**Paraguay**

**IFD/CMF**

**Broadband 2.0: Diagnosis and Recommendations for Sustainable Broadband Development in Paraguay, Honduras and Argentina**

**(RG-T2785)**

**Políticas Públicas para el Plan Nacional de Banda Ancha (“PNBA”)**

**Términos De Referencia**

**Antecedentes**

La propuesta de un PNBA está alineada con la transformación que está ocurriendo en la actualidad en Paraguay. En los últimos años, el Gobierno Paraguayo viene llevando a cabo varias iniciativas con el objetivo de promover el sector de las telecomunicaciones y la adopción de las Tecnologías de la Información y las Comunicaciones (TIC). En ese sentido, el país está llevando a cabo una reforma en telecomunicaciones a nivel constitucional, dentro del Pacto por Paraguay, el cual fue firmado por los principales partidos políticos.

**Objetivos de la Consultoría**

El objetivo general de la consultoría será apoyar al Gobierno de Paraguay en la elaboración de las Políticas Públicas del Plan Nacional de Banda Ancha (PNBA) en donde se articulen las políticas y modernizaciones regulatorias necesarias para alcanzar el acceso universal y la democratización de la banda ancha y de las TIC, así como apoyar al país a la reducción de la problemática asociada a la falta de conectividad en zonas rurales. Este trabajo se deberá realizarse en coordinación con CONATEL, El Ministerio de la Presidencia, DINAPI y los distintos actores de la sociedad civil y operadores.

**Objetivo de las Políticas Públicas del Plan Nacional de Banda Ancha**

Establecer políticas públicas que incidan en la oferta (acceso) y la demanda (adopción y uso) en el mercado de banda ancha, con metas específicas y responsables y, con ello, soportar e impulsar una óptima explotación de las TIC por parte del gobierno, las empresas y población en general.

Para ello, es importante que Paraguay cumpla con dos condiciones clave o ejes estratégicos:

1. Establecer políticas públicas que faciliten el despliegue de infraestructura para banda ancha, tomando en cuenta la convergencia tecnológica y la regulación y de tal forma que se reduzcan los costos de conectividad internacional.
2. Establecer las políticas de adopción y uso que impulsen la apropiación de contenidos y aplicaciones, que identifiquen las prioridades nacionales y estén apegados a las mejores prácticas internacionales.

**Características Generales de las Políticas Públicas del PNBA**

1. La articulación de las políticas deberán contemplar un conocimiento profundo de la estructura del mercado de banda ancha a nivel regional y local, que permita entender y la situación actual del país, así como las acciones encaminadas al fomento del mercado:

* **Oferta:** el estado actual de la infraestructura de telecomunicaciones, la oferta tecnológica disponible, las políticas de inclusión digital, las políticas sobre el espectro radioeléctrico para los próximos 10 años, la seguridad de la información de los usuarios sobre las redes de telecomunicación, la calidad de los servicios de telecomunicaciones, la prospectiva regulatoria, entre otros.
* **Demanda:** el estado actual y prospectivo de la demanda de datos, los impactos esperados del programa Paraguay Conectado, impactos esperados de los programas para fomentar la apropiación digital, el estatus actual y prospectivo de las aplicaciones de gobierno electrónico, entre otros.

1. Establecer la estrategia óptima de financiamiento para garantizar la cobertura de acceso a banda ancha en la población.
2. Generar un plan para la red compartida de telecomunicaciones, con metas de cobertura definidas temporal y geográficamente.
3. Establecer los criterios de gobernabilidad de la infraestructura de la red compartida de telecomunicaciones, que cumpla que ningún prestador de servicios de telecomunicaciones tenga influencia en la operación de la red.
4. Establecer las acciones para el impulso de la demanda de banda ancha en el país.

