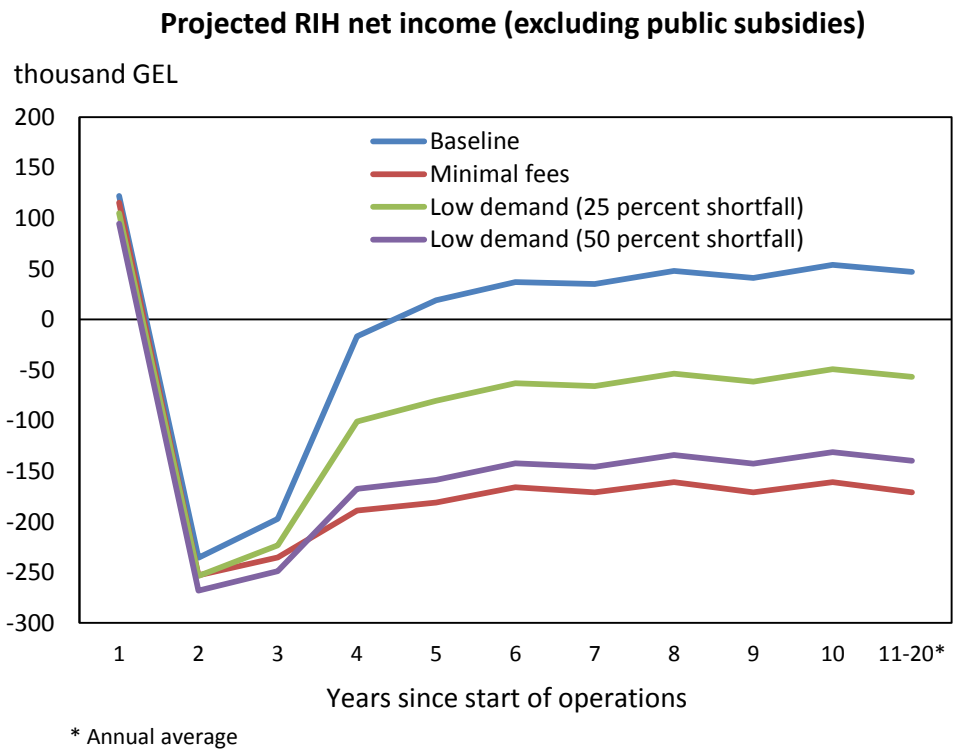


Table 5.10. RIH User Demand Projections (Baseline Scenario)

	Years since start of operations										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11-20**
TOTAL NUMBER OF USERS*	**4,073**	**6,738**	**9,053**	**9,104**	**11,328**	**11,328**	**11,328**	**11,328**	**11,328**	**11,328**	**11,328**
TOTAL USER HOURS	**8,508**	**13,860**	**23,745**	**25,909**	**31,470**	**31,470**	**31,470**	**31,470**	**31,470**	**31,470**	**31,470**
General info & computer access											
Number of users	1,500	3,000	4,500	4,500	6,000	6,000	6,000	6,000	6,000	6,000	6,000
per day	5	10	15	15	20	20	20	20	20	20	20
User hours	1,500	3,000	9,000	9,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
per person per day	1	1	2	2	2	2	2	2	2	2	2
Fabrication equipment											
Number of users	940	1,340	1,680	1,780	2,080	2,080	2,080	2,080	2,080	2,080	2,080
Individuals	900	1,300	1,600	1,700	2,000	2,000	2,000	2,000	2,000	2,000	2,000
per paid day	2	3	4	4	5	5	5	5	5	5	5
per free day	5	7	8	9	10	10	10	10	10	10	10
Firms	40	40	80	80	80	80	80	80	80	80	80
per paid day	0	0	0	0	0	0	0	0	0	0	0
User hours	1,520	2,160	3,600	4,700	5,400	5,400	5,400	5,400	5,400	5,400	5,400
Individuals	1,400	2,000	3,200	4,300	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Free days	1,000	1,400	2,400	2,700	3,000	3,000	3,000	3,000	3,000	3,000	3,000
per day	2	2	3	3	3	3	3	3	3	3	3
Paid days	400	600	800	1,600	2,000	2,000	2,000	2,000	2,000	2,000	2,000
per day	1	1	1	2	2	2	2	2	2	2	2
Firms	120	160	400	400	400	400	400	400	400	400	400
per paid day	3	4	5	5	5	5	5	5	5	5	5
Innovation labs											
Number of users	600	900	900	900	1,200	1,200	1,200	1,200	1,200	1,200	1,200
per day	2	3	3	3	4	4	4	4	4	4	4
User hours	1,200	1,800	1,800	1,800	2,400	2,400	2,400	2,400	2,400	2,400	2,400
per day	2	2	2	2	2	2	2	2	2	2	2
Co-working spaces											
Number of users	600	900	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
per day	2	3	4	4	4	4	4	4	4	4	4
User hours	1,200	2,700	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600
per day	2	3	3	3	3	3	3	3	3	3	3
Trainings											
Number conducted	22	25	30	36	36	36	36	36	36	36	36
Innovaton/enterpreneurship	12	15	18	21	21	21	21	21	21	21	21
Advanced technical (iLab)	10	10	12	15	15	15	15	15	15	15	15
Number of participants	298	390	453	384	478	478	478	478	478	478	478
Digital literacy	188	225	225	113	150	150	150	150	150	150	150
Innovaton/enterpreneurship	60	105	144	166	208	208	208	208	208	208	208
per training	5	7	8	8	10	10	10	10	10	10	10
Advanced technical (iLab)	50	60	84	105	120	120	120	120	120	120	120
per training	5	6	7	7	8	8	8	8	8	8	8
Innovation competitions											
Number per year	6	6	8	8	8	8	8	8	8	8	8
Participants per event	10	12	15	15	15	15	15	15	15	15	15
Seminars and meet-ups											
Number per year	15	17	20	22	25	25	25	25	25	25	25
Participants per event	5	8	10	10	10	10	10	10	10	10	10
Advertisements sold	5	10	15	20	20	20	20	20	20	20	20

