Document of
The World Bank

FOR OFFICIAL USE ONLY

Report No: PAD1554

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF US$20.1 MILLION

TO THE

REPUBLIC OF NICARAGUA

FOR A

CARIBBEAN REGIONAL COMMUNICATIONS INFRASTRUCTURE PROGRAM NICARAGUA

PROJECT

July 7, 2016

Transport and ICT Global Practice
Latin America and the Caribbean Region

CURRENCY EQUIVALENTS

(*Exchange Rate Effective June 28, 2016)*

Currency Unit = Nicaraguan Córdoba (NIO)

US$1 = NIO 28.61

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

ACS	Association of Caribbean States
BPO	Business Process Outsourcing
CARICOM	Caribbean Community and Common Market
CARCIP	Caribbean Regional Communications Infrastructure Program
CTU	Caribbean Telecommunications Union
EMF	Environmental Management Framework
ENATREL	National Electricity Transmission Company
ESMM	Environment and Social Management Manual
FDI	Foreign Direct Investment
FITEL	Investment Telecommunications Fund
IADB	Inter-American Development Bank
ICT	Information and Communications Technology
IDA	International Development Agency
IPPF	Indigenous Peoples Planning Framework
IT/ITES	Information Technology / Information Technology-Enabled Services
ITO	Information Technology Outsourcing
KPO	Knowledge Process Outsourcing
LAC	Latin America and the Caribbean
MOU	Memorandum of Understanding
PCU	Project Coordination Unit
PDO	Project Development Objective
PPP	Public Private Partnership
REDCA	Central American Telecommunications Network
RPF	Resettlement Policy Framework
SIECA	Secretariat for Central American Economic Integration
SIGFA	Governmental Integrated Financial Management System
SME	Small and Medium Enterprise
TELCOR	Nicaraguan Institute for Telecommunications and Postal Service

Regional Vice President:	Jorge Familiar
Country Director:	J. Humberto Lopez
Senior Global Practice Director:	Pierre Guislain
Practice Manager:	Boutheina Guermazi
Task Team Leader:	Doyle Gallegos/ Elena Gasol Ramos

NICARAGUA
Caribbean Regional Communications Infrastructure Program– Nicaragua Project (P155235)

TABLE OF CONTENTS

Page

PAD DATA SHEET

Nicaragua

Caribbean Regional Communications Infrastructure Program -Nicaragua Project (P155235)

PROJECT APPRAISAL DOCUMENT

LATIN AMERICA AND CARIBBEAN

Transport and ICT Global Practice

Report No.: PAD1554

Basic Information			
Project ID P155235	EA Category B - Partial Assessment		Team Leader(s) Doyle Gallegos, Elena Gasol Ramos
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [X]		
Project Implementation Start Date 1-Sep-2015	Project Implementation End Date 31-Jul-2022		
Expected Effectiveness Date 28-Oct-2016	Expected Closing Date 31-Jul-2022		
Joint IFC No			
Practice Manager/Manager Boutheina Guermazi	Senior Global Practice Director Pierre Guislain	Country Director J. Humberto Lopez	Regional Vice President Jorge Familiar

Borrower: Ministerio de Hacienda y Credito Publico			
Responsible Agency: TELCOR			
Contact:	Orlando José Castillo	Title:	Executive President
Telephone No.:	50522227350	Email:	ocastillo@telcor.gob.ni

Project Financing Data(in USD Million)					
[ ] Loan	[ ] IDA Grant	[ ] Guarantee			
[X] Credit	[ ] Grant	[ ] Other			
Total Project Cost:	22.7		Total Bank Financing:	20.1	
Financing Gap:	0.00				

Financing Source	Amount
BORROWER/RECIPIENT	2.6
International Development Association (IDA)	20.1
Total	22.7

Expected Disbursements (in USD Million)

Fiscal Year	2017	2018	2019	2020	2021	2022
Annual	2.00	3.00	4.25	5.25	4.00	1.60
Cumulative	2.00	5.00	9.25	14.50	18.50	20.10

Institutional Data

Practice Area (Lead)

Transport & ICT

Contributing Practice Areas

N/A

Cross Cutting Topics

[X] Climate Change
[ ] Fragile, Conflict & Violence
[X] Gender
[X] Jobs
[X] 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	Information technology	70	0	0
Information and communications	Telecommunications	30	100	0
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	%
Trade and integration	Regional integration	50
Trade and integration	Technology diffusion	50

Total	100

Proposed Development Objective(s)

Increase access to regional broadband networks and advance the development of an IT/ITES industry in Nicaragua and in the Caribbean region.

Components

Component Name	Cost (USD Millions)
Component 1: Regional Connectivity Infrastructure	8.00
Component 2: ICT-Enabled Innovation	12.10
Component 3: Project Implementation Support	2.60

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	Moderate
8. Stakeholders	Substantial
OVERALL	Moderate

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
ProNicaragua MOU (Schedule 2; Section I, A.2)		28-Apr-2017	No later than 6 months after effectiveness

Description of Covenant

For the purposes of carrying out Part 2.A. of the Project, the Recipient shall cause TELCOR to enter into a memorandum of understanding with ProNicaragua ("ProNicaragua MOU") no later than six (6) months after the Effectiveness Date, on terms and conditions acceptable to the Association, and further detailed in the Operational Manual.

Name	Recurrent	Due Date	Frequency
CTU MOU (Schedule 2; Section I, A.3)	**X**		CONTINOUS

Description of Covenant

For purposes of carrying out the Project, the Recipient shall cause TELCOR to comply with the provisions of the CTU MOU on terms and conditions acceptable to the Association.

Conditions

Source Of Fund	Name	Type
IDA	Subsidiary Agreement	Effectiveness

Description of Condition

The Subsidiary Agreement has been executed on behalf of the Recipient and TELCOR.

Source Of Fund	Name	Type
IDA	Retroactive Financing	Disbursement

Description of Condition

No withdrawal shall be made for payments made prior to the date of the Financing Agreement, except that withdrawals up to an aggregate amount not to exceed $200,000 may be made for payments made within one year prior to that date, for Eligible Expenditures under Category (4)

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit

Doyle Gallegos	Team Leader (ADM Responsible)	Lead ICT Policy Specialist	Telecommunications Specialist	GTI11
Elena Gasol Ramos	Team Leader	Senior ICT Policy Specialist	ICT Policy Specialist	GTI09
Carlos Federico Lago	Procurement Specialist (ADM Responsible)	Senior Procurement Specialist	Procurement Specialist	GGO04
Enrique Antonio Roman	Financial Management Specialist	Financial Management Specialist	Financial Management Specialist	GGO22
Andrea Ruiz-Esparza	Team Member	Senior Program Assistant	Operations Specialist	GTI09
Claudia Ivette Garcia Romero	Team Member	Consultant	IT/ITES Industry Lead Specialist	GTI09
Tatiana Cristina O. de Abreu Souza	Team Member	Finance Officer	Disbursements Specialist	WFALN
Elene Allende Letona	Team Member	Consultant	Open Innovation Specialist	GTI09
Jose Antonio Galaso Cerezo	Team Member	Consultant	Open Innovation Specialist	GTI11
Marco Antonio Zambrano Chavez	Safeguards Specialist	Consultant	Environmental Specialist	GEN04
Ricardo Jose Castellon Zamora	Safeguards Specialist	Consultant	Social Specialist	GSU10
Rocio Sanchez Vigueras	Team Member	Consultant	ICT Policy Specialist	GTI09
Sofia De Abreu Ferreira	Counsel	Counsel	Legal	LEGEN

Extended Team

Name	Title	Office Phone	Location

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
Nicaragua	Rio San Juan	Departamento de Rio San Juan	X		Area where the connectivity infrastructure will be deployed
Nicaragua	Managua	Departamento de Managua	X		A co-working space is planned to be created in Managua

Nicaragua	Costa Caribe Norte	North Caribbean Coast Autonomous Region (RACCN)	**X**		Area where the connectivity infrastructure will be deployed
Nicaragua	Costa Caribe Sur	South Caribbean Coast Autonomous Region (RACCS)	**X**		Area where the connectivity infrastructure will be deployed
Consultants Required? Consultants will be required					

I. STRATEGIC CONTEXT

A. Country Context

1. **Poverty reduction has accelerated in Nicaragua in the last six years in both urban and rural areas, although challenges remain.** Between 2009 and 2014 there was a significant reduction in poverty of nearly 13 percentage points, with the national poverty rate standing at 29.6 percent, while extreme poverty[1] fell from 14.6 percent to 8.3 percent.[2] However, urban-rural disparities remain stark, with urban poverty at 2.4 percent compared to rural poverty at 16.3 percent. Challenges remain in terms of reducing poverty given that most of the poor live in rural areas, and many in remote communities where access to basic services is still constrained by very limited infrastructure. Moreover, social and basic service indicators in the rural Atlantic coast region are significantly lower than in the rest of the country, disproportionately impacting indigenous and Afro-descendant populations.

2. **Sound macroeconomic policies have allowed for moderate and steady economic growth, but increasing productivity is critical to accelerate growth and further reduce poverty and boost shared prosperity.** Nicaragua has maintained disciplined macroeconomic management resulting in both good economic performance, with growth averaging 4.8 percent since 2010, and Foreign Direct Investment (FDI) expansion. Nonetheless, although FDI levels have improved since 2010, they are still below the Latin America and the Caribbean (LAC) average, US$ 7,250,000,000. Given Nicaragua's low levels of per capita income, higher growth rates are necessary to further reduce poverty and boost shared prosperity. A key challenge constraining the ability of the country to move to a higher growth equilibrium is aggregate productivity, which has been declining over the last ten years.

3. **Small size, export-driven growth and susceptibility to natural hazards are common challenges for Nicaragua and other Caribbean and Central American countries.** The gross national income per capita of Caribbean and Central American countries is lower than the LAC average. Poverty reduction is largely constrained by their small size, which limits their competitiveness, and by their susceptibility to natural hazards. These countries have been traditionally characterized by weak capacity in both public and the private reducing their integration into world markets. The consequent limited access to external capital and know-how have profoundly affected their economies and contributed to slower growth and poverty reduction. With a growth model that relies on the export of commodities, these countries remain vulnerable to external shocks. Furthermore, countries in the Caribbean and Central America are vulnerable to the impacts of climate change and natural disasters, such as hurricanes, cyclones, droughts, earthquakes, and volcanic eruptions that typically affect an entire population and economy.

4. **Given these challenges, some of these countries, including Nicaragua, are seeking to foster poverty reduction and sustainable growth through greater regional integration.** To promote trade, investment and regional integration in the Caribbean and Central America, a number of organizations were formed, including the Association of Caribbean States (ACS),[3] the

[1] Based on national poverty lines in 2014 (extreme poverty line US$396, overall poverty line US$640).
[2] Living Standards Measurement Study, 2014.
[3] ACS brings together the Caribbean and Central American sub-regions, Mexico, Venezuela and Colombia, to strengthen regional co-operation, integration, and promote sustainable development.

Caribbean Community and Common Market (CARICOM),[4] and the Secretariat for Central American Economic Integration (SIECA).[5] In 2007, CARICOM and SIECA signed a Plan of Action, outlining a number of priority areas for cooperation, including development of skilled labor and greater usage of information and communications technologies (ICT).[6] These agreements have helped to increase Nicaragua's trade with CARICOM countries from US$12.08 million in 2011 to US$17.5 million in 2013. In 2014, the ACS identified the development of trans-border technologies as key for increasing competitiveness in the sub-region.[7] To this end, it set objectives of developing and promoting the Information Technology/Information Technology-Enabled Services (IT/ITES) industry,[8] and increasing productivity, growth and innovation in productive sectors through ICTs.

5. **Nicaragua's National Human Development Plan 2012-2016 seeks to expand social programs and promote inclusive growth by enhancing competitiveness.** The Plan highlights science, technology, innovation, entrepreneurship and regional economic integration as key elements to catalyze a productive transformation of the country, with an emphasis on increasing economic growth through employment. In particular, it underlines the need to develop and integrate the Caribbean coast better with the rest of the country, including through expansion of basic infrastructure (transport, telecommunications, and electricity). The Plan also includes regional economic integration as one of its key priorities, and advocates for greater participation of Nicaragua in the CARICOM as an observer, and in all ACS activities to enable ACS countries to compete more effectively in the international market.

B. Sectoral and Institutional Context

6. **Challenges to the creation of a strong regional IT/ITES industry include lack of skilled labor and under-developed infrastructure and policies.** The United Nations E-government Index measures availability and use of online services, broadband connectivity, skilled labor and human capital, among other things. Most of the Caribbean and Central American countries rank low on this Index, averaging 0.43, far below developed countries such as the Republic of Korea (0.94) or the United States (0.87).[9] In particular, lack of skilled labor is a key bottleneck. Moreover, the sub-region, including Nicaragua, lag behind not only in broadband infrastructure, but also in demand-side policies stimulating a productive use of broadband and ICT services.

7. **To try to address these common ICT sector challenges, the World Bank approved the Caribbean Regional Communications Infrastructure Program (CARCIP) in 2012.** The Program seeks to address common challenges, including limited broadband connectivity, particularly in marginalized areas, high broadband prices, immature digital economy, low digital literacy, and shortage of skilled labor. It also recognizes that the sub-region has great potential to

[4] CARICOM was established in 1973 to promote different areas of cooperation and establish a free trade agreement.
[5] SIECA was created in 1991 and is the regional body responsible for facilitating the economic integration of the member countries of the Central American Integration System.
[6] http://www.caricom.org/jsp/secretariat/legal_instruments/caricom_sica_poa.pdf
[7] Source : http://www.acs-aec.org/sites/default/files/espanol_ebook_aec_20_baja.pdf
[8] The ICT services industry, known as IT/ITES, includes: (i) IT services such as application services (application development and maintenance, system integration, infrastructure services, and consulting) and engineering services (such as software product development including gaming); and (ii) ITES such as business process outsourcing (BPO) services, including customer support through call centers; information technology outsourcing (ITO) such as programming; or knowledge process outsourcing (KPO) such as digital animation.
[9] United Nations E-government Survey 2014: unpan3.un.org

collectively overcome these common challenges and increase the attractiveness for investment in the IT/ITES sector by increasing the overall size of the market. As such, CARCIP serves as an umbrella for a Series of Projects in participating countries with the objective of building strong regional broadband networks and developing a regional IT/ITES industry. To date, Saint Vincent and the Grenadines, Saint Lucia, and Grenada have joined the Program, financed by IDA, CARCIP First Phase Project (P114963).

8. **Twenty-five years after the telecommunications reform in Nicaragua, the sector faces new challenges that need to be addressed**. During the 1990s, the sector was liberalized, privatizing the incumbent and creating TELCOR (the Nicaraguan Institute for Telecommunications and Postal Service) to promote competition in the sector. Currently, there is limited competition in the sector, resulting in low coverage and relatively high prices, especially for broadband in low-income areas. In fact, Nicaragua has very low penetration compared to the LAC average, with fixed broadband subscriptions at 2.5 per 100 subscribers in Nicaragua compared to 9.7 per 100 subscribers on average in LAC. Moreover, a critical barrier to effectively utilizing ICT to promote economic growth in Nicaragua is ICT affordability.[10] High prices for fixed broadband are due to high concentration of the market, with a focus of services in Managua and larger locations, and low penetration in rural areas due to lack of supply.[11]

9. **TELCOR is already implementing an infrastructure telecom project in the Pacific and Central regions of Nicaragua, which includes regulatory reforms.** To support the implementation of the National Broadband Plan, the Inter-American Development Bank (IADB) and the Korean Exim Bank are providing US$50 million to Nicaragua. The IADB project aims to increase broadband penetration in the Pacific and Central regions of Nicaragua through the expansion of long distance fiber optic network to many locations in these regions. The IADB project also seeks to improve the legal and regulatory framework to increase competition in the sector as well as reduce interconnection fees by the use of "peering[12]" in Managua Internet Network Access Point. The proposed CARCIP Nicaragua Project is being closely coordinated with the IADB-financed project.

10. **Given Nicaragua's immature digital economy, lack of skilled labor, and business environment that is not yet able to foster innovation, CARCIP can help the country develop its IT/ITES industry.** In addition to the challenges in the telecommunications sector, the private sector reports limited skills among ICT specialists, and universities in Nicaragua have not been able to respond to the needs of a constantly evolving industry. Seven of the ten main universities in the country offer IT studies, with only 6,093 students or around 7 percent of total enrollment. Moreover, there is a big gender gap given that women represent only 36 percent of students enrolled in IT university programs. A third barrier is the country's under-developed business and innovation environment, as evidenced by Nicaragua's ranking on the Global Innovation Sub-Index of 130 out of 141 countries. This low rank highlights the country's weaknesses in human resources, research, and knowledge and technology outputs. As with other Caribbean countries, availability of the latest technologies is low in Nicaragua, and although labor may be low-cost compared to other countries, it is not adequately skilled for the IT/ITES

[10] Nicaragua ranks 134 out of 143 economies on Affordability (Networked Readiness Index, 2015).
[11] National Broadband Plan for Nicaragua 2014.
[12] Peering in telecommunications means the exchange of routing announcements between two Internet Service Providers for the purpose of ensuring that traffic from the first can reach customers of the second, and vice-versa. Telecommunications Regulation Handbook, infoDev.

industry. Finally, Nicaragua's digital economy is immature resulting in a low economic impact of ICTs on new services and products.[13]

11. **Moreover, rapid job creation is a key Government priority, particularly in the Caribbean coast, which can be supported by the IT/ITES industry.** Nicaragua's IT/ITES industry is growing, and exports grew from US$84 million in 2014 to US$98[14] million in 2015, largely generated by Business Processing Outsourcing (BPO). Thus the IT/ITES industry can be a key driver for growth and job creation. In 2014, the IT/ITES industry created 6,300 jobs, (95 percent BPO, 5 percent, Information Technology Outsourcing (ITO) and Knowledge Processing Outsourcing (KPO)),[15] around 0.19 percent of the workforce, albeit few compared to the 10 million jobs generated by the sector in India, around 2.5 percent of the workforce.

12. However, Nicaragua by itself cannot become a global provider of IT/ITES services, and global positioning requires working regionally. As is the case of other ACS countries, Nicaragua seeks to be identified as an IT/ITES services export player. However, local software providers are scarce (only 65 providers according to the Ministry of Development, Industry, and Trade), small in size (the largest has only 40 employees), and are concentrated in Managua. Given the small size of ACS countries and Nicaragua, building a solid base of skilled labor at the regional level is critical for the sub-region to attract investment. Although the CARCIP First Phase Project included a skills development component, the participating countries have not been able to train as many people as originally planned due to lack of training providers and the high cost of the available training. A regional approach is thus needed to bundle demand, as has been acknowledged by the Caribbean Telecommunications Union (CTU) in the Memorandum of Understanding (MOU) signed with TELCOR on March 15th, 2016, underlining the need to establish mechanisms that can help CARCIP countries access training and certifications relevant for the IT/ITES industry. Higher Level Objectives to which the Project Contributes.

C. Higher Level Objectives to which the Project Contributes

13. **The CARCIP Nicaragua Project contributes to strengthening the resilience of CARCIP countries to disaster risk and adaptation to climate change, a priority area for the ACS.** The multi-hazard average annual losses in Nicaragua account for almost US$36 million.[16] A study analyzing historical climate data found that there is a strong warming trend across the country, manifested through diurnal temperature increases (~0.40 °C per decade) in deforested areas. These rates are more than 50 percent higher than average temperature change rates in tropical areas. Rising temperatures and more frequent droughts and floods will present a major challenge for the country's production systems by 2030.[17] The lack of emergency communications networks or redundancy in ICT infrastructure,[18] at both regional and national levels, leaves the Caribbean countries and Nicaragua exposed to potential major disruptions in communications. This makes the region particularly vulnerable in the face of recurrent natural disasters, such as earthquakes, high winds, and flooding. Expansion of regional and national

[13] Nicaragua ranks 126 out of 143 economies for this particular dimension on the Networked Readiness Index (2014).
[14] Preliminary Data, Outsourcing Survey 2016, ProNicaragua
[15] "Strategic Plan for the Development of the IT/ITES Industry in Nicaragua", *Prospecta Estrategia*, September 2015, prepared for the World Bank.
[16] United Nations Office for Disaster Risk Reduction, Global Assessment Report on Disaster Risk Reduction 2015.
[17] World Bank Climate Change Knowledge Portal.
[18] "Redundant" describes network system components that are installed to back up primary resources in case they fail.

backbone networks as well as redundancy through the CARCIP Nicaragua Project has benefits not only for the country in which the investments take place, but also for neighboring countries which can then use this infrastructure to access alternative submarine cables, thereby increasing competition, lowering prices and improving resilience. Having additional points in the network ensures that it is easier to reroute information traffic or use alternative routes in the event of a network failure, for instance, due to a natural disaster. According to the International Telecommunications Union, ICTs can play an important role in facilitating climate change adaptation, given that ICTs not only help improve weather forecasting and climate monitoring, but are also essential in disseminating information to large audiences, for example, via mobile phones.[19] Component 1 will finance the development of broadband infrastructure, which will enable ICT-based services to minimize multi-hazard annual losses, as described.

14. **Furthermore, it is aligned with the World Bank's Country Partnership Strategy FY13-FY17 for Nicaragua[20] and contributes to the World Bank's Twin Goals.** The objectives of the CARCIP Nicaragua Project are fully aligned with the Country Partnership Strategy, particularly with the second pillar: "Increase Competitiveness and Productivity". Improving access, quality and use of telecommunications and ICT services, especially in one of the poorest areas of the country, will enhance the socio-economic development of Nicaragua, while the development of skilled labor will both help the country to compete globally and generate jobs for more people. Finally, the Project contributes to Nicaragua's objective of fostering the country's integration with the wider region through greater telecommunications and broadband connectivity, enabling it to improve trade and information networks with other countries.

15. **The CARCIP Nicaragua Project also operationalizes the 2016 World Development Report "Digital Dividends".** The World Development Report 2016 focuses on the critical role of internet in promoting development, with an emphasis on three dimensions: (i) ensuring the internet is universal, affordable, open and safe; (ii) strengthening the foundations of digital economy, including related policies and skills; and (iii) improving global cooperation to address trans-boundary problems. The Project addresses these three areas by: (i) increasing broadband connectivity to underserved areas and promoting competition in the sector, thus increasing affordability; (ii) implementing policies and programs to improve the necessary skills; and (iii) promoting regional and global cooperation through the inclusion of Nicaragua in an already existing Regional program.

II. PROJECT DEVELOPMENT OBJECTIVES (PDO)

A. PDO

16. **The objective of the Project is to increase access to regional broadband networks and advance the development of an IT/ITES industry in Nicaragua and the Caribbean region.** The development objective is fully consistent with the overall program objective, supported by the Series of Projects (currently including the CARCIP First Phase Project, P114963, and the

[19] www.wri.org/our-work/project/world-resources-report/icts-key-technology-help-countries-adapt-effects-climate

[20] World Bank Group's Country Partnership Strategy for Nicaragua FY2013-2017 (Report No. 69231-NI), discussed by the Board of Executive Directors on October 3, 2012.

proposed CARCIP Nicaragua Project) to increase access to regional broadband networks and advance the development of an ICT-enabled services industry in the Caribbean region.

