

## TC Document

### I. Basic Information for TC

▪ Country/Region:	ECUADOR
▪ TC Name:	Digital infrastructure in Ecuador as a trigger to overcome the effects of COVID
▪ TC Number:	EC-T1447
▪ Team Leader/Members:	Garcia Zaballos, Antonio (IFD/CMF) Team Leader; Iglesias Rodriguez, Enrique (IFD/CMF) Alternate Team Leader; Almeida Oleas, Natalia (LEG/SGO); Bernedo, Cecilia (IFD/CMF); Gonzalez Murillo, Lidice Alexa (IFD/CMF); Porras Herrera, Fanny Eliana (IFD/CMF) Oleas, Natalia (LEG/SGO); Bernedo, Cecilia (IFD/CMF); Gonzalez Murillo, Lidice Alexa (IFD/CMF); Porras Herrera, Fanny Eliana (IFD/CMF)
▪ Taxonomy:	Client Support
▪ Operation Supported by the TC:	N/A
▪ Date of TC Abstract authorization:	02 Oct 2020.
▪ Beneficiary:	Ecuador
▪ Executing Agency and contact name:	Inter-American Development Bank
▪ Donors providing funding:	Knowledge Partnership Korea Fund for Technology and Innovation(KPK)
▪ IDB Funding Requested:	US\$900,000.00
▪ Local counterpart funding, if any:	US\$0 None
▪ Disbursement period (which includes Execution period):	24 months (Execution period: 18 months)
▪ Required start date:	January 30 2021
▪ Types of consultants:	Individuals and Firms
▪ Prepared by Unit:	IFD/CMF-Connectivity Markets and Finance Division
▪ Unit of Disbursement Responsibility:	IFD/CMF-Connectivity Markets and Finance Division
▪ TC included in Country Strategy (y/n):	Yes
▪ TC included in CPD (y/n):	Yes
▪ Alignment to the Update to the Institutional Strategy	Social inclusion and equality; Productivity and innovation; Institutional capacity and rule of law; Gender equality

### II. Objectives and Justification of the TC

- 2.1 The use of Information and Communication Technologies (ICTs) 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 broadband speed and bandwidth.
- 2.2 Broadband infrastructure is an enabler of development. According to several studies, a 10% growth of broadband penetration is associated with a 1.21% increase in the Gross Domestic Product (GDP) of high-income countries and a 1.38% increase in the GDP of low-income countries (World Bank, 2009). It is estimated that in case region, for, a 10% growth in the penetration rate of broadband services, the GDP can be increased by 3.19%; the productivity by 2.61% and more than 67,000 jobs can be created.

- 2.3 The Government of Ecuador has launched the agenda Connected Ecuador which intends to increase coverage to 98% of the population, reduce the internet prices, install more than 100 Wi-Fi hotspots, and evolve the 2G/3G customer base to new technologies in such a way that the country gets ready for the introduction of 5G across different sectors of the economy, most important challenge was adopting and finding usability of services. More specifically, by 2021 the main indicators of the agenda consist of: (i) increasing the 4G coverage to 80%, (ii) increasing the smartphone penetration up to 65%, (iii) increasing the penetration of fixed broadband services to 59% of the total households and (iv) increasing the penetration of computer up to 62%. The required investment to achieve these goals will benefit over 12,000 schools, more than 4,2 million households and almost 2,000 health centers.
- 2.4 Moreover due, to current ongoing unexpected pandemic situation (COVID-19), the deployment of broadband network to connect the hospitals and health centers has become the highest priorities. To respond to this highly contagious virus, real-time information sharing system through the Internet is necessary for the related organizations. Also, by deploying the broadband infrastructures to the rural areas and increasing the accessibility of public institutions like schools and government offices, ICT tools to overcome the pandemic crisis may be available.
- 2.5 ICT applications can play a vital role in fighting COVID-19. Korea was able to successfully flatten the curve on COVID-19 in only 20 days without enforcing extreme draconian measures that restrict freedom and movement of people.<sup>1</sup> Mobile devices and applications can be used to support early testing and contact tracing, government websites can share latest virus information and news, smart drones may be used to deliver medicine without face-to-face contact, and AI technology can be used to predict and prevent medical supplies and human resources.
- 2.6 Also, by, deploying network to the education centers and schools at rural areas, the government of Ecuador can also provide students with curriculums which can provide capacity building of the ICT skills to bridge the digital gap in the country. Currently, Ecuador is one of 15 Latin American countries actively promoting a digital agenda as part of a larger domestic policy, but still the number of Internet users does not exceed 50% of the population, and the digital gap is being worse.
- 2.7 **Objectives.** The general objective of this Technical Cooperation (TC) is to conduct feasibility studies to improve the connectivity of public institutions and households in Ecuador. Particularly, these feasibility studies aim to support the current COVID-19 crisis by exploring market (including demography), forecasting demand, identifying the best cable routes, designing the network, preparing its specifications and developing the technical, financial, and managerial studies of the network and its utilization. The TC will suggest possible application areas, which will make the full use of developed infrastructure. Especially the best practice of Korean governments' use of ICT to fight COVID-19.