**Actividades Principales de la Consultoría**

Los trabajos propuestos se estructuran en torno a los siguientes componentes propuestos:

1. Identificación de los principales retos en términos de infraestructura de telecomunicaciones de banda ancha.
2. Establecimiento de los principios regulatorios del sector.
3. Definición de las políticas para lograr la cobertura y el acceso universal a la banda ancha.
4. Establecimiento de indicadores, metas, responsabilidades, calendario y presupuesto.
5. Diseño de un modelo de gobernanza.

A continuación, se describen los componentes propuestos:

**Componente 1.- Identificación de los principales retos en términos de infraestructura de telecomunicaciones.**

En este apartado se busca identificar los principales retos para reducir la brecha de infraestructura de telecomunicaciones en Paraguay. Se analizará cuál es la infraestructura existente, la demanda estimada y las necesidades que se generarán, en términos de una red dorsal y de “última milla”, considerando opciones neutralmente tecnológicas y costo eficientes.

Para ello, el proveedor de los servicios tendrá como insumos los estudios y documentos que sustentaron la reforma de telecomunicaciones, y todos aquellos que hayan sido realizados por los distintos actores que se relacionen con los temas antes descritos, así como las leyes resultantes de la reforma de telecomunicaciones. Con esto realizará las siguientes actividades:

1. Consultas con los principales actores del Sector sobre las distintas opciones de política**.**
2. Discusión con los responsables de las distintas instituciones involucradas para generar lo acuerdos de política pública. Propondrá la mecánica de discusión, la metodología de gobierno de estas llevar a cabo los consensos, el calendario de trabajo, los participantes y la redacción de los posibles acuerdos/compromisos logrados.

Los acuerdos, deberán establecer las condiciones de gobernabilidad de la red compartida de telecomunicaciones que permita que ningún operador tenga injerencia sobre su funcionamiento y que garantice la reinversión necesaria para su operación continua.

1. Análisis y presentación a las Autoridades del Gobierno de los acuerdos/compromisos logrados**.**

**Componente II.- Establecimiento de los principios regulatorios del sector.**

Los principios regulatorios que guiarán las políticas del PNBA se encontrarán en este componente. Se propondrán modelos económicos sustentables y políticas de neutralidad tecnológica; se identificarán inversiones innecesarias; se priorizarán metas de precio, cobertura, calidad y equidad.

Asimismo, en el marco de las acciones de política, se deberá generar un plan de acciones para los próximos 6 años que opere y determine la CONATEL, con el objeto de que se genere certidumbre en los planes de inversión de los operadores, se garanticen los niveles mínimos de calidad de los servicios de telecomunicaciones, se impulse la competencia por el mercado final de banda ancha y se provean los insumos necesarios de forma oportuna y óptima para que los operadores puedan hacer frente a la demanda creciente de datos sobre las redes fijas y móviles a precios asequibles. Se considerarán:

1. Las acciones y criterios de asignación en el espectro radioeléctrico para que los operadores cuenten permanentemente con suficiente capacidad espectral para enlaces punto a punto y punto multipunto de mediana distancia y “última milla”, con objeto de satisfacer la demanda de servicios fijos, nómadas inalámbricos y móviles.
2. Las acciones para el reordenamiento del espectro radioeléctrico.
3. Las acciones para reducir las asimetrías en la tenencia espectral de los operadores en los próximos 10 años.
4. Las acciones que garanticen los niveles de calidad de los servicios.
5. Un plan espectral que promueva una mayor armonización internacional en el uso del espectro y permita que los operadores hagan frente al crecimiento de la demanda de datos en el mercado.
6. Las acciones que generen las salvaguardas necesarias y fomenten la entrada de competidores en el mercado final a través de los operadores móviles virtuales (MVNOs; por sus siglas en inglés).
7. Las acciones para el establecimiento de Puntos de Intercambio de Tráfico (IXP), el alojamiento local de contenidos y otras iniciativas que promuevan el tránsito eficiente en las redes de telecomunicaciones.
8. Las acciones para garantizar la integridad de la infraestructura.
9. Las acciones para garantizar la desagregación de la red local del operador preponderante
10. Otras políticas y formulaciones regulatorias que se consideren relevantes para que la política regulatoria coadyuve a cumplir con el mandato constitucional de acceso universal, a propuesta del proveedor y la CONATEL.