B. Project Beneficiaries

17. **The primary target groups of the proposed Project are the actual and potential ICT services consumers (government, residential, and business).** ICT consumers are expected to enjoy greater access to better quality and lower priced ICT services, while better IT/ITES skills of students, faculty, and industry professionals should help Nicaragua and other CARCIP countries position themselves as global players. The Project will focus in the Caribbean Coast of Nicaragua, an area with one of the highest poverty rates in Nicaragua, Project intervention areas will be selected based on criteria such as poverty level, internet penetration and population size. Direct project beneficiaries total 110,000, of which at least 40 percent are women, and will benefit 62,000 people under extreme poverty[21].

C. PDO-Level Results Indicators

18. **Achievement of the objectives will be measured by the following outcome indicators (which fully aligned with those of the CARCIP First Phase Project):**

(i) Broadband penetration on the Caribbean coast (Percentage);
(ii) IT companies' satisfaction with the IT/ITES skills training and certification program (Percentage of good and better responses);
(iii) Trainees certified under the skills and training program (Percentage); and
(iv) Services or applications created as a result of the ICT Innovation Ecosystem activities (Number).

III. PROJECT DESCRIPTION

A. Project Components

19. **The CARCIP Nicaragua Project is structured in line with the CARCIP, First Phase Project taking into consideration the country's specific needs, while prioritizing regional actions**. Additional components and/or scale-up of activities may be added in the future, based on progress and the Government's request. The Project will finance the following three Components:

20. **Component 1: Regional Connectivity Infrastructure (US$8.0 million, of which US$2.0 million is national IDA, US$4.0 million regional IDA, and US$2.0 million provided by the Borrower). The objective of this Component is to fill key gaps in broadband connectivity on the Caribbean coast of Nicaragua, so as to contribute to improved regional telecommunications linkages.** This Component will support bridging priority gaps in the regional broadband communications infrastructure, which will be deployed in Nicaragua's Caribbean coast, an area with one of the lowest Internet penetration rates and one of the highest poverty rates in LAC. It will provide connectivity for at least 44 locations, including schools and health centers, several universities, and public entities and cooperatives. The new infrastructure

[21] Estimation made from the latest Census of Nicaragua, 2005, and The World Bank Data.

will benefit about 110,000 people on the Caribbean coast, increasing the broadband penetration in the area by 14 percent, with regional spillovers in the Caribbean region by strengthening the regional broadband network. This Component will finance three types of infrastructure: (i) fiber optic cable links to connect locations to the nearest network point; (ii) local wired networks to connect houses and businesses, including fiber optic connectivity to strategic IT/ITES based enterprises; and (iii) wireless networks for the smaller locations where fiber lines are too expensive, consisting of cellular towers with 4G equipment and microwave links or short fiber lines to the nearest network point. Specifically, the Project will finance two fiber optic lines to connect 12 larger locations and an estimated 32 wireless sites for smaller locations. These investments will also connect some public entities and cooperatives to broadband Internet in the communities served. This support includes critical equipment for operations of IT/ITES based enterprises, such as structured wiring and redundant energy sources.

21. **The new fiber lines and interconnection points financed by the Project will make the regional broadband infrastructure network stronger and more resilient.** Having more points in the network allows for rapid rerouting of traffic when there is a technical failure in a particular location. This is especially important in areas as vulnerable to natural disasters as the Caribbean region. The added resilience will have a strong positive spillover effect in neighboring countries by ensuring robustness of the overall broadband network through much needed redundancy.[22]

22. **Financing the connectivity infrastructure will be based on a competitive "least cost" subsidy under a Public Private Partnership (PPP) model.[23]** In order to facilitate competition, the bidding specifications will only describe the services required, and operators will choose the technology that they believe will best meet service specifications in specific localities. The winning operator will be required to provide training on basic ICT literacy skills, free of charge to the population in Project intervention areas for a reasonable period of time.

23. **Component 2: ICT-Enabled Innovation (US$12.1 million, of which US$5.8 million is national IDA, US$6.3 million regional IDA). The objective of this Component is to boost human capacity and business development under a regionally harmonized framework and approach, so as to generate employment and position the region and Nicaragua in particular, as a destination of choice for IT/ITES businesses.** This Component finances three subcomponents aimed at: (i) enhancing the enabling environment for fostering a productive use of the broadband infrastructure, including the IT/ITES industry; (ii) creating an IT/ITES skills development and certification program; and (iii) fostering an ICT innovation ecosystem.

24. ***Subcomponent 2A: Enabling Environment Program*** **(US$1.5 million, of which US$0.5 million is national IDA, and US$1.0 million regional IDA). This subcomponent seeks to establish a harmonized framework at the regional level that ensures and promotes the productive use of the broadband infrastructure.** To do so, policy, regulatory, institutional and advisory support will be provided to main stakeholders in the country, such as TELCOR or ProNicaragua, to foster the productive use of the connectivity infrastructure. The subcomponent will finance the provision of technical assistance and capacity building, such as (i) participation of Nicaraguan organizations in regional efforts for IT/ITES industry promotion and FDI

[22] Additional network paths ensures minimal downtime and continuity of services if primary path is unavailable.
[23] Build, Own and Operate.

attraction, with ProNicaragua as a beneficiary and in coordination with CTU, including carrying out an analysis of the IT/ITES niches of Nicaragua and the Caribbean region; (ii) regional learning and knowledge exchange with IT/ITES leaders, to learn from the different successful models implemented to boost the industry; (iii) operate the IT/ITES skills and certification program in consultation with the industry, other agencies, and with other countries in the Caribbean region. This will include support to design additional options to link trainees to future employment, and a Project mid-term analysis to ensure implementation of all activities and the Project objectives are on track; and (iv) carrying out an analysis of different business models for carrying IT/ITES certification, so as to continue bundling the demand for certified courses for CARCIP members, beyond the life of the Project, and which could take the form of a specific model for the Caribbean.

25. ***Subcomponent 2B: IT/ITES Skills Development and Certification Program*** **(US$9.4 million, of which US$4.7 million is national IDA, US$4.7 million regional IDA). This subcomponent will help the IT/ITES industry from Nicaragua and the Caribbean region to compete globally by increasing the quantity, and improving the quality of skilled manpower.** This subcomponent will finance, the strengthening of IT/ITES skills though the provision of training aiming to increase the number of internationally recognized certified manpower, for areas with significant market potential, and in line with the industry's needs and requirements.

26. **Subcomponent 2B will establish and implement a program to support critical IT/ITES skills development in both Nicaragua and the wider Caribbean region.** The skills development program will aggregate demand for training from companies and individuals to ensure lower training and certification program costs, and thus increase the availability of high quality training. This program is intended to create middle income IT/ITES jobs in the long term, including those that require a medium level of education (i.e. Micro Task, Online Freelance, and Animation), and more complex profile jobs in Information Technology and Knowledge Processes. Skills development and certification will include four sets of competencies: (i) technical; (ii) soft skills, such as communication, negotiation, and innovation; (iii) English skills; and (iv) freelancing and online talent platform use.

27. **Training will be offered with a combination of financing modalities depending on the set of competencies required**. Two modalities of support will be employed during the implementation of the skills program:

(i) a reimbursement financing modality, which will reimburse the beneficiary a share of the cost of the course, in an institute or provider pre-selected by the Project Coordination Unit (PCU), and/or certification, upon achieving the internationally recognized certification, and having been registered as a potential beneficiary; and

(ii) a training financing modality, which will finance a share of the cost of the training. Additionally, in cases where certification is considered extremely valuable, incentives based on the actual number or percentage of certified trainees will be added.

28. **The estimated number of beneficiaries under this subcomponent is more than 5,500 people (of which 70 percent are expected to obtain an internationally recognized certification), and the expected number of training courses is more than 200.** Trainees may include current IT/ITES employees who want to upgrade their skills, students, professors, or potential candidates to join the IT/ITES industry. The number of internationally recognized

certified manpower is the way the IT/ITES industry globally, measures the quality of the manpower. Special emphasis will be placed on making training and certification accessible to women to ensure that by the Project's end, women comprise 40 percent of the training beneficiaries.

29. **The subcomponent will also develop regionally relevant online courseware aimed at boosting skills related to online outsourcing,[24] freelancing and innovation.** Development of original, regionally sensitive content in this area is important in the absence of a globally recognized certification scheme and given the identified potential to market the region as an outsourcing destination. This courseware will be available for free and online to all CARCIP countries.

30. **Nicaragua will establish mechanisms to enable access to training and certification for the three other CARCIP countries (Grenada, Saint Lucia, and Saint Vincent and the Grenadines), maximizing regional access and participation.** Nicaragua will take the lead in coordinating with the existing CARCIP communications specialists in the CTU to ensure proper dissemination of courses to all CARCIP countries.

31. **A self-sustaining, regional model for aggregating the IT/ITES skills demand and brokerage of IT/ITES skills training and certification for the Caribbean region is expected to be developed.** The design of this model, as well as the different processes needed for its implementation will be carried out under subcomponent 2A. The objective of the new regional model would be to facilitate access to training and certification services for Nicaragua, all Caribbean countries and new potential entrants to the program from Central America. To this end, under subcomponent 2A, a study determining the design, the form of the model, and the different steps needed to establish it, will be carried out. Moreover, key stakeholders for the successful implementation of this model will participate in knowledge exchange activities to countries with this type of structure, financed under subcomponent 2A.

32. **Activities under this subcomponent require a start-up period of about one year to set up and test the new facilities, systems, procedures, and processe**s. For this reason, the project implementation period is estimated to be six years. As the activities under this subcomponent, as well as under subcomponent 2C are new in the country, the Project will benefit from a start-up period where the best mechanism for implementing the different activities could be tested.

33. ***Subcomponent 2C: ICT Innovation Ecosystem[25]*** **(US$1.2 million, of which US$0.6 million is national IDA, US$0.6 million regional IDA). This subcomponent will support the overall CARCIP strategy to increase the region's potential for innovation.** The Caribbean region lacks a competitive and vibrant environment for technology innovation. There is limited capacity for and scale of research and development (both physical and human), entrepreneurship

[24] Online outsourcing is a new approach for contracting work, as compared to the traditional onshoring, nearshoring or offshoring. It encompasses two major sub segments that have significant overlaps: i) Microwork, where projects and tasks are broken down into microtasks that can be completed in seconds or minutes and microworkers require basic numeracy and literacy skills; and ii) Online freelancing, where clients contract professional services to distributed third party workers and requires a higher level of expertise than microwork.

[25]"Innovation ecosystem" refers to a set of relationships between actors whose goal is to enable technology development and innovation. The ecosystem brings together material resources (funds, equipment, facilities, etc.) and human capital (entrepreneurs, students, faculty, researchers, investors, government officials and staff, etc.).

is low, and national markets are generally too small to attract significant investment and establish sustainable ICT-based value chains.

34. **The subcomponent will finance the design and implementation of an industry-university collaboration platform for regional innovation.** This "platform" will consist of physical facilities and human resources that will link young talent to the private sector and universities. The specific activities to be financed are: (i) small works contracts to rehabilitate two sets of office facilities, one in Managua[26] and the other in Bluefields[27] (which will be provided by universities), including supplying them with telecommunications links; (ii) small goods contracts to equip these facilities with furniture, computers, and other equipment; (iii) consultancy contracts for training and technical assistance, including facilitators for these centers and other skills for users; and (iv) contracts with specialized providers to adapt and operate successful models from other countries of open innovation systems. The platform will focus on creating innovative solutions that could become services or applications, in traditional regional industries, such as fisheries or tourism, through the use of ICT. This aims to ensure that the innovations developed have significant potential for uptake, productivity enhancement, and impact throughout the region. The two host universities will organize and match teams of students with real private sector challenges. TELCOR has begun reaching out to industry members that have expressed interest in participating. Once established, the platform is expected to invite universities and industries from across the region to collaborate, by having specific calls for proposals involving students from other CARCIP countries, as well as from Nicaragua. The design of the platform will allow it to become self-sustainable by becoming an ongoing university program, while at the same time collecting small fees from the industry players that want to submit problems for students' resolution.

35. **To broaden the scope of the intervention beyond university students participating in the platform, this subcomponent will also finance activities for the promotion of communities of entrepreneurs, including the creation of two open collaboration spaces.** These would aim to stimulate communities of entrepreneurs through a series of open innovation events, such as hackathons and community building activities. For these, the subcomponent will finance: (i) repurposing of existing physical spaces into open collaboration spaces for connecting key stakeholders, which include among others, entrepreneurs or traditional industries' associations; (ii) consultancy contracts for training and technical assistance, including facilitators for these centers and other skills for users; and (iii) consultant contracts for specialized open innovation events. Entrepreneur communities from different CARCIP countries will be involved in the process, including through joint events.

36. **Component 3: Project Implementation Support (US$2.6 million, of which US$0.7 million is national IDA, US$1.3 million is Regional IDA, and US$0.6 million provided by the borrower). The objective of this Component is to provide resources for Project implementation through a PCU.** This Component will finance support to the PCU for (a) the implementation, monitoring and evaluation of the Project's activities, including for: (i) the carrying out of Project audits; (ii) the design and implementation of strategies and other dissemination tools to inform Project stakeholders on the progress achieved during Project implementation; and (iii) the carrying out of impact evaluation surveys to evaluate the Project's

[26] TELCOR has begun conversations with the American University in Managua to host these activities.
[27] TELCOR has begun conversations with the Bluefields Indian Caribbean University to host these activities.

impacts; and (b) the carrying out of capacity building[28] activities for the benefit of relevant policy and regulatory institutions, and in particular, Nicaragua's participation in quarterly CARCIP Steering Committee Meetings, and up to twelve regional training sessions for the harmonization of ICT policies among CARCIP countries.

B. Project Financing

Table 1. Project Cost and Financing (in US$million equivalent)

Component Name	National IDA	Regional IDA	Total IDA	Borrower	Total
1. Regional Connectivity Infrastructure	2.0	4.0	6.0	2.0	8.0
2. ICT-Enabled Innovation	5.8	6.3	12.1	0.0	12.1
3. Project Implementation Support	0.7	1.3	2.0	0.6	2.6
Total	8.5	11.6	20.1	2.6	22.7

37. **The Project will be financed using an Investment Project Financing.** The total cost of the CARCIP Nicaragua Project is estimated at US$22.7 million, funded by an IDA credit of US$20.1 million, and Borrower funds of US$2.6 million.

C. Lessons Learned and Reflected in the Project Design

38. **The proposed Project will benefit from the World Bank's experience in providing implementation support for regional and national ICT projects as well as with PPPs.** The proposed Project takes into account experience from implementation of ICT projects, in particular in the Caribbean region, such as the CARCIP First Phase (P114963) or IT Industry Development Project (P106589); Africa, e.g., Central African Backbone (P108368); South Asia, e.g. Bangladesh: Leveraging ICT Growth, Employment and Governance Project (P122201); and East Asia and Pacific, e.g., Pacific Regional Connectivity Program (P113184). Lessons include ensuring: (i) country and regional ownership; (ii) strong policy and regulatory environment, including PPP and safeguards to underpin investment in ICT infrastructure; (iii) a flexible program able to adapt to changing environments; and (iv) strong but lean implementation arrangements with effective performance monitoring. The design of Component 1 takes into account experience from other World Bank telecommunication projects in the use of a PPP to ensure broadband service delivery to citizens, Government and businesses. Private operators will be responsible for designing, building, installing, testing, commissioning and operating the services for 15 years, thus enhancing sustainability of the services.

39. **Moreover, the World Bank Independent Evaluation Group report on ICT, Evaluation number 64702[29], includes a set of recommendations related to enhancing the ICT sector.** The report suggests building ICT expertise and awareness across regions, while taking into account the local context, building ICT skills, implementing the right policies, and promoting the benefits of shared infrastructure and services so that applications and services may be shared across Government agencies wherever feasible. This is the approach taken by customizing

[28] The MOU signed between TELCOR and the CTU in March 2016, established that TELCOR could participate in workshops and other meetings related with the promotion of the CARCIP countries.

[29] An Evaluation of World Bank Group Activities Information and Communications Technologies. Capturing Technology for Development. The Independent Evaluation Group, The World Bank, 2011. http://ieg.worldbankgroup.org/Data/reports/ict_evaluation.pdf

CARCIP to individual country needs, within the regional context, as well as in defining the components, and in particular Component 2.

40. **Lessons learned from the Nicaragua Rural Telecom Project (P089989) in dealing with the environmental and social safeguards have also been integrated.** The Rural Telecom Project demonstrated that extensive consultations with the communities involved in the Project were critical for identifying, avoiding, and minimizing potential harm to people and the environment and ensuring full participation of and consultations with affected communities. For this Project, communities in the Caribbean coast where the infrastructure could be deployed were consulted during preparation through community meetings, and they will be involved in its implementation, through consultation and information sessions. In addition, there were extensive consultations with over 350 members of the industry, the Government and academia in relation to activities under Component 2 in different locations, including Bluefields, Managua and Leon.

41. **Limited availability of training institutions and the high cost of specialized courses both domestically and within the region, have proven to be critical obstacles in the implementation of the CARCIP.** To address this issue, the CARCIP Nicaragua Project will aggregate demand across the country to lower unit costs. Additionally, the schedule of all training courses will be shared with CTU to allow for participation from other CARCIP countries interested. Finally, the main ICT industry stakeholders in the country and the region need to be on board and fully supportive of the initiative. TELCOR, ProNicaragua and CTU have expressed their interest and strong endorsement of the proposed mechanism.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

42. **The CARCIP Nicaragua Project will be implemented by TELCOR under a Subsidiary Agreement with the Ministry of Finance, using the institutional capacity it developed during the implementation of the Nicaragua Rural Telecom Project (P089989).** The CARCIP Nicaragua Project will use the PCU that was created in TELCOR for the implementation of the Nicaragua Rural Telecom Project (P089989), and still continues to exist. The PCU will coordinate the technical, logistical, implementation and monitoring and evaluation aspects of the Project, including safeguards, and ensure involvement of relevant stakeholders and beneficiaries in Nicaragua and in the Caribbean. The PCU will comprise 10 dedicated staff, including a Project Director, technical specialists for telecoms infrastructure, IT/ITES skills specialist, innovation specialist, business environment specialist, and qualified procurement and financial management staff. The Project Director will report directly to the Director General of TELCOR. The Director, the infrastructure specialist, an accountant, and a procurement specialist from the previous World Bank-financed project have been retained by TELCOR. The remaining staff would be hired competitively within 2 months of effectiveness. In case of insufficient capacity for collecting data, TELCOR will recruit or designate a person responsible for monitoring and evaluation, based on regular capacity assessments In addition, TELCOR will support the PCU as needed, since TELCOR has built-in house expertise in several relevant areas, such as social and environmental safeguards. The Project will be implemented in accordance with the Project Operational Manual, acceptable to the World Bank.

43. **Component 2A activities related to IT/ITES export promotion and FDI attraction will be implemented by TELCOR in partnership, through a Memorandum of Understanding (MOU), with ProNicaragua, the Government's investment and export promotion agency**. ProNicaragua will carry out promotional events, but all contracting and payments for such activities will be handled by TELCOR.

44. **Finally, TELCOR has signed an MOU with the CTU, which will enhance the regional impact of Component 2.** The MOU outlines the participation of Nicaragua in regional activities organized by the CTU, including dialogue between countries on relevant polices and strategies; regional harmonization of policies and frameworks; establishment of mechanisms for countries to obtain cost-effective training and certifications for the IT/ITES industry; development of standard tools and execution of joint studies and assessments; and conduct of research, conferences, symposia, seminars, and workshops. At the August 2015 Meeting of the CARCIP Steering Committee, held in Trinidad and Tobago, current CARCIP countries endorsed Nicaragua joining CARCIP, and the MOU with the CTU was signed in March 2016.

B. Results Monitoring and Evaluation

45. **TELCOR will be responsible for monitoring Project implementation and expected outcomes, including the Result Framework in Annex 1.** The Operational Manual will include a detailed description of how Project activities will be monitored and evaluated, including assigned roles and responsibilities (staff/units) within TELCOR for data collection, analysis, reporting, evaluation and use within certain time frames. The PCU will establish standard formats and guidelines for data collection and reporting. Sources of data include telecommunications operators/regulator and national entities responsible for collecting economic and demographic data. For activities under Component 1, TELCOR will receive the data from the telecom operator on an annual basis. TELCOR already has experience in collecting this type of data from the Rural Telecom Project, and will include in the bidding process the obligation to share the data needed for monitoring the implementation of these activities. With respect to activities related to the promotion of exports and the attraction of FDI for the IT/ITES industry (subcomponent 2A), the PCU will receive data from ProNicaragua. A survey financed under the Project will be used to measure the satisfaction of IT companies with the Skills Development and Certification Program (subcomponent 2B). This survey will be implemented annually by TELCOR starting in year 2 of the Project. For this process, TELCOR will receive support by an Advisory team, which will be created to support implementation of subcomponent 2B, and will include the private sector, ProNicaragua, as well as academia.

C. Sustainability

46. **The approach of the Project, covering both the supply and the demand side of the ICT sector, ensures its sustainability beyond the Program's duration.** Sustainability of Component 1 is guaranteed by the provision of subsidy only for the initial investments, while ensuring that the private sector, through a competitive PPP, charges tariffs that are at once sustainable and affordable. With respect to Component 2, the project will finance the establishment of a skills and certification program, and activities to foster the innovation ecosystem in Nicaragua. These activities will be self-sustaining at the end of the project as enough demand from the private sector and the civil society will be generated. To ensure

sustainability of the IT/ITES skills and certification program, the Project will finance, under subcomponent 2A, the design and implementation of a sustainability model to continue bundling the demand for certified courses for CARCIP members, beyond the life of the Project. The design of the model will be undertaken during the third year of the Project and after there is more clarity on the size of the continuous training demand that the Region can consolidate. The design of the Innovation Ecosystem (subcomponent 2C) has taken into account models that allow the university industry platform to become self-sustainable by becoming an ongoing university program, while at the same time collecting small fees from the industry players that want to submit problems for students' resolution.

V. KEY RISKS

47. **The overall risk to achieving the PDO is assessed as Moderate**. The key risks and mitigation measures are as follows:

- The **Technical design** of Component 2 proposes innovative activities and anticipated benefits might not be immediately evident. To address this, activities under Component 2 have been discussed with stakeholders, including private sector, public institutions, universities and civil society. Moreover the ICT innovation ecosystem subcomponent (2C) design includes linking with existing open innovation efforts in the country, and activities to help entrepreneurs create their own start-up to attain sustainability.
- **Institutional capacity**: Component 2 is new for TELCOR and challenging to implement. This risk is mitigated by the provision of technical specialists in the areas of ICT innovation, business environment, and skills development. Moreover, the proposed Project will include substantial support for capacity building, following international good practices from implementation of programs fostering the IT/ITES industry. The World Bank Project team will strive to reduce complexity by approaching the program in phases, applying proven models to ensure the program achieves clear measurable outcomes, ensuring full stakeholder involvement, implementing a communication strategy, and by learning from experiences and sharing knowledge in roll-out throughout the sub-region.
- **Stakeholder support**: The Project may face potential resistance by incumbent operators to new broadband network segments that could increase competition, and reduce their market share. This is being mitigated by extensive consultations with incumbent operators and awareness raising activities on benefits of new infrastructure. There is also a challenge of overcoming initial lack of understanding by stakeholders of the skills development and innovation subcomponents, given their complexity and novelty. These risks are mitigated by (i) organization of south-south knowledge exchanges between key Nicaraguan stakeholders from the industry, academia and the Government, together with organizations from other countries that have implemented similar projects; (ii) carrying out of pre-feasibility studies to determine adequate demand and involvement of the private sector; and (iii) partnering with the CTU to carry out regional initiatives.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

48. **A financial analysis was carried out for the activities financed under Components 1 and 2.** For Component 1, revenues were estimated from the projected increase in the number of

broadband subscribers. On the cost side, expenditures for Component 1 included: (i) the investment costs of the infrastructure; (ii) incremental operating costs for the major operators (Claro and Telefónica); and (iii) the incremental expenses for the rental of internet capacity by the operators. With respect to Component 2, and more specifically subcomponents 2B and 2C, revenues were estimated from the additional income taxes to be paid by the increased salaries of the incremental jobs created in the long term. For subcomponent 2B and 2C, the costs were the investment costs financed by the Project, depreciation, and financing costs.