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<sup>1</sup> Flattening the curve on COVID-19, how Korea responded to a pandemic using ICT, The government of the Republic of Korea 2020

- 2.8 **Strategic alignment.** The TC is aligned with the priorities identified in the IDB's second update to the Institutional Strategy (AB-3190-2). Specifically, it is aligned with the following strategic policy objectives: (i) Gender equality; (ii) Institutional capacity and rule of law; (iii) Productivity and innovation and (iv) Social inclusion and equality. Additionally, this TC is expected to contribute to the following Corporate Results Framework (CRF) (GN-2727-12) indicators: (i) telecommunications Infrastructure, contributions directed to develop extension and quality of telecoms infrastructure, including infrastructure; and (ii) public policy in telecommunications; contributions directed to increase the level playing-field competition and the transparency of the regulatory policy and reforms within the telecom sector. The TC is also aligned to gender and diversity since it is considered the design of specific training program that contribute to reduce the gender gap, also since notice that the infrastructure that will be deployed will contribute to the reduction of the gender gap. Lastly the TC is also aligned to the country strategy GN-2924 and will provide inputs for the preparation of the loan EC-L1262. Finally, the TC is aligned to the priorities of the KPK fund and will bring specific experiences from Korea.

### III. Description of activities/components and budget

- 3.1 The activities that are proposed in this project are divided into three main components, which define the strategic approach of this technical cooperation: Component 1 will include a demand forecast to quantify the size of the infrastructure that is required to guarantee the quality of service. Component 2 will develop a technical analysis of the existing infrastructures and the additional infrastructure requirements to improve the connectivity of public institutions. Component 3 will focus on the economic and financial indicators associated to the project as well as the most efficient way to execute the recommendations (governance model). of the deployment and select a governance model. Component 4 is expected to develop new application services which can be adopted to the enhanced infrastructure and expert training workshop.
- 3.2 **Component 1: Demand forecast.** The objective of this component is to conduct a demand study for Ecuador and identify international best practices on how to promote digital infrastructure for connectivity in this pandemic crisis.
- 3.3 **Activity 1.1 Market study.** The scope to be implemented within this analysis will be: (i) study of the supply: identify current supply of telecommunications services in Ecuador (households, hospitals, health centers, and public institutions like schools and education centers); and (ii) study of the demand: estimate the current demand for those services and forecast, considered political, economic, sociodemographic, and cultural circumstances of the region, especially considering the demands from the health organizations.
- 3.4 **Activity 1.2: International best practices.** This activity aims to gather various cases across the globe and draw lessons learned related to the operation and governance in the deployment of infrastructure to rural areas and the use of ICTs responding to pandemic situations. The results of this study will serve as reference models for the Technical and Economic study to be carried out in the following components.
- 3.5 **Component 2: Identification of the technical considerations for deploying digital infrastructure which improve connectivity of public institutions, especially hospitals, health centers, public schools, education centers, and households.** This component will focus on the identification of alternatives with different routes and technologies and the selection of the most cost-efficient technical solution to improve

the connectivity. As part of the component, it will be estimated the investment requirement on digital infrastructure.