* In addition to users of co-working spaces and computer and fabrication labs, this includes number of people participating in structured training classes, innovation competitions, and seminars and meet-ups.

Community Innovation Centers (CICs)

73. The financial sustainability analysis for a representative CIC follows the same framework as that for the RIH. The main differences relate to the scale of the CIC, which is considerably smaller than a typical RIH in terms of equipment requirements, range of services provided, and the number of users it can accommodate. Specific differences in the operating and cost structure include:

- **No fab labs or advanced computing laboratories.** The absence of these laboratories in the CIC greatly reduces the amount of advanced equipment and software that GITA needs to purchases for the center. In total, the assumed up-front equipment requirement is about GEL 28,000 (consisting primarily of basic furniture and 6–8 computer workstations) compared to GEL 420,000 for the RIH. Furthermore, no annual license costs for advanced software are incurred since the CICs require only basic packages such as Microsoft Windows and Office which already come bundled with the computer workstations.

- **Narrower range of training programs.** For the time being, it is assumed that only basic digital literacy training will be offered at the CIC as well as the occasional structured training course, and that those seeking more advanced trainings will be channeled to the RIHs.

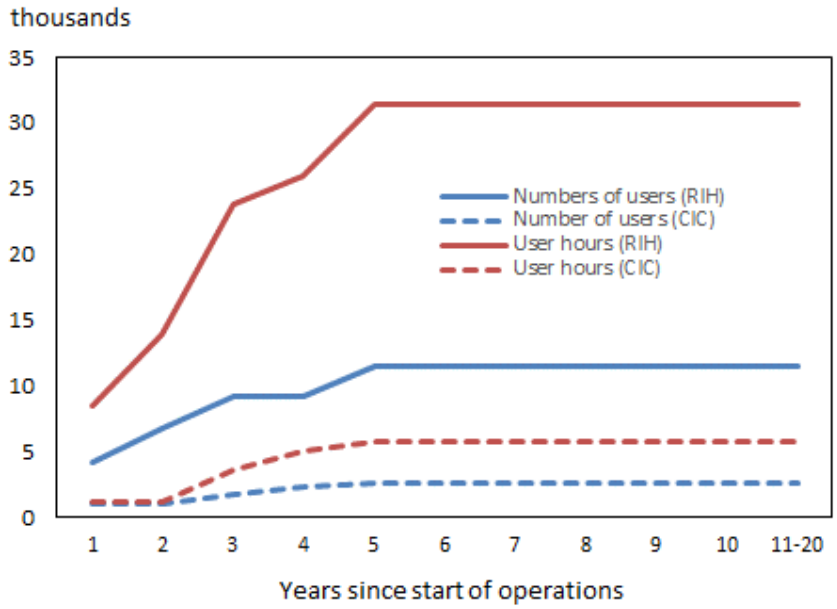
- **Smaller staff size.** The CIC is assumed to require only 1 full-time employee for its core operations—a general manager tasked with guiding visitors to online resources, conducting basic needs assessments, and linking users to the local RIHs if necessary.