**Componente III.- Definición de las políticas para lograr el acceso universal a la banda ancha (oferta y demanda)**

En este apartado se detallarán, principalmente, las medidas de política pública necesarias para promover el acceso a la infraestructura. Se propondrán políticas para el acceso a la “última milla” y fomento a la demanda de internet y dispositivos. Se propondrán políticas para promover la inversión privada y las asociaciones público privadas, así como el uso de los derechos de vía a nivel federal, estatal y municipal.

Este apartado estará alineado con la estrategia de conectividad de sitios públicos.

**Componente IV. Establecimiento de indicadores, metas, responsabilidades, calendario y presupuesto.**

En el Componente V se identificarán los indicadores relevantes para medir los avances en la ejecución del PNBA. Además se realizara un plan de indicadores para el sector de telecomunicaciones, estableciendo metas específicas para el uso y la penetración de los servicios de telecomunicaciones, incluyendo la cobertura, calidad y precio junto con otros indicadores que sean susceptibles de ser incluidos.

**Componente V. Diseño de un modelo de gobernanza.**

En este componente se propondrá un modelo de gobernanza que promueva el esfuerzo coordinado de los distintos actores involucrados, así como el diseño de mecanismos de consulta, monitoreo y evaluación. Adicionalmente, el análisis incluirá un cronograma detallado para la implementación del PNBA identificando claramente los tiempos y las responsabilidades de cada uno de los actores participantes.

**Informes/Productos de la Consultoría**

El Informe incluirá:

1. Las Políticas Públicas del PNBA que contenga políticas sólidas para alcanzar la meta de acceso universal.
2. Un documento con el plan de acciones regulatorias que promueven la competencia y la cobertura en el mercado de banda ancha.
3. El diagnóstico de las necesidades de las TIC, las acciones a instrumentar con responsables y plazos, indicadores de seguimiento e impacto, metas esperadas y el plan de acciones de políticas y programas estructurado y calendarizado.

**Cronograma de Pagos**

1. 30% a la firma del contrato, contra entrega del Plan de Trabajo;
2. 40% a la entrega del borrador del informe; y
3. 30% a la entrega del informe final.

**Calificaciones**

* **Calificaciones generales de los consultores:** Las firmas deberán tener amplia experiencia en el sector de telecomunicaciones, con miembros del equipo de trabajo con experiencia en proyectos en la región América Latina y Caribe y otras regiones en desarrollo. El conocimiento del sector de telecomunicaciones en Paraguay también se valorará. Adicionalmente, las firmas deberán presentar experiencia en el desarrollo de planes de banda ancha, así como en trabajos para el desarrollo de política pública o regulación en el sector de las telecomunicaciones. Las firmas seleccionadas deberá tener capacidad demostrada para emitir recomendaciones detalladas y estructuradas así como demostrar un amplio conocimiento del sector.
* **Calificaciones específicas de las dos firmas a contratar:**

1. **Firma Técnica**. La firma debe tener consultores con por lo menos 25 años de experiencia en el diseño de políticas públicas del Sector de Telecomunicaciones, Reforma del Sector de Telecomunicaciones, Alianzas Público-Privadas, Privatización de Empresas Públicas y también de Ingeniería de Telecomunicaciones, Análisis Financiero de Proyectos de Telecomunicaciones y Diseño de Redes de Banda Ancha Nacionales.
2. **Firma Legal**. La firma debe tener consultores con al menos 15 años de experiencia en el diseño de marcos regulatorios, experiencia legal en el Sector de Telecomunicaciones, en Europa o en otros países desarrollados, en mercados en competencia de telecomunicaciones. Los Abogados de la Firma deben dominar el idioma español y tener experiencia en países donde se practique el derecho comercial napoleónico (base del derecho paraguayo). Se debe incluir un Abogado con amplia experiencia en el derecho de telecomunicaciones Paraguay.

