

TECHNICAL COOPERATION ABSTRACT (TC-ABSTRACT)

PERU

I. BACKGROUND

Country:	Peru		
TC Name:	Feasibility study of the backhaul and partial last-mile network in Peru to increase integration		
TC Number:	PE-T1296		
Team Leader/Members:	Antonio García Zaballos (IFD/ICS), Team Leader; Claudia Suaznabar (CTI/CPE); Claudia Stevenson (IFD/ICS); Agustina Calatayud (IFD/CTI); Felix Gonzalez (IFD/ICS); Rafael Capristan (TSP/CPE); Paola Arrunategui (CAN/CPE); y Cecilia Bernedo (IFD/ICS).		
TC Taxonomy:	Operational Support (OS)		
Reference to request:	IDBDocs 37739178		
Date of TC Abstract authorization:	June, 2013		
Donors providing funding:	TBD		
Beneficiary:	Peru - Ministry of Transport and Communications		
Executing agency and contact name:	Inter-American Development Bank (IDB)		
IDB Funding Requested:	IDB: US\$850,000		
Local counterpart funding:	Local: US\$ 0		
	Total: US\$850,000		
Execution period:	12 months	Disbursement period:	15 months
Required start date:	September, 2013		
Types of consultants:	Firm and individual consultants		
Prepared by Unit:	Division Institutional Capacity of the State (IFD/ICS)		
Unit of Disbursement Responsibility:	IFD/ICS		
TC included in Country Strategy:	N/A	TC included in CPD:	No
GCI-9 sector priority:	Mentioned under current sector strategies: “Support Competitive Global and Regional Integration”, and “Institutions for Growth and Social Welfare”.		

II. OBJECTIVES AND JUSTIFICATION OF THIS TC

- 2.1 There is evidence that the acceleration of broadband penetration, adoption and effective use brings clear social inclusion and economic benefits. In particular, it is estimated that increases of 10% in broadband penetration in Latin American

- and Caribbean (LAC) countries, on average, have associated increases of 3.19% in GDP, 2.61% in productivity and a net generation of more than 67,000 jobs.¹
- 2.2 In Peru, most of the fiber optic network is highly concentrated on the coast and does not reach populations in the highlands and the Amazonian Region, which are typically more isolated communities as a result of difficult geographic features, which include some of the most impoverished regions in the country.² Broadband penetration in Huancavelica, the lowest in the country, is only 0.35%, compared to 0.89% in Apurimac and 9.85% for Lima and Callao.³
 - 2.3 Having a broadband network that links Peru to other countries in the LAC Region will provide abundant bandwidth, easier connectivity and reduced costs. It will help to integrate Perú by facilitating trade, social, and cultural exchange between countries. Perú is already part of the UNASUR project (RG-T2080) that intends to increase the interoperability among the different countries as a trigger for trade and integration. In addition to those regional efforts, through this project Perú will improve the connectivity as well within the country and, therefore, new opportunities of integration will occur in rural or remote areas such as those considered in this project.
 - 2.4 The Government of Peru (GoP) has reckoned the importance of leveraging that national fiber optic backbone network to expand its capillarity and contribute to regional integration within the country and with other countries. For this purpose, the GoP has initiated a project to deploy several regional backhaul networks that connect the district capitals (where the backbone network arrives) with province capitals (i.e. municipalities) where, additionally, a last-mile access will be built to connect dependencies to the backhaul networks; primarily schools, health centers and government facilities.
 - 2.5 Aligned with its social inclusion and integration strategic objectives, the GoP has prioritized five regions to build this backhaul and last-mile networks, and has asked the Bank to support 4 Regions through this technical cooperation and a subsequent loan operation (PE-L1146), currently in pipeline for 2015 for US\$70 million. The loan project will be an opportunity to develop a model to showcase the potential social inclusion benefits that can derive from investing in broadband capabilities and services in terms of social inclusion, regional integration and economic growth. This technical cooperation will conduct technical and financial work as a support for the upcoming related loan proposal.
 - 2.6 The deployment of an optical fiber ring presents several advantages for Peru and the different regions, 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 other countries from cities near the Pacific coast could be sent through the terrestrial network across the country connecting thus the west and east, and the north and the south.