- **Lower overhead costs.** Due to the smaller size of the CIC facility and scale of its operations, annual utility costs (electricity, water, internet, etc.) are also assumed to be around 50 percent lower than for the RIH, as are general maintenance costs.

- **Lower advertising expenses.** The resources needed to raise awareness of the CIC and its services in the local community will naturally be lower than for the RIH given that the CICs will be located primarily in small villages and rural areas where it is easier to rely on word-of-mouth and cheaper and more traditional marketing techniques.

74. On the demand side, it is assumed that, due to its smaller size, the CIC can accommodate only a fraction of the RIH's potential daily users for information services, internet access, and co-working spaces. This leads to a much lower expected path for total users and user hours over the projection horizon (see Figure 5.3). On the flip side, because the CIC's trainings are focused exclusively on digital literacy, the CIC is assumed to be able to deliver slightly more of these on an annual basis compared to the RIH. Finally, it is also assumed that no innovation competitions are held in the CIC due to its limited capacity to host such large events.

Figure 5.3. Evolution of Expected User Demand for Representative RIH and CIC



75. From a financial perspective, this smaller scale of demand and diversity of services greatly limits both the sources and magnitude of revenues that the CIC can reasonably collect. As a result, a fee structure identical to that of the baseline RIH case is insufficient to place the CIC on a financially sustainable path, and results in consistently negative net income and net cash flows over the projection horizon. To get to a position of positive and sustained annual net income, the CIC, unlike an RIH, must resort to eventually charging an annual membership fee for all users (from year 3 of operations onwards) to the tune of 20 GEL per person, which may prove difficult in the generally poorer communities it is intended to serve. The CIC would also need to charge approximately 6 GEL per hour for the use of its working spaces. Alternatively, in lieu of the working space fee, it could raise the price of its structured training courses from 25 percent of their underlying cost of provision to 65 percent (still subsidized but by a lower amount). However, this would create an unsustainable arbitrage in the market since similar training would be offered more cheaply in a nearby RIH, which ideally should be fairly easily accessible to the CIC community. Therefore, the 20 GEL membership fee and working space fees are treated as the baseline case for minimum financial sustainability—the present value of the CIC's net cash flows after it loses subsidy support from GITA (i.e. after year 3) is slightly positive in this case. The pro-forma income statement, cash flow statement, and balance sheet for the CIC under this baseline scenario are presented in **Table 5.13.** 5.13.

76. As in the case of the RIH, any shortfalls in expected demand would erode this already tenuous financial position and would require further fee increases to maintain sustainability. Thus, it is critical for the CIC's management to run a strong program of promotion and awareness raising to ensure a steady flow of paying users.

Conclusions

77. The key takeaways from the detailed analysis above are:

Regional Innovation Hubs

- A "minimal fee" pricing scheme for the RIH where users are charged only for fab labs usage and trainings is not financially viable over the medium- to long-term due to a shortfall in revenues relative to operating costs and large borrowing requirements.

- A financially sustainable *baseline* pricing scheme would include small user fees for the full range of RIH services (but not facility entrance fees), with the added benefit of mitigating overcrowding risks and imparting accountability on RIH management to maintain a certain standard of service.

- Under the baseline pricing scheme, there is some room for shortfalls in expected user demand while still maintaining financial sustainability, but not much: a 25 percent reduction in the expected number of users and user hours (relative to the baseline case) could be absorbed but a 50 percent reduction would require a prohibitively large increase in user fees to compensate

Community Innovation Centers

- Due to the CIC's limited sources of potential revenue, it will need to charge users for all its services (including annual membership fees for general access to the facility) in order to cover operating costs in the medium- to long-term.

- In light of this already-high fee structure, the financial resilience to shortfalls in expected demand is considerably weaker for the CIC than for the RIH, since compensating for these shortfalls will necessitate even higher user fees inconsistent with the inclusive mandate of the CIC and the income levels of the predominantly rural population it is intended to serve.

- Alternatively, if user fees are not a viable option, ongoing public subsidies to maintain each CIC would be required.