49. **The Project is viable financially and economically**. An initial analysis was carried out assuming no public financing for Component 1. This yielded a Net Present Value of US$882,000 and an Internal Rate of Return of 9 percent. These results show that the CARCIP Nicaragua Project is feasible, although it would not provide the minimum rate of return that private companies usually expect (around 14 to 15 percent) and thus, telecommunication operators would not likely invest. Therefore, Government financing is needed to make the Project viable. A second analysis including public financing for the Regional Connectivity Infrastructure Component results in a Net Present Value of US$3.6 million and an Internal Rate of Return of 19 percent. Thus the Project's Regional Connectivity Infrastructure Component with IDA financing would be enough attractive to operators. A third analysis of the entire Project gives a Net Present Value of US$3.75 million (flows discounted at 8 percent rate). These results show that the Project is attractive for the Government.

50. **The economic rate of return is higher than the financial rate, because the Project will benefit a rural population that will receive telecommunication services for the first time.** Without such service, residents have to travel to the nearest town that has services to make phone calls and use the Internet. With the Project, they will be able to make calls or access the Internet in their homes or places of work, saving considerable time and travel expenses. The ICT-Enabled Innovation Component also brings positive externalities, as it is estimated that for every person employed in ICT at least three new indirect jobs are created in the economy.[30] Details of the economic and financial analyses are included in Annex 5.

B. Technical

51. **The technical design of the CARCIP Nicaragua Project builds on lessons learned and best practices of similar projects that have been implemented in Nicaragua and the LAC region.** The infrastructure component builds on lessons learned from the implementation of the Rural Telecom Project (P089989) and will use PPPs in a Build, Own, and Operate model. The bidding specifications will be technology neutral in order to allow as many operators as possible to participate in the bid, and will not have a technology-based bias that could favor one operator over the others. The bidding will request only minimum specifications, such as minimum internet speed and number of locations to be covered. The operators will be able to select the technology of their choice, which could include, among others: (i) installation of fiber optic cables on existing poles of the electricity company for long distance links; (ii) hybrid fiber/coaxial solution (also known as Cable TV) with cable modems for local distribution; and (iii) installation of cell towers with 4G LTE equipment and connecting to the fiber optic network using microwave point-to-point links. The technical design is consistent with international best

[30] Mexico, ICT Industry Development Loan, World Bank, Supervision reports, based on information from the Secretary of Economy.

practice. Lastly, the design of the Project is based on a model of competitive, private-sector delivery wherever possible. This is fully consistent with international experience which shows that this is a more cost-effective way of delivering ICT services than the Government becoming directly involved in service delivery itself.

C. Financial Management

52. **Project implementation will benefit from TELCOR's existing financial management arrangements, including those that were used for the recently closed Rural Telecom Project (P089989), through the PCU, and strengthening them as needed.** A financial management assessment was carried out, in accordance with OP/BP 10.00 and the Financial Management Manual for World Bank-Financed Investment Operations updated in 2014, to evaluate the adequacy of financial management arrangements of TELCOR to support the implementation of the Project. The assessment evaluated the specific arrangements for the different Components, including those related to staffing structure, financial recording system and financial reporting, funds flow, audit arrangements, internal control system and asset management, identifying some strengthening measures.

53. **Based on the capacity assessment, key strengths of TELCOR's financial management systems and risk factors include the following**: (i) TELCOR is in general an experienced entity with qualified staff and experience with World Bank requirements through the recently closed Rural Telecom Project, the financial management performance for which was rated as Moderately Satisfactory; ii) basic budgeting, accounting, reporting, recording and filing arrangements are in place. The entity uses the Governmental Integrated Financial Management System (SIGFA), considered to be reliable automated financial system to support budgeting execution processes and provision of financial reports; (iii) the Project does not require complex or decentralized financial management arrangements. However, it is larger in size than the previous Project implemented by the same PCU, and involves the financing of IT/ITES training and certification through completely new approaches, including grants. This will significantly increase the number of contracts and transactions managed by TELCOR and will require the design, implementation and maintenance of specific procedures. As mitigating measures, the financial management team will be strengthened by the hiring two additional fiduciary support staff to be financed with counterpart funding. The existing Financial Management Specialist and Procurement Specialist will also be rehired by the PCU and financed by Credit proceeds. As implementation advances, it will be critical to assess performance of subcomponent 2B to identify the need of any adjustment either in the financing model or agreed procedures. The detailed procedures, rules and responsibilities related to financial management will be outlined in the Operational Manual.

D. Procurement

54. **Procurement for the CARCIP Nicaragua Project will be carried out by the existing PCU in TELCOR.** Given the experience built under the recently closed Rural Telecom Project (P089989), procurement will be carried out by the same PCU of TELCOR. An assessment of the PCU determined that it has capacity to carry out Project procurement activities, but considering the increase in volume of procurement activities compared to the previous project, and to avoid implementation delays, the PCU will hire an additional procurement consultant with experience

in implementing World Bank-financed projects. The Procurement Plan for the next 18 months has been agreed upon with the Government (Annex 3) and will be updated annually or as often required to reflect Project implementation needs and improvements in institutional capacity.

E. Social (including Safeguards)

55. **The Project triggers two social safeguard policies, OP/BP 4.10 Indigenous Peoples, and Involuntary Resettlement OP/BP 4.12.** The exact locations of network towers and fiber optic construction have not yet been determined. Therefore, an Environmental and Social Management Manual (ESMM) was prepared by the Borrower and approved by the Bank, and afterwards, consulted with the main stakeholders on August 25, 2015, and disclosed in-country on October 30, 2015, and in the World Bank's external website on November 2, 2015. These stakeholders included the Caribbean Coast Regional Government, universities, among others. The minutes of the stakeholder meetings, including comments and recommendation are included in the ESMM Annex. Some of the feedback received by the participants during these consultations were included in the ESMM. Such as the possible effects in health of radiation due to the construction of the telecommunications towers. The ESMM includes an Indigenous Peoples Planning Framework (IPPF) and a Resettlement Policy Framework (RPF). The Indigenous Peoples safeguard policy is triggered given the presence of indigenous peoples and afro-descendants in the Project intervention area. While no significant negative impacts are expected on these communities, the towers and fiber optic construction could potentially affect them. Similarly, the construction of new communication towers and optical fibers (underground or aerial) could potentially affect right of way, requiring people to physically move or causing loss of land for productive use. Each site will be evaluated and the appropriate safeguard policy triggered. During site design, specific Indigenous and Afro-descendent Plans and Resettlement Actions Plans will be developed in line with the IPPF and RPF respectively. The telecommunications infrastructure works in the areas of CARCIP Nicaragua will only affect lots or homes located in areas where work needs to be done. If moving occupants or owners of structures and/or lands is unavoidable, the aim will be to compensate for the replacement value or replace the premises, housing, access to services, and productive economic activities, on an equal level or better than what they had before the execution of the project. The IPPF also includes a specific grievance redress mechanisms prepared by the PCU, which includes mechanisms that allow addressing any grievance in any indigenous territory affected.

56. The Project is expected to have many positive social impacts by improving access to communications, and the development of an ICT-enabled open innovation ecosystem in Nicaragua. Particularly, the program is expected to: (i) enable ICT to become a driver for sustainable economic growth; (ii) support ICT experts, businesses and entrepreneurs for the creation of innovative solutions to fight poverty and inequality in vulnerable communities of urban and non-urban areas of Nicaragua; (iii) enable the government to use ICT to provide decentralized services; (iv) improved access and quality of ICT services for the general population, business, and government; (v) reduce isolation and enhance economic activities in rural areas; and (vi) create additional opportunities for women entrepreneurs to develop ICT-related SMEs through targeted skills development and relevant business development support. The open innovation component will implement citizen engagement and co-creation activities, including tailored programs for women and children, taking into account the levels of poverty and access to internet, amongst other parameters, to target the beneficiary communities.

F. Environment (including Safeguards)

57. **The proposed Project triggers Environmental Assessment Policy OP/BP 4.01, Natural Habitats OP/BP 4.04, and Physical Cultural Resources OP/BP 4.11, and is rated as a Category B for environmental risk.** These environmental safeguard policies have been triggered given the potential environmental impact of proposed Project activities related to building infrastructure (e.g. construction of the fiber optic and transmission towers). For example, the construction of the fiber optic may affect the environment, including during excavation, which might affect physical, cultural, or archeological sites and cut across natural habitats, such as national parks and protected areas. Nonetheless, given that the potential environmental impacts of Project activities are expected to be minor and reversible, the Project has an Environmental Risk Category B. Appropriate safeguards instruments have been prepared to ensure that all proposed Project activities meet the requirements of the relevant national legislation and international conventions to which Nicaragua is a signatory, as well as World Bank Group environmental and social safeguard policies. The above mentioned ESMM includes an Environmental Management Framework (EMF), which was consulted with main stakeholders on August 25, 2015, and disclosed in-country on October 30, 2015, and in the World Bank's external website on November 2, 2015. These stakeholders included the Caribbean Coast Regional Government, universities, among others. The minutes of the stakeholder meetings, including comments and recommendation are included in the ESMM Annex. The main concerned of the stakeholders was how to minimize or regulate the possible effects of the infrastructure in the landscape, which will be studied, together with the communities, when the exact locations are determined. The EMF includes provisions and guidelines for dealing with potential impacts on Physical Cultural Resources and Natural Habitats, such as screening criteria to minimize negative impacts on physical cultural resources, and procedures for "chance finds" and avoiding critical natural habitats. During site design, specific environmental assessments will be carried out in line with the EMF.

G. World Bank Grievance Redress

58. **Communities and individuals who believe that they are adversely affected by a World Bank-supported project may submit complaints to existing project-level grievance redress mechanisms or the World Bank's Grievance Redress Service.** The latter 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 World Bank's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of 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 World Bank Management has been given an opportunity to respond. Further information on the World Bank's corporate Grievance Redress Service and Inspection Panel is provided under http://www.worldbank.org/GRS and http://www.inspectionpanel.org.

Annex 1: Results Framework and Monitoring

Country: Nicaragua

Caribbean Regional Communications Infrastructure Program - Nicaragua Project (P155235)

Results Framework

Project Development Objectives

Increase access to regional broadband networks and advance the development of an IT/ITES industry in Nicaragua and the Caribbean Region.

These results are at	Project Level

Project Development Objective Indicators

Indicator Name	Baseline		Cumulative Target Values					
		YR1	YR2	YR3	YR4	YR5	YR6	End Target
Broadband Penetration on the Caribbean coast (Percentage)	0.00	0.00	0.00	5.00	10.00	12.00	14.00	14.00
IT companies' satisfaction with the IT/ITES skills training and certification program (Percentage)	0.00	0.00	35.00	40.00	45.00	55.00	65.00	65.00
Trainees certified under the skills and training program (Percentage)	0.00	20.00	30.00	40.00	50.00	65.00	70.00	70.00
Services or applications created as a result of the ICT Innovation Ecosystem activities (Number)	0.00	0.00	1.00	2.00	3.00	5.00	8.00	8.00

Intermediate Results Indicators

Indicator Name	Baseline		Cumulative Target Values					
		YR1	YR2	YR3	YR4	YR5	YR6	End Target
Direct Project Beneficiaries (Number)	0.00	0.00	0.00	39,500	94,600	110,000	110,000	110,000

Indicator Name	Baseline	Cumulative Target Values						
		YR1	YR2	YR3	YR4	YR5	YR6	End Target
of which female (Percentage - Sub-Type: Supplemental)	0.00	30.00	30.00	30.00	35.00	40.00	40.00	40.00
Locations connected under Project (Number)	0.00	0.00	0.00	15.00	31.00	44.00	44.00	44.00
4G-enabled base stations in rural locations (Number)	0.00	0.00	0.00	9.00	25.00	32.00	32.00	32.00
Length of Fiber Optic Network Built (km)– (Core)	0.00	0.00	70.00	220.00	255.00	255.00	255.00	255.00
Implementation of a Strategy to Foster the IT/ITES Industry in Nicaragua and in the Caribbean Region launched (YES/NO)	NO	NO	NO	YES	YES	YES	YES	YES
Events organized to promote IT/ITES industry and attract FDI in Nicaragua and in the Caribbean (Number)	0.00	2.00	5.00	10.00	15.00	20.00	25.00	25.00
Other CARCIP countries with access to IT/ITES skills training (Number)	0.00	1.00	2.00	2.00	3.00	3.00	3.00	3.00
Manpower Trained under the Project (Number) – (Core)	0.00	800.00	1,600.00	2,500.00	3,500.00	4,500.00	5,500.00	5,500.00
of which female (Percentage – Sub-Type: Supplemental)	0.00	30.00	30.00	30.00	35.00	35.00	40.00	40.00
of which from other CARCIP countries (Number – Sub-Type: Supplemental)	0.00	10.00	20.00	30.00	60.00	80.00	120.00	120.00
Collaboration agreements between University and firms under the Innovation Ecosystem (Number)	0.00	0.00	5.00	10.00	20.00	30.00	50.00	50.00
Solutions created under the Innovation Ecosystem (Number)	0.00	2.00	5.00	10.00	15.00	20.00	30.00	30.00
Open Innovation Events in the Collaboration Spaces	0.00	2.00	6.00	10.00	14.00	19.00	25.00	25.00

(Number)								

Indicator Description

Project Development Objective Indicators

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Broadband Penetration on Caribbean coast	The percentage increase penetration in the broadband network in 44 locations in the Caribbean coast of Nicaragua due to deployment of infrastructure financed under the Project. It is measured by the number of subscribers to internet services per 100 inhabitants.	Annual	Operators/ Regulator (TELCOR)	TELCOR
IT companies' satisfaction with the IT/ITES skills training and certification Program	Percentage of IT companies satisfied with the provision and implementation of the IT/ITES skills training and certification program, as measured by the percentage of good and better responses on a satisfaction survey. To this end, an independent entity will prepare a survey to measure the quality of the program. Lessons learned from other World Bank Projects showed that this indicator measured the quality of a training and certification program to cover the necessities of the IT/ITES industry.	Annual	TELCOR Surveys	TELCOR
Trainees certified under the skills and training program	Number of trainees in the skills and training program who have been certified (Internationally Recognized), where available, divided by the total number of trainees in the skills and training program. The skills and training program will provide training in English, soft skills and technical skills for an estimated 5,500 people from Nicaragua and other CARCIP countries. Internationally recognized certifications will be provided in English and technical skills. Right now, the industry estimates that about 40 percent of the people trained get internationally recognized certification. The target is to have 70 percent of the people who participated in the training program	Annual	Training providers/ Certifiers	TELCOR

	under the program receive internationally recognized certification.			
Services or applications created as a result of the ICT Innovation Ecosystem activities	Number of services or applications created under the ICT Innovation Ecosystem activities under the Project.	Annual	TELCOR	TELCOR

Intermediate Results Indicators

Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
Direct Project Beneficiaries	Number of people benefitting from the new infrastructure	Annual	Operator Report	TELCOR
of which female	Percentage of direct Project beneficiaries that are female	Annual	Operator Report	TELCOR
Locations connected under Project	Number of locations gaining broadband access as a result of the Project	Annual	Operator Report	TELCOR
4G-enabled base stations in rural Locations (Number)	Number of 4G-enabled base stations that will be financed in rural locations.	Annual	Operator Report	TELCOR
Length of Fiber Optic Network Built (km)	It measures the number of kilometers of fiber-optic network built under the Project (i.e. with project funds). Fiber optic network refers to the network constructed with fiber optic cables. The definition of "built" means the condition that the fiber optic cables are physically laid regardless lit or in use. The measure would be in terms of "route kilometers" not in actual length of fiber (i.e. the number of individual fibers carried in a duct, or their transmission capacity, would not be factored into the indicator).	Annual	Operator Report	TELCOR
Implementation of a Strategy to Foster the IT/ITES Industry in Nicaragua and in the Caribbean Region launched	The Project will finance the design of a strategy for advancing the development of the IT/ITES industry in Nicaragua and the Caribbean. ProNicaragua is expected to start implementing some of the activities included in the strategy before end of the Project.	Annual	CTU/ProNicaragua	TELCOR
Events organized to promote IT/ITES industry and attract	Number of global and regional events to promote IT/ITES industry and attract FDI in Nicaragua and in the	Annual	ProNicaragua	TELCOR

FDI in Nicaragua and in the Caribbean	Caribbean.			
Other CARCIP countries with access to IT/ITES skills training	Number of countries apart from Nicaragua that had access to IT/ITES skills training under the Project.	Annual	CTU	TELCOR
Number of Manpower Trained under the Project (number of people)	It measures the total number of people trained for the IT/ITES industry under the project. IT services typically comprise of remote infrastructure management, custom application development, systems integration, package software implementation and support, IT consulting, embedded systems, design, plant engineering and products. ITES are business services that include basic voice, specialized voice, basic data, rules-based decisions, research and analytics and knowledge services. "Trained manpower" mean s people who obtained sufficient training in order to work as skilled-labor in the IT/ITES industry. It is expected that the baseline for this indicator will be zero.	Annual	TELCOR / Training institutions	TELCOR
of which female	Number of females trained under the Project divided by total number of people trained under the Project.	Annual	TELCOR / Training institutions	TELCOR
of which from other CARCIP countries	Number of people from CARCIP First Phase countries trained under the Project.	Annual	CTU	TELCOR
Collaboration agreements between University and firms under the Innovation Ecosystem	Number of collaboration agreements between the private sector and the universities/students to create ICT-based and innovative solutions under the ICT Innovation Ecosystem subcomponent (2C).	Bi-Annual	Universities/ Telecenters	TELCOR
Solutions created under the Innovation Ecosystem	Number of problems solved by university students through open innovation methodologies developed under the ICT Innovation Ecosystem subcomponent (2C).	Bi-Annual	Universities/ Telecenters	TELCOR
Open Innovation Events in the Collaboration Spaces	Number of events carried out in the open collaboration spaces to develop activities to create an open innovation	Annual	Collaboration Spaces	TELCOR

	community, such as challenges, skills development, or open innovation events.			

Annex 2: Detailed Project Description
NICARAGUA: Caribbean Regional Communications Infrastructure Program – Nicaragua Project

1. **A regional approach is needed to take full advantage of ICT infrastructure investments in the Caribbean region, and to be able to transform them into job creation and productivity gains.** The countries in the region are small. They need a critical mass of specialized talent meeting globally recognized standards to be able to attract long term investments for the IT/ITES sector, and accelerate ICT diffusion.[31] To achieve this critical mass requires countries in the region to work together towards that goal. The addition of Nicaragua to the existing regional CARCIP would boost availability of employable ICT talent in the region.

Table 2.1: Selected Broadband (BB) Indicators for some Caribbean and Central American countries

Country	Fixed BB Subscription per 100 people	Mobile BB Subscription per 100 people	Fixed BB Price per Month/GNI per Capita in PPP	Mobile BB Price per Month/GNI per Capita in PPP
Nicaragua	2.5	1.4	6.0%	4.4%
St. Vincent & the Grenadines	14.9	34.4	3.8%	3.3%
Grenada	17.0	1.2	3.0%	2.3%
St. Lucia	15.3	29.8	4.2%	n.a.
LAC Average	9.7	35.3	1.9%	1.4%
OECD Average	30.6	77.4	0.9%	0.6%

Source: International Telecommunications Union

2. **CARCIP is aligned with regional priorities.** Two of the main objectives of the Association of Caribbean States (ACS; see Figure 2.1) are strengthening of the regional co-operation and integration process and promoting the sustainable development of the Greater Caribbean. One of the major priorities of the ACS is to establish an enhanced economic space for trade and investment, and in particular, improve business mobility to stimulate trade and economic growth through specialization, more rapid technology and expertise transfer leading to increased innovation, and improved resource allocation.

3. **CARCIP promotes regional economic integration and supports the updating of related policies and regulations, while at the same time implementing programs that build capacity and strengthen the institutions involved.** CARCIP will deliver important economies of scale and overall economic benefits, as it will support major public goods, such as (i) a highly interconnected broadband infrastructure; (ii) ICT capacity building; (iii) development of ICT-enabled services; and (iv) institutional capacity building to ensure sustainability. All these initiatives will have positive regional externalities that will accrue to each country in much larger measures than if it were to embark on these activities separately. This Project also considers a strong collaboration and spillovers in the Caribbean region, especially with those countries that are already part of the CARCIP initiative (Santa Lucia, Saint Vincent and the Grenadines and

[31] ICT Diffusion means the use of ICTs in a productive way.

Grenada), as well as other who are not, such as Honduras or Mexico. The Program provides an open opportunity to link more countries in the region in the future.

