

## **TERMS OF REFERENCE**

### **ECUADOR**

### **DIGITAL INFRASTRUCTURE IN ECUADOR AS A TRIGGER TO OVERCOME THE EFFECTS OF COVID (EC-T1447)**

### **CONSULTANCY 1: PRE-FEASIBILITY STUDIES RELATED TO THE DEPLOYMENT: MARKET STUDY**

#### **I. BACKGROUND AND JUSTIFICATION**

- 1.1 **Justification:** 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.
- 1.2 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 the case of the LAC 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.
- 1.3 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 on: (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.
- 1.4 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.
- 1.5 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.

## II. OBJECTIVES

- 2.1 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.

## III. CHARACTERISTICS OF THIS CONSULTANCY

- 3.1 **Type of consultancy:** Firm
- 3.2 **Start date and duration:** 2021 expected 6 months
- Place of work /travel:** Place of residence. Travel required. During this period, the firm is expected to participate in a total of two (2) coordination meetings with IDB Specialists in Headquarters (Washington DC) and (2) presentation meeting with government of Ecuador.
- 3.3 **Qualifications:** The firm will have extensive experience in the telecommunications sector, with Senior team members involved in projects in LAC and other developing regions. Specific domain of domestic and international broadband infrastructure is required, including both terrestrial and undersea cables. The firm must have a proven capability to deliver detailed and accurate market studies, particularly as the results of Component 1 will serve as critical inputs for the development of the feasibility studies in Components 2 and 3 of the projects.
- 3.4 **Source of funding:** EC-T1447.

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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

#### **IV. MAIN ACTIVITIES AND REPORTS/DELIVERABLES**

- 4.1 **Component 1: Improve the understanding of market dynamics in Ecuador.**  
The objective of this component is to conduct a market study for every country, 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. The scope of the activities to be implemented within the market analysis will be:
- 4.2 **Activity 1: Study of the supply**
- 4.3 Identify the type of services that are available for the final users (citizens, SMEs and public administrations). Specific information should also be provided on how the market is distributed among the different players, providing an analysis in terms of HHI<sup>2</sup> and any other concentration index that the firm may consider necessary in order to come up with a detailed description of the level of competition in the different countries and the type of services that are available.
- 4.4 **Activity 2: Study of the demand**
- 4.5 Considering the analysis conducted in the previous activity, identify how the demand is behaving in terms of consumption and whether there is any unsatisfied demand. Provide an analysis of what is demanded today.
- 4.6 **Activity 3: Study on the distribution of the population**
- 4.7 Identify how the population is distributed in terms of socio-demographic and economic conditions and discern conclusions on the implications that the composition of the population density may have in terms of the infrastructure deployment of the optical fiber ring for each member country.
- 4.8 **Activity 4: Demand forecast**
- 4.9 Provide a forecast of the demand in each country, considering the demand behavior identified in activity 2 and the socio-demographic conditions from activity 3. To conduct this study, the consulting firm must take into consideration not only the existing services that are available in Ecuador, as per activity 1, but also the new services that may be launched after the deployment of the infrastructure. Specific attention should be given to market and sectorial trends to justify the forecast.
- 4.10 The results of these studies will serve as the basis for the Technical Study to be carried out in the following component.
- 4.11 **Reports:**

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<sup>2</sup> Herfindahl–Hirschman Index (HHI) is a measure of the size of firms in relation to the industry and an indicator of the amount of competition among them.

- a. Analysis of the current demand for telecommunications services.
  - b. Analysis of the current supply of telecommunications services.
  - c. Document explaining how the population is distributed and which are the implications in terms of demand and supply.
  - d. Forecast of the demand for services, based on statistical methods, assuming that the improvement of infrastructure is complete, and taking into account the new services that may be provided once the optical fiber ring becomes available.
- 4.12 Notice that all pre-feasibility or feasibility studies of specific investment projects including environmental and social studies should be consistent with the Environmental and Social Policy Framework (GN-2965-21).