Scale of Public Support

- Across the various financial scenarios considered for the RIH, GITA will need to provide a cumulative GEL 540,000 in subsidies over first three years to cover financing gaps in the RIH's operations. This is an addition to the estimated GEL 420,000 in up-front financing for equipment and furniture purchases for the RIH.

- In the case of the CIC, the longer the CIC waits to introduce membership and service fees, the larger the scale of financial support that will be needed from GITA. In the baseline case where the CIC only begins charging fees in the fourth year of its operations, cumulative subsidies from GITA are estimated at around GEL 45,000, in addition to the GEL 28,000 in up-front equipment and furniture financing.

- For both the RIH and CIC, the local government providing the public facility to host these centers is expected to contribute roughly 75 percent to renovation costs. This amount is estimated at GEL 75,000 for a typical RIH and GEL 37,500 for the CIC. In addition, local governments are expected to provide a cumulative GEL 96,000 in operating subsidies for each RIH and 93,000 for each CIC (to finance operating expenses in excess of those covered by GITA's subsidies and internally-generated revenues).

- In total, the public support from GITA and local authorities over the 20-year projection horizon in this analysis is estimated at GEL 1.1 million for a typical RIH and GEL 204,000 for a CIC in the baseline case, the breakdown of which is summarized in Table 1. For illustrative purposes, assuming all 8 RIH and 24 CICs that GITA intends to establish over the 5-year GENIE project period have similar support needs, the aggregate public financial support for this network of innovation centers over a 20-year projection period is estimated to be around GEL 19.3 million, or US$8.1 million, of which a large portion will have to be financed from the GENIE budget.

Table 5.11. Estimated Public Financial Support for Innovation cCenters

(over 20-year projection period)

	Per center *(thousand GEL)*			**# of**	**TOTAL**	**TOTAL**
	Years 1-3	*Years 4-10*	*Total*	**centers**	*(thousand GEL)*	*(thousand USD)*
Regional innovation hubs	**1107.2**	**27.4**	**1134.6**	**8**	**9076.7**	**3813.7**
GITA	**963.9**	**0.0**	**963.9**	**8**	**7711.1**	**3240.0**
Equipment donations	420.1	0.0	420.1	8	3361.0	1412.2
Operating subsidies	543.8	0.0	543.8	8	4350.1	1827.8
Local governments	**143.4**	**27.4**	**170.7**	**8**	**1365.6**	**573.8**
Initial setup contributions	75.0	0.0	75.0	8	600.0	252.1
Operating subsidies	68.4	27.4	95.7	8	765.6	321.7
Community Innovation Centers	**198.5**	**5.2**	**203.7**	**50**	**10184.3**	**4279.1**
GITA	**73.4**	**0.0**	**73.4**	**50**	**3669.3**	**1541.7**
Equipment donations	28.3	0.0	28.3	50	1416.1	595.0
Operating subsidies/loans	45.1	0.0	45.1	50	2253.2	946.7
Local governments	**125.1**	**5.2**	**130.3**	**50**	**6515.0**	**2737.4**
Initial setup contributions	37.5	0.0	37.5	50	1875.0	787.8
Operating subsidies	87.6	5.2	92.8	50	4640.0	1949.6
GRAND TOTAL	**–**	**–**	**–**	**–**	**19261.0**	**8092.9**