Figure 2.1: Members of the Association of Caribbean States

Source: http://www.eird.org/cd/acs/English/AboutACS.pdf

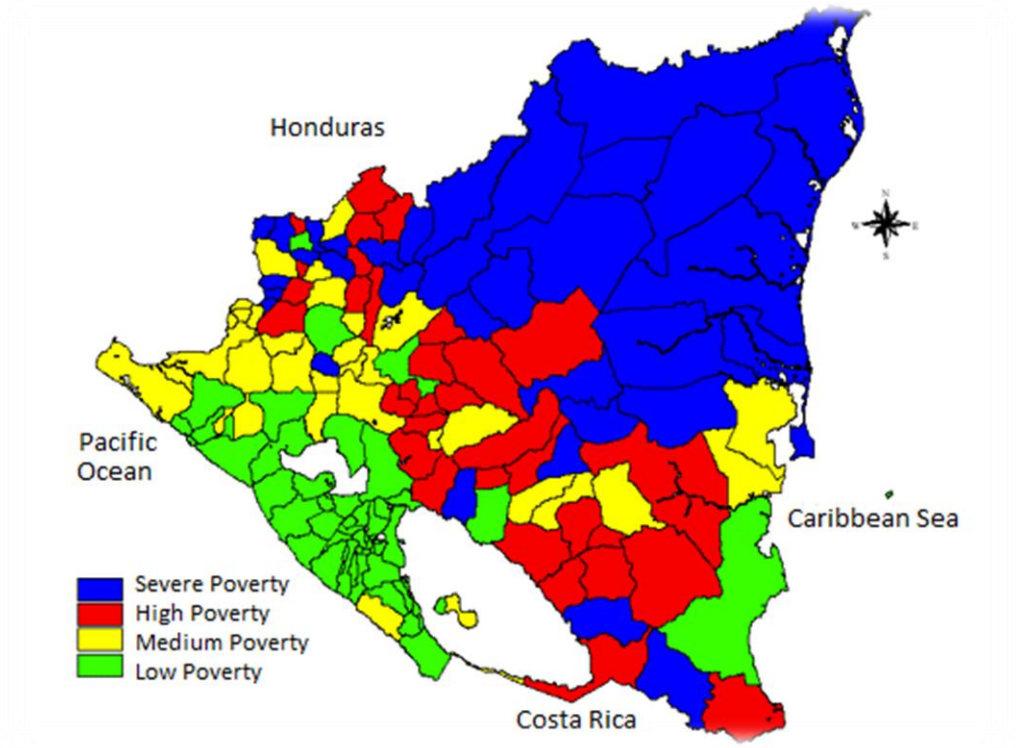
4. **CARCIP provides a platform for a high level of policy harmonization between participating countries, and is part of a well-developed and broadly-supported regional strategy.** The Caribbean Telecommunications Union (CTU), recipient of a regional IDA grant under the CARCIP First Phase Project (P114963), organizes quarterly CARCIP steering committee meetings to discuss project implementation, knowledge exchange, and coordination of regional policies. In addition, the CTU organizes about eight trainings per year to build stronger institutions for CARCIP countries. Conversations have already taken place to have Nicaragua participate in these regional events and trainings, and St. Lucia and St. Vincent and the Grenadines have already sent their formal endorsement of Nicaragua's participation. Endorsement from Grenada is expected. In fact, Nicaraguans already participated in a CARCIP training event at the end of August 2015 in Trinidad and Tobago, to start coordinating with other CARCIP counterparts on regional broadband and innovation policies. The CTU has signed a Memorandum of Understanding (MOU) with Nicaragua formalizes Nicaragua's joining the CARCIP regional activities.

Component 1: Regional Connectivity Infrastructure (US$8.0 million of which US$2.0 million financed by national IDA, US$4.0 million by regional IDA, and US$ 2.0 million provided by the borrower)

5. **This Component mirrors Component 1 in the CARCIP First Phase Project, and will fill the remaining gaps in the regional broadband communications infrastructure.** This Component will support bridging priority gaps in the regional broadband communications infrastructure, which will be deployed in Nicaragua's Caribbean coast, an area with one of the lowest Internet penetration rates and one of the highest poverty rates in LAC (Figure 2.2). The

installed infrastructure will be connected with neighboring countries and regional broadband backbones such as the Central American Telecommunications Network (REDCA) and will include a new connection to a submarine cable at Bilwi on Nicaragua's northern Caribbean coast, close to the Honduras border. The Project will use fiber optic and broadband wireless networks to reach interconnection points with existing regional backbone networks, as part of CARCIP's regional strategy. The Project's area of intervention complements infrastructure deployment, as well as policy and regulatory reforms, under projects by other donors, such as the Inter-American Development Bank, the Korean Exim Bank, and private operators.

Figure 2.2: Poverty Map in Nicaragua



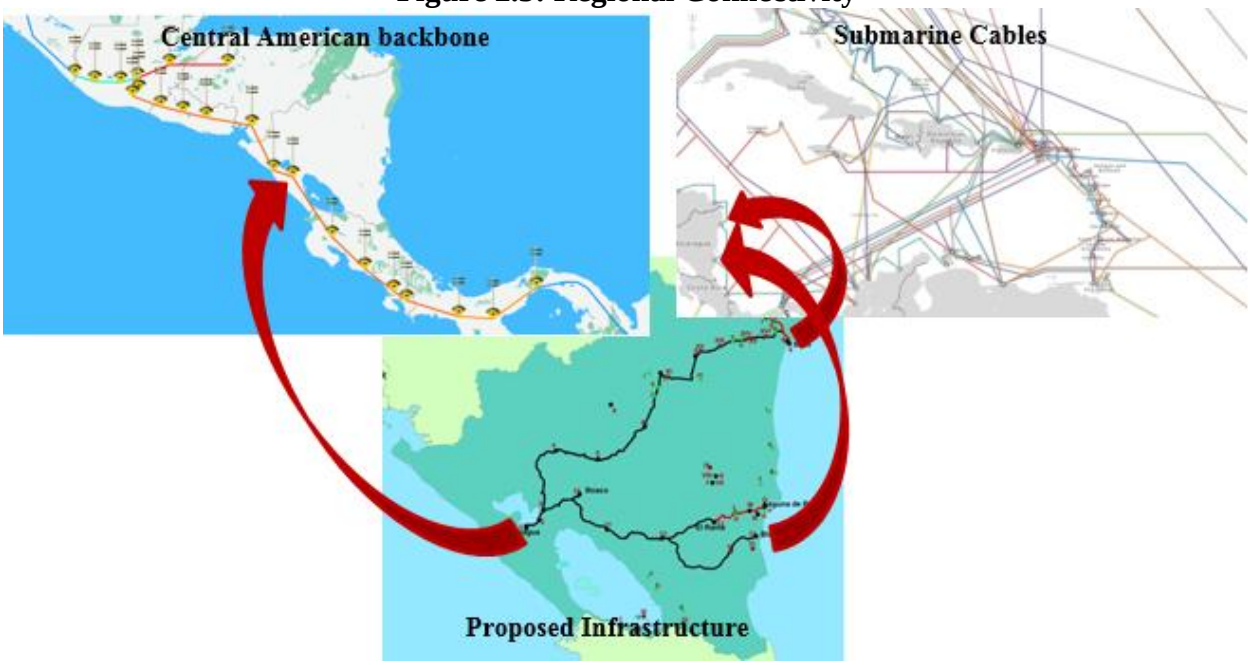
Source: FAO

6. **The regional broadband infrastructure network will become stronger and more resilient by building additional interconnection points in the Nicaragua's Caribbean coast.** Having more points in the network allows for rapid rerouting of traffic when there is a technical failure in a particular area. Such failures could be due to natural hazards, which are very common in the region. Regional efforts to build the broadband infrastructure in the Caribbean and Central America are expected to have a strong positive spillover effect in all countries of the region by ensuring sustainability of the broadband network and resilience against disaster risk.

7. **The planned broadband infrastructure will help attract the IT/ITES industry to the region by: (i) ensuring strong and reliable infrastructure that the industry needs to operate; and (ii) increasing the potential pool of talent that can be trained for the IT/ITES industry in the whole region.** Increasing access to broadband infrastructure will mean that more people are capable of working in IT/ITES services as they have higher and cheaper access to the internet. The increase in the pool of available talent, supported by a regionally harmonized

enabling environment, will attract additional investment to the region, as multinationals take advantage of the increased workforce for the establishment and expansion of call centers, IT desk centers, banking, insurance, accounting and many other IT-enabled services, outsourced from other countries to CARCIP countries. In addition, the IT/ITES industry relies heavily on broadband connectivity for without reliable connectivity, the industry cannot function. Call centers, for instance, need connectivity in order to be able to provide reliable outsourcing services 24 hour, seven days a week. Even if Nicaragua had a very skilled pool of talent, standardized with other CARCIP countries under a regional strategy to attract the IT/ITES industry, the industry would never consider the country as part of these regional efforts if there was no reliable broadband connectivity. Moreover, as the network grows in number of users, this means that more and more people are capable of working in IT/ITES services.[32] The increase in the pool of available talent is expected to attract additional investment to the region, as multinationals tap the increased workforce for the establishment and expansion of call centers, IT/ITES desk centers, banking, insurance, accounting and many other IT/ITES enabled services, outsourced from developed countries to CARCIP countries. This "network effect" will benefit all the CARCIP countries of the region, as they work in a unified strategy to attract the IT/ITES industry.

Figure 2.3: Regional Connectivity



Source: REDCA and Telegeography (Submarine Cables)

8. **The Caribbean broadband network will provide high-speed fiber optic connectivity to the regional network for backhaul.** It will provide connectivity for at least 44 locations, including schools and health centers, several universities, and public entities and cooperatives, benefiting about 110,000 people on the Caribbean Coast, with regional spillovers in the

[32] There is evidence that higher rates of ICT penetration are associated with greater levels of exports and employment. A recent study concludes that if Latin American countries were to increase broadband penetration to its potential, they could create almost 400,000 new jobs.

Caribbean region by strengthening the regional broadband network (Figure 2.3). The new fiber connections will use existing electricity transmission poles and towers through main roads, reducing costs and minimizing environmental impact. Although a potential list of communities to benefit has been identified, the private operators will provide the final list as part of the assessment that they will do in order to present their bid to be part of the Public Private Partnership (PPP) that will build and operate the network.

9. **This Component will finance three types of infrastructure:** (i) fiber optic cable links to connect locations to the nearest network point; (ii) local wired networks to connect houses and businesses, including fiber optic connectivity to strategic IT/ITES based enterprises; and (iii) wireless networks for the smaller locations where fiber lines are too expensive, consisting of cellular towers with 4G equipment and microwave links or short fiber lines to the nearest network point. Specifically, the Project will finance two fiber optic lines, of a total of 255 km, to connect at least 12 larger locations (Bilwi/Waspan and El Rama/Laguna de Perlas) and an estimated 32 wireless sites for smaller locations (of which 14 are new and 18 are migration from 2G equipment that provides only voice communications to 4G that provides voice and data). This support also includes critical equipment for operations of IT/ITES based enterprises, such as structured wiring, engine-generator, or backup batteries.

Figure 2.4: Fiber Optic Routes, New and Migrated 4G Towers Under the Project

Source: TELCOR

10. **The two new fiber lines will double Nicaragua's interconnection points to submarine cables (Figure 2.4).** The installed infrastructure will allow connections with neighboring countries and regional broadband backbones and will include a new connection between a submarine cable at Bilwi on Nicaragua's northern Caribbean coast, and Waspan, close to the

Honduras border, allowing for a future link across the border. They will also facilitate future interconnections between the existing submarine cables located on the Caribbean coast and REDCA.

11. **Financing the connectivity infrastructure would be based on a competitive "least cost" subsidy under a PPP model.** The Government will contribute part of the financing of the Project and a private operator will contribute the remaining cost. In the bidding specifications, the maximum Government contribution will be defined. The operator that complies with all the technical and commercial specifications and is able to execute the Project with the minimum Government contribution (i.e. with a maximum private contribution) to the overall cost of the Project will win the bid. This modality of PPP, also known as Build, Operate, Own, was successfully used in the Rural Telecom Project (P089899) for several international bids. The Government entity that set up these past PPPs, TELCOR, is the same agency responsible for implementing the CARCIP Nicaragua Project, thus reducing the implementation risk. The operators that build these sections will be required to provide open access and/or interconnection with all existing operators in equal and non-discriminatory basis. With respect to cell towers, there is an obligation in the Cell Tower Law to share infrastructure with other users, so any new tower to be built will have to be shared with any operator as long as it is technically feasible.

12. **There will be synergies with a World Bank-financed education project, Education Sector Strategy Support Project (P133557), currently under implementation.** TELCOR obtained maps that show where the World Bank will support the creation of digital classrooms on the Caribbean coast and looked for synergies with other CARCIP countries. As a result, the CARCIP Nicaragua Project will be seeking to connect some of the localities that will house "digital classrooms" with broadband.

13. **A digital literacy agenda will be included along with the broadband rollout work.** The Internet Service Providers that roll out broadband connectivity will be requested to deliver (themselves or via partners) ICT training for the new subscribers. This is a way to foster smaller numbers of trainers who could be "mobile" (following the rollout schedule, rather than be in all places at the same time, risking diluting their capacity). It will also be a way to monitor the rollout of the network itself.

14. **The improved infrastructure will increase access to business opportunities and delivery of basic services in Nicaragua.** This includes (i) educational institutions (schools, technical education centers, and universities) that will now be able to access regional educational networks, such as Red Clara or C@ribnet; (ii) health centers and hospitals that can multiply their effectiveness through internet connectivity; (iii) cooperatives that gain access to market information, suppliers, and customers; and (iv) new opportunities for the development of IT/ITES-based enterprises.

Regional aspects of Component 1:

Regional Spillovers	**How Will They Be Achieved?**
- Stronger, more resilient regional broadband infrastructure that can better support the industry needs and provide them more	- Using a PPP approach that has been proven to work in

options on how to connect to their employees (either in a physical space or in an online outsourcing platform). - Increased capacity to address climate change and become more resilient to natural disasters. - Expansion of regional educational networks, such as Red Clara or C@ribnet, as infrastructure reaches more academic institutions. - Increased number of connected people, i.e. increased number of potential workforce and overall attractiveness of the CARCIP countries for the industry.	the previous Rural Telecom Project, and the expansion of broadband services (fixed and mobile) will bridge the critical regional connectivity gaps.

Component 2: ICT-Enabled Innovation (US$12.1 million of which US$5.8 million financed by national IDA, US$6.3 million by regional IDA)

15. **This Component mirrors Component 2 in CARCIP First Phase.** The objective of the Component is to boost human capacity and business development under a regionally harmonized framework and approach, including support for university-industry collaboration with impact in regional industries, so as to generate employment and position the region and within it, Nicaragua, as a destination of choice for IT/ITES businesses. This Component finances three subcomponents aimed at: (i) enhancing the enabling environment for fostering a productive use of the broadband infrastructure; (ii) creating an IT/ITES skills development and certification program; and (iii) fostering an ICT innovation ecosystem.

Subcomponent 2A: Enabling Environment Program

16. **This subcomponent will provide policy, regulatory, institutional and transaction advisory support that will maximize the benefits of the infrastructure (Component 1), and of the ICT- enabled innovation (subcomponents 2B, and 2C).** Subcomponent 2A will support a multilingual regional IT/ITES industry capable of meeting local, regional and global demands, in a harmonized regional framework, and will finance the provision of technical assistance and capacity building, such as:

(a) Participation of Nicaraguan organizations in regional efforts for IT/ITES industry promotion and FDI attraction, with ProNicaragua as a beneficiary, such as:
    (i) Carrying out an analysis of the specific IT/ITES niches that can help Nicaragua and the region position itself as a relevant player in the global market, including an analysis of the current gaps and recommendations for the revision and strengthening, as needed, of the legal and regulatory environment, and in particular for the regional harmonization of such regulatory environment;
    (ii) Participation in specific promotion activities, including the organization and participation of regional IT/ITES industry fairs on an annual basis;
    (iii) Design and implementation of a Marketing Campaign for Nicaragua and the region to generate a regional brand in the IT/ITES industry in the global market;
(b) Regional learning and knowledge exchange with IT/ITES leaders, to learn from the different successful models implemented to boost the industry, which could include on-site visit to

these countries and visits from IT/ITES Industry Specialists to Nicaragua and other Caribbean countries;

(c) Operate the IT/ITES skills and certification program in consultation with the industry, other agencies, and with other countries in the Caribbean region. This will include support to design additional options to link trainees to future employment, and a Project mid-term analysis to ensure implementation of all activities and the Project objectives are on track;

(d) Carrying out an analysis of different business models for carrying IT/ITES certification, so as to continue bundling the demand for certified courses for CARCIP members, beyond the life of the Project, and which could take the form of a specific model for the Caribbean. The design of the model will be done during the third year of the Project and once there is enough evidence on the size of the continuous training demand in the region.

Regional aspects of Subcomponent 2A:

Regional Spillovers	**How Will They Be Achieved?**
- Increased regional harmonization of different relevant policies and regulations among CARCIP countries. - Increased attractiveness of the IT/ITES market of the whole region.	- Through promotional fairs and other activities to promote the IT/ITES industry of Nicaragua and of the whole region as one market with specific niches, in coordination with CTU. - By determining the most suitable IT/ITES niches that the region should target. - Through an analysis of the best model for sustainability of the talent program, and development of a model for the Caribbean. - Through an analysis of the best options available to harmonize the regulatory framework of the region in online platforms and microworks employment.

Subcomponent 2B: IT/ITES Skills Development and Certification Program

17. **This subcomponent will help increase the quantity and quality of manpower, for attracting investments and developing the IT/ITES industry in Nicaragua and the Caribbean region.** Although the IT/ITES industry in Nicaragua has been growing in recent years, the demand for talent is far outstripping supply. This subcomponent is designed not only to maintain the number of people working in the IT/ITES industry, but also increase the qualified pool of talent in Nicaragua and the Caribbean region.

18. **This subcomponent will finance the strengthening of IT/ITES skills though the provision of training aiming to increase the number of internationally recognized certified manpower, for areas with significant market potential, and in line with the industry's needs and requirements.** To overcome a fragmented training demand in Nicaragua, this program will consolidate the IT/ITES industry training demands using a two phased approach. During the first phase, implementation will cover four steps: i) identify training demand; ii) group demand by skills to be developed; iii) use different financing mechanisms based on the type of training needed for developing specific skills; and iv) monitor satisfaction related to the effectiveness of the training.

19. **This approach is expected to result in a self-sustaining, and strongly affiliated regional model.** As demand for training and certification within the region becomes more structured, the availability of high quality local providers is expected to grow, thereby increasing competition and reducing prices, creating the necessary foundation to establish a self-sustaining model for the region. To facilitate this process, the proposed Project will provide technical assistance to inform institutional design and establish a sustainability model, building on lessons learned from the first phase, under subcomponent 2A. It will also seek to include strong representation from other Caribbean countries in the governance structure.

20. **This subcomponent is designed to accelerate the growth of the pool of talent suitable to be hired by the IT/ITES industry in the Caribbean region**. It will finance the training and certification of people in IT/ITES related skills to boost regional job creation and become an attractive market for the industry. Trainees are expected to be able to: a) be hired by IT/ITES companies (multinational or local); b) create their own startup; or c) become self-employed or freelances taking advantage of online talent platforms (i.e. marketplaces for contingent work or microwork).

21. **This subcomponent will train and certify people on IT/ITES related skills, linked to businesses needs to ensure a market-driven approach to increase job creation.** This subcomponent is intended to create middle income IT/ITES jobs in the long term in the Caribbean region, including those that require a medium level of education (i.e. Micro Task, Online Freelance, BPO and Animation), and more complex profile jobs , such as ITO and KPO. To this end, an Advisory team, with representatives from the private sector, academia, and ProNicaragua will be created, and consulted regarding: (i) beneficiary eligibility criteria; (ii) the percentage of the cost of the certification, or course to be reimbursed or financed; (iii) communication to potential beneficiaries, including campaigns to attract potential beneficiaries, such as students and the private sector; and (iv) which set of skills to prioritize.

22. **Different set of skills, including technical and generic, have been identified as key for employment in the IT/ITES sector.** The skills development program implemented under this subcomponent will include four sets of competencies identified as value-added and key for the industry: (i) English skills; (ii) soft skills, such as communication, negotiation, and innovation related skills; (iii) specialized training on IT/ITES technologies and methodologies; and (iv) freelancing skills and online talent platform use.

23. *English skills:* **Language proficiency is one of the most important generic skills for employment in the IT/ITES industry.** English language proficiency can open up a range of business opportunities in the IT/ITES sector for Nicaragua. The feedback obtained from the industry has been consistent in identifying English language skills as a distinct area requiring improvement. For bridging the gap of English proficient employees, some IT/ITES companies in Nicaragua are implementing in-house English training for their employees, though internationally recognized certification is not provided. From the supply side, there are several apt English institutions that provide the language courses and offer international recognized certification required by the industry.

24. *Soft Skills:* **Developing soft skills such as negotiation, adequate communication (including neutralization of the accent), or emotional intelligence related skills is also important for increasing employability opportunities in this industry.** The industry in Nicaragua has identified this kind of skill as one of the most important for the development of the industry, but do not offer trainings to employees in this area. From the supply side, several local training institutions offering this kind of skills training have been identified. Moreover, well-known international certification exists for this set of skills.

25. *Technical IT/ITES Skills:* **The global IT/ITES industry recognizes the level of proficiency in specific technical skills through the number of internationally recognized certified employees within a company.** Under this subcomponent, the Project aims to increase the number of people with internationally recognized certification in these skill sets, thus attracting investment and fostering the industry in Nicaragua and the Caribbean region. IT/ITES companies in Nicaragua by themselves are not able to provide this type of course to employees due to the low or inexistent number of local providers.

26. **This subcomponent will finance certification grants (courses and certifications), and training dependent on the set of skills required.** Different modalities of support will be employed for the skills program:

(a) a reimbursement financing modality, which will reimburse the beneficiary a share of the cost of the course, in an institute or provider pre/selected by the Project Coordination Unit (PCU), and/or certification, upon achieving the internationally recognized certification, and having been registered as a potential beneficiary; and

(b) a training financing modality, which will finance a share of the cost of the training. Additionally, in cases where certification is considered extremely valuable, incentives based on the actual number or percentage of certified trainees will be added.

27. **Different modalities are used for different skill requirements**. In principle the reimbursement financing modality will be used for English skills (reimbursements will be given only to those that achieve a minimum pre-established certification); the training financing modality will be used for soft skills; and the training with incentives modality will be used for technical skills. However, TELCOR will have the flexibility to assign different types of training to any of these modalities in coordination with the World Bank.

28. **The process for each of the modalities has been established**. They are as follows:

(a) In the case of **reimbursement**, the process will be as follows:

- The PCU, in consultation with the Advisory team, will establish the eligibility criteria for beneficiaries as well as the cap of total cost to be reimbursed, after receiving quotations from institutions and/ or providers.
- The PCU will publish a request for expressions of interest for providers or institutes to provide courses.
- The PCU will create a list of the certified institutes and providers from those who reply to the request for expressions of interest. The PCU will announce a call for the reimbursement program, with the support of the Advisory team members.

- The PCU will create an initial list of interested individuals (who could be sponsored by their employers), who will need to submit information to verify their eligibility for the reimbursement program.
- The PCU will carry out a verification of the eligibility criteria.
- A final registry of eligible individuals will be created.
- The PCU will give each of the eligible individuals a Guide with information on the period to present the certification (or other criteria established), a list of entities that are eligible to provide the training/ certification, documentation that will be required for the reimbursement, and the percentage and / or maximum amount to be reimbursed.

(b) In the case of **training**, the process will be as follows:

- The PCU, in consultation with the Advisory team, will establish an annual training and certification plan which will include the percentage or total cost to be covered, as well as the eligibility criteria for beneficiaries of the different types of training.
- The PCU will disseminate among potential beneficiaries (university students, IT/ITES companies, etc.) the different courses to be provided, with the support of the members of the Advisory team. The communication will include the list of training, certification, eligibility criteria, and coverage.
- Based on the submissions received, the PCU will create a registry of potential trainees and check whether they meet the eligibility criteria.
- The PCU will sign an agreement with qualifying beneficiaries, establishing the commitment from both parties and including the portion of the cost to be covered by TELCOR and the procedure for the beneficiary to pay for the difference.
- Simultaneously, the PCU will start a process to select a training institution:
    a. The PCU will publish an international call for expressions of interest from qualified training institutions, establishing the type of training and certification required, and detailed information on required documentation and eligibility criteria. In principle, this publication will be done at least once a year, after the annual training plan is approved.
    b. All expressions of interest from training institutions that meet the criteria will be added to a long list of eligible training institutions.
- The PCU will request a quote from those any long-listed training institutions that are eligible to carry out specific training courses. The requested quote will include a price per student and the maximum number of students that can be trained at such price.
- For those training courses where certification is deemed a priority, information on the incentives for certification will also be included in the request for quotes.
- Once the PCU receives the quotes, the training will be assigned to that provider that sent the lowest quote. The PCU will also send a communication to the CTU informing them of the training course, available slots, and vendor information.
- After selecting the training entity, the PCU will receive the counterpart from the beneficiary.