**Características de La Consultoría**

* **Categoría de la Consultoría y Modalidad:** Empresas de consultoría y consultores individuales.
* **Fecha de Inicio y duración de la consultoría:** 12 meses.
* **Lugar de trabajo:** Los trabajos se desarrollarán en las oficinas de la firma de consultoría seleccionada. Aunque los trabajos se desarrollen en su lugar de origen, la firma seleccionada deberá realizar, al menos, dos viajes, a Paraguay uno al principio de la consultoría para empezar el levantamiento de datos entrevistándose con los actores clave y otro al final de la misma para presentar el PNBA.
* **Coordinación:** La supervisión y coordinación de esta consultoría estará a cargo del Sr. Antonio García Zaballos (IFD/CMF), Jefe de Equipo de esta operación, [antoniogar@iadb.org](mailto:antoniogar@iadb.org), tel. (202) 623-2980.

**Honduras**

**IFD/CMF**

**Broadband 2.0: Diagnosis and Recommendations for Sustainable Broadband Development in Paraguay, Honduras and Argentina**

**(RG-T2785)**

**Development of Broadband ICT Infrastructure Services – Broadband Data Center in Honduras**

**Terms of Reference**

1. **Background**

There is evidence that the acceleration of broadband penetration, adoption and effective use brings clear social 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]](#footnote-2).

Honduras is one of the countries in the LAC Region that faces the greatest challenges to effectively harness the benefits brought about by broadband connectivity, as it is characterized by: (i) low levels of penetration;[[2]](#footnote-3) (ii) low broadband quality, in terms of speed[[3]](#footnote-4); and (iii) high prices[[4]](#footnote-5). Not surprisingly given this context, the use of Information and Communications Technologies (ICT) in Honduras is also low compared to international standards.[[5]](#footnote-6)

In this line, the main barriers found in Honduras 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 Honduras 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 Honduras, 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 goal of this Consultancy is to support the Government of Honduras develop a sustainable environment for the efficient and effective use of broadband services, enable business continuity, consolidate systems, and protect critical information and infrastructure for the public and private sectors, through the development of all the studies needed for the establishment of cloud-computing broadband infrastructure.

1. **Main activities**

The activities proposed in this project are divided into five 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 analysis of cloud-computing infrastructure for broadband services**

The objective of this component is to conduct a market assessment of demand and supply of government broadband supported services to all the population, public and private sectors in Honduras. These are key elements to determine the scope, requirements of the proposed infrastructure to advance broadband services and subsequent return on investment. To that goal, the following activities will be developed:

**Activity 1.1 Demand estimation.** Elaborate on the current estimation and future (five years) demand for government broadband enabled services throughout various sectors, to the population, private companies, government and non-government organizations in the country.

**Activity 1.2 Supply analysis.**Analyze the current and future supply of broadband and ICT enabled services, needs for data storage, processing and security; assess the capacity of the government existing facilities and planned deployment of broadband infrastructure; diagnose the gaps between the supply and demand of government broadband services to the individuals, private and public sectors.

**Activity 1.3 Design of public policies*.*** Design public policies to bridge the gap through the deployment of cloud-computing infrastructure and alternative technologies.

**Component 2: Design and modeling of recommended cloud-computing and additional infrastructure investments.**

Based on the previous section, the objective of this component is to evaluate the technical, economic, and financial feasibility of migration of existing independent data centers into a consolidated cloud network, determine the appropriate scope investments, inter-operability standards and strategy to foster broadband services, through a close collaboration between the public and private sectors. The result is to enable more effective delivery of services to government, business, and citizens while at the same time yielding substantial cost savings. This component includes the following activities:

**Activity 2.1 Technical study.**Identify the key design criteria and technical specifications for the overall cloud-computing infrastructure and services related to the technology and the facility support infrastructure, keeping in mind the availability requirements, security, power and cooling dynamics, and business objectives. Determine standards and approaches specific to technologies selected to be compliant with ecological and legal regulations. Conduct site selection for 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.