**V. PAYMENT AND SCHEDULE**

- 5.1 Payment will be made as per the following schedule, upon approval by the Team Leader responsible for this TC (See item VI below).
- 5.2 **Schedule of payments:**
- a. 30% upon approval work plan,
  - b. 30% upon approval of draft report, and
  - c. 40% upon approval of final report

**VI. SUPERVISION AND REPORTING**

- 6.1 Supervision and coordination of the consultant's work will be the responsibility of Antonio García Zaballos (IFD/CTI), Team Leader, [antoniogar@iadb.org](mailto:antoniogar@iadb.org).

## TERMS OF REFERENCE

### **ECUADOR**

#### **DIGITAL INFRASTRUCTURE IN ECUADOR AS A TRIGGER TO OVERCOME THE EFFECTS OF COVID (EC-T1447)**

#### **Consultancy 2: PRE-FEASIBILITY STUDIES RELATED TO THE DEPLOYMENT: TECHNICAL STUDY**

##### **I. BACKGROUND AND JUSTIFICATION**

- 1.1 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.
- 1.2 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 the case of the LAC 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.
- 1.3 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 on: (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.
- 1.4 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.
- 1.5 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>3</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.

## II. OBJECTIVES

- 2.1 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.

## III. CHARACTERISTICS OF THIS CONSULTANCY

- 3.1 **Type of consultancy:** Firm
- 3.2 **Start date and duration:** 2021, expected 6 months.  
**Place of work /travel:** Place of residence. Travel required. During this period, the firm is expected to participate in a total of two (2) coordination meetings with IDB Specialists in Headquarters (Washington DC) and (2) presentation meeting with government of Ecuador.
- 3.3 **Qualifications:** The firm will have extensive experience in the telecommunications sector, with Senior team members involved in projects in LAC and other developing regions. Specific domain of domestic and international broadband infrastructure is required, including both terrestrial and undersea cables. The firm must have a proven capability to deliver detailed and accurate market studies, particularly as the results of Component 1 will serve as critical inputs for the development of the feasibility studies in Components 2 and 3 of the projects.
- 3.4 **Source of funding:** EC-T1447.

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<sup>3</sup> Flattening the curve on COVID-19, how Korea responded to a pandemic using ICT, The government of the Republic of Korea 2020

#### **IV. MAIN ACTIVITIES AND REPORTS/DELIVERABLES**

- 4.1 **Component 2: Identify the technical considerations for deploying the infrastructure, including the structure of the network and the expected social and environmental impacts.** The objective of this component is to develop a technical study including: (i) orographic study and population distribution; (ii) assessment of the existing available infrastructure; (iii) design of the logic diagram node of the network; (iv) estimation of the expected traffic according to the 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; and (viii) development of a deployment and execution plan. The activities included within the technical analysis are:
- a. Orographic Analysis
  - b. Assessment of the current situation of Telecommunications Infrastructure
  - c. Design of the Logic Diagram Node
  - d. Estimation of the expected traffic
  - e. Estimation of capacity and choice of interfaces
  - f. Analysis of technological alternatives
  - g. Physical layout diagram
  - h. Deployment Plan and Implementation Schedule
  - i. Environmental and social impact assessment
- 4.2 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.
- 4.3 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.
- 4.4 **Reports:**
- a. A technical study including an analysis of the technical parameters 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.
- 4.5 Notice that all pre-feasibility or feasibility studies of specific investment projects including environmental and social studies should be consistent with the Environmental and Social Policy Framework (GN-2965-21).

#### **V. METHOD OF PAYMENT**

- 5.1 Payment will be made as per the following schedule, upon approval by the Team Leader responsible for this TC (See item VI below).

