**Dominican Republic**

**IFD/CMF**

**Support to the digitalization in Dominican Republic**

**(DR-T1183)**

**Terms of Reference**

1. **Background**

Digitalization, usually represented by the access and use of broadband, is well known as an enabler of socio-economic development, since it could spur economic growth by contributing to the enhancement of national competitiveness, the increase of productivity and efficiency, as well as the creation of decent jobs. With regard to the economic impacts of broadband, it has been estimated that 10% growth in penetration would raise GDP of high-income countries by 1.21% and that of low-income countries by 1.38% (World Bank, 2009). In particular, in the Latin American and the Caribbean (LAC) region, it is calculated that an increase of 10% in penetration, on average, has been associated with the increase of 3.19% in GDP; 2.61% in productivity and a net generation of more than 67,000 jobs.[[1]](#footnote-2)

DOMINICAN REPUBLIC, during the time, has experienced relatively high growth in the digital or ICT sector, with the liberalization of telecommunications market. Especially, the development of mobile broadband is considerable (21% as of 2016, GSMA). However, fixed broadband, which is more reliable and cost-effective for intensive usage in institutions, corporates and households still lags, resulting partly from under-investment over the years and partly from insufficient competition at the wholesale level (6.4% as of 2017, well below the Latin American average 13.8%, ITU). Particularly, persistent digital divide between major urban cities and rural areas in terms of the fixed broadband worsens the situation, functioning as a main obstacle to the rapid and wide spread of broadband and so furthermore inclusive growth in DOMINICAN REPUBLIC.[[2]](#footnote-3) Rural broadband development, therefore, is now a challenge to be addressed urgently for DOMINICAN REPUBLIC to proceed digital economy.

In this line, the main barriers found in Dominican Republic to increase broadband services penetration, adoption and use are: (i) limited awareness of the benefits that broadband and ICTs have particularly regarding their potential for innovation and competitiveness in sectors such as health, education, government, trade, finance and SMEs, as well as a general lack of skills for their adoption by public officials, policy makers, entrepreneurs and citizens; (ii) need to continue pushing, implementing and monitoring specific policies promoting the adoption and effective use of ICTs for all the population (the government of Dominican Republic has a comprehensive ICT policy framework that is now implementing); (iii) outdated regulatory frameworks that fail to adequately attend the recent evolution of the telecommunications sector; and (iv) inadequate deployment of infrastructure and technology with scarce participation by the private sector in the investment and provision of technology.

In light of the many challenges observed to promote broadband in the DOMINICAN REPUBLIC, particularly regarding the lack of understanding of the broadband status quo given the absence of appropriate data, the Government requested technical and financial support from the Inter-American Development Bank (IDB) to address these issues through this technical cooperation. This technical cooperation will support technical work to be carried out for the design of a national broadband cloud-computing infrastructure, and regulatory frameworks.

1. **Consultancy objective(s)**

The general objective of this TC is to support the comprehensive digitalization of the Dominican Republic by way of developing a strategy for deploying rural broadband infrastructure and introducing a nationwide digital broadcasting system that would contribute to improved connectivity of rural production centers, as well as, better access for rural populations to health and education services. Under the national Information and Communication Technologies (ICT) plan called “*Republica Digital*”, Dominican Republic is driving to extend fiber-optic networks further into remote and rural areas. On top of it, the country has also committed repeatedly to complete analog switch off (by doing so successful transition to digital broadcasting) in close collaboration with the Bank and advanced countries. Through this project, we hope to provide Dominican Republic a strong tool on how to achieve those goals in a cost˗effective and timely manner.

1. **Main activities**

The activities proposed in this project are divided into three main components, which define its strategic approach. The consultant will be in charge of delivering various services and products described below:

**Component 1: Diagnostic and studies for the deployment of digital infrastructure**

The objective of this component is to determine the need for digital infrastructure to develop new broadband services. To that goal, the following activities will be developed:

**Activity 1.1 Demand estimation.** Develop an estimation and forecast (five years) demand for both broadband services and cloud computing. The study will consider all possible beneficiaries: citizens, private companies (multisector analysis) and public institutions.

**Activity 1.2 Supply analysis.**Analyze the current and future supply of broadband networks (backbone, backhaul and last mile) and ICT enabled services (needs for data storage, processing and security). Diagnose the gaps between the supply and demand of broadband networks and government broadband services to citizens, private companies (multisector analysis) and public institutions.

**Activity 1.3 Technical study.**Identify the key design criteria and technical specifications for the both the broadband networks (backbone, backhaul and last mile) and the overall cloud-computing infrastructure and services related to the technology into the key touristic areas defined by República Digital. Assess different technological alternatives considering the identified needs.

Provide design specifications to deploy new broadband networks and bridge the existing gaps. Develop a map that includes existing backbone and backhaul networks and the proposed new routes. Provide design specifications for the different last mile network alternatives proposed.

Analyze the main and back-up data centers and conceptualize the cloud-computing facility in diagram format, detailing the components and systems that will comprise the project investment.

**Activity 1.4 Financial and economic analysis*.*** Quantify all the investments described in the previous three items, and the associated OPEX for the first five years of the operation. Calculate the revenues and operational expenditures for the first five-year period. Formulate a five-year operating and commercial management strategy. The study will be separated in two sections: (i) broadband networks and (ii) cloud computing infrastructure.