Table 5.12. Representative Regional Innovation Hub (RIH) Financial Accounts

TABLE A1: RIH INCOME STATEMENT

	Years since start of operations										
thousand GEL	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11-20**
1. REVENUES	**542.7**	**73.8**	**124.0**	**299.3**	**342.3**	**345.3**	**348.3**	**351.3**	**354.3**	**357.3**	**360.3**
Membership fees	6.9	12.5	17.5	20.1	23.1	26.1	29.1	32.1	35.1	38.1	41.1
Entrance fees	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Co-working and maker space rental fees	0.0	0.0	0.0	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8
Services provided	27.7	37.7	70.5	181.4	218.4	218.4	218.4	218.4	218.4	218.4	218.4
Fablabs	20.4	22.8	36.0	100.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0
iLabs	0.0	0.0	0.0	14.4	19.2	19.2	19.2	19.2	19.2	19.2	19.2
Trainings	7.3	14.9	34.5	67.0	79.2	79.2	79.2	79.2	79.2	79.2	79.2
Competition fees	3.0	3.6	6.0	9.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Equipment donations from GITA	420.1	0	0	0	0	0	0	0	0	0	0.0
Contributions from local government	75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other (e.g. advertising revenues)	10.0	20.0	30.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
2. COSTS	**420.6**	**309.4**	**321.0**	**316.1**	**323.3**	**308.3**	**313.3**	**303.3**	**313.3**	**303.3**	**313.3**
2.1. Operating costs	**369.3**	**258.1**	**269.7**	**264.8**	**272.0**	**257.0**	**262.0**	**252.0**	**262.0**	**252.0**	**262.0**
Staff salaries	51.9	51.9	51.9	51.9	51.9	51.9	51.9	51.9	51.9	51.9	51.9
Overhead/administrative	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8
Utilities	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8
Facility rent	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Materials	74.2	76.0	77.5	78.0	79.3	79.3	79.3	79.3	79.3	79.3	79.3
Training	24.5	15.6	28.8	22.8	32.8	22.8	32.8	22.8	32.8	22.8	32.8
Trainer fees and program administration	14.5	15.6	18.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8
Training of permanent staff	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0	0.0	10.0
Software	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Promotion & advertising	50.0	45.0	40.0	40.0	35.0	30.0	25.0	25.0	25.0	25.0	25.0
Events	7.7	8.6	10.6	11.2	12.1	12.1	12.1	12.1	12.1	12.1	12.1
Competitions	3.1	3.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Seminars and meet-ups	4.6	5.3	6.3	6.9	7.8	7.8	7.8	7.8	7.8	7.8	7.8
Maintenance	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1
Facility renovation	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.2. Non-operating costs	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Interest expense	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.3. Depreciation	**51.3**	**51.3**	**51.3**	**51.3**	**51.3**	**51.3**	**51.3**	**51.3**	**51.3**	**51.3**	**51.3**
3. NET INCOME (pre-tax) (1-2)	**122.1**	**-235.6**	**-197.0**	**-16.8**	**19.0**	**37.0**	**35.0**	**48.0**	**41.0**	**54.0**	**47.0**
4. Taxes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. NET INCOME (after tax) (3-4)	**122.1**	**-235.6**	**-197.0**	**-16.8**	**19.0**	**37.0**	**35.0**	**48.0**	**41.0**	**54.0**	**47.0**
6. Subsidies from GITA/MOESD	197.8	165.7	180.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7. Subsidies from local government	49.0	18.6	0.8	0.0	27.4	0.0	0.0	0.0	0.0	0.0	0.0
8. NET INCOME (after tax and subsidies) (7+6)	**368.8**	**-51.3**	**-15.9**	**-16.8**	**46.3**	**37.0**	**35.0**	**48.0**	**41.0**	**54.0**	**47.0**

TABLE A2: RIH CASH FLOW STATEMENT

	Years since start of operations										
thousand GEL	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11-20**
1. CASH FLOW FROM OPERATING ACTIVITIES (NET)	**-246.7**	**-184.3**	**-145.7**	**34.5**	**70.3**	**88.3**	**86.3**	**99.3**	**92.3**	**105.3**	**98.3**
Net income (before subsidies)	122.1	-235.6	-197.0	-16.8	19.0	37.0	35.0	48.0	41.0	54.0	47.0
Plus adjustments for non-cash items:	-368.8	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3
Depreciation	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3	51.3
Equipment & software donations from GITA	-420.1	0	0	0	0	0	0	0	0	0	0.0
2. CASH FLOW FROM INVESTING ACTIVITIES (NET)	**0.0**	**0.0**	**-35.4**	**0.0**	**-132.2**	**-35.4**	**0.0**	**0.0**	**-35.4**	**-132.2**	**0.0**
Inflows	**0.0**	**0.0**	**15.2**	**0.0**	**87.6**	**15.2**	**0.0**	**0.0**	**15.2**	**87.6**	**0.0**
Sale of property or equipment	0.0	0.0	15.2	0.0	87.6	15.2	0.0	0.0	15.2	87.6	0.0
Outflows	**0.0**	**0.0**	**50.6**	**0.0**	**219.7**	**50.6**	**0.0**	**0.0**	**50.6**	**219.7**	**0.0**
Furniture and equipment purchase	0.0	0.0	50.6	0.0	219.7	50.6	0.0	0.0	50.6	219.7	0.0
3. CASH FLOW FROM FINANCING ACTIVITIES (NET)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Inflows (ex. debt/loan issuance)	0	0	0	0	0	0	0	0	0	0	0
Stock issuance	0	0	0	0	0	0	0	0	0	0	0
Outflows	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt/loan repayment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. OVERALL CASH FLOW (NET, before subsidies)	**-246.7**	**-184.3**	**-181.1**	**34.5**	**-61.9**	**52.9**	**86.3**	**99.3**	**56.9**	**-26.9**	**98.3**
6. Cash subsidies from GITA/MOESD	197.8	165.7	180.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7. Cash subsidies from local government	49.0	18.6	0.8	0.0	27.4						
8. FINANCING GAP	**0.0**	**0.0**	**0.0**	**0.0**	**34.5**	**0.0**	**0.0**	**0.0**	**0.0**	**26.9**	**0.0**
9. Drawdown of cash reserves	0.0	0.0			34.5					26.9	
10. Debt/loan issuance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11. RESIDUAL FINANCING NEED	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