**5.2 Schedule of payments:**

- 5.2.1 30% upon approval work plan,
- 5.2.2 30% upon approval of draft report, and
- 5.2.3 40% upon approval of final report

**VI. SUPERVISION AND REPORTING**

- 6.1 Supervision and coordination of the consultant's work will be the responsibility of Antonio García Zaballos (IFD/CTI), Team Leader, [antoniogar@iadb.org](mailto:antoniogar@iadb.org).



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#### **Consultancy 3: PRE-FEASIBILITY STUDIES RELATED TO THE DEPLOYMENT: ECONOMIC STUDY**

##### **I. BACKGROUND AND JUSTIFICATION**

- 1.1 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.
- 1.2 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 the case of the LAC 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.
- 1.3 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 on: (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.
- 1.4 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.
- 1.5 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>4</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.

## II. **OBJECTIVES**

- 2.1 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.

## III. **CHARACTERISTICS OF THIS CONSULTANCY**

- 3.1 **Type of consultancy:** Firm
- 3.2 **Start date and duration:** 2021, expected 6 months.  
  
**Place of work /travel:** Place of residence. Travel required. During this period, the firm is expected to participate in a total of two (2) coordination meetings with IDB Specialists in Headquarters (Washington DC) and (2) presentation meeting with government of Ecuador.
- 3.3 **Qualifications:** The firm will have extensive experience in the telecommunications sector, with Senior team members involved in projects in LAC and other developing regions. Specific domain of domestic and international broadband infrastructure is required, including both terrestrial and undersea cables. The firm must have a proven capability to deliver detailed and accurate market studies, particularly as the results of Component 1 will serve as critical inputs for the development of the feasibility studies in Components 2 and 3 of the projects.
- 3.4 **Source of funding:** EC-T1447

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<sup>4</sup> Flattening the curve on COVID-19, how Korea responded to a pandemic using ICT, The government of the Republic of Korea 2020

#### **IV. MAIN ACTIVITIES AND REPORTS/ DELIVERABLES**

- 4.1 **Component 3: Analyze the economic and financial feasibility of the deployment and select a governance model.** The objective for this component is to develop an economic and financial study on the sustainability of the network and the services to be eventually provided.
- 4.2 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. The activities to be included in the economic analysis are:
- a. Estimation of the required investment to satisfy the demand
  - b. Valuation of the different scenarios, considering the different technological alternatives
  - c. Development of a business model
  - d. Selection of the technology and financial figures of the project
- 4.3 The result of this component will be an analysis of the economic feasibility of the deployment considering the data from the Market Research (component 1) and the Technical Study (component 2).
- 4.4 Additionally, the conclusions drawn from this study will serve as feedback for the technical study and may introduce specific changes in the Deployment Plan (component 2).
- 4.5 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.
- 4.6 **Reports:**
- a. An economic and financial study on the sustainability of the network and the services to be eventually provided.
  - b. Taking into account the results and conclusions of the feasibility studies, specific recommendations should 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.
- 4.7 Notice that all pre-feasibility or feasibility studies of specific investment projects including environmental and social studies should be consistent with the Environmental and Social Policy Framework (GN-2965-21).

#### **V. METHOD OF PAYMENT**

- 5.1 Payment will be made as per the following schedule, upon approval by the Team Leader responsible for this TC (See item VI below).
- 5.2 **Schedule of payments:**

- 5.2.1 30% upon approval work plan,
- 5.2.2 30% upon approval of draft report, and
- 5.2.3 40% upon approval of final report.

**VI. SUPERVISION AND REPORTING**

- 6.1 Supervision and coordination of the consultant's work will be the responsibility of Antonio García Zaballos (IFD/CTI), Team Leader, [antoniogar@iadb.org](mailto:antoniogar@iadb.org).

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### **Consultancy 4: FEASIBILITY STUDIES RELATED TO THE APPLICATION SERVICE: INSTITUTIONAL AND TECHNICAL STUDY**

#### **I. BACKGROUND AND JUSTIFICATION**

- 1.1 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.
- 1.2 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 the case of the LAC 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.
- 1.3 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.
- 1.4 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.