Evaluate the investment and analyze the economic return associated with the different alternatives for deploying cloud-computing infrastructure, taking into account the different deployment scenarios. The study will also include an estimation of the Net Present Value (NPV) and Rate of Return (IRR) associated with the 2 investments.

**Activity 1.6 Roadmap for implementation.**For each of the two described investments (broadband networks and cloud computing infrastructure), create a roadmap for project schedule and development of services, expanding on stages for detailed design and engineering, construction, operations, service introduction, monitoring etc. Define key milestones and measurable targets. Identify who should be responsible for each activity.

**Activity 1.7 Workshop to present and validate results*.*** Develop a workshop that will take place in Dominican Republic to validate and disseminate the results from the previous activities. Participants will include all key stakeholders and the project team will take into account their feedback to update or modify the project deliverables if necessary.

**Component 2: Institutional framework.**

The objective of this component is to review and propose updates to, the IT institutional, legal and regulatory frameworks to advance the adoption and use of broadband services and cloud computing. This component is particularly relevant as the decision of investing by the government and private sector requires a stable and predictable regulatory framework that creates the conditions to facilitate investments, as well as a coordinated government investment policy and administrative arrangements. This component includes the following activities:

**Activity 2.1 Review of the administrative, regulatory and legal frameworks related to digital infrastructure*.*** Review and analysis of the current telecommunications and IT administrative, regulatory and legal frameworks related to network deployment.

**Activity 2.2 Public policies.**Development of a set of public policies to foster the growth of the digital ecosystem in Dominican Republic. The scope will include not only specific actions directed to develop the offer and demand for ICT services but also recommendations to enable digitization in other sectors and services such as small enterprises, agriculture, finance, education or health.

**Component 3: Roadmap for digital broadcasting**

The objective of this component is to support the Dominican Republic in the transition from analogue to digital, proposing specific actions for the implementation of the analogue switch off and the implications on the national connectivity plan.

The consulting firm will conduct the following activities:

1. Best practices on technical, regulatory and economic aspects related to the analogue switch off and the implementation of a national connectivity plan
2. Spectrum evaluation for the different countries
3. Analysis of the market structure and future needs of Spectrum
4. Review of the regulatory framework and propose specific recommendations to update the frameworks in terms of spectrum
5. Development of a roadmap for the switchover.
6. Evaluation of the current technology choices;
7. An assessment of the spectrum efficiency relative to the technologies and techniques in use and those that could possibly be implemented;
8. Evaluation of current DTTB networks;
9. Development of the National Frequency Allocation Table (NFAT) for each country; and
10. Development of a Regional Frequency Allocation Table (RFAT) for the Central American countries Region.
11. Main principles of the implementation of digital transition: universal access and equitable provision of services;
12. Regulatory matters: assessment of the current regulatory framework and the changes necessary to promote the analogue switch-off;
13. Institutional framework: assessment of the current institutional framework and recommendations for possible changes;
14. Licensing models: assessment of current licensing model and recommendation for possible changes;
15. Technical issues: Technology and standard application, design principles and network architecture; network planning, infrastructure and spectrum compatibility;
16. Digital dividend: recommendations for the allocation of frequencies.
17. **Reports / Deliverables**
18. Reviewing and proposing new strategic policies and regulatory reforms to facilitate digitalization in DOMINICAN REPUBLIC, particularly, in rural broadband and digital switchover, taking advantage of international best practices;
19. Identifying technical considerations for the cost-effective rural broadband and digital broadcasting, including the design of desirable network configuration and the comparison of different technological alternatives;
20. Conducting financial and economic analysis of proposed investment for upgrading broadband and broadcasting facilities;
21. Recommending road-maps and action plans for implementation and governance framework as well;
22. Capacity building program and knowledge sharing
23. **Payment Schedule**

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

Schedule of payments:

1. 15% upon delivery and approval of the Work Plan;
2. 30% upon delivery and approval of Products 1, 2;
3. 30% upon delivery and approval of Products 3 and 4;
4. 25% upon delivery and approval of Products 5.
5. **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 broadband infrastructure is required, including but not limited to backbone and last mile networks and data centers deployment. The firm must have a proven capability to deliver detailed and accurate financial, economic and environmental studies.

1. **Characteristics of the Consultancy**

**Type of consultancy:** Firm and individual consultants

**Start date and duration:** Estimated duration period: 10 months.

**Place of work /travel:** Place of residence. Travel required. During this period, the firm is expected to participate in coordination meetings with IDB Specialists in Headquarters (Washington DC) as well as in presentation meetings with government representatives in Dominican Republic.

**Coordination:** Supervision and coordination of the consultant’s work will be the responsibility ofAntonio García Zaballos (IFD/CMF), Team Leader, [antoniogar@iadb.org](mailto:antoniogar@iadb.org), Telephone (202) 623˗2980.

1. García-Zaballos, A. / López-Rivas, R.: Governmental control on socio-economic impact of broadband in LAC countries. IDB, 2012. [↑](#footnote-ref-2)
2. In 26 municipalities (16.8% of the existing 155), there said to be no fixed internet accounts registered, with 22.1% of households having internet in the city of Santo Domingo versus only 5% in certain rural areas (World Bank, 2014). [↑](#footnote-ref-3)