TABLE A3: RIH BALANCE SHEET

	Years since start of operations										
thousand GEL	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11-20**
ASSETS	**368.8**	**317.5**	**301.6**	**284.7**	**331.1**	**368.1**	**403.0**	**451.0**	**492.0**	**546.0**	**593.0**
Cash and current assets	0.0	0.0	0.0	34.5	0.0	52.9	139.2	238.5	295.4	268.6	366.9
Property, plant and equipment (net)	**368.8**	**317.5**	**301.6**	**250.2**	**331.1**	**315.2**	**263.8**	**212.5**	**196.6**	**277.4**	**226.1**
Equipment	420.1	420.1	455.5	455.5	587.7	623.1	623.1	623.1	658.5	790.6	790.6
Less: accumulated depreciation	51.3	102.6	154.0	205.3	256.6	307.9	359.2	410.6	461.9	513.2	564.5
LIABILITIES AND EQUITY	**368.8**	**317.5**	**301.6**	**284.7**	**331.1**	**368.1**	**403.0**	**451.0**	**492.0**	**546.0**	**593.0**
Current liabilities	0	0	0	0	0	0	0	0	0	0	0
Long-term liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Owner's equity	368.8	317.5	301.6	284.7	331.1	368.1	403.0	451.0	492.0	546.0	593.0
Retained earnings	368.8	317.5	301.6	284.8	331.1	368.1	403.1	451.0	492.0	546.0	593.0

Table 5.13. Representative Community Innovation Center (CIC) Financial Accounts

TABLE A4: CIC INCOME STATEMENT

	Years since start of operations										
thousand GEL	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11-20**
1. REVENUES	**70.4**	**9.2**	**16.1**	**40.9**	**42.1**	**43.3**	**44.5**	**45.7**	**46.9**	**48.1**	**49.3**
Membership/registration fees	2.3	3.6	5.1	6.2	7.4	8.6	9.8	11.0	12.2	13.4	14.6
Entrance fees	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Working space rental fees	0.0	0.0	0.0	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2
Services provided	1.4	4.1	9.0	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5
Trainings	1.4	4.1	9.0	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5
Equipment donations from GITA	28.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Contributions from local government	37.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other (e.g. advertising revenues)	1.0	1.5	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
2. COSTS	**104.4**	**49.9**	**49.4**	**44.9**	**44.4**	**42.0**	**44.0**	**42.0**	**44.0**	**42.0**	**44.0**
2.1. Operating costs	**100.7**	**46.2**	**45.7**	**41.2**	**40.7**	**38.7**	**40.7**	**38.7**	**40.7**	**38.7**	**40.7**
Staff salaries	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Overhead/administrative	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2
Utilities	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
Facility rent	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Materials	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Training programs	2.0	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0
Program administration	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Staff training	2.0	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0
Software	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Promotion & advertising	20.0	17.5	15.0	12.5	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Maintenance	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Facility renovation	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.2. Non-operating costs	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Interest expense	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.3. Depreciation	**3.6**	**3.6**	**3.6**	**3.6**	**3.6**	**3.3**	**3.3**	**3.3**	**3.3**	**3.3**	**3.3**
3. NET INCOME (pre-tax) (1-2)	**-33.9**	**-40.7**	**-33.3**	**-4.0**	**-2.3**	**1.2**	**0.4**	**3.6**	**2.8**	**6.0**	**5.2**
4. Taxes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. NET INCOME (after tax) (3-4)	**-33.9**	**-40.7**	**-33.3**	**-4.0**	**-2.3**	**1.2**	**0.4**	**3.6**	**2.8**	**6.0**	**5.2**
6. Subsidies from GITA/MOESD	24.0	9.5	11.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7. Subsidies from local government	34.6	27.6	25.5	0.4	2.0	2.8	0.0	0.0	0.0	0.0	0.0
8. NET INCOME (after tax and subsidies) (7+6)	**24.7**	**-3.6**	**3.7**	**-3.6**	**-0.3**	**4.0**	**0.4**	**3.6**	**2.8**	**6.0**	**5.2**