- 1.5 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>5</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.

## II. OBJECTIVES

- 2.1 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 also 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.

## III. CHARACTERISTICS OF THIS CONSULTANCY

- 3.1 **Type of consultancy:** Firm
- 3.2 **Start date and duration:** 2021, expected 6 months.
- Place of work /travel:** Place of residence. Travel required. During this period, the firm is expected to participate in a total of two (2) coordination meetings with IDB Specialists in Headquarters (Washington DC) and (2) presentation meeting with government of Ecuador.
- 3.3 **Qualifications:** The firm must have extensive experience in the Information and Communication Technologies sector, with Senior team members involved in projects in LAC or other developing regions. The firm must have an experience of implementing or operating the smart drone service infrastructure. The firm should be able to deliver detailed and accurate infrastructure model that meets the situation in the country.
- 3.4 **Source of funding:** EC-T1447.

## IV. MAIN ACTIVITIES AND REPORTS/DELIVERABLES

- 4.1 **Component 4: Identify the institutional strategy and the technical expertise in implementing the smart drone service infrastructure, including the suggestion of data center model to manage and operate the drones and data collected by them.** The objective for this component is to suggest cutting-edge ICT application which will support full utilization of the network to be provided.

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<sup>5</sup> Flattening the curve on COVID-19, how Korea responded to a pandemic using ICT, The government of the Republic of Korea 2020

- 4.2 The activities to be included in the research are:
- e. Development of the smart drone service model
  - f. The technical methods to be selected in implementation stage
  - g. Institutional changes to be suggested
  - h. Case study on the ICT infrastructure monitoring system using smart drone, surveillance camera, and IoT devices, etc.
  - i. Suggestion of datacenter model to manage and operate drone service
  - j. Suggestion of utilization of data collected by the drones
  - k. Capacity training of relevant government employees and experts
- 4.3 The study will compare the system and policy between Ecuador and advanced country (like Korea), a) the institutional and organizational status and to what level and extent they have been developed and applied, b) the budget or investment plans for restructuring the facility monitoring system, and c) the level and extent of co-operation among different agencies regarding the study.
- 4.4 The result should suggest policy and master plan recommendations to execute key prioritized activities of ICT Infrastructure monitoring system.
- 4.5 The dissemination seminar will be held to share results of the project in Ecuador. The seminar aims to disseminate the project outputs for the national and local stakeholders.
- 4.6 The conclusions drawn from this study (the drone service infrastructure-systems, solutions and network) will be proposed to the government as the example application areas to be implemented to utilize the broadband network to be provided.
- 4.7 **Reports:**
- a. An institutional and technical study on the ICT application model (Smart drone) and service to be eventually provided.
  - b. Considering the current situation of Ecuador's infrastructure management system, and government officials and stakeholders' capabilities, should be able to provide the best way to implement the newly suggested Smart drone infrastructure.
  - c. Capacity building workshop and interim Workshop: the agenda for the capacity building workshop with a focus on Korean knowledge and experience in development of the public facility and ICT Infrastructure monitoring management in Korea. Workshop with Korean experts, site visits and meetings with Korean government authorities and company representatives.

## **V. METHOD OF PAYMENT**

- 5.1 Payment will be made as per the following schedule, upon approval by the Team Leader responsible for this TC (See item VI below).
- 5.2 **Schedule of payments:**
- 5.2.1 30% upon approval work plan,
  - 5.2.2 30% upon approval of draft report, and

5.2.3 40% upon approval of final report

**VI. SUPERVISION AND REPORTING**

- 6.1 Supervision and coordination of the consultant's work will be the responsibility of Antonio García Zaballos (IFD/CTI), Tem Leader, [antoniogar@iadb.org](mailto:antoniogar@iadb.org)