- 3.6 **Activity 2.1: Developing and comparing alternatives.** This technical analysis includes, among others: (i) assessment of the existing available infrastructure; (ii) estimation of the infrastructure requirement to connect the public institutions and households included. This component will assess the orography, the design of the logical diagram nodes, estimation of the expected traffic and the capacity of the interfaces as well as the physical layout diagram and deployment plan and implementation schedule.
- 3.7 **Activity 2.2: Selection of the most feasible and desirable option.** Following the steps of the activity 2.1, the most cost-efficient route to connect the public institutions (hospitals, health centers, schools, education centers) and households in Ecuador will be determined. Finally based on the results, a deployment and execution plan will be development and the specific requirements in terms of capacity and quality will also be determined.
- 3.8 **Activity 2.3: Suggestion of application model.** This activity will suggest an ICT application model for Ecuador government which can support the government responding to COVID-19 and make the full use of broadband network to be deployed in the selected area.
- 3.9 **Component 3: Socio-economic and financial feasibility study of the deployment and select a governance model.** The objective for this component is to conduct a socio-economic and financial study on the deployment and sustainability of the network and the services to be eventually provided.
- 3.10 **Activity 3.1: Socio-economic and financial analysis.** This study includes: (i) estimation of financial KPIs related to the required investment; (ii) valuation of the different scenarios; and (iii) development of a business model.
- 3.11 **Activity 3.2: Governance model.** Taken all the conditions and willingness of related stakeholders into account, appropriate approach could be selected.
- 3.12 **Component 4: Development of Application item and capacity building:** This component will finance the developing specific application item such as smart drone and the training program to educate personals for operation and management of the related system. The result of this component can be considered as one of use cases for future investment programs. The project will finance the following activities:
- 3.13 **Activity 4.1. Project roadmap and design:** As part of this activity, it will provide the governance model, technical recommendation, financing model and regulatory framework to adopt and utilize the drone operations.
- 3.14 **Activity 4.2. Training program:** As part of this this activity, it will be provided training and capacity building on how digital infrastructure could be used for improving the productivity of strategic sectors. To do so, and as part of the work, the project will present the lessons learnt from Korea in terms of Governance model, applications and alternative technical solutions based on big data collected from smart drones. As part of this activity, Ecuador is expected to interact with Korean Institutions to get first-hand experience on technical and policy aspects that work, and which does not work.
- 3.15 **Activity 4.3. Workshop:** As part of the Regional Public Good (RG-T3096) and the regional dialogue that the Bank is promoting on digital infrastructure, the project is expected to organize a specific workshop on the outcomes and results achieved from

this project. As part of that dialogue, the project will be inviting the Korean Institutions involved in previous activity to share lessons learnt and identify next steps as part of the strategy going forward.

- 3.16 The total cost of this TC will be **US\$900,000** which will be financed by the Knowledge Partnership Korea Fund for Technology and Innovation (KPK).
- 3.17 **Beneficiaries.** The results of this technical cooperation will benefit the country since it will provide the inputs for a digital infrastructure strategy to improve the connectivity of different municipalities (parishes), as well as public institutions such as schools, hospitals, police stations. Therefore, in addition to MINTEL, the outcomes of this TC will also benefit the telecom and energy regulator that are regulating the provision of digital services through telecommunications and/or electricity pipeline and the sector ministries such as education, health, justice, etc. It is important to note that all rights resulting from intellectual-property products this TC finances shall be the property of the Bank.
- 3.18 **Expected results.** This project will provide technical assistance and investment strategy for laying optical fiber rings to connect public institutions and households in Ecuador, and also suggest ICT application models that can support Ecuador government fighting COVID-19. Specifically, the expected results of the project are: (i) Demand analysis and forecast, including an analysis of the socio-demographic and economic conditions; an analysis of current supply and demand of telecommunication services, (ii) Technical study including an analysis of the quality of service indicators to consider in the deployment of the infrastructure. The selection of appropriate technologies and the stages of the deployment plan, including the structure of the network, and the implementation schedule should also be defined (iii) Economic and financial study on the sustainability of the network and the services to be eventually provided and (iv) Best practices on how to promote and utilize digital infrastructure paying special attention to the Korean case.