Any adjustments to these processes during implementation (for example, changes in percentages of coverage or determining the need to outsource part of the process due to a high operational burden on the PCU) will be included in the Operational Manual and will require prior approval from the World Bank. Moreover, for both processes, the eligibility criteria, as well as basic

parameters to determine the percentage/amount to be financed out of credit proceeds, will be defined in the Operational Manual, together with the mechanisms/rules to periodically review/approve any changes to such criteria.

29. **The beneficiaries of the activities under this subcomponent will include students, faculty, trainers, industry professionals, and potential recruits for the IT/ITES Industry.** Training and reimbursement beneficiaries will be specifically defined in the Operational Manual, and will include current IT/ITES employees, to upgrade specialization; students, professionals and unemployed individuals who are candidates to join the IT/ITES industry, but need to improve their skills to comply with job profiles; university faculty; and vendors' trainers to improve their capacity. There will be a special emphasis on capacity building for women, with a specific target of percentage of people trained, that will increase throughout the Project until it reaches 40 percent by the end of the Project. To reach such targets, special calls for women will be designed and paired with targeted promotion efforts.

30. **The impact of this subcomponent will be increased by including co-investments of IT/ITES firms and individuals to cover courses and certification cost.** The Operational Manual will include the percentage/amount to be financed by the Project for each type of course and candidate. This subcomponent is expected to provide more than 200 courses to 5,500 people (not all beneficiaries require training, but one person can take more than one course) of which 70 percent are expected to receive internationally recognized certification.

31. **Nicaragua will establish mechanisms to enable access to training and certification for other CARCIP countries, maximizing regional access and participation.** Nicaragua will take the lead in coordinating with the CARCIP communications specialists in the CTU to ensure proper dissemination and access of the courses to all three CARCIP countries. Other CARCIP countries have indicated their intent to identify additional funds to finance similar grants and other incentive programs to encourage participation of local students.

32. **By consolidating and increasing the demand of training courses within CARCIP countries, the availability of high quality local providers should grow within the region, competition should increase, and as a result prices should drop.** Reaching an attractive and continuous flow for training demand will be the ground foundation in designing a sustainable model for agglutinating regional demand, and brokerage of training. The design of such model would be done during year 3 of the Project. Doing the design in year 3 will allow for a better understanding of the size of the continuous training demand that the region can consolidate. The design should seize and leverage the capacity built within the PCU during implementation. CARCIP countries are expected to develop capabilities to identify training demands, bundle demand according to training requirements, and supervise locally and assess impact. Among the activities under this capacity building, the Project will support knowledge exchange with IT/ITES global leaders, under subcomponent 2A.

33. **This subcomponent will also finance development of regionally relevant online courseware aimed at boosting skills related to online outsourcing and innovation.** Online outsourcing is a new trend in Nicaragua and CARCIP countries for which there are no readily available training materials online. Specific training will be developed to cover topics to help individuals: a) understand the various types of online outsourcing marketplaces that exist;

b) identify the types of tasks that they could undertake and how to find their competitive niche; c) improve their profiles and marketing of themselves; d) propose and negotiate with clients; e) ensure quality and timely delivery; f) receive payments; and g) build a long-term relationship with clients. Innovation skills include entrepreneurial, managerial, design thinking, and rapid prototyping skills, among others. Development of original content adapted to the region's needs in this area is important, in particular given the absence of a globally-recognized certification in such skills.

34. **Activities under this subcomponent require a start-up period to set up and test the new facilities, systems, procedures, and processe**s. As the activities under this subcomponent and subcomponent 2B are new in the country, the Project will benefit from a start-up period where the best mechanism for implementing the different activities could be tested.

Regional aspects of Subcomponent 2B:

Regional Spillovers	**How Will They Be Achieved?**
- Increased pool of talent that has the profile required by the industry, helping the region position itself as an attractive destination for the IT/ITES industry. - Innovative approach for reducing costs and increasing variety of IT/ITES training in the region, providing access to specialized courses in countries which are too small to attract high quality training at low prices.	- Through the MOU between TELCOR and the CTU which aims to ensure mechanisms to enable access to relevant IT/ITES industry training and certifications. - Designing a courseware for skills related to online outsourcing and innovation available for the all the CARCIP countries. - Designing the sustainability model for having a mechanism for aggregation of IT/ITES industry skills demand, and brokerage service for the Caribbean beyond the life of the Project.

Subcomponent 2C: ICT Innovation Ecosystem

35. **To boost productivity and realize its economic potential, the region needs to go beyond foreign investment, and use ICTs to foster innovation in the more traditional regional industries (Box 2.1).** With activities that foster ICT adoption and the innovative use of ICTs for solving problems of their traditional industries, the Caribbean can promote entrepreneurship and fight brain drain. This, in turn, can promote the development and growth of the local regional IT/ITES sector, by increasing their client base and multiply their impact. This subcomponent has two activities, both to be implemented by the PCU in TELCOR through contracts with qualified service providers: i) establishing an industry-university collaboration platform; and ii) catalyzing communities of entrepreneurs.

Establishing an Industry-University Collaboration Platform

36. **The first activity under this subcomponent will support the implementation of an industry-university collaboration platform in the Caribbean.** It will link young talent with ICT knowledge to large and small companies to create innovative solutions for the challenges of these businesses. This subcomponent will facilitate the creation or strengthening of innovative

IT/ITES niche startups with regional impact and support the growth of existing IT/ITES SMEs by creating a platform (i) introducing real market problems to be solved with ICT; (ii) creating channels that link them with regional traditional sectors representatives that are willing to innovate and invest in ICT; and (iii) supporting promising ideas to reduce the time for final solutions to reach the market. It is expected that over 100 firms will receive a proposal for an ICT solution for the problem they have presented, and about 350 people will be trained in innovative skills. The specific activities to be financed are (i) small works contracts to rehabilitate two sets of office facilities, one in Managua and another in Bluefields (which will be provided by universities[33]), including supplying them with telecommunications links; (ii) small goods contracts to equip these facilities with furniture, computers, and other equipment; (iii) consultancy contracts for training and technical assistance, including facilitators for these centers and other skills for users; and (iv) contracts with specialized providers to adapt and operate successful models from other countries of open innovation systems.

37. **The development of the platform will draw on previous experiences, including on open innovation ecosystem developments in Chile, Colombia and Lebanon.** Some of these platforms enable multidisciplinary teams, including SME or students from multiple universities and backgrounds, to work on finding solutions for problems provided by the private sector. To promote entrepreneurship, students can retain the intellectual property rights of the developed solution to obtain earnings from license fees, or by further developing the intellectual property rights asset in an ICT startup. Several universities have already expressed an interest in participating in the platform, and one university in Managua and one in the Caribbean coast have already indicated their interest in hosting and coordinating the activities to activate the Platform.

38. **As a lesson learned from the CARCIP First Phase Project, the pipeline of potential entrepreneurs is not large enough for the incubators that are being set up in other CARCIP countries.** CARCIP Nicaragua will create a model and a pipeline of young talent and entrepreneurs for the incubators that are already being set up in other countries in the Caribbean under the CARCIP First Phase Project. Creating this university-industry platform with the spirit of expanding it as a regional platform will strengthen linkages with existing regional efforts to foster innovation and entrepreneurship. This will catalyze and facilitate links between challenges with a regional dimension and existing skills in universities, thus creating business opportunities for university students and companies going beyond Nicaragua, promoting the creation of jobs in the long term, and a spirit of entrepreneurship. Furthermore, this Component will look at leveraging regional funding vehicles and incubators, like those being set up in other CARCIP countries or the incubator being planned in Jamaica with the support of the World Bank under the "Youth Employment in the Digital and Animation Industries Project".

Catalyzing communities of entrepreneurs

39. **To go beyond the industry- university platform, and reach people outside of academia, this subcomponent will promote the innovation ecosystem with activities such as targeted skills development, connecting stakeholders, and community building or open innovation events.** In addition, to reduce initial setup cost for entrepreneurs and engage their participation in the innovation ecosystem, the subcomponent will help strengthen open collaboration spaces.

[33] One University in Managua and one in Bluefields have already expressed interest in hosting the platform.

Existing spaces in Managua and Bluefields will be equipped as co-working spaces, and support will be given to develop activities to create an active regional open innovation community, such as challenges based on regional societal or industry problems, skills development, connecting stakeholders, and community building or open innovation events. For these, the subcomponent will finance: (i) repurposing of existing physical spaces into open collaboration spaces for connecting key stakeholders; (ii) consultancy contracts for training and technical assistance, including facilitators for these centers and other skills for users; (iii) consultant contracts for specialized open innovation events. Entrepreneur communities from different CARCIP countries will be involved in the process, including through joint events.

Box 2.1: Open Innovation Ecosystems and Open Innovation

Open Innovation Ecosystems: The concept of "innovation ecosystem" is used to describe the interaction between the main innovation actors that contribute to enhance competitiveness and generate growth and employment. In the context of the knowledge economy, beyond researchers, university faculty and industries; public administration, entrepreneurs, developers and investors are also considered important actors of the innovation ecosystem. Innovation ecosystems grow continuously with the increase of skilled persons capable of creating innovative products and solutions.

Open Innovation: Henry Chesborough defines Open Innovation as 'a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as firms look to advance their technology". This same concept can be translated to the way a government interacts with its citizens. For open innovation ecosystems, emphasis is placed on instruments such as Open Innovation Platforms, used to catalyze collaboration and spur innovation activities between public and private actors. In order to do so, community creation and community support activities to create awareness are crucial. These lead to new investments and new firms, as well as to the co-creation of new ideas, technologies, products and services.

40. **This subcomponent will also support knowledge exchanges.** These will take place in particular with entrepreneurs' communities from other CARCIP countries, and joint capacity building for both entrepreneurs in Nicaragua and other CARCIP countries, to support regional integration efforts towards a common approach to building innovation ecosystems. These activities will allow traditional Regional industries to benefit from new solutions to some of their common issues and will also open new work possibilities for regional ICT firms.

41. **A regional approach is needed to overcome limited local capacity of research and development infrastructure (physical and human) in participating countries, as well as to have access to enough ICT suppliers and buyers** that could make this a sustainable and successful investment. Regional spill-overs will be maximized by focusing problem solution and ICT-diffusion in sectors relevant to CARCIP countries, creating new markets for small ICT firms. These activities will allow traditional Regional industries to benefit from new solutions to some of their common issues and will also open new work possibilities for regional ICT firms.

42. **The funds will be used to:**

(a) Develop an Open Innovation Platform to connect Universities, and Private Sector around productive collaborations to tackle specific problems, by creating innovative ICT-based products and services;
(b) Support the development of the most successful prototypes resulting from the Co-creation Competitions and from the Open Innovation Platform, and connect identified talent to existing Entrepreneurship support programs;
(c) Equip spaces to facilitate the roll out of the Platform and facilitate co-working, and develop activities to create an active open innovation community.

Regional aspects of Subcomponent 2C:

Regional Spillovers	**How Will These Be Achieved?**
- Increased ICT diffusion (productive use of ICTs). Traditional regional industries will benefit from new solutions to some of their common issues. - Native regional IT-ITES industry will be strengthened. - Model developed and prototyped to build an open innovation ecosystem, that can later be scaled to other countries in the region.	- Establishing an alliance between the industry and the university (university-industry platform) to tackle real problems of traditional regional industries, and catalyzing local communities of entrepreneurs.

Component 3: Project Implementation Support (US$2.6 million, of which US$0.7 million financed by national IDA, US$1.3 million by regional IDA, and US$0.6 million provided by the Borrower)

43. **The objective of this Component is to provide resources for Project implementation through a Project Coordination Unit (PCU).** It will also support oversight arrangements and capacity building for key policy and regulatory institutions. The Component provides support for: (a) the implementation, monitoring and evaluation of the Project's activities, including: (i) carrying out of Project audits; (ii) the design and implementation of strategies and other dissemination tools to inform Project stakeholders on the progress achieved during Project implementation; and (iii) carrying out impact evaluation surveys to evaluate the Project impacts; and (b) carrying out capacity building activities for the benefit of relevant policy and regulatory institutions, including relevant knowledge exchanges. Under the CARCIP First Phase Project, the CTU received a grant to supervise regional policies and coordinate capacity building events at the regional level. As Nicaragua is entering the program in a second phase, the CTU has agreed to include Nicaragua in these activities, but as the regional grant covered the travel and accommodation expenses for the other CARCIP countries, Nicaragua will join at its own expense which will be covered under this Component.

44. **This Component will support the following activities:**

(a) Operating Costs of core Project implementation staff, such as the Project Director, a Procurement Specialist, a Financial Management Specialist, a Project Accountant, a Connectivity Infrastructure Specialist, an IT/ITES Industry specialist, and an Innovation Specialist to support Project preparation and subsequent implementation.

(b) Capacity building activities for strengthening the skills of the PCU, especially those regarding procurement and financial management.
(c) Logistic support for PCU as needed (office equipment, operating costs, audits, and communication support among others).
(d) Monitoring and Evaluation consultant and surveys to support indicator data collection for the various Components.
(e) Expenses to cover the participation in the Caribbean Regional Coordination Policy events and regional capacity building activities held by the CTU.

Regional aspects of Component 3:

Regional Spillovers	**How Will They Be Achieved?**
- Joint institutional capacity building with other CARCIP countries. - Regional harmonized Policies for the IT-ITES industry in the whole region.	- Through the participation in specific capacity building activities for CARCIP countries. - Through the participation in active discussions with other CARCIP countries to ensure the harmonization of IT/ITES regulatory policies.

Annex 3: Implementation Arrangements
NICARAGUA: Caribbean Regional Communications Infrastructure Program – Nicaragua Project

I. Project Institutional and Implementation Arrangements

1. **The PCU within TELCOR was created for the Rural Telecom Project (P089989) that closed in June 2015, and has been maintained for Project preparation and future implementation.** The PCU is the entity responsible for overseeing the day-to-day execution of Project activities. The PCU Director, the Head Engineer for the Infrastructure Component, and the procurement and financial management specialists have been maintained by TELCOR during project preparation and will be rehired for the PCU prior to Project effectiveness.

2. **The PCU will be responsible for the implementation of all Components financed by the Project, receiving the support of other stakeholders such as ProNicaragua for the implementation of the activities related to the promotion of the IT/ITES industry.** Although the PCU has no experience in implementing activities under Component 2, it has successfully implemented the previous World Bank-financed project. To address this lack of experience, the PCU will be reinforced with six specific specialized positions needed for this Project, and in total the PCU will comprise 10 dedicated staff, including a Project Director, technical specialists for telecoms infrastructure, IT/ITES skills specialist, innovation specialist, business environment specialist, and qualified procurement and financial management staff. The Project Director will report directly to the Director General of TELCOR. The Director, the infrastructure specialist, an accountant, and a procurement specialist from the previous World Bank-financed project have been retained by TELCOR. The remaining staff are being hired competitively within 2 months of effectiveness. In case of insufficient capacity for collecting data, TELCOR will recruit or designate a person responsible for monitoring and evaluation, based on regular capacity assessments. In addition, TELCOR will support the PCU as needed, since TELCOR has built-in house expertise in several relevant areas, such as social and environmental safeguards. The Project will be implemented in accordance with the Project Operational Manuel, acceptable to the World Bank.

3. **The PCU is responsible for environmental and social management, for which it has built capacity over the last few years working on the Rural Telecom Project, and it will also be able to rely on experienced TELCOR staff.** The instrument developed for compliance with environmental and social safeguard during project implementation is the ESMM, which includes the following instruments: a) Environmental Management Framework (EMF); b) Resettlement Policy Framework (RPF); and c) Indigenous Peoples Planning Framework (IPPF). The Technical Safeguard Team of the PCU will apply these instruments during the Project implementation.

(i) Project Administration Mechanisms

4. **The Project Director will be responsible for the effective and flexible coordination, management, and implementation of the Project.** He/She will report directly to the General Director of TELCOR and will liaise effectively with selected Caribbean and the Nicaraguan focal points, and with all public and private stakeholders involved in the implementation of the

Project.

5. **The already established PCU under TELCOR will be in charge of the day-to-day management of the Project technical and logistical aspects, including the work program and coordinating with the relevant ministries and departments, procurement, financial management and monitoring and evaluation.** As this new Project is more complex than the preceding one, including the skills and innovation subcomponents that are new for Nicaragua, the capacity of the PCU will be increased under the Project to accommodate the additional work to be undertaken. The PCU will coordinate, at the regional level, with the CTU. Specialists will interact with TELCOR's current structures and further details will be included in the Operational Manual.

(ii) Subsidiary Agreement

6. **To facilitate the carrying out of the Project,** a Subsidiary Agreement will be duly authorized or ratified by the Recipient and TELCOR and will be legally binding upon the Recipient and TELCOR in accordance with its terms. The signing of said Agreement is an Effectiveness Condition.

(iii) Memorandum of Understanding (MOU)

7. **Nicaragua has signed a MOU with the CTU to facilitate the participation of the Nicaraguan officials in the Regional Coordination policy events and the Regional capacity building activities.** The MOU was signed in March 2016.

8. **TELCOR will also sign an MOU with ProNicaragua**. Although ProNicaragua will not execute any funds, it will benefit from the activities related to the promotion of the Nicaraguan and regional IT/ITES industry and the attraction of FDI to Nicaragua and the region envisaged in the Project. TELCOR is working on a draft MOU that it is expected to be shared with ProNicaragua by July 2016.

II. Financial Management, Disbursements and Procurement

(a) Financial Management and Disbursements

9. **The World Bank carried out a financial management capacity assessment of TELCOR as the implementing agency for the CARCIP Nicaragua Project.**[34] TELCOR is the telecommunications and postal services regulator created by Decree No. 1053 of June 5, 1982, as an indefinite decentralized entity with its own legal status, assets, budget and full capacity to acquire rights and obligations. As such, TELCOR is a well-established entity, with a solid and experienced Finance and Administrative team that has developed experience with World Bank-financed projects. Project implementation will benefit from TELCOR's existing financial management arrangements, strengthening them as needed to respond to Project specific features. The financial management arrangements will be outlined in the Operational Manual.

[34] The Financial Management Assessment was carried out in accordance with OP/BP 10.00 and the Financial Management Manual for World Bank-Financed Investment Operations updated on 2014

10. **Based on the capacity assessment, Project features and TELCOR's capacity and experience, fiduciary risk is considered moderate**. Key strengths of TELCOR's financial management systems and risk factors include: (i) TELCOR is an experienced entity with qualified staff to support project execution. The existing PCU staff reports directly to TELCOR's General Director, allowing for a more streamlined decision making process. Such experience involves familiarity with World Bank requirements through the recently closed Rural Telecom Project , the financial management performance for which was rated as Moderately Satisfactory; ii) basic budgeting, accounting, reporting, recording and filing arrangements are in place. The entity uses the Governmental Integrated Financial Management System (SIGFA), considered to be reliable automated financial system to support budgeting execution processes and provision of financial reports; (iii) the Project does not require complex or decentralized financial management arrangements. However, it is larger in size than the previous Project implemented by the same PCU, and involves the financing of IT/ITES training and certification through completely new approaches, including grants. This will significantly increase the number of contracts and transactions managed by TELCOR and will require the design, implementation and maintenance of specific procedures. As mitigating measures, it should be remarked that TELCOR existing fiduciary team (Financial Management Specialist and Accountant) will be strengthened with two additional support staff financed by Government counterpart, and the existing staff will be re-hired to be financed with project proceeds prior to effectiveness. As implementation advances, it will be critical to assess performance of subcomponent 2B to identify the need of any adjustment either in the financing model or agreed procedures. The detailed procedures, rules and responsibilities related to financial management will be outlined in the Operational Manual.

11. **The financial management arrangements as designed are considered acceptable to the World Bank, subject to the finalization of the Operational Manual.** The Operational Manual will outline the agreed financial management arrangements, including eligibility criteria for the selection of training beneficiaries, financing percentages under different modalities, and clear roles and responsibilities for different units within TELCOR. It also defines the property arrangements for goods to be financed under subcomponent 2C. Once the Project becomes effective, the PCU will have to carry out the following tasks: i) re-hiring of the Financial Management Specialist and Accountant and contracting of additional support staff (Financial and an Administrative Assistants) for the PCU; and ii) selection and contracting of external auditors six month after effectiveness. The following sections provide a summary of the specific financial management arrangements.

12. *Organization and staffing*: **The PCU currently has an administrative and finance team that includes a Financial Management Specialist and an Accounting Analyst, both with qualifications and experience in World Bank-financed operations, and who will be financed with Credit proceeds**. This team is responsible for budgeting, accounting, disbursements, financial reporting, and auditing. Some functions, such as annual budget registration and payment approval, have to be coordinated with TELCOR's Finance Directorate as described below. Roles and responsibilities in TELCOR's financial management team are, nonetheless, well defined. Taking into account that the Project is not only larger in size but also in type of activities, the financial management team will be strengthened with a Financial Assistant and an

Administrative Assistant to be financed with local counterpart. Terms of reference of these positions will be included in the Operational Manual.

13. *Planning and budgeting*: **Between August and September of each year, TELCOR prepares its tentative investment program for the upcoming year (including the investment program for the proposed project) and submits it to the Ministry of Finance for review and approval.** No special considerations will be required for the budget registration of most Project transactions. However, TELCOR needs to confirm the treatment of counterpart funding to be provided by individuals and sponsoring enterprises under the IT/ITES training. The PCU will coordinate with TELCOR's Finance Directorate for budgetary processes when incorporating the Project budget into the institutional budget.

14. *Accounting policies and procedures, information system and financial reporting*: **As a public sector entity, the PCU keeps all its budgeting and accounting records in the Governmental Integrated Financial Management System (SIGFA).** Thus, its budget execution is subject to internal controls and approvals built in the system. For project purposes, and similar to the previous project, the PCU will complement SIGFA with a module within SIGFA developed to register, verify, control and prepare financial statements and financial reports on the cash-basis of accounting for externally financed projects. Payments processed in SIGFA will be recorded in the module classifying expenditures by Project component and cost category. The PCU keeps adequate records for budget execution and financial transactions. Specific accounting policies and procedures are being designed for the recording, control and reporting of counterpart contributions paid by training beneficiaries under subcomponent 2B.

15. *Project Financial Reporting*: **The PCU will be responsible for preparing financial information on a semi-annual basis and submit Unaudited Interim Financial Reports to the World Bank.** These will include: i) sources and uses of funds, reconciling items (as needed), and cash balances, with expenditures classified by Project Component/subcomponent, including all sources of financing (credit proceeds, TELCOR's counterpart and counterpart contributions paid by training beneficiaries); ii) a statement of investments reporting the current semester and the accumulated operations against ongoing plans, as well as footnotes explaining the important variances; and iii) a reconciliation of the Designated Account. The reports will be prepared in local currency and US dollars and issued directly from SIGFA. While the content has been defined, the specific format, especially as it relates to the recording and reporting of counterpart contributions, will be reviewed and approved during negotiations. The Unaudited Interim Financial Reports will be submitted no later than 45 days after the end of each semester for the World Bank's review. On an annual basis, the PCU will also prepare Project financial statements, including cumulative figures, for the year and as of the end of the fiscal year (December 31). All documentation for consolidated Statements of Expenditure will be maintained for post review and audit purposes for up to three years after the closing date of the Project, or for 18 months after receipt by the World Bank of an acceptable final financial audit, whichever is the later.

