

## TECHNICAL COOPERATION ABSTRACT (TC-ABSTRACT)

### REGIONAL

#### I. BASIC INFORMATION

**Country:** Regional  
**TC Name:** Central American Broadband Network  
**TC Number:** TBD  
**Team Leader/Members:** Antonio García Zaballos (Team Leader, IFD/CTI); Jiyoun Son (IFD/CTI); Rubén López-Rivas (Consultant); Claudia Salazar (Consultant); and Cecilia Bernedo (IFD/CTI).  
**TC Taxonomy:** Client Services  
**Reference to request:** [IDBDocs#37172161](#)  
**Date of TC Abstract authorization:** September 28, 2012  
**Donors providing funding:** Korean Fund for Technology and Innovation (KPK)  
**Beneficiary** Guatemala, Honduras, Costa Rica, El Salvador, Nicaragua and Panama  
**Executing Agency and contact name:** Banco Interamericano de Desarrollo (IDB)  
Antonio García Zaballos (IFD/CTI)  
**IDB Funding Requested:** Korean Fund for Technology and Innovation (KPK)  
**Local counterpart funding:**  
    **BID:** US\$600,000  
    **Local:** US\$ 0  
    **Total:** **US\$600,000**  
**Execution period:** 15 months      **Disbursement period:** 18 months  
**Required start date:** November 1, 2012  
**Types of consultants:** Consulting firms or individual consultants  
**Prepared by Unit:** Competitiveness and Innovation Division (IFD/CTI)  
**Unit of Disbursement Responsibility:** IFD/CTI  
**TC Included in Country Strategy:** No      **TC included in CPD:** No  
**GCI-9 Sector Priority:**

The current Sector Strategy: “Institutions for Growth and Social Welfare” identifies improving innovation and productivity as a major area where the Bank can help the Region overcome the challenges that hinder growth and social welfare. To this end, the IDB will work towards strengthening institutions, and has specifically recognized the need to improve policies and governmental action in the ICT sector (¶5.21 of the referred Sector Strategy). Consistent with the Strategy, the Bank has been working in the design and implementation of a Broadband Platform to accelerate the penetration rate and usage of broadband services in the Region.

It is also worth noting that the current Sector Strategy: “Support Competitive Global and Regional Integration”, also identifies bridging the digital divide as one of the Bank’s priorities to promote integration, placing specific emphasis on promoting broadband infrastructure.

## I. BACKGROUND, OBJECTIVES AND JUSTIFICATION OF THE TC

- 1.1 **Background.** Today, what has come to be known as the digital economy continues to evolve at unprecedented rates, changing the way in which individuals, businesses and governments around the world communicate and access, supply and produce goods and services. The use of Information and Communication Technology (ICT) services and applications available over the Internet can reinforce sectors such as education, health, business and government, with broad implications for economic development, competitiveness and innovation. Yet, harnessing the benefits of this new digital economy increasingly relies on the availability of broadband Internet in a country, as evolving services and applications require high speed connectivity. In line with these observations, a recent study conducted by the IDB, concluded that for the Latin American and Caribbean (LAC) Region, an increase of 10% in the broadband penetration has, on average, associated increases of 3.19% in GDP, 2.61% in productivity, and a generation of over 67,000 new jobs.
- 1.2 Today, countries in Central America present low broadband penetration and use, limiting the region's development and integration efforts. On average, fixed broadband penetration is  $\approx 5\%$  and mobile broadband penetration is  $\approx 8\%$ <sup>1</sup>, due mainly to: (i) lack of access to infrastructures and unfavorable policy environment; (ii) inexistence of sufficient applications to stimulate the demand; and (iii) limited human skills for promoting greater broadband adoption and use. In addition, the existing broadband in these countries has not only a very low quality (average broadband speed is less than 2 Mbps compared to 17 Mbps in the OECD countries), but also inaccessible prices for the final users (average price per Mbps is US\$136 PPP compared to US\$8 PPP in the OECD countries<sup>2</sup>), making services expensive and ineffective for users and particularly marginalizing the lower income segments of the population.
- 1.3 Overall, there are several impediments to universalize broadband connection in the region, particularly: (i) lack of interconnection among the different countries; (ii) lack of infrastructure in less populated regions (the "last mile"); and (iii) low quality and high prices both at wholesale and retail levels.
- 1.4 All of the beneficiary countries have access to the Internet through submarine cables. However, to connect a Central American country with a South American country, the traffic has to go through the Miami Gateway, which is costly, inefficient and ineffective. Even though this arrangement made sense at the beginning of the Internet era, when most of the traffic was to and from the United States of America (USA), as countries develop their own domestic networks and produce their own content and services, there is a need to have direct connections, especially between countries in Central and South America.