#### Indicative Budget (US\$)

Activity/Component	Description	IDB/Fund Funding	Counterpart Funding	Total Funding
<b>Component 1</b>	Demand forecast study in Ecuador and review of international best practices.	150,000.00	<b>0</b>	150,000.00
<b>Component 2</b>	Identification of the technical considerations study for deploying digital infrastructure to improve connectivity of public institutions, especially hospitals, health centers, public schools, education centers, and household.	300,000.00	<b>0</b>	300,000.00
<b>Component 3</b>	Socio-economic and financial feasibility of the deployment and select a governance model.	100,000.00	<b>0</b>	100,000.00
<b>Component 4</b>	Smart drone governance model research and expert training course.	350,000.00	<b>0</b>	350,000.00
<b>TOTAL</b>		<b>900,000.00</b>		<b>900,000.00</b>

#### **IV. Executing agency and execution structure**

- 4.1 The executing agency will be the Bank through Connectivity, Markets and Finance (IFD/CMF). The justification for this execution structure is: (i) the Bank has the technical experience to coordinate and executive the different activities included in the technical cooperation; (ii) the technical cooperation will need extensive partnership with international organizations, academic institutions and private firms; and (iii) the technical cooperation will also imply the participation of different areas from the Government that are involved in the implementation of the digital strategy, in addition to MINTEL, the regulator of energy and telecom, the Ministry of Education, Ministry of health and Ministry of finance, to facilitate the coordination the Bank will be the be the executor to overcome the technical difficulties related to the project. Supervision and coordination of the consultant's work will be the responsibility of Antonio García Zaballos (IFD/CMF), Team Leader, [antoniogar@iadb.org](mailto:antoniogar@iadb.org), telephone (202) 623-2980.
- 4.2 **Procurement:** All activities to be executed under this TC have been included in the Procurement Plan (see Annex IV) and will be contracted in accordance with Bank policies as follows: (a) AM-650 for Individual consultants; (b) GN-2765-4 and Guidelines OP-1155-4 for Consulting Firms for services of an intellectual nature and; (c) GN-2303-28 for logistics and other related service

#### **V. Major issues**

- 5.1 This project entails two risks that could potentially affect the project: (i) the lack of coordination necessary to make the different institutions (Ministry, Regulator, Operators, etc.) from Ecuador collaborate with one another; and (ii) the lack of expertise to deal with the large business like the deployment of infrastructure beyond national borders. The first risk will be mitigated by utilizing the Regional Public Good the Bank is executing RG-T3096 as a channel to facilitate preliminary dialogue and further cooperation. The second risk will be reduced the cooperation between the Bank, and renowned international institutions which could provide specific support, knowledge, and training throughout the execution of the project, for instance Korean Institutions.

#### **VI. Exceptions to Bank policy**

- 6.1 There are no exceptions of the policy of the bank.

#### **VII. Environmental and Social Strategy**

- 7.1 Given that current TC revolves around a study, there are no social or environmental risks associated with it. Based on the Environmental and Social Safeguard Compliance Policy (OP-703), this TC has been classified as a Category "C" according to the classification toolkit of the Bank (see: [Safeguard Policy Filter](#) and [Safeguard Screening Form](#)).

#### **Required Annexes:**

[Request from the Client - EC-T1447](#)

[Results Matrix - EC-T1447](#)

[Terms of Reference - EC-T1447](#)

[Procurement Plan - EC-T1447](#)