16. *Processes and Procedures (including internal controls):* **The PCU's internal processes and procedures are in general adequate.** They provide for an adequate segregation of duties, and clear responsibilities for the financial reporting, contract management and approval of

payments. TELCOR is obliged to comply with local requirements related to administrative and control systems (Law 550 of Financial Administration and Budgeting), which are mainly integrated into the operation of SIGFA, as they relate to budget preparation and execution. An Operational Manual of the Project is being prepared by TELCOR detailing the financial management procedures including budgeting, accounting, payments, support documentation, accounts reconciliation and financial reporting.

17. *Specific procedures for the financing of IT/ITES training and certification*: **As described in Annex 2, based on the training needs identified and the peculiarities of the IT/ITES industry, two financing modalities have been defined for the implementation of the skills and training Program.** These include: i) a reimbursement modality for English training and internationally recognized certification, with reimbursement to the beneficiary of a share of the cost of the course in an institute or preselected provider, and certification, upon presentation of the achieved certification; and ii) a training financing modality, for soft and technical skills, through which the Project will finance a share of the cost of the training services provided by competitively selected training providers. The contract with training providers could include the payment of an incentive based on achieving certain targets of certified trainees only in cased where certifications is considered extremely valuable (e.g. specialized technical skills). Following the overall process described in Annex 2, the Operational Manual will also include detailed flowcharts for different procedures required for the implementation of each of the above mentioned financing modalities. Those detailed procedures clearly identify: i) roles and responsibilities of different instances involved within TELCOR as well as for other participating entities (e.g. ProNicaragua); ii) authorization and approval levels throughout the process; iii) documentation requirements; iv) eligibility criteria for the selection of beneficiaries; and v) specific documentation requirements for payment purposes. TELCOR will prepare simplified guidelines/instructions for training beneficiaries and/or sponsoring companies laying out basic obligations, counterpart funding and supporting documents required, especially under the reimbursement modality.

18. *Internal audit*: **TELCOR has in place an Internal Audit Department.** The financial documentation of this Project will be included in its internal audit plan. If that review occurs, internal audit reports will be made available to the World Bank as requested.

19. *External Audit*: **An external, independent, private audit firm, acceptable to the World Bank under defined terms of reference will be contracted by TELCOR for the entire life of the Project no later than six months after effectiveness to audit Project financial statements.** The audit firm will review and provide an opinion on the Annual Financial Statements, covering the fiscal year (which coincides with the calendar year). The audited financial statements shall be presented to the World Bank no later than six months after the end of the fiscal period. Terms of reference and a short list will be approved by the World Bank and selection will follow the World Bank's consultant guidelines. In accordance with the World Bank's Access to Information policy, the audited financial statements will be made publicly available by TELCOR and the World Bank, as established by the Financing Agreement. Specific audit requirements are specified in Table 3.1.

Table 3.1: Audit Requirements and Timetable

Audit type	Due date
Project financial statements	June 30
Special Opinions – Statements of Expenditures	June 30
Management Letter	June 30

20. *Flow of funds*: **Similar to previous project, the following disbursement methods will be used: advances, direct payment and reimbursements.** A Designated Account will be opened in the Central Bank of Nicaragua. Advances made to the Designated Account will follow procedures established in the respective Disbursement Letter. Funds deposited in the Designated Account will be transferred to a "Cuenta Operativa" for payments in local currency (Cordobas) following local standard procedures. Advances made to the Designated Account will be documented through the use of Statements of Expenditures and supporting documents defined in the Disbursement Letter. Statements of Expenditure will be prepared in excel spreadsheets based in the SIGFA records. A customized Statement of Expenditure will be designed for reporting on amounts reimbursed to eligible beneficiaries for recognized English learning course and certifications (Category 3). Internal controls, including reconciling mechanisms, are in place to secure consistency of the information. Retroactive financing will be allowed up to an aggregate amount not to exceed US$200,000 for payments made within one year prior to the signing of the Financing Agreement, expected to be in September 2016, for covering expenditures under Component 3. The ceiling for advances to be made into the Designated Account will be defined in the Disbursement Letter. Documentation of eligible expenditures paid out of the Designated Account is expected to be on a quarterly basis. The supporting documentation requirements to document Project expenditures (the Statements of Expenditure and customized Statement of Expenditures forms), as well as the minimum value for direct payments and reimbursements will be defined in the Disbursement Letter, respectively.

21. *Counterpart funding*: **Counterpart funding provided by TELCOR for operating costs will be managed by TELCOR PCU in a specific bank account.** Contributions made by beneficiaries and/or sponsoring companies under the skills and training Program will be deposited in a separate and exclusive bank account opened and maintained by the TELCOR PCU, from where payments will be made to training providers following the respective financing percentages that will be defined in the Operational Manual. TELCOR will open and maintain a bank account in US dollars for counterpart funding as in most cases, training fees would need to be paid in US dollars.

22. *Payments made under the skills and training Program*: **These payments will be made as follows:** i) reimbursement payments for English learning courses will be made to each beneficiary from the credit bank account upon submission of the supporting documents (e.g. invoices of the training in an institute or provider pre-selected by TELCOR and certification costs, if any) and evidence of the achievement of international certification; and ii) payments under the training financing modality for soft and technical skills learning courses will be made directly to training providers from credit and counterpart bank accounts in the respective percentage upon receiving the invoice detailing participants, cost and evidence of certification, where applicable. Financing percentages and caps under both modalities, and documentation requirements will be detailed in the Operational Manual.

(b) Procurement

23. **Procurement for the CARCIP Nicaragua will be carried out in accordance with World Bank's Guidelines.** Procurement for the CARCIP Nicaragua Project will be carried out in accordance with the World Bank "Guidelines: Procurement of Goods, Works and Non-consulting Services Under International Bank for Reconstruction and Development Loans And IDA Credits & Grants By World Bank Borrowers" dated January 2011, Revised July 2014; Guidelines and "Guidelines: Selection and Employment of Consultants under International Bank for Reconstruction and Development Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011, Revised July 2014, and the IDA Anticorruption Guidelines dated October 15, 2006, Revised in January 2011, and as amended through October 15, 2006, in addition to the provisions stipulated in the Grant and Legal Agreements. The implementation of all procurement activities financed under the Credit will be managed by the PCU at TELCOR.

24. *Anti-Corruption Measures:* **The World Bank will maintain customary oversight and conduct prior review, as per the thresholds agreed and adjusted as needed in the Procurement Plan.** Additionally, the World Bank's Anti-Corruption Guidelines will apply to this proposed Project. Examples of anti-corruption measures included under the Project are:

- Training of fiduciary staff
- Prior Review on high value and/or risk contracts
- Procurement Post Reviews and Independent Procurement Reviews
- Guaranteed publication of advertisements and contract information
- Follow Up on debarred firms and individuals
- Handling of complaints
- Ensuring proper experience and qualification of members of Evaluation Committees
- Monitoring of contract awards
- Monitoring of payments
- Other additional measures

25. **The Project will finance works, goods, PPPs, consultant services and training services, as follows:**

a) ***Works*** to be financed under the Credit will include small rehabilitation and modernization works to improve office facilities, and other eligible minor works;

b) ***Goods*** to be financed under this Project will include equipment needed to implement broadband connectivity services; wireless equipment; IT, communication and office equipment; computers; vehicles; office furniture; etc.;

c) ***Public Private Partnerships*** for the Connectivity Infrastructure development and installation will be conducted on the Build, Own and Operate modality, open for international bid operators complying with the connectivity via International Competitive Bidding and based on a competitive "least cost" subsidy, with the Government contributing a share of the cost, and the private Operator, the rest;

d) ***Consultants Services*** to be financed under the Project would include feasibility and design studies, advisory services in fields related to the improvement of broadband connectivity, legal and other advisory and Project implementation related services. These services will be rendered either by firms or individuals, as indicated in the Procurement Plan; and

e) ***Training Services*** to be delivered by Training Providers for soft skills and IT/ITES. The procedure for the selection of Training Providers will be the following: (i) TELCOR will carry out International Public Requests for Information, on which basis it will prepare a long list of Training Providers meeting the requirements specified in such requests, and they will be classified by type of services (the long list may be refreshed from time to time); and (ii) TELCOR will require quotations from the qualified Training Providers, with selection made on the basis of the lowest quotation submitted. For training of technical and other highly specialized skills, incentives for certification (carried out by independent institutions) will be provided. This procedure will be described in detail in the Operational Manual and in a manner acceptable to the World Bank.

26. *Bidding and Selection Documents*. **The above mentioned goods and services will be procured using World Bank's Request for Proposals, standard bidding documents or bidding and quotation documents for goods, works and non-consultants services agreed with -- and satisfactory to -- the World Bank**, within the currently defined thresholds for Nicaragua.

27. *Operating Costs*. **Operating costs means the incremental reasonable costs which would not have been incurred by the PCU absent the Project, on account of Project administration, implementation, monitoring and supervision**, including vehicle operation and maintenance, communication and insurance costs, banking charges, office rental expenses, freight charges, office equipment, utilities, printing, non-durable goods, and travel costs (but excluding consultants' services, non-consulting services and salaries of officials of the Recipient's civil service).

28. *Training.* **The Project will finance a large number of training courses,** including travel costs and per diems of trainers and trainees, and training logistics such as hotel services, catering, travel services, and the rental of training facilities and equipment and training materials.

29. *Project Operational Manual*. **All procurement procedures agreed with the World Bank will be described in the Operational Manual, which includes samples for bid evaluation reports and other necessary guidance.**

Thresholds per Procurement Method and for World Bank's Prior Review

A. Civil Works

A1. Per Method, values in US Dollars

ICB	NCB [(a)]	Simplified NCB[(b)]	Shopping
>5,000,000	≤5,000,000 and >1,500,000	≤1,500,000 and >50,000	≤50,000

Notes:

(a) 30 calendar days from publication of special procurement notice to bid submission date, bidding document must be previously approved by the World Bank.

(b) 20 calendar days from publication of special procurement notice to bid submission date, bidding document must be previously approved by the World Bank.

A2. World Bank's Prior Review

(i) All World Bank-financed contracts must be included in a Procurement Plan approved by the Association before being implemented.
(ii) All contracts with values > US$5,000,000 and the first contract of each National Competitive Bidding (NCB) method. The rest will be subject to post review, except otherwise identified in the Procurement Plan.
(iii) All direct contracts with values ≤ US$50,000 shall be subject to post review, except otherwise identified in the Procurement Plan.

B. Goods, Non-Consultant Services and Information Systems

B1. Per Method, values in US Dollars

ICB	NCB [(a)]	Simplified NCB[(b)]	Shopping
>500,000	≤500,000 and >100,000	≤100,000 and >30,000	≤30,000

Notes:
(a) 30 calendar days from publication of special procurement notice to bid submission date, bidding document must be previously approved by the World Bank.
(b) 20 calendar days from publication of special procurement notice to bid submission date, bidding document must be previously approved by the World Bank.

B2. World Bank's Prior Review

(i) All World Bank-financed contracts must be included in a Procurement Plan approved by the Association before being implemented.
(ii) All contracts with values > US$500,000 and the first contract of each NCB method. The rest will be subject to post review, except otherwise identified in the Procurement Plan.
(iii) All direct contracts with values ≤ US$10,000 shall be subject to post review, except otherwise identified in the Procurement Plan.

C. Consultants Services

(i) All World Bank-financed contracts must be included in a Procurement Plan approved by the World Bank before being implemented.
(ii) All contracts with firms with values ≤ US$200,000, shall be subject to post review, except those dedicated to strategic or with high risk activities.
(iii) Contracts with individual consultants with values ≤ US$100,000, shall be subject to post review, except those dedicated to strategic or with high risk activities.
(iv) Short lists for contracts with values ≤ US$300,000, may be formed entirely by national firms.

PROCUREMENT SPECIAL PROVISION AND PROCUREMENT PLAN

30. **In addition and without limitation to any other provisions set forth in this Section, the Procurement Guidelines or the Consultant Guidelines, the following principles of procurement shall expressly govern all procurement of works, goods, non-consulting services or consultants' services, as the case may be:**

(a) Foreign bidders shall not be required to be registered with local authorities as a prerequisite for bidding.
(b) No bids shall be rejected, and no provisional awards shall be made at the time of bid opening.
(c) The invitation to bid shall not establish, for purposes of acceptance of bids, minimum or maximum amounts for the contract prices.
(d) The invitation to bid shall not publish the estimated cost of the contract.
(e) In the case of Shopping, a minimum of three quotations shall be obtained as a condition to award the contract.
(f) Unless the Association may otherwise agree, for the procurement of goods and non-consultant services, the "best offer" shall be the one submitted by the Bidder whose offer was determined to be the lowest evaluated bid and was found substantially responsive to the Bidding Document, provided further that the Bidder was determined to be qualified to perform the Contract satisfactorily.
(g) Bidders and Consultants shall not be allowed to review or make copies of other bidder's bids or consultants' proposals, as the case may be. Likewise, bidders' and consultants' responses to requests of clarifications made by the procuring entity during the bidding process shall not be disclosed to other bidders or consultants, as the case may be. Finally, reports including recommendations for award shall not be shared with bidders and consultants prior to their publication.
(h) Eligibility criteria shall be the one defined in Section I of the Procurement and Consultant Guidelines. Articles 17 and 18 of Law 737 shall not apply.
(i) Automatic rejection of bids or proposals, as the case may be, due to differences between bid or proposal prices and cost estimates being higher than predetermined percentages, shall not be allowed.
(j) Bidders shall have the possibility of procuring hard copies of bidding documents even if they are published on the procurement portal.
(k) Unless so indicated in the applicable World Bank Standard Bidding Documents, pre-bid conferences shall not be conducted.
(1) Bid preparation terms shall not be reduced as a result of re-bidding.
(m) Consultants shall not be requested to submit bid and performance securities.
(n) Complaints shall be handled as indicated in the appendixes to the Procurement and Consultant Guidelines. Articles 110 to 116 of Law 737 shall apply in a subsidiary manner.
(o) Procurement plans shall be processed through any system required by the World Bank, for example Procurement Plan Execution System.
(p) SISCAE publication requirements will be followed. The Recipient, shall: (i) supply SEPA with the information contained in the initial Procurement Plan within 30 days after the Project has been approved by the Association; and (ii) update the Procurement Plan at least every three months, or as required by the Association, to reflect the actual Project implementation needs and progress and shall supply SEPA with the information contained in the updated Procurement Plan immediately thereafter.
(q) Invitations to bid, bidding documents, minutes of bid opening, requests for expressions of interest and the pertinent summary of the evaluation reports of bids and proposals of all goods, works, non-consulting and consultants' services shall be published in SISCAE, and in a manner acceptable to the Association. The bidding period shall be counted from the date of publication of the invitation to bid or the date of the availability of the bidding documents, whichever is

later, to the date of bid opening, and proposals of all goods, works, non-consulting and consultants' services shall be published in SISCAE, and in a manner acceptable to the Association. The bidding period shall be counted from the date of publication of the invitation to bid or the date of the availability of the bidding documents, whichever is later, to the date of bid opening.

Summary of the Procurement Plan

Goods & Non Consultants Contracts:

Item	Component	Description	Estimated Cost (US$)	Procurement Method	Type of Review	Contract Start	Contract End
1	1	Contratación de servicios para despliege de infraestructura de banda ancha (Lote 1.- fibra óptica - Lote 2.- usuario última milla, redes locales)	$3,802,082.49	LPI	PREVIA	1-Jun-17	30-May-18
2	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	PREVIA	1-Mar-17	30-Jun-17
3	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	PREVIA	1-Mar-17	30-Jun-17
4	3	Compara de medios de transporte (vehículos)	$160,000.00	LPN	PREVIA	10-Apr-17	31-Jul-17
5	2C/3	Adquisición de equipos de cómputo (computadoras, baterías), software (Microsoft Office, mapeo), equipo multifuncional (copiadora, impresora, escaner), sistema de video conferencias, impresora plotter	$165,000.00	LPN	PREVIA	10-Apr-17	31-Jul-17
6	3	Adquisición de mobiliario de oficina	$40,000.00	LPNS	PREVIA	2-May-17	31-Aug-17
7	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	3-Apr-17	30-Jun-17
8	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	3-Apr-17	30-Jun-17
9	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	3-Apr-17	30-Jun-17

10	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	3-Apr-17	30-Jun-17
11	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	3-Apr-17	30-Jun-17
12	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-May-17	31-Jul-17
13	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-May-17	31-Jul-17
14	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-May-17	31-Jul-17
15	1/2B/3	Compra de boletos áreos nacionales e internacionales 2017	$30,000.00	CP	POSTERIOR	24-Apr-17	21-Oct-17
16	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Jun-17	31-Aug-17
17	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Jun-17	31-Aug-17
18	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Jun-17	31-Aug-17
19	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Jun-17	31-Aug-17
20	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Jun-17	31-Aug-17
21	2C	Acondicionamiento de locales para espacio de co-working (no obras civiles)	$60,000.00	LPNS	POSTERIOR	4-Jul-17	9-Oct-17

22	1	Contratación de servicios para despliege de infraestructura de telecomunicaciones (tecnología 4G)	$2,486,400.00	LPI	PREVIA	28-Jul-17	28-Jul-18
23	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	3-Jul-17	30-Sep-17
24	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	3-Jul-17	30-Sep-17
25	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	3-Jul-17	30-Sep-17
26	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Aug-17	31-Oct-17
27	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Aug-17	31-Oct-17
28	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Aug-17	31-Oct-17
29	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Aug-17	31-Oct-17
30	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Aug-17	31-Oct-17
31	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	31-Aug-17	30-Nov-17
32	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	31-Aug-17	30-Nov-17

33	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	31-Aug-17	30-Nov-17
34	2C	Arriendo de equipos de cómputos para innovación abierta y espacio de co-working	$40,000.00	LPNS	POSTERIOR	3-Oct-17	31-Dec-17
35	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Oct-17	31-Dec-17
36	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Oct-17	31-Dec-17
37	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Oct-17	31-Dec-17
38	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Oct-17	31-Dec-17
39	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Oct-17	31-Dec-17
40	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Nov-17	31-Jun-2018
41	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Nov-17	31-Jun-2018
42	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Nov-17	31-Jun-2018
43	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Nov-17	31-Jun-2018

44	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Nov-17	31-Jun-2018
45	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Mar-18	31-May-18
46	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Mar-18	31-May-18
47	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Mar-18	31-May-18
48	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Mar-18	31-May-18
49	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Mar-18	31-May-18
50	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	1-Mar-18	31-May-18
51	1/2C/3	Compra de boletos áreos nacionales e internacionales 2018	$30,000.00	CP	POSTERIOR	5-Feb-18	4-Aug-18
52	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-May-18	31-Jul-18
53	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-May-18	31-Jul-18
54	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-May-18	31-Jul-18
55	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-May-18	31-Jul-18

56	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-May-18	31-Jul-18
57	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-May-18	31-Jul-18
58	2A	Contratación de empresa para montaje de Evento Regional CANS (ProNicaragua)	$55,000.00	LPNS	POSTERIOR	3-Apr-18	30-Sep-18
59	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Jul-18	30-Sep-18
60	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Jul-18	30-Sep-18
61	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Jul-18	30-Sep-18
62	2B	Contratación de servicio de entrenamiento en habilidades técnicas y certificación (17 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Jul-18	30-Sep-18
63	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Jul-18	30-Sep-18
64	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Jul-18	30-Sep-18
65	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Jul-18	30-Sep-18
66	2B	Contratación de servicio de entrenamiento en habilidades blandas (28 personas)	$28,900.00	Comparación de precios	POSTERIOR	2-Jul-18	30-Sep-18
		TOTAL	**$8,486,882.49**				

Consultants Contracts with firms

Item	Component	Description	Estimated Cost (US$)	Selection Method	Type of Review	Contract Start Date	Contract End Date
1	2C	Contratación de firma consultora para desarrollo de metodología de trabajo para actividad de innovación abierta y bottom up innovation (1 año)	$60,000.00	SBCC	PREVIA	1-Dec-17	31-Mar-17
2	3	Auditoría del proyecto (2016 -2020)	$60,000.00	SBMC	PREVIA	1-Dec-17	31-Mar-17
3	2A	Análisis del ambiente de negocio favorable para la implementación de broker de capacitación y entrenamiento	$100,000.00	SBCC	POSTERIOR	16-Dec-17	15-May-18
4	2A	Análisis del ambiente de negocio favorable para el desarrollo de Microworks y freelancers	$65,000.00	SBCC	POSTERIOR	10-Jan-18	9-Jul-18
5	2A	Análisis de indicadores para medir impacto en el empleo de microwork y freelancer	$65,000.00	SBCC	POSTERIOR	10-Jan-18	9-Jul-18
TOTAL CONSULTORÍAS (FIRMAS)			$350,000.00				

Consultants Contracts (individual)

Item	Component	Description	Estimated Cost (US$)	Selection Method	Type of Review	Contract Start Date	Contract End Date
1	3	Contratación equipo clave UCP (5 años)	$1,540,000.00	Contratación directa	PREVIA	1-Oct-16	30-Sep-21
2	2B/2C	Contratación de consultor (facilitador 1) para talento e innovación (5 años)	$120,000.00	3CV	PREVIA	3-Apr-17	30-Sep-21
3	2B/2C	Contratación de consultor (facilitador 1) para talento e innovación (5 años)	$120,000.00	3CV	PREVIA	3-Apr-17	30-Sep-21
TOTAL CONSULTORÍAS (INDIVIDUALES)			$1,780,000.00				

Operational Expenditures

Item	Component	Description	Estimated Cost (US$)	Selection Method	Type of Review	Start Date	End Date
1	3	Contratación personal de apoyo (3 conductores)	$90,000.00	Contratación directa	PREVIA	1-Sep-16	31-Dec-20
2	2C	Alquiler de locales para centros de innovación abierta y bottom up innovation	$125,000.00	GO	POSTERIOR	1-Apr-17	31-Dec-20
3	2C	Gastos operativos de innovación abierta y bottom up innovation (espacio, gastos industriales, mantenimiento, varios)	$120,000.00	GO	POSTERIOR	1-Apr-17	31-Dec-20
TOTAL GASTOS OPERATIVOS			$335,000.00				

III. Environmental and Social (including safeguards)

31. **The Project triggers two social safeguard policies, OP/BP 4.10 Indigenous Peoples, and Involuntary Resettlement OP/BP 4.12.** The Indigenous Peoples safeguard policy is triggered given the presence of indigenous peoples and afro-descendants in the Project area. While no significant negative impacts are expected on these communities, they could be potentially affected by the towers and fiber optic construction. Similarly, the construction of new communication towers and optical fibers (under-ground or aerial) could potentially affect right of way, requiring people to physically move or causing loss of land for productive use. The exact locations of network towers and fiber optic construction have not been determined. Therefore, an Environmental and Social Management Manual (ESMM) was prepared, consulted and disclosed in-country on October 30, 2015, and in the World Bank's Infoshop on November 2, 2015. The ESMM includes an Indigenous Peoples Planning Framework (IPPF) and Resettlement Policy Framework (RPF). Each sub-project will be evaluated and the appropriate safeguard policy triggered. During sub-project design, specific Indigenous and Afro-descendent Plans and Resettlement Actions Plans will be developed in line with the IPPF and RPF respectively.