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<sup>1</sup> ICT Indicators Database, International Telecommunications Union (2011).

<sup>2</sup> Galperin and Ruzzier (2011).

- 1.5 In addition, the deployment of an optical fiber ring presents several advantages for the beneficiary countries and their population, related to the improved cost-efficiency of their inter-connection. First, it will allow all of the main cities to access each other through the network directly, without paying transit fees. Second, traffic to Europe from cities near the Pacific coast could be sent through the network across the continent to submarine cables in the Caribbean. Similarly, traffic to Asia from cities near the Atlantic coast could be sent through the continental network to the submarine cables in the Pacific. Finally, traffic to the USA could be sent through the network, and vice-versa. Overall, building the network will provide access for countries to more submarine cables in the Atlantic, Pacific and Caribbean coasts, contributing to the development of a real market for submarine cables, which in turn, would reduce the prices of connectivity due to increased competition.
- 1.6 Although countries in Central America are eager to address these pressing challenges, the effective deployment of regional telecommunications networks requires not only political support, but also extensive technical expertise. Developing appropriate technical specifications for future bidding processes entails a profound understanding of the market dynamics in all countries involved, an analysis of technical parameters and alternative deployment options available, and awareness of environmental and social consideration of the deployment. The Bank is an ideal partner, capable of providing an impartial, third-party approach in its support to Central American countries as they undertake this highly innovative and capital intensive effort.
- 1.7 **Justification.** Countries in Central America have acknowledged the importance of further developing their telecommunications infrastructure to provide broadband services to all of their population and businesses, as a critical infrastructure to improving the countries' competitiveness in the knowledge economy of the 21st century and to strengthening the region's integration process.
- 1.8 Given the highly technical nature of this effort, representatives of Guatemala (SIT), Honduras (CONATEL), Costa Rica (MINAET), El Salvador (SIGET), Nicaragua (TELCOR) and Panama (ASEP), requested the Bank's support to accompany the region's efforts related to the deployment of infrastructure and to the aggregation of contents in the region.
- 1.9 The current Technical Cooperation (TC) proposes the development of feasibility studies to support future investment in the deployment of an optical fiber ring to improve the interconnection among the Central American countries. The studies conducted under this TC will also support countries in their efforts to reduce international Internet connectivity charges through the creation of Inter-Connection Provider (IXP) that allows content aggregation.
- 1.10 **Objective.** The objective of this project is to contribute to the extension of broadband penetration to all population strata in participating countries, through the future deployment of a new fiber optic ring that will complement the current

ARCOS network, improving access to infrastructures, enhancing broadband quality and reducing prices for the final users; thereby supporting an enabling environment for regional participation in the digital economy.

- 1.11 To this end, feasibility studies will be conducted to identify the best cable routes, design the network, prepare its specifications and calculate the technical, financial and environmental feasibility of the network. In addition, the studies will support an assessment of the best ways to create and aggregate contents and applications, and offer appropriate regulatory revisions as needed, to ensure that international Internet connectivity charges can be reduced from the existing levels.