¹ García-Zaballos, A. / López-Rivas, R.: Governmental control on socio-economic impact of broadband in LAC countries. IDB, 2012.

² Data from Ministry of Transport and Communications of Peru

³ Data for Broadband penetration for regions come from Ministry of Communications and Transport in Peru.

Similarly, traffic to other countries from different cities could be achieved thanks a better interoperability. Overall, building the network will provide access for Peru to more countries, contributing to the development of a real digital market that contributes to the integration at the same time that it allows for a reduction in the prices of connectivity due to increased competition.

2.7 **Objectives of the project.** The general objective of this Technical Cooperation (TC) is to provide support to the Government of Peru in the process of bridging the Digital Divide in 4 Regions through the universalization of Broadband that leads to a clear integration of these two regions with other areas of the country, as well as it increased the integration of the country throughout the international backbone which will be deployed under the umbrella of UNASUR (RG-T2080). Specific objectives of this TC are:

- i) To quantify and to evaluate the Divide in terms of infrastructure for 4 Regions by identifying the gap between supply and forecast of the demand.
- ii) To understand the socio-economic dynamics of the 4 Regions to propose an adoption and usage plan with a focus on achieving social inclusion, economic growth and integration of those two regions within the country and regionally through education, health and key government services.
- iii) To analyze the financial and economic feasibility of the project and the amount of the necessary subsidy coming from the GoP.
- iv) To develop a detailed methodology to analyze the economic, social and integration (national and regional) impact on 4 Regions as a result of the loan project.
- v) To define a set of public policies that foster the deployment of the infrastructure and the adoption and usage plan in 4 Regions that contributes to the integration of the country both nationally and regionally.
- vi) To review and update the regulatory framework with the aim of ensuring that the deployment fosters competition and allows a smooth interconnection with backbone networks.
- vii) To support OSIPTEL in regulatory issues related to the supervision of the networks operation.
- viii) To conduct additional environmental, institutional and administrative analyses supporting the incoming loan (PE-L1146).
- ix) To develop a regional dialogue that will show the benefits that broadband connectivity has for the integration of rural and urban areas, as well as the as the integration among different countries. In addition it will present successful cases and the policies that have been implemented to maximize the effects on trade and integration.

III. DESCRIPTION OF ACTIVITIES

3.1 The activities proposed in this project are divided into seven main components:

3.2 **Component 1: Market Study.** The objective of this component is to improve the understanding of market dynamics in the selected regions, by preparing a market

study for each one, including an analysis of the socio-demographic and economic conditions of the different geographic areas and how these impact broadband availability; an analysis of current supply and demand of telecommunication services; and a forecast of the demand.

- 3.3 The activities for the market analysis will include two main pillars, one on the supply side (access) and one on the demand side (adoption and usage).
- 3.4 As for the former, the analysis will include: (i) study of the current supply of telecommunications services in each region (type of service, technology, price and penetration); (ii) study of the existing supporting infrastructure (type of technology, coverage, real usage in terms of used capacity, purpose and user, and owner of the infrastructure) including the existing and planned interconnection points with backbone networks (and/or other backhaul networks) either the national backbone network or that of private operators; (iii) study of the infrastructure planned to be deployed, including coverage, capacity, purpose, user, timing and owner; and (iv) study of the physical infrastructure that can support broadband infrastructure (e.g. roads, electricity, ducts) where the ESW RG-K1294 may be used as an input.
- 3.5 **Component 2: Technical Study.** The objective of this component is to identify the technical considerations for deploying the infrastructure (backhaul and last-mile), including the structure of the network and the different technological alternatives through the development of a technical study.
- 3.6 The activities for the technical study should include: (i) orographic study according to the distribution of the population; (ii) design of the logic diagram of the network (nodes and links); (iii) identification of technological alternatives associated to the physical design (both for backhaul and access) indicating the advantages and disadvantages of each of them; (iv) physical design of the network defining the specific location and typology of the nodes, the links between the nodes (the design will consider and show the existing infrastructure), the interconnection points with backbone networks and the necessary physical supporting infrastructure indicating whether some of the existing can be reutilized (e.g. high-tension); (v) determination of the requirements in terms of capacity and sizing of each of the elements of the network according to the expected traffic that results from the demand study conducted in the Component 1; (vi) determination of the auxiliary elements associated to each of the elements of the network that are necessary indicating whether they exist (e.g. facility to host the nodes); (vii) recommendation of selection of the best technology to attend the estimated traffic; (viii) deployment Plan and Implementation Schedule; and (ix) set of public policies that would facilitate the deployment.
- 3.7 **Component 3: Adoption and Usage study.** The objective of this component is to analyze and define an adoption and usage strategy that guarantees that the infrastructure defined in Component 1 be used by citizens and government with a special focus on schools, health centers and government facilities and services.
- 3.8 The content of the technical study should include, based on the socio-economic characterization of the population conducted in the Component 1 and on a benchmark