TABLE A5: CIC CASH FLOW STATEMENT

	Years since start of operations										
thousand GEL	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11-20**
1. CASH FLOW FROM OPERATING ACTIVITIES (NET)	**-58.6**	**-37.1**	**-29.6**	**-0.4**	**1.3**	**4.5**	**3.7**	**6.9**	**6.1**	**9.3**	**8.5**
Net income (before subsidies)	-33.9	-40.7	-33.3	-4.0	-2.3	1.2	0.4	3.6	2.8	6.0	5.2
Plus adjustments for non-cash items:	-24.7	3.6	3.6	3.6	3.6	3.3	3.3	3.3	3.3	3.3	3.3
Depreciation	3.6	3.6	3.6	3.6	3.6	3.3	3.3	3.3	3.3	3.3	3.3
Equipment donations from GITA	-28.3	0	0	0	0	0	0	0	0	0	0.0
2. CASH FLOW FROM INVESTING ACTIVITIES (NET)	**0.0**	**0.0**	**-7.3**	**0.0**	**-3.3**	**-7.3**	**0.0**	**0.0**	**-7.3**	**-3.3**	**0.0**
Inflows	**0.0**	**0.0**	**3.1**	**0.0**	**1.4**	**3.1**	**0.0**	**0.0**	**3.1**	**1.4**	**0.0**
Sale of property or equipment	0.0	0.0	3.1	0.0	1.4	3.1	0.0	0.0	3.1	1.4	0.0
Outflows	**0.0**	**0.0**	**10.5**	**0.0**	**4.8**	**10.5**	**0.0**	**0.0**	**10.5**	**4.8**	**0.0**
Furniture and equipment purchase	0.0	0.0	10.5	0.0	4.8	10.5	0.0	0.0	10.5	4.8	0.0
3. CASH FLOW FROM FINANCING ACTIVITIES (NET)	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Inflows (ex. debt/loan issuance)	0	0	0	0	0	0	0	0	0	0	0
Stock issuance	0	0	0	0	0	0	0	0	0	0	0
Outflows	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Debt/loan repayment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5. OVERALL CASH FLOW (NET, before subsidies)	**-58.6**	**-37.1**	**-37.0**	**-0.4**	**-2.0**	**-2.8**	**3.7**	**6.9**	**-1.2**	**6.0**	**8.5**
6. Cash subsidies from GITA/MOESD	24.0	9.5	11.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7. Cash subsidies from local government	34.6	27.6	25.5	0.4	2.0	2.8					
8. FINANCING GAP	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.2**	**0.0**	**0.0**
9. Drawdown of cash reserves						0.0			1.2		
10. Debt/loan issuance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11. RESIDUAL FINANCING NEED	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

TABLE A6: CIC BALANCE SHEET

	Years since start of operations										
thousand GEL	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11-20**
ASSETS	**24.7**	**21.1**	**24.8**	**21.1**	**20.8**	**24.8**	**25.3**	**28.9**	**31.7**	**37.8**	**43.0**
Cash and current assets	0.0	0.0	0.0	0.0	0.0	0.0	3.7	10.7	9.5	15.5	24.0
Property, plant and equipment (net)	**24.7**	**21.1**	**24.8**	**21.1**	**20.8**	**24.8**	**21.5**	**18.2**	**22.3**	**22.3**	**19.0**
Equipment	28.322	28.322	35.6524	35.6524	39.0	46.3	46.3	46.3	53.6	57.0	57.0
Less: accumulated depreciation	3.6	7.3	10.9	14.5	18.2	21.5	24.8	28.1	31.4	34.7	38.0
LIABILITIES AND EQUITY	**24.7**	**21.1**	**24.8**	**21.1**	**20.8**	**24.8**	**25.3**	**28.9**	**31.7**	**37.8**	**43.0**
Current liabilities	0	0	0	0	0	0	0	0	0	0	0
Long-term liabilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Owner's equity	24.7	21.1	24.8	21.1	20.8	24.8	25.3	28.9	31.7	37.8	43.0
Retained earnings/accumulated deficit	24.7	21.1	24.8	21.2	20.9	24.9	25.3	28.9	31.8	37.8	43.0

Annex 6: Implementation Support Plan

GEORGIA: National Innovation Ecosystem Project

Strategy and Approach for Implementation Support

1. The proposed Project is the first project in Georgia that lends to innovation activities, and the first project with ICT sector components in more than a decade of no lending activities in that sector. GITA is a newly established agency with no experience implementing World Bank projects, and limited but growing experience in implementing a number of small projects funded by different financiers, including the Government budget. Hence, Bank implementation support is essential to the successful implementation of the Project and to realize the transformational potential of various activities.