## **II. DESCRIPTION OF ACTIVITIES/COMPONENTS AND BUDGET**

- 2.1 The activities that are proposed in this project are divided into four main components, which define the strategic approach of this technical cooperation: In a country by country basis, component 1 will include a socio-demographic analysis dealing with the demand and supply particularities in each country. Subsequently and based on the information gathered in this analysis, component 2 will develop a technical analysis of the existing infrastructures and the recommended technological alternatives. Both inputs will be considered in the implementation of component 3, which includes an analysis of the economic and financial feasibility of the deployment and a suggested governance model. Finally, complementary to the above activities, component 4 consists of issuing recommendations to regulate interconnection prices.
- 2.2 **Component 1: Market Study.** The objective of this component is to improve the understanding of market dynamics in participating countries, by preparing a market study for every country in Central America, including an analysis of the socio-demographic and economic conditions; an analysis of current supply and demand of telecommunication services; and a forecast of the demand.
- 2.3 The activities for the market analysis should include: (i) socio-demographic study (analysis of how the population is distributed); (ii) study of the supply side (identify current supply of telecommunications services in each beneficiary country); (iii) study of the demand side: estimate the current demand for those services; and (iv) services demand forecast (estimate the demand for telecommunication services after the improvement of infrastructure). The results of these studies will serve as the basis for the Technical Study to be carried out in the following component.
- 2.4 **Component 2: Technical Study.** The objective of this component is to identify the technical considerations for deploying the infrastructure, including the structure of the network and the expected social and environmental impacts, through the development of a technical study.
- 2.5 The activities for the technical study should include: (i) orographic study and population distribution; (ii) assessment of the existing available infrastructure; (iii) design of the logic diagram node of the network; (iv) forecast of the expected

traffic according to socio-demographic and economic conditions; (v) identification of technological alternatives; (vi) determination of the requirements in terms of capacity and sizing of the network; (vii) selection of the best technology to attend the estimated traffic; (viii) deployment Plan and Implementation Schedule; and (ix) environmental and social impact assessment.

- 2.6 Based on the market study conducted in component 1, an analysis of technical parameters to consider in the deployment project will be done in component 2. The selection of appropriate technologies and the stages of the deployment plan, including the structure of the network, and the implementation schedule will be the main results of this component.
- 2.7 The Technical Study will be used as basis for the economic study to be conducted in component 3, and will be revised, as needed, based on the results of the latter.
- 2.8 **Component 3: Economic and financial study.** The objective for this component is to analyze the economic and financial feasibility of the deployment and select a governance model, through the development of an economic and financial study on the sustainability of the network and the services to be eventually provided.
- 2.9 Particularly important will be the specification of the consortium and the governance model to guarantee the success of the optical fiber ring, not only during the deployment, but also during the exploitation.
- 2.10 The activities for the economic analysis should include: (i) estimation of the required investment to satisfy the demand; (ii) valuation of the different scenarios, taking into account the different technological alternatives; (iii) development of a business model; and (iv) selection of the technology and financial figures of the project.
- 2.11 The result of this component will be an analysis of the economic feasibility of the deployment taking into account the data from the Market study (comp. 1) and the Technical Study (comp. 2). Additionally, the conclusions drawn from this study will serve as feedback for the technical study and the Deployment Plan may be adjusted.
- 2.12 Taking into account the results and conclusions of the feasibility studies, specific recommendations will also be provided on the best way to aggregate traffic in Interconnection Exchange Points (IXPs), which will allow for the international Internet connectivity charges in the Region to be reduced.
- 2.13 **Component 4: Regulatory Recommendations on Interconnection Prices.** The objective of this component, complementary to the previous three, is to issue the appropriate regulatory recommendations to provide lower prices for interconnection between operators. In particular, the regulation should ensure transparency in interconnection agreements and address issues on the regulation of the incumbent, in order to avoid discrimination between different operators and ensure a level playing field for competition in the sector.