of best practices from other countries: (i) a proposal of a set of services for the population prioritizing education (e.g. tele-education), health (e.g. tele-medicine) and government (e.g. e-transactions) but also considering those suitable to the occupation of the local people; (ii) for each of the proposed services, a detailed description of the content (e.g. online books, online classes), specific applications (e.g. virtual classroom) and devices required (e.g. computer/smartphone); (iii) a training plan on the use of ICTs (and internet) and on each of the services proposed both for specialists (e.g. doctors, teachers, government officials), citizens and professionals, identifying the specific audience and the objective; (iv) budget; (v) deployment Plan and Implementation Schedule to guarantee the sustainability of this component later in time; and (vi) specific set of public policies to guarantee and promote the usage considering the three pillars aforementioned (content, applications/services and devices).

- 3.9 **Component 4: Financial study & Governance model.** The objective of this component is to analyze the economic and financial feasibility of the deployment (of the network and of the adoption & usage component) and select a governance model for the bidding and exploitation phases.
- 3.10 The activities for the financial analysis should include a three-step analysis. The first step will consist of a financial analysis of the network deployment and a financial analysis of the usage and adoption modules. The second step will consolidate those two financial analyses into a single one. The third step will estimate the amount of subsidy necessary to make the project feasible. An additional step will include a sensitivity analysis on the critical variables (e.g. price, traffic per user, discount rate)
- 3.11 The result of the consolidated financial indicators will determine the amount of necessary subsidy to make the project feasible.
- 3.12 **Component 5: Cost-Benefit analysis (CBA).** The objective of this component will be to conduct a CBA by identifying all the economic and social benefits that will be derived from this project (quantitative and qualitative) and the costs that have been identifying and quantified in the Component 4.
- 3.13 The activities for this component will include: (i) the methodology for the CBA, including detailed references to published papers and recent literature regarding impact evaluation of broadband development programs; (ii) identification of the quantitative benefits that can be incorporated to the cost-benefit analysis (this includes the revenues calculated in the Component 4); (iii) cost-benefit analysis with specific indicators such as: SRR (social rate of return) and economic NPV; and (iv) identification of the qualitative benefits (i.e. indirect benefits and positive externalities) that, although not incorporated to the numeric study, are relevant. The consultants will present the detailed CBA methodology and results in a power-point presentation to representatives of the GoP in a training session to be arranged by the IDB.
- 3.14 **Component 6: Revision of the regulatory framework and support to OSIPTEL.** The objective of this component is to revise and propose updates to the regulatory framework and legislation in order to boost broadband development in the selected areas. This component is particularly relevant as the decision of investing in the

deployment of access infrastructures by the private sector requires a stable and predictable regulatory framework that creates the conditions to facilitate investments, thus promoting universality in access. The analysis will cover technical, legal and economic aspects.

- 3.15 **Component 7: Support to the preparation of a related loan operation.** The objective of this component is to support the preparation of additional environmental, institutional and administrative studies that will support the preparation of the loan proposal (PE-L1146).
- 3.16 **Component 8: Identification of public policies and strategic regulations that contribute to the integration of Perú with other countries of the Region and development of a regional dialogue to share success cases from other Regions.** The objective of this component is to identify specific public policies and strategic regulations that have been defined in different countries around the world to increase the trade opportunities and the integration. Also a regional dialogue will be conducted to increase awareness and understanding among policy makers and private sector stakeholders of the importance of developing broadband in the region as a trigger for integration and as a trigger for new ways of doing business.
- 3.17 **Expected results:** As a result of this project, the Government of Peru will have a better understanding of the current status of broadband in the selected regions; the economic, financial, technical and environmental feasibility of the different alternatives for the network deployment; the adequacy of the regulatory environment and how broadband could be a tool for integration within the country and with other countries. As follow-up this TC, a loan proposal will be elaborated in collaboration with the government to enable the implementation of the resulting recommendations of this TC. Ultimately, a greater penetration of broadband connectivity is expected to increase competitiveness and social inclusion in the selected regions, overcoming the lagging patterns currently observed.