2. The strategy and approach for implementation of the Project stem from the risks associated with the implementation of the Project and mitigation measures as described herein. The Bank has been working closely with GITA to ready the Project for accelerated implementation upon effectiveness, with preparatory work and some pilots possibly financed through retroactive financing.

Implementation Support Plan

3. **Technical inputs**: Technical consultants will be financed by the Project to provide assistance on the design and implementation of various components, including the CIC and RIH setup, skills development and matching grants activities. In addition, Bank staff and consultants will provide strategic support and advice to the client to assist it in technical issues, and to provide international best practice information on-demand.

4. **Procurement**: The procurement related implementation support will include consultations on the procurement related issues and will be provided from the country office-based procurement officer. The Bank procurement officer will also provide capacity building and training workshops to the GITA team. A Bank-approved procurement consultant will be financed by the Project and work within GITA.

5. **Financial management**: As part of its Project implementation support missions, the Bank will conduct risk-based financial management implementation support and supervisions within a year from the Project effectiveness, and then at appropriate intervals. During Project implementation, the Bank will supervise the Project's financial management arrangements in the following ways: (a) review the Project's semi-annual IFRs as well as the Project's annual audited financial statements and auditor's management letters and remedial actions recommended in the auditor's management letters; and (b) during the Bank's on-site missions, review the following key areas: (a) Project accounting and internal control systems; (b) budgeting and financial planning arrangements; (c) disbursement management and financial flows, including counterpart funds, as applicable; and (d) any incidences of corrupt practices involving Project resources. As required, a Bank-accredited Financial Specialist will participate in the implementation support and supervision process.

6. **Environmental and social safeguards**: The Bank's environmental and social specialists will continue providing regular support to GITA in tackling safeguards related issues during the Project implementation.

7. **Operation**: The co-TTLs of the Project are in regular contact with GITA and implementation support missions are planned for at least once every six months to supervise the Project and coordinate with the client. Regular video-conferences with GITA and partners will help to provide timely guidance and support to the client.

Table 6.1. Implementation Support Plan

Time	Focus	Skills Needed	Resource Estimate
0–12 months	Technical support in strategic design of the various activities	TTLs, ICT specialists, innovation specialists	12 SWs
	Procurement review of bidding documents	Procurement specialist	4 SWs
	Project implementation support	TTLs, procurement specialist	4 SWs
	Financial management and disbursements	Financial management specialist	4 SWs
	Environmental and social supervision	Safeguards specialists	4 SWs
	Task management	TTLs	4 SWs
12–48 months	Procurement review of bidding documents	Procurement specialist	4 SWs
–	Project implementation support	TTLs	10 SWs
–	Financial management and disbursements	Financial management specialist	4 SWs
–	Environmental and social supervision	Safeguards specialists	4 SWs
Other	On-demand technical advisory support	ICT and innovation specialists	8 SWs

Table 6.2. Skills Mix Required

Skills Needed	Number of Staff Weeks 2015–2020	Number of Trips	Comments
Task team leaders	50	Field trips as required	2, HQ-based
Environmental specialist	10	Field trips as required	Country-office based
Social specialist	10	Field trips as required	HQ-based
Procurement specialist	30	Field trips as required	Country-office based
Financial management specialist	20	Field trips as required	Country-office based
ICT or innovation specialists	20	Field trips as required	HQ-based, on demand
Program Assistants	40	Field trips as required	Country-office based

Table 6.3. Partners

Name	Institution/Country	Role
Minister	Ministry of Economy & Sustainable Development	Head of the Project oversight and coordination
Deputy Minister	Ministry of Finance	Financial management and disbursement support
Deputy Minister	Ministry of Education & Science	Project implementation support,

		technical support on skills development
Chairman	Georgian National Communications Commission	Project implementation support, technical support on broadband connectivity