32. **The Project also triggers Environmental Assessment Policy OP/BP 4.01, Natural Habitats OP/BP 4.04, and Physical Cultural Resources OP/BP 4.11.** These environmental safeguards have been triggered given the potential environmental impact of Project activities related to building infrastructure (e.g. construction of fiber optic and transmission towers). For example, the construction of fiber optic may affect the environment, and during excavation affect physical, cultural, or archeological sites or cut across natural habitats, such as national parks and protected areas. The Project has an Environmental Risk Category B, as the potential environmental impacts of Project activities are expected to be minor and reversible. The appropriate safeguards instruments have been prepared to ensure that all Project activities meet the requirements of the relevant national legislation and international conventions to which Nicaragua is a signatory, as well as World Bank Group environmental and social safeguard policies. Because specific locations of sub-projects have yet to be defined, an ESMM was prepared and includes an Environmental Management Framework (EMF), which was consulted with the main stakeholders in Managua on August 25, 2015, and disclosed in-country on October 30, 2015, and in the World Bank's Infoshop on November 2, 2015. The EMF includes provisions and guidelines for dealing with potential impacts on Physical Cultural Resources and Natural Habitats, such as screening criteria to minimize negative impacts on physical cultural resources, including procedures for "chance finds" and avoiding critical natural habitats. During sub-project design, specific Environmental Assessments will be developed in line with the EMF.

33. **The EMF includes, *inter alia*:**

a) The legal and institutional framework related to the environmental and social context in the telecommunication sector in Nicaragua;
b) The main potential environmental and social impacts in the works proposed for the CARCIP Nicaragua Project (fiber optic, broadband wireless network, and others), and its general measures to minimize, mitigate, and/or compensate the negative impacts;
c) The environmental and social management processes (methodologies, tools, and procedures) into the CARCIP Nicaragua subprojects that the environmental and social specialists should take into account during the assessment process; and

d) The environmental and social management procedures that the PCU and, specifically, the Technical Safeguards Team should take into account during the "Project cycle" to ensure compliance with national/regional laws in obtaining the respective environmental permits from the environmental authority.

34. **The procedures to comply with the environmental law in order to obtain the permits for each Category is included in the EMF.** With respect to the environmental studies required for each sub-project, the Environmental Assessment System (Decree 76-2006) of the country, which is in full accordance with the World Bank's Environmental Assessment Policy (OP/BP 4.01), includes the scope of the study required for each sub-project. Subprojects classified as Category I and II (A or B+ according with the EMF classification), requires an Environmental Impact Assessment (EIA); Subprojects classified as Category III (or B-), requires an Environmental Valuation (EV); and subprojects classified as Category IV (or C), requires an Environmental Assessment Municipal Form (EAMF).

35. **Regarding the infrastructure component, in relation to the subprojects execution, subprojects classified as A and B, according to the methodology established in the EMF, requires the World Bank's "no objection".** This agreement was included in the EMF and will be also included in the Operational Manual.

36. **The overall objective of the RPF is to have an instrument of reference for easy interpretation and a management tool to minimize the displacement of population and land acquisition**. In particular, the telecommunications infrastructure works in the areas of CARCIP Nicaragua will only affect lots or homes located in areas where work needs to be done. If moving occupants or owners of structures and/or lands is unavoidable, the aim will be to compensate for the replacement value or replace the premises, housing, access to services, and productive economic activities, on an equal level or better than what they had before the execution of the project. The following involuntary resettlement protocol will be applied before starting the subprojects. A process of analysis begins by filling the social datasheet of the project. Based on the content of this sheet, the PCU will determine the impacts on resettlement and the type and extent of social impact. If there are negative social impacts, the PCU will determine the mitigation measure through a Resettlement Action Plan (RAP). Each RAP will be sent to the World Bank for its No Objection.

37. **The main objective of the IPPF is to ensure that the project implementation will incorporate the necessary measures to facilitate the participation of indigenous peoples of the Atlantic Coast of Nicaragua who are in the areas of Project intervention.** Participation includes in process planning, implementation, and decision-making processes, whereas the implementation of the program is carried out with absolute respect for the dignity, human rights, economies and cultures of indigenous peoples. In the case of being affected by a Project, they should receive appropriate social and economic benefits from the cultural point of view. If possible adverse effects are identified, these effects should be avoided, reduced as much as possible, mitigated, or compensated for.

38. **The IPPF has been created to**: i) ensure that the indigenous and afro-descendent people are consulted and mechanisms to ensure their participation in all stages of the Project are created,

while respecting their assets, culture, spirituality, governance and common laws; ii) implement processes of free, prior and informed consultation; iii) keep, within the action framework of the project, natural resources and biodiversity of indigenous territories, taking into consideration the spiritual nature of the link between the indigenous and afro-descendent people and land, forest, water and wildlife, and other natural resources; iv) that activities related to the indigenous and afro-descendent people are framed within the recognition of their social, political and cultural governance, according to the particular characteristics of each of these peoples. So as to ensure free, prior and informed consultations of good quality and effective during the whole life of the Project, the Operational Manual of the PCU TELCOR will include a methodological framework for the consultations that will have, at least, the following elements: i) identification and mapping of the beneficiaries; ii) evaluation of the beneficiaries; iii) a culturally adequate communication and dissemination strategy; iv) systematic consultations that take into account traditional management structures, the language, and that ensure the inclusion of women and other vulnerable groups; and v) compensation mechanisms for economic affectations and resettlement. These execution mechanisms guarantee that the observance of safeguards is adequate. However, the PCU has expressed the need to receive technical assistance in order to know how to use the social safeguard instruments.

39. **During Project preparation, the PCU was supported by the Technical Safeguard Team who is responsible for environmental and social management during implementation.** The staff of the Technical Safeguard Team include three environmental specialists and two social specialists. This team has a good knowledge and experience with the World Bank's safeguards policies for the World Bank's previous project (Rural Telecom Project). With the support of the Bank, the PCU will receive training in the Safeguards instruments included in the ESMM, before the CARCIP Nicaragua Project implementation, in order to build capacity in the use and application of the safeguards instruments.

40. **The additional financing of the Rural Telecom Project had a focus on the Caribbean coast**. This new Project will continue bringing connectivity to the area and will also help the country implement several policies and programs to have the best productive use of this infrastructure. There is adequate experience in the PCU in dealing with the sometimes challenging communities in the Caribbean coast, and significant experience with handling safeguards in the context of indigenous communities benefiting from this Project. The PCU has already sent its experts to the coast to make an in depth safeguards assessment and adapt the previous framework.

41. **The PCU of TELCOR conducted public consultations on the ESMM draft (including the environmental and social frameworks) with representatives of the main stakeholders**. These stakeholders included the Caribbean Coast Regional Government, universities, among others. This consultation was held in Bluefields on August 25th, 2015. The minutes of the stakeholder meetings, including comments and recommendation are included in the ESMM Annex.

IV. Monitoring & Evaluation

42. **The PCU will be responsible for monitoring Project implementation and progress on expected outcomes**. The PCU will bear the primary responsibility for Project monitoring and evaluation, and, as such, will establish standard formats and guidelines for data collection and reporting, and will organize training sessions for Project stakeholders on their use. In addition, data for a number of the proposed indicators are already collected on a regular basis by TELCOR or at the national level by other public institutions, especially the data collected by ProNicaragua related to IT-ITES industry job creation and number of people trained and certified under the Project. In case of insufficient capacity for collecting data, TELCOR will recruit or designate a person responsible for monitoring and evaluation, based on the capacity assessment immediately after effectiveness. This person will liaise with all the Project's stakeholders to regularly gather relevant information and data. Regional institutions such as the CTU are being leveraged to evaluate progress and share lessons and best practice. Implementation support missions will be conducted at least twice a year. TELCOR may perform evaluations jointly with the World Bank and conduct supervision or implementation support missions at least twice a year. Missions will be based on the latest quarterly implementation and financial monitoring reports prepared by the Government.

Annex 4: Implementation Support Plan
NICARAGUA: Caribbean Regional Communications Infrastructure Program – Nicaragua Project

Strategy and Approach for Implementation Support

1. **The Implementation Support Plan focuses on helping to manage the risks identified in the Systematic Operations Risk-rating Tool (SORT) for achieving the expected outcomes, and on making implementation support to the client more flexible and efficient.** It also seeks to provide the technical advice necessary to facilitate the achievement of the PDO (linked to results/outcomes identified in the result framework), as well as identify the minimum requirements to meet the World Bank's fiduciary obligations.

(a) **Monitoring and Evaluation:** The implementation support aims at reporting the progress, or lack thereof, towards achieving the PDO and component targets based on the results framework and other evidence (not only at reporting outputs) and agreeing with the client on the actions to get the project on track when needed.

(b) **Procurement.** Implementation support will include: (a) providing additional training as needed to the PCU; (b) reviewing procurement documents and providing timely feedback to the PCU; (c) providing detailed guidance on the World Bank's Procurement Guidelines to the PCU; and (d) monitoring procurement progress against the detailed Procurement Plan.

(c) **Financial management.** Implementation support will include: (a) reviewing the Project financial management system of the PCU in TELCOR, including but not limited to, budgeting, accounting, reporting and internal controls; (b) providing training to the PCU on financial management aspects of World Bank-financed operations during Project launch, or as needed; and (c) reviewing submitted unaudited financial and audit reports and providing timely feedback to the PCU, providing guidance and support to address recommendations issued by the external audit team.

(d) **Environmental and Social Safeguards.** The World Bank will supervise the implementation of the agreed ESMM, which includes the environmental and social frameworks (EMF, RPF and IPPF), and the respective Plans.

Implementation Support Plan

2. **While the PCU has adequate experience in implementing World Bank-financed projects, and despite the World Bank's own experience in supporting the preparation of similar projects, this proposed Project is relatively complex and innovative for the country with respect to activities under component two.** World Bank team members will be based either in Washington DC, or in the Nicaragua Country Office, and will be available to provide timely, efficient and effective implementation support to the client. Formal supervision and field visits will be carried out three to four times annually in the first two years, with possibility for annual or bi-annual visits in later years of the Project. These will be complemented with monthly video conferences to discuss Project progress. Detailed inputs from the World Bank team are outlined below:

(a) **Technical, Policy and legal/Regulatory inputs.** Technical, policy and legal/regulatory related inputs will be required to review all the bid documents to ensure fair competition,

sound technical specifications and assessments, and confirmation that activities are in line with Government's ICT and growth strategies.

(b) **Fiduciary requirements and inputs.** Training will be provided by the World Bank's financial management and procurement specialists as needed to the PCU. The Bank team will also help identify capacity building needs to strengthen financial management capacity and to improve procurement management efficiency. Financial management and the procurement specialists will be based in both Washington DC and the country to provide timely support. Formal supervision of financial management will be carried out semi-annually or annually, while procurement supervision will be carried out on a timely basis as required by the client.

(c) **Safeguards.** Inputs from environment and social specialists will be provided as needed.

(d) **Operation.** The Task Team will provide day-to-day supervision of all operational aspects, as well as coordination with the clients and among World Bank team members. Relevant specialists will be identified as needed.

What would be the main focus in terms of support to implementation during:

Time	***Focus***	***Resource Estimate (On an annual basis)***
Project Duration	*Team leadership, technical, legal and procurement review of the bidding documents and Institutional arrangement and Project supervision/coordination Procurement training*	*ICT Policy Specialist 10SWs ICT Legal Specialist 2SWs Procurement Specialist 10SWs*
	Financial management training and supervision	*Financial management Specialist(s) 10SWs*
	Environmental and Social Issues	*Social Specialist(s) 1SW Environmental Specialist(s) 1SW*

Note: SW-Staff Week

Skills Mix Required

Skills Needed	***Number of Staff Weeks***	***Number of Trips***	***Comments***
Task team leaders	*10 SWs annually*	*Fields trips as required*	*Based in DC or the Nicaragua CO*
Procurement Specialist	*10 SWs annually*	*Fields trips as required*	*Based in DC or the Nicaragua CO*
Financial management Specialist	*10 SWs annually*	*Fields trips as required*	*Based in DC or the Nicaragua CO*
Social Specialist	*1 SW annually*	*Fields trips as required*	*Based in DC or the Nicaragua CO*
Environmental Specialist	*1 SW annually*	*Fields trips as required*	*Based in DC or the Nicaragua CO*
Legal Specialist	*1 SW annually*	*Fields trips as required*	*Based in DC or the Nicaragua CO*

Annex 5: Economic and Financial Analysis.
NICARAGUA: Caribbean Regional Communications Infrastructure Program – Nicaragua Project

A. Methodology and Assumptions

1. *Revenues from Component 1 – Regional Connectivity Infrastructure:* **The projected increase in the number of broadband subscribers, year to year, resulting from Component 1, was based on the actual average number of current subscribers in similar locations in Nicaragua.** A gradual take-up rate increase was used, as new subscribers are added to the network in the first few years of operation of services. The following assumptions were used:

- Population/household ratio: 5.3, based on the population census 2005, carried out by the National Institute for Development Information
- Take-up ratios:
  - Fixed Broadband Connections/households: 20 percent, 30 percent, 40 percent for years 1, 2, 3 and thereafter, respectively.
  - Mobile Broadband New Subscribers/population: 10 percent, 20 percent, 30 percent, 50 percent for years 1, 2, 3, 4 and thereafter.
  - Mobile Broadband for Migrated localities,[35] Subscribers/population: 10 percent for year 1, 5 percent increase per year for years 2 to 9.
- Revenue per subscriber/household was based on current averages for Nicaragua as follows:[36]
  - Fixed Broadband revenue per household/building: US$20/month
  - Mobile Broadband revenue per new user (voice and data): US$24/month
  - Mobile Broadband revenue per migrated user (data only): US$8/month

2. *Revenues from Component 2 – ICT-Enabled Innovation:* **The analysis starts with an estimation of the expected number of graduates from ICT courses.** Then the turnover rate was estimated, based on actual data for Nicaragua for: (1) BPO (38 percent); (2) ITO (3.5 percent); and (3) Multimedia (5 percent). Based on this, the pro-rated average turnover was calculated resulting in an average of 25 percent, assuming that there will be three times the number of employees in BPO than in ITO or Multimedia. This turnover ratio was used to calculate the numbers of employees expected to be needed on an annual basis. At the peak, about 3,420 direct jobs will be created.

3. **The average salary of employees of the ICT Industry assumed was US$500 per month, or US$6,000 per year.** These estimations are conservative, because ITO or Multimedia employees would likely earn more than BPO employees. Income tax for this level of salary is 9 percent, as per the income tax tables from the Ministry of Finance. Income tax paid for each year was then calculated by multiplying the number of employees by income and by tax rate.

4. *Estimation of operational expenditures for Component 1:* **Operational expenditures were estimated as follows**:

[35] Migrated means localities where 4G service replaces 2G, meaning that subscribers will have access to data.
[36] For Fixed Broadband, data from "Internet Use Survey", 2013, TELCOR, funded by IADB was used. For new 4G subscribers, data from GSMA Intelligence for Nicaragua for 2014 was used, in www.wirelessintelligence.com. For migrated 4G subscribers, data from "Internet Use Survey", 2013, TELCOR was used.

(i) Operational expenditures were estimated as a percentage of total revenues based on Industry averages for major operators (Claro and Telefónica) for LAC. The average Operational expenditures /Revenue ratio used was 68 percent;[37]
(ii) Expenses for rental of Internet capacity were estimated, using the current rates in Nicaragua for wholesale Internet purchases of similar capacity (international and local segments), and using a declining scale (the trend in these expenses is a declining scale) using Telegeography forecasts.[38] The rental costs assumed were:

- Rental of 1 megabit per second capacity to the Internet gateway: US$100/month in 2016.
- Decline of unit costs for capacity to the Internet gateway: 10 percent per year for every year from 2018 to 2036.

5. **Then, traffic for both fixed and mobile broadband subscribers was calculated with the following assumptions:**

- Fixed Broadband Internet download capacity, first year of operation: 1 Mbps, for 2020;
- Oversubscription rate: 20 to 1;
- Rate of increase of download capacity, per year: 10 percent, for every year from 2021 to 2036;
- Mobile Broadband Internet download capacity, minimum (at cell edge): 1 Mbps, for all years;
- Oversubscription rate: 40 to 1

6. **Traffic was multiplied by number of users, oversubscription rates and cost per megabit to estimate rental of capacity costs.**

7. *Investments – Component 1 – Regional Connectivity Infrastructure:* **The investments for Component 1 only were calculated assuming** only 75 percent of investment costs will be financed by the IDA Credit and the Borrower. The rest will be financed by telecommunication operators.

8. *Investments – Component 2 – ICT-Enabled Innovation:* **Investments were calculated dividing the total investment cost of US$10.6 million[39] into five equal portions for each of the five years of the Project, in the Investment Tab.**

9. *Calculation of Depreciation costs:* **Depreciation of equipment and plant was calculated using the following assumptions, which are common in the telecommunication industry worldwide**:[40]

- Use of the straight line method (equal amounts for the life of the plant, per year);
- Useful lives of plant:
    - Cables and infrastructure: 20 years
    - Equipment, including network, radio base stations and microwave links: 8 years

[37] Financial Statements of Claro, Telefonica.
[38] www.telegeography.com
[39] Note that this includes Training courses and all other investments, including technical assistance, promotion, and project administration (all Components except infrastructure).
[40] Federal Communications Commission Depreciation Guidelines for the Telecommunication Industry, at www.fcc.gov.

10. *Financing Costs:* **An IDA Credit of US$20.1 million will be provided, under the following terms:**

1. Amortization Period: 25 years
2. Grace Period: 5 years
3. Interest Rate: 1.25 percent
4. Repayment ratios: 3.3 percent of accumulated outstanding amounts for years 6 to 15
5. 6.7 percent of accumulated outstanding amounts for years 16 to 25

B. **Results**

11. *Financial Analysis:* **Table 5.1 shows the Income Statement for the Project.** Income tax was calculated using the 30 percent current corporate rate that the Government charges operators. Based on the Table, the Project starts to have positive returns in year 5.

12. **Table 5.2 shows Cash Flow for Component 1 without IDA financing.** The results are: (i) the Net Present Value is US$882,000; and (ii) the Internal Rate of Return is 9 percent. These results show that the Project is feasible, although it is not as profitable as other urban telecommunication projects in Nicaragua, and telecommunication operators would not invest in this Project, because it would not provide the minimum rate of return that private companies usually expect (around 14 to 15 percent). Therefore, Government financing is needed to make the Project possible.

13. **Table 5.3 shows Cash Flow for Component 1 with IDA financing**. The results are: (i) the Net Present Value is US$3.6 million; and (ii) the Internal Rate of Return is 19 percent. Therefore Component 1 with IDA financing would be attractive to operators.

14. **Table 5.4 shows total Cash Flow for the entire Project**. Revenues to the Government come from Corporate Tax for Component 1, Investment Telecommunication Fund (FITEL) contributions (2 percent on gross revenues) and Income Tax from ICT employees. Expenses are the amortization and interest payments of the IDA Credit. The result shows a Net Present Value of US$3.75 million (flows discounted at 8 percent rate). These results show that the Project is attractive for the Government.

15. *Economic Analysis:* **The economic rate of return is higher than the financial rate, because the Project is beneficial for the population that will receive telecommunication services for the first time.** Today, they would have to travel to the nearest town that has services to make phone calls and use the Internet. With the Project, they will be able to make calls or access the Internet in their homes or places of work, saving the cost of travel and the time to do it. Component 2 also brings externalities, as it is estimated that for every person employed in ICT at least three new indirect jobs will be created in the economy.[41]

[41] Mexico, ICT Industry Development Loan, World Bank, Supervision reports, based on information from the Secretary of Economy.

Table 5.1 Income Statement (000´s of US$)

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Income	-	-	859	2,276	3,769	5,191	7,723	8,261	8,820	9,402	10,007	10,276	10,552	10,837	11,130	11,431	11,741	12,061	12,389	12,728
Total Income	-	-	859	2,276	3,769	5,191	7,723	8,261	8,820	9,402	10,007	10,276	10,552	10,837	11,130	11,431	11,741	12,061	12,389	12,728
O & M Expenditures	-	500	768	1,873	3,014	4,064	5,906	6,276	6,657	7,050	7,457	7,601	7,753	7,914	8,083	8,261	8,447	8,641	8,844	9,055
EBITDA	-	- 500	92	403	755	1,127	1,817	1,985	2,163	2,352	2,550	2,675	2,799	2,923	3,047	3,170	3,295	3,420	3,546	3,673
Depreciation	0	283	409	730	972	972	972	972	972	840	840	840	840	840	840	840	840	840	840	840
Operational Result	-	- 783	- 317	- 327	- 217	155	845	1,013	1,191	1,512	1,711	1,835	1,960	2,083	2,207	2,331	2,455	2,580	2,706	2,833
Income Taxes		-	-	-	-	47	254	304	357	454	513	551	588	625	662	699	736	774	812	850
Profit After Taxes		**- 783**	**- 317**	**-327**	**- 217**	**109**	**592**	**709**	**834**	**1,058**	**1,197**	**1,285**	**1,372**	**1,458**	**1,545**	**1,632**	**1,718**	**1,806**	**1,894**	**1,983**

Table 5.2 Cash Flow for Component 1 without IDA Financing

		2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Investment		4,281	1,654	2,694	2,033	-	-	-	-	1,110	662	2,694	2,033	-	-	-	-	1,110	662	2,694	2,033
Working Capital		0	556	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Operating Flow			-500	92	403	755	1,081	1,564	1,681	1,806	1,898	2,037	2,125	2,211	2,298	2,385	2,471	2,558	2,646	2,734	2,823
Recovery of working Capital																					556
Net flow		-4,281	-2,710	-2,603	-1,630	755	1,081	1,564	1,681	696	1,237	-657	92	2,211	2,298	2,385	2,471	1,448	1,984	40	1,346
Residual Value – X Operational Flow	4																				11,291
Net flow with RV		**-4,281**	**-2,710**	**-2,603**	**-1,630**	**755**	**1,081**	**1,564**	**1,681**	**696**	**1,237**	**-657**	**92**	**2,211**	**2,298**	**2,385**	**2,471**	**1,448**	**1,984**	**40**	**12,637**
NPV Net Flow		-1,734																			
NPV Residual Value		10,455																			

NPV Net Flow with RV	**882**
Internal Rate of Return	**9%**
Annual Discount Rate	8%

Table 5.3 Cash Flow for Component 1 with IDA Financing

Net flow with Financing	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**
Net flow without financing	- 4.281	- 2.710	- 2.603	- 1.630	755	1.081	1.564	1.681	696	1.237	- 657	92	2.211	2.298	2.385	2.471	1.448	1.984	40	12.637
Financing		3.211	1.241	2.021	1.525															
Net flow with Financing	- 4.281	501	- 1.362	390	2.280	1.081	1.564	1.681	696	1.237	- 657	92	2.211	2.298	2.385	2.471	1.448	1.984	40	12.637
NPV Net flow with RV	**3.546**																			
Internal Rate of Return	**19%**																			
Annual rate of Discount	12%																			

Table 5.4 Total Project Government Cash Flow Analysis

Total Project: Component 1 and 2
Flow of Funds for the Project

		2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Income															
FITEL Tax over Gross Income	2%	0	0	17	46	75	104	154	165	176	188	200	206	211	217
Income Tax		0	0	-	-	-	47	254	304	357	454	513	551	588	625
Total Income Component 1		0	0	17	46	75	150	408	469	534	642	713	756	799	842
Income Tax Component 2		-	554	1,047	1,487	1,828	1,702	1,277	958	718	539	404	303	227	170
Total Income		-	554	1,064	1,533	1,903	1,853	1,685	1,427	1,252	1,180	1,117	1,059	1,026	1,012
Expenses															
Amortizations		-	-	-	-	-	729	729	729	729	729	729	729	729	729
Interests		-	84	144	213	276	276	267	258	249	240	231	222	212	203
Total Expenses		-	84	144	213	276	1,005	996	987	978	969	960	951	942	932
Utility/Loss		-	470	920	1,320	1,627	847	689	440	274	211	157	108	85	80

	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Income											
FITEL Tax over Gross Income	223	229	235	241	248	255	255	255	255	255	255
Income Tax	662	699	736	774	812	850	850	850	850	850	850
Total Income Component 1	885	928	971	1,015	1,060	1,104	1,104	1,104	1,104	1,104	1,104
Income Tax Component 2	128	96	72	54	40	30	23	17	13	10	7
Total Income	1,013	1,024	1,043	1,069	1,100	1,135	1,127	1,122	1,117	1,114	1,112
Expenses											
Amortizations	729	1,480	1,480	1,480	1,480	1,480	1,480	1,480	1,480	1,480	1,480
Interests	194	185	167	148	130	111	93	74	56	37	19
Total Expenses	923	1,666	1,647	1,629		1,592	1,573	1,554	1,536	1,517	1,499

						1,610						
						-						
Utility/Loss		89	- 642	- 604	- 559	510	- 457	- 446	- 433	- 419	- 403	- 387
Net Present Value		**3.749**										
Discount Rate	**8%**											

Annex 6: Climate and Disaster Risk Screening Report for General Projects[42]
NICARAGUA: Caribbean Regional Communications Infrastructure Program – Nicaragua Project

A. Introduction

1. **Building resilience to climate and geophysical hazards is a vital step in the fight against poverty and for sustainable development.** Screening for risks from these hazards improves the likelihood and longevity of a project's success. The Project level Climate and Disaster Risks Screening Tool provides due diligence on climate and disaster risks at an early concept stage. The tool uses an exposure – sensitivity – adaptive capacity framework to characterize risks from climate and geophysical hazards, based on key components of a project and its broader development context (see Annex 6.A).