Additionally, the technical study will recommend network investments to allow the infrastructure to connect all the government offices and institutions and the local and international telecommunication carriers.

**Activity 2.2 Identification of services*.*** Identify services to be provided by the cloud˗computing platform, including the main horizontal services that will be used across government and the specific verticals of some applications. Since the services will be introduced gradually, their introduction should be done in phases, specifying in detail the ones for the first five years, while only generally the others that will be developed in the following five years.

**Activity 2.3 Financial and economic analysis*.*** Quantify all the investments described in the previous three items, for the first five years of the operation of the cloud-computing platform. Calculate the revenues and operational expenditures for the first five-year period. Formulate a five-year operating and commercial management strategy. Identify commercial and operational alternatives including ownership structure (PPP), management mechanisms and options for operations and maintenance.

Evaluate the investment and analyze of the economic return associated with the different alternatives for deploying cloud-computing infrastructure, taking into account the different deployment scenarios. An estimation of the Net Present Value (NPV) and Rate of Return (IRR) associated with the investment is required, which implies an estimation of the expected demand for services; the operative break-even point, defined as the minimum investment or the minimum service penetration that make the deployment economically viable; and of the savings associated with the online provision of different types of services as compared to the current situation.

**Activity 2.4 Roadmap for implementation.**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.

**Component 3: Review and proposal of updates to the IT institutional, legal, and regulatory, framework.**

The objective of this component is to review of, and propose updates to, the IT institutional, legal and regulatory framework to advance cloud services development. This component is particularly relevant as the decision of investing in cloud infrastructure 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 3.1 Review of the administrative, regulatory and legal frameworks*.*** Review and analysis of the current IT administrative, regulatory and legal frameworks including: inter-alia, data privacy, security, intellectual property rights protection, digital signature, and consumer protection.

**Activity 3.2 Development of proposals to update the administrative, regulatory and legal frameworks.**Elaboration of a proposal to modify and/or update the administrative, legal and regulatory frameworks to meet international best practices, defining the steps required for its implementation.

**Activity 3.3 Workshop to present and validate results.**Develop a workshop that will take place in Honduras 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 4: Environmental and social Impact Analysis.**

The objective of this component is to ensure the proposed infrastructure is compliant to legal, regulatory and administrative processes for the protection of the environment, natural habitats, and cultural resources in accordance to the Government of Honduras and the IDB norms and regulations. This component includes the following activities:

**Activity 4.1 Development of the Environmental and Social Impact Management Plans (EMPs).**Development of the Environmental and Social Impact Management Plans (EMP) for the project, consistent with the Honduran and IDB Environmental and Social Safeguards and Regulations.

**Activity 4.2 Workshop to present and validate results*.*** Develop a workshop that will take place in Honduras to validate and disseminate the results from the previous activity. 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.

1. **Reports / Deliverables**
2. Diagnostic of supply and demand for cloud-computing network services,
3. Study with the design and Identification of technology, data center infrastructure, network and Services for cloud-computing service deployment,
4. Financial and economic analysis of cloud-computing platform and its five-year operating and commercial strategy,
5. Review and propose revisions of Honduras IT institutional, legal, and regulatory frameworks to promote cloud-computing services,
6. Development of national broadband plan
7. Environmental and social impact management plans.
8. **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. 30% upon contract signature;
2. 10% upon delivery and approval of Product 1 and 2;
3. 30% upon delivery and approval of Product 3 and 4;
4. 30% upon delivery and approval of Product 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 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 Honduras.

**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.

**TERMS OF REFERENCE**

**IFD/CMF**

**Feasibility study of the broadband networks (backbone, backhaul and last mile) for the connectivity plan in Argentina**

**(RG-T2785)**

1. **BACKGROUND**

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[[6]](#footnote-7). Additionally, according to a study by Arthur D. Little and Ericsson, 1% increase in broadband penetration can bring 4.3% increase in exports.