Table 3.1: Indicative matrix of the results

Suggested indicator	Measurement Unit	Baseline	Target at the end of the TC
Output Indicators:			
Component 1: Market study	No. of Documents	0	1
Component 2: Technical study	No. of Documents	0	3
Component 3: Adoption & usage study	No. of Documents	0	2
Component 4: Financial study & Governance model	No. of Documents	0	2
Component 5: Cost-benefit analysis	No. of Documents	0	2
Component 6: Revision of the regulatory framework and support to OSIPTEL	No. of Documents	0	2
Component 7: Support to the preparation of a related loan operation	No. of Documents	0	2
Component 8: Regional dialogue on how broadband may contribute to increase integration in the region and within the country with the participation of public and private stakeholders	No. of events	0	1
Outcome Indicators:			
Increased government awareness and understanding of the current status of broadband in the country and additional related action to accelerate the penetration, adoption and use of broadband services, and better understanding on how broadband could be a catalyzer for regional integration	No. of citations of the TC products in national government strategic documents	0	3

Table 3.2: Indicative budget

Activities	Description	IDB	Total
Component 1: Market study	Consultancy: understanding of market dynamics	100,000	100,000
Component 2: Technical study	Consultancy: identification of the technical considerations for deploying the infrastructure (backhaul and last-mile),	250,000	250,000
Component 3: Adoption & Usage study	Consultancy: analysis and definition of an adoption and usage	80,000	80,000
Component 4: Financial study & Governance model	Consultancy: analysis of the economic and financial feasibility of the deployment	70,000	70,000
Component 5: Cost-Benefit analysis	Consultancy: cost-benefit analysis	30,000	30,000
Component 6: Revision of the regulatory framework and support to OSIPTEL	Consultancy: review and proposal of updates to the regulatory framework	100,000	100,000
Component 7: Support to the preparation of a related loan operation	Consultancy: support to the preparation of the loan proposal (PE-L1146)	70,000	70,000
Component 8: Identification of public policies and strategic regulations that contributes to the integration of Perú with other countries and within the country.	Development of a Regional Dialogue	100,000	100,000
Contingences		50,000	50,000
Total		850,000	850,000

IV. EXECUTING AGENCY AND EXECUTING STRUCTURE

- 4.1 In response to the petition from the Ministry of Transport and Communications of Peru, the executing agency will be the IFD/ICS Division, which will operate in coordination with the staff of the Ministry and of other involved institutions.

V. PROJECT RISKS

- 5.1 This project presents three risks that could affect the impact, quality or sustainability of the expected results: (i) that the results of the project are not taken into account to increase broadband connectivity due to a lack of formal commitment to deploy infrastructure once the project is finished, (ii) that the backhaul networks are required to connect to the wholesale carriers and those present any kind of reluctance or blocking practices (e.g. delays in the agreements, excessive prices), (iii) that the regulation is not strong enough and micro-monopolies are created within regional and local networks.
- 5.2 The first risk is mitigated by the fact that in response to the interest presented by the government to the Bank, a related loan operation has been registered for the pipeline for the year 2015. This technical cooperation will facilitate the identifications of the specific components to be included in the referred operation, according to the needs of the government in terms of software and hardware. The

second and third risks are mitigated by the Component 6 that aims at reviewing and strengthening the regulatory framework.

VI. EXCEPTIONS TO THE POLICY OF THE BANK

- 6.1 There are no exceptions to the policy of the Bank.

VII. ENVIRONMENTAL STRATEGY

- 7.1 Given that the current TC revolves around a study, there are no social or environmental risks associated with it. This operation is classified as a Category “C” according to the classification toolkit of the Bank (see the link: [IDBDocs#37850971](#)).