2. **This annex summarizes the results of the screening process for the Nicaragua CARCIP Project.** This process was applied to the following selected sub-sectors/components:

- ☐ Multi-Modal and Transit
- ☐ Rail
- ☐ Aviation
- ☐ Marine Transportation
- ☐ River Transportation
- ☑ ICT Sector
- ☐ Mining and Metals
- ☐ Solid Waste
- ☐ Industry
- ☐ Fisheries / Aquaculture
- ☐ Forestry
- ☐ Biodiversity
- ☐ Urban Development
- ☐ Education
- ☐ Finance
- ☐ Community Development
- ☐ Social Development
- ☐ Other

3. This early stage due diligence can be used to strengthen the consideration of climate and disaster considerations in key components of project design, including the physical (i.e. farm irrigation, water storage) and non-physical aspects (i.e. capacity building of farmers, institutional

[42] This annex summarizes the application of the World Bank Group's Climate and Disaster Risk Screening Project Level Tool (Global website: climatescreeningtools.worldbank.org; World Bank users: wbclimatescreeningtools.worldbank.org). The findings, interpretations, and conclusions expressed from the application of this tool are those of the individual that applied the tool and should be in no way attributed to the World Bank, to its affiliated institutions, to the Executive Directors of the World Bank or the Governments they represent. The World Bank does not guarantee the accuracy of the information included in the screening and this associated output report and accepts no liability for any consequence of its use.

strengthening at community level, early warning systems, etc.). The broader sectoral (i.e. appropriate policies on crop prices, water tariffs, risk insurance schemes for agriculture production) and development sectors conditions (i.e. access to technology for enhanced productivity, climate-related early warning systems) could help modulate the risks, or enhance the risks to the delivery of the outcome/service level. The results of the screening are presented below, with supporting narrative to guide their interpretation.

B. Climate and Disaster Risk Screening Results Summary

4. *Project Information Summary:* **Table 6.1 below provides key project information including the location and key project development objectives.** This information is provided by the task team. The activities within the components are important as their sensitivity to the climate and geophysical hazards will determine the level of potential impact from these hazards.

Table 6.1: Project Information

Project Information	
Title	Caribbean Regional Communications Infrastructure Program (CARCIP)-Nicaragua
Number	P155235
Region	Latin America and the Caribbean
Country	Nicaragua
Type of Assessment	General Projects
Purpose of Screening	Screen a Project at the Concept Stage
Current Project Phase	Concept (Identification)
Funding Source	IDA
Keyword	Information and Communication Technology
Brief Description of Project or Goals/ Objectives	Increase access to regional broadband networks and advance the development of an IT/ITES industry in Nicaragua and the Caribbean region.
Sub Sectors	ICT Sector
Location	The infrastructure deployed under the project will cover the North Caribbean Coast Autonomous Region, the South Caribbean Coast Autonomous Region, the Department of Rivas, and the Department of Rio San Juan
GPS Coordinates	Latitude: 12.865416 Longitude: -85.20722
Physical Components	This project is in the information and communications technology subsector. The project will invest in telecommunications infrastructure. Specifically, the project will finance four types of infrastructure: (i) fiber optic cable links to connect towns to the nearest network point; (ii) local wired networks to connect houses and businesses; (iii) wireless networks for the smaller towns where fiber lines are too expensive, consisting of (a) cellular towers with 4G equipment and (b) microwave links or short fiber lines to the nearest network point.
Outcome / Service Delivery	The project objective is to increase access to regional broadband networks and advance the development of an IT/ITES industry in Nicaragua and the Caribbean region. The project will increase the broadband penetration rate in the Caribbean Coast of Nicaragua as well as decrease the retailer price of internet service. It will also increase the number of qualified manpower in the IT/ITES sector.

5. *Summary of Exposure to Climate and Geophysical Hazards:* Table 6.2 presents a summary description of exposure to climate and geophysical hazards at the project location for the Historical/Current and Future time frames.[43] Exposure to climate hazards is evaluated in two time frames, because past records are not necessarily indicative of future conditions.

[43] The Future Time Frame is providing a scenario based on changes projected to occur between the 1980-1999 average and a future average. This future average is most likely the 2040-2059 average (i.e., the default in the

Table 6.2: Summary of Exposure to Climate and Geophysical Hazards at Project Location

Hazard	Time Frame	Description of hazards for your location
Sea Level Rise	Current	The exact project location is not determined. Few of the key structural measures of the project are located at sea level (height is to be determined). Therefore, it is slightly exposed to sea level rise."
	Future	The starting point for this rating is the Historical/Current rating of Slightly Exposed. The project lifetime is 20 years. Sea-level in this region is projected by climate models to rise by the following levels by the 2090s, - 0.18 to 0.43m under SRES B1 - 0.21 to 0.53m under SRES A1B - 0.23 to 0.56m under SRES A2 Few project locations may experience up to 0.33 m of sea level rise by the end of the project lifetime. So, it will continue to be slighlty exposed to sea level rise in the future
Strong Winds	Current	The project location has been exposed to strong winds due to tropical cyclones. The coastlines of Nicaragua are vulnerable to tropical cyclones and hurricanes from both the Atlantic and Pacific oceans from July through to October.
	Future	Tropical cyclones are poorly captured by GCMs and thus potential changes in intensity and tracks of tropical cyclones in the future are very uncertain. Whilst evidence indicates that tropical cyclones are likely to become, on the whole, more intense under a warmer climate as a result of higher sea-surface temperatures, there is great uncertainty in changes in frequency, and to storm tracks and their interactions with other features of climate variability (such as the El Nino Southern Oscillation), introducing uncertainty at the regional scale.
Earthquake	Current	Nicaragua lies in an earthquake zone where hundreds of minor tremors, shocks, and earthquakes occur each year. More severe earthquakes have occurred periodically. Some of these are centered off the coast of Nicaragua, such as the 6.9 magnitude earth-quake on 9 October 2003 the 6.6 magnitude quake of 2 July 2005, and the 7.3 magnitude of 14 October 2014. The seismic risk is concentrated in the Pacific Coast, and it decreases through the Atlantic Coast where the infrastructure under this project will be deployed.

Insufficient Understanding	Not Exposed No Potential Impact No Risk	Slightly Exposed Low Potential Impact Low Risk	Moderately Exposed Moderate Potential Impact Moderate Risk	Highly Exposed High Potential Impact High Risk

Hazard	Time Frame	Description of hazards for your location
Extreme Temperature	Current	The highest monthly average maximum daily temperature is 26.1C. The average number of 'hot' days per year in Nicaragua has increased by 60 (an additional 16.4% of days) between 1960 and 2003.
	Future	The starting point for this rating is the Historical/Current rating of Slightly Exposed. Annual average temperature is expected to increase by 1 and 2°C by 2050 relative to current conditions
Extreme Precipitation and Flooding	Current	Mean annual rainfall has declined within the last 15 years. This is mainly due to lower wet season (JJA and SON) rainfalls. The average trend over the observed period since 1960 is a decrease of 5-6% of average total rainfall per decade. Despite the observed decreasing trend in total rainfall, the proportion of rainfall that occurs in 'heavy' events has increased since 1960 by 2.2 per decade, on average, since 1960. The observed maximum 1- and 5-day rainfalls have also shown significantly increasing trends since 1960. The annual maximum 1-day (5-day) rainfall had increased by 8mm (14mm) per decade, on average, since 1961. Increasing trends in these extremes are seen in both wet season and dry season rainfall
	Future	The starting point for this rating is the Historical/Current rating of Moderately Exposed. Likewise, more intense precipitation on the Atlantic coast has been projected. However, most of the models project a reduction of precipitation at a national level, and a slight increase for the Pacific South region.

6. **The descriptions provide a summary of the key characteristics and some indication of the trends in exposure from each hazard, drawing on global, quality controlled data sets from the Climate Change Knowledge Portal.** It is useful, for example to understand the temperature range and the rate of annual or decadal increase in a region, or precipitation patterns

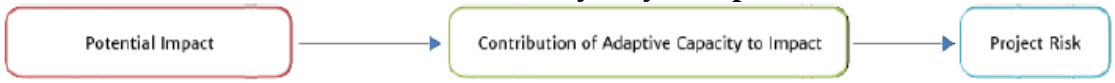
---

Climate Change Knowledge Portal. Users can choose to select another time frame, or choose to use national/local data sets, but if so, this should be reflected in the notes section of the tool (and summarized in Annex 2). The Climate Change Knowledge Portal draws on global, quality-controlled datasets and is continually updated as new data become available. In some cases, the Climate Change Knowledge Portal is supplemented by other sources of information. For more detail on the data used in this step, please refer to the Data Annex. Climate Change Knowledge Portal (http://climateknowledgeportal.worldbank.org).

for historical and future time frames and seasonality shifts. Understanding the trends of hazards is important as they act individually and collectively on components/sub-sectors of the Project. Because geophysical hazards (such as earthquakes, tsunamis, landslides, and volcano eruptions) do not have associated future projections, exposure for those hazards is assessed only in the Historical/Current time frame. The colors shown in Table 6.2 refer only to exposure at the Project's location. Overall risk to the Project's outcome/service delivery, taking into account sensitivity of physical investments and adaptive capacity (non-physical components and development context), is depicted in Tables 6.3A and 6.3B.

7. *Summary of Overall Project Risk:* **Tables 6.3A and 6.3B present the same results.** Table 6.3A highlighting the impact ratings on the Project's components/subsectors, and the overall risk to the outcome/service level for both Historical/Current and Future time frames. Table 6.3B draws attention to how the climate impacts and risks shift from the Historical/Current to the Future time frame. The ratings are derived on the basis of the hazard information, subject matter expertise, contextual understanding of the Project, and modulated on the basis of adaptive capacity and the larger development context of the sector/subsector and country. The results indicate what components are most at risk. The actual ratings themselves, while instructive, should inform further consultations, dialogue, and future planning processes. It should be noted that the greatest value of the tool is that it provides a structured and systematic process for understanding climate and disaster risks.

Table 6.3A: Results Summary – by Component



Sector / Subsector	Project Components				Development Context				Outcome / Service Delivery	
	Potential Impact		Non-Physical Components		Selected Sector / Subsector		Broader Context			
Time Frame	Current	Future	Current	Future	Current	Future	Current	Future	Current	Future
ICT Sector			Emergency planning Slightly Reduces Impact Data gathering, monitoring, and information management systems Slightly Reduces Impact		ICT Sector Significantly Reduces Impact		Access to technology Slightly Reduces Impact			

8. **Table 6.3A provides a characterization of risks caused by climate and geophysical hazard on the Project's subsector/components for both Historical/Current and Future time frames.** The results indicate where risks may exist within one or multiple components and where further work may be required to reduce or manage these climate and geophysical risks. An ongoing process of monitoring risks, refining climate and other information, and regular impact

assessment may also be appropriate. The potential impact on key component(s) due to exposure from hazards is modulated by the Project's non-physical components (enabling and capacity building activities). The right kind of capacity building measures could increase preparedness and longer-term resilience and reduce risks. An understanding of larger sector and development context with respect to key modulating factors helps to assess the climate risks in terms of adaptive capacity. For example, in the education sector, incorporating climate change into curriculum reforms may help reduce risks, while gender disparities and access may aggravate the risks.

9. **The results in Table 6.3B display the results by time frame.** Potential impacts to the components are evaluated separately for the Historical/Current and Future time frames to capture changes in the exposure from climate hazards over time. For investments with long operational lifetimes, such as physical infrastructure, considering future climate variability and change is critical to avoid "locking in" designs and features that are only suited to current climate. For example, rail track can be subject to buckling in the future if the materials are not designed to withstand extreme temperatures greater than recent or historical temperatures. Buildings may be damaged if they are located in areas that will be more exposed to sea level rise and storm surge, or if they are not designed to withstand more frequent or severe flooding.

Table 6.3B: Results Summary – by Time Frame

Sector / Subsector	Current					Future				
	Potential Impact	Non-Physical Components	Development Context: Selected Sector / Subsector	Development Context: Broader Context	Outcome / Service Delivery	Potential Impact	Non-Physical Components	Development Context: Selected Sector / Subsector	Development Context: Broader Context	Outcome / Service Delivery
ICT Sector		Emergency planning [Slightly Reduces Impact] Data gathering, monitoring, and information management systems [Slightly Reduces Impact]	ICT Sector [Significantly Reduces Impact]	Access to technology [Slightly Reduces Impact]			Emergency planning [Slightly Reduces Impact] Data gathering, monitoring, and information management systems [Slightly Reduces Impact]	ICT Sector [Significantly Reduces Impact]	Access to technology [Slightly Reduces Impact]	

Insufficient Understanding	Not Exposed No Potential Impact No Risk	Slightly Exposed Low Potential Impact Low Risk	Moderately Exposed Moderate Potential Impact Moderate Risk	Highly Exposed High Potential Impact High Risk

10. *Key Drivers of Risk:* **Based on the results above, Table 6.4 highlights the key drivers of risk for Project component/subsector ratings, in terms of hazards that are likely to pose the greatest challenge.** The ratings for the potential impact for each component/subsector reflect the aggregate rating across multiple hazards, drawing on all of the exposure information and their own expert judgment. For example, the combined impacts of increased temperature and drought on forests can be greater than the individual effects of each hazard – higher temperatures can increase the extent, intensity, and frequency of insect outbreaks, while drought can weaken trees and make them more susceptible to insect infestation. Specific consideration should be given to

those hazards which have high ratings, or are moving from moderate to high ratings over time. For example, sea-level rise may not be a key risk driver in the Historical/Current time frame but may emerge as a key driver across multiple sectors in the future time frame. Understanding which hazards are key drivers may help flag follow-on work to manage climate risks within the design and delivery of the Project.

Table 6.4: Key Drivers of Risk

	Historical/Current Drivers	Future Drivers
Hazards and Location	Extreme Precipitation and Flooding Storm Surge Strong Winds	Extreme Temperature Storm Surge Extreme Precipitation and Flooding Strong Winds
Physical Components	*	ICT Sector
Outcome / Service Delivery	*	*

Key: High Risk Moderate Risk

** If a cell is blank it implies there is 'No high or moderate risks' identified for this aspect of the Project.*

- Overall, the Non-physical Components: insufficient information provided
- The Selected Sector/ Subsector is expected to: Significantly Reduces Impact
- Overall, the Non-physical Components: insufficient information provided

C. Next Steps

11. **Understanding which Project components are most at risk from climate change and other natural hazards on the basis of the screening, measures can be taken to avoid their impacts.** Such measures include:

- Enhancing the consideration of climate and disaster risks early in the Project design stage.
- Using the risk screening analysis to inform follow-up feasibility studies and technical assessments.
- Encourage local stakeholder consultations and dialogues to enhance resilience measures and overall success of the Project.

12. Table 6.5A provides some general guidance based on the risk ratings for the Outcome/Service Delivery, and Table 6.5B lists some climate risk management measures.

Table 6.5A: General Guidance Based on Risk Ratings for Outcome/Service Delivery

Insufficient Understanding	Gather more information to improve your understanding of climate and geophysical hazards and their relationship to your project.
No Risk	If you are confident that climate and geophysical hazards pose no risk to the project, continue with project development. However, keep in mind that this is a high-level risk screening at an early stage of project development. Therefore, you are encouraged to monitor the level of climate and geophysical risks to the project as it is developed and implemented.
Low Risk	If you are confident that climate and geophysical hazards pose low risk to the project, continue with project development. However, keep in mind that this is a high-level risk screening at an early stage of project development. Therefore, you are encouraged to monitor the level of climate and geophysical risks to the project as it is developed and implemented. You may also consider gathering additional information to increase your level of confidence in your rating.
Moderate Risk	For areas of Moderate Risk, you are encouraged to build on this screening through additional studies, consultation, and dialogue. This initial screening may be supplemented with a more detailed risk assessment to better understand the nature of the risk to the project.
High Risk	For areas of High Risk, you are strongly encouraged to conduct a more detailed risk assessment and to explore measures to manage or reduce those risks.

Table 6.5B: Types of Climate Risk Management Measures for typical General Projects

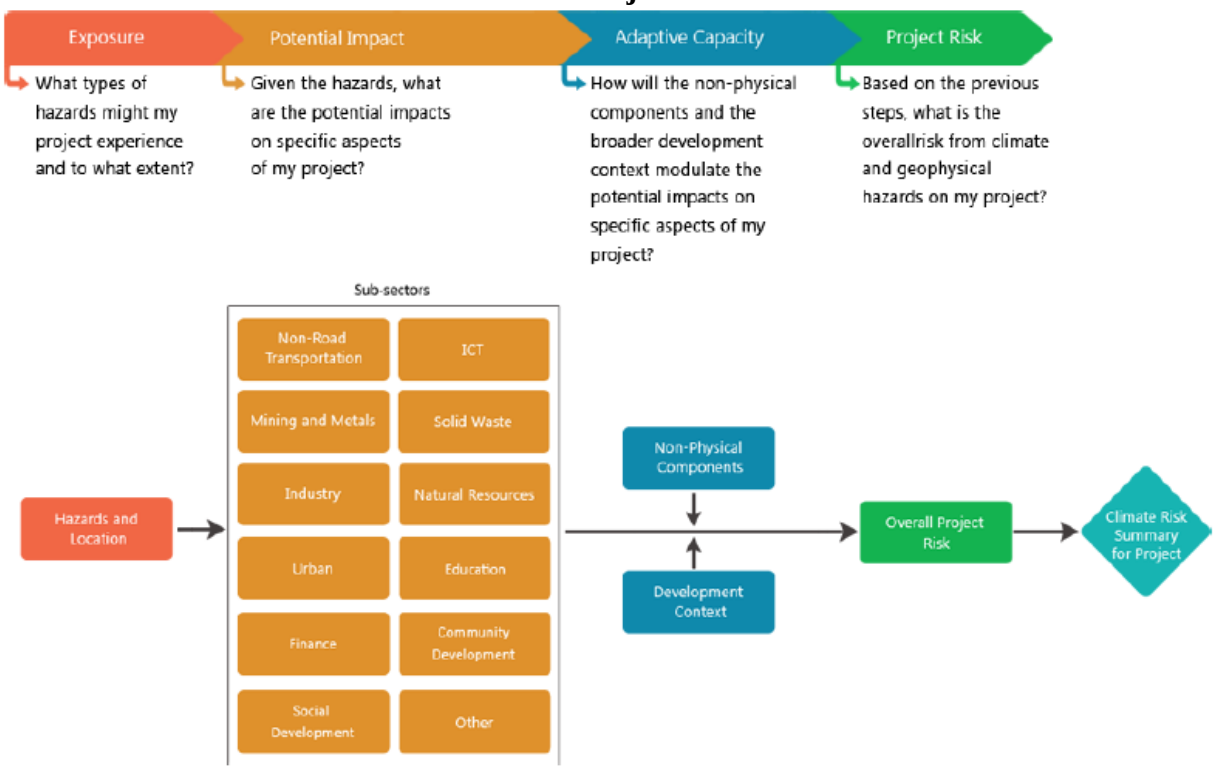
CATEGORY	PROS	CONS	EXAMPLES
Accommodate and Manage	• Flexible • Typically low-cost • Useful when risk is low, but projected to rise in the future	• Temporary solution • Can be insufficient in preventing losses	• Increasing operations and maintenance budget • Modifying management practices • Conduct monitoring through data collection and analysis
Protect and Harden	• Can be used for existing and new assets • Responds to immediate risks	• High cost • Inflexible • Effectiveness may decrease over time	• Elevating key infrastructure • Expanding drainage capacity • Implementing wind protection measures
Retreat and Relocate	• Long-term solution • Responds to immediate risk	• High cost • Inflexible	• Relocating project • Moving infrastructure further inland or on higher ground

Annex 6.A: Tool Approach

13. **The framework below describes the approach taken to screen the Project.** Climate and natural hazards information used to screen the Project is most likely obtained from the World Bank's Climate Change Knowledge Portal, which houses numerous global data sets with historical records and future projections as well as country-specific adaptation profiles. Table

6.A1 summarizes the sub-national locations of high risk noted during the assessment, if the user entered these sub-national locations.

Figure 6.A1: Project Level Climate and Disaster Risk Screening Tool: Approach for General Projects



Annex 6.B: Notes

14. **Table 6.B1 summarizes all the notes entered by user for each section while completing the assessment, if the user elected to enter notes**. These notes can help shed light on specific ratings as well as considerations and limitations of the user's expertise.

Table 6.B.1 Summary of Comments by Section

Section		Notes
Hazards and Location	Extreme Precipitation and Flooding	Likewise, more intense precipitation on the Atlantic coast has been projected. However, most of the models project a reduction of precipitation at a national level, and a slight increase for the Pacific South region