- 2.14 The activities to be undertaken are as follows: (i) study of interconnection rules applicable to Central American countries in question; (ii) international analysis of the various schemes and techniques applied to interconnection and identification of best practices; (iii) analysis of international interconnection rates and rules of interconnection and access; and (iv) specific recommendations on interconnection regulations and how to make them effective.
- 2.15 **Expected results of the project.** The knowledge products generated in the framework of this project will contribute to inform the efforts to extend broadband penetration in participating Central American countries. Specifically, the future deployment of a new fiber optic ring will be facilitated, which will improve access to infrastructures, enhance broadband quality and reduce prices for the final users; thereby supporting an enabling environment for regional participation in the digital economy. Specific results include: (i) a market study for each participating Central American country; (ii) a technical study including an analysis of the technical parameters to consider in the deployment of the infrastructure; (iii) specific recommendations will be provided on the best way to aggregate traffic in Interconnection Exchange Points (IXPs); (iv) an economic and financial study on the sustainability of the network and the services to be eventually provided; and (v) Specific regulatory recommendations on interconnection prices.

**Table 2.1: Indicative Results Matrix**

<b>Suggested Indicator (Outcome)</b>	<b>Base Line</b>	<b>Target at the end of the TC</b>
The results of the study are used by Central American countries in the award process of the national backbone	0	yes
The results of the study are used in the award process of the international connection by Central American countries	0	yes

**Table 2.2: Indicative Budget**

<b>Activity/Component</b>	<b>Unit*</b>	<b>Unit US\$</b>	<b>Total Funding US\$</b>
Component 1: Market studies	6	12,500	75,000
Component 2: Technical studies	6	50,000	300,000
Component 3. Economic and financial studies	6	16,667	100,000
Component 4. Regulatory recommendations	6	20,833	125,000
<b>TOTAL</b>			<b>US\$600,000</b>

\*For consistency, preference will be given to a single firm developing the 6 studies in each component.

### **III. EXECUTING AGENCY AND EXECUTION STRUCTURE**

- 3.1 As previously mentioned, the representatives of Guatemala (SIT), Honduras (CONATEL), Costa Rica (MINAET), El Salvador (SIGET), Nicaragua (TELCOR)

and Panama (ASEP), requested the Bank's support to assist countries in the implementation of this project (the request letter is in process).

- 3.2 This Technical Cooperation will be executed by the Competitiveness and Innovation Division (IFD/CTI) as part of a comprehensive set of documents being prepared under the framework of the Bank's broadband platform. In this sense, the knowledge products generated by the Bank will also serve to inform the study. Also as noted, the IFD/CTI is defining the broadband strategy of the Bank to accelerate the penetration and usage within the Latin American and Caribbean (LAC) countries and it is taking a very active role to achieve this goal. In this regard, it is expected that in the framework of this strategy, similar initiatives will be undertaken in other countries throughout the Region. As the first of such initiatives a regional level, a closer involvement by the Bank at this stage will provide valuable input and guidelines for conducting future regional and country-specific activities.

#### **IV. PROJECT RISKS AND ISSUES**

- 4.1 The development of a feasibility study needs information from variables such as: (i) existing and expected consumption calling pattern; (ii) description of the topography and how the population is distributed (density of the population at regional and local level); (iii) estimation of the infrastructure requirements in accordance with the demand forecasted; and (iv) design and valuation of the technological alternatives, etc. In this regard, one of the major risks in the implementation of this TC is the lack of reliable information on key performance indicators and variables at a regional and local basis. To mitigate the risk, the project team will contact the respective government agency and the private sector (telecom operators, vendors, associations, etc.) to identify alternative variables that better reflect the existing socio-demographic and technical conditions in the country.
- 4.2 Another risk identified is possible delays in the execution of the project due to lack of coordination between involved entities, both within each country and among countries. To overcome this risk, the Team will closely monitor and provide support in the design and implementation of the TC.

#### **V. EXCEPTIONS TO BANK POLICY**

- 5.1 No exceptions to Bank policy are foreseen.

#### **VI. ENVIRONMENTAL AND SOCIAL STRATEGY**

- 6.1 Due to the nature of this TC which involves a research study, there are no expected environmental and social risks associated with it, only those standards of any study project. As previously mentioned, however, the feasibility studies will include the environmental feasibility of the network. The operation was classified as Category "C", according to the Bank's classification toolkit (see link: [IDBDocs#37172490](#)).

**Annexes:**

- **Annex I: Request Letter**
- **Annex II: Terms of Reference**
- **Annex III: Procurement Plan**