Having a broadband network that links Argentina to other countries in the LAC Region will provide abundant bandwidth, easier connectivity and reduced costs. It will also help to integrate Argentina by facilitating trade, social, and cultural exchange between countries. Through connectivity new ways of trade appear in a digitalized world where there are no boundaries.

This situation has led the Government of Argentina (GoAR) to recognize the importance of increasing broadband connectivity in the country in an effort to facilitate social inclusion for all the population strata, economic growth and contribute to the integration of the country both nationally and regionally. In fact, the GoAR is already working on the development of a national connectivity plan that sets the objectives and milestones that will help promoting broadband access, adoption and usage.

Thus, the GoAR has identified the deployment of new infrastructure as a necessary step to improve the capabilities of the national broadband. This will imply the construction of new optical backbone and backhaul networks, as well as improved last mile coverage and international connectivity that would present several advantages for Argentina and its 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, the north and the south. Similarly, traffic to other countries from different cities could be achieved thanks a better interoperability. And the citizens will be benefited from the improved quality and performance of the last mile access networks as well as lower prices.

1. **Consultancy Objectives**

The general objective of this Technical Cooperation (TC) is to support the GoAR in their efforts to increase access, adoption and use of broadband services. Therefore, the specific objectives of this TC are:

1. To quantify and to evaluate the Divide in terms of infrastructure among the different regions in Argentina, analyzing the gap between supply of demand.
2. To design a national connectivity plan.
3. To understand the socio-economic dynamics of the different regions to propose an adoption and usage plan with a focus on achieving social inclusion, economic growth and integration of the less developed regions through education, health and key government services. This plan should include a set of public policies that foster the deployment of the infrastructure and the adoption and usage plan in the different regions that will contribute to the integration of the country both nationally and regionally.
4. To analyze the financial and economic feasibility of the project and the amount of the necessary subsidy coming from the GoAR.
5. To review and update the regulatory framework with the aim of ensuring that the network deployment fosters competition and allows a smooth interconnection with the existing networks.
6. To support ENACOM in regulatory issues related to the supervision of the networks operation.
7. To conduct additional environmental, institutional and administrative analyses supporting a possible incoming loan operation.
8. To develop a dialogue that shows the benefits that broadband connectivity has for the integration of rural and urban areas as well as the integration among different countries. In addition it will be presented success cases and the policies that have been implemented to maximize the effects on trade and integration.
9. **ACTIVITIES AND PRODUCTS**

The consultancy will have to be structured around the following components and activities.

**Component 1: Market Study**

The objective of this component is to improve the understanding of the market dynamics in the different regions of Argentina, 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, including the potential demand for international connectivity.

**Activity 1.1: Study of the current supply of telecommunications services:** Study of the current supply for each region. For last-mile networks: type of service, technology, coverage, speed, price, penetration and owner of the infrastructure. For backbone and backhaul networks: type of technology, coverage, real usage in terms of used capacity, owner of the infrastructure, existence and location of Internet Exchange Points (IXP) and location and bandwidth of international connectivity links.

**Activity 1.2: Study of the infrastructure planned to be deployed:** The plans for new infrastructure will be analyzed at every network level: backbone, backhaul and last mile, including coverage, capacity, purpose, user, timing and owner.

**Activity 1.3: Study of the physical infrastructure**: Study of the physical infrastructure that can support broadband infrastructure (e.g. roads, electricity, ducts) where the results of the ESW RG-K1294 (Development of Broadband Maps for Latin America and the Caribe) may be used as an input.

**Activity 1.4: Socio-demographic study:** Socio-demographic study that will include an analysis of how the population is distributed geographically, the density of population per geography, their occupation and their purchasing power measured as the monthly salary

**Activity 1.5: Demand Estimation:** Study to estimate the current demand for broadband-enabled services specifying the service and the device used to access that service, including the demand coming from citizens, enterprises and public institutions (schools, health centers and government facilities).

***Activity 1.6: Demand Forecast:*** Forecast of the demand (estimate the demand for broadband-enabled services after the improvement of infrastructure not only by carrying out surveys but also by benchmarking with other countries where such a deployment has happened before), including the demand coming from citizens, enterprises and public institutions (schools, health centers and government facilities).

**Activity 1.7: Demand Curves:**Based on the surveys performed in previous activities, develop an estimation of the demand curves for the different broadband speeds.

***Products***

The product from this component will be structured in two main parts: (i) analysis of current broadband supply, (ii) estimation and forecast of broadband demand.

**Component 2: Technical Study**

The objective of this component is to identify the technical considerations for deploying the infrastructure (backbone, backhaul and last-mile as well as international connectivity), including the structure of the network and the different technological alternatives through the development of a technical study. The geographic scope of the study should be at least the province level.

**Activity 2.1: Orographic study:** Taking as an input the results of the socio-demographic study developed in the previous activity, an orographic study will be performed to identify possible difficulties and considerations for the network deployment.

**Activity 2.2: Logic Diagram:** Design of the logic diagram of the network (nodes and links) taking into account the results of the previous component as well as the **orographic** study.

**Activity 2.3: Technological Alternatives:**Identification of technological alternatives associated to the physical design (for last mile, backhaul and backbone) indicating the advantages and disadvantages of each of them and calculating the costs associated.

**Activity 2.4: Physical Design:**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), and the necessary physical supporting infrastructure indicating whether some of the existing can be reutilized (e.g. high-tension, roads, paths).

**Activity 2.5: Sizing:**Determination of the requirements in terms of capacity and sizing of each of the elements of the networks according to the expected traffic that results from the demand study conducted in the Component 1.

**Activity 2.6: Auxiliary Elements:**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).

**Activity 2.7: Technology selection:**Recommendation of selection of the best technology to attend the estimated traffic.

**Activity 2.8: Implementation plan and recommendations:**Deployment Plan for the proposed network and implementation schedule including a set of public policies/regulation recommendations that would facilitate the deployment.

***Products***

The product from this component will be the detailed technical study with enough information to serve as an input for the financial study and rest of components.

**Component 3: Adoption and use study**

The objective of this component is to analyze and define an adoption and usage strategy that guarantees that the infrastructure foreseen to be deployed in Component 1 would be used by citizens and government with a special focus on schools, health centers and government facilities and services. This study will have to consider at least the province level.

**Activity 3.1: Proposal of services:** 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 financial services (e.g. e-banking) and productivity and **competitiveness** improvements and others suitable to the occupation of the local people

**Activity 3.2: Services structure:** 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).

**Activity 3.3: Training Plan:**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

**Activity 3.4: Budget and Implementation Plan:**Budget for the proposed services and activities and implementation Schedule to guarantee the sustainability of this component **later** in time.

**Activity 3.5: Public policies recommendations:** Specific set of public policies to guarantee and promote the usage considering the three pillars aforementioned (content, applications/services and devices).

In addition to the previous activities, the study will recommend a few selected centers (schools, health and government-related facilities, SMEs and Telecentres) in which to concentrate the intervention so as to showcase the potential social benefits of broadband-related services. The specific criteria for the selection will be proposed by the consultants (and cleared by the IDB) but will prioritize potential social impact on population as well as the existence of a minimum set of capabilities and conditions to ensure a productive and sustainable use of the new technologies. Additionally, there will be a recommendation in terms of the elements that will be part of each of the pilots.

**Component 4 – Financial Study and 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 & use component) and select a governance model for the possible future bidding and exploitation phases. This study will have to consider at least the province level.

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, users that sign into the service, traffic per user, discount rate)

**Activity 4.1.Network Financial Analysis:** For the financial analysis of the network the analysis should include: (i) an estimation of the required investment and operating costs (CAPEX and OPEX) for each of the technological alternatives that aims at satisfying the demand (output of Component 2); (ii) development of a business model and an exploitation model for the network; (iii) estimation of revenues that could arise from the network exploitation; (iv) financial estimates of the sustainability and feasibility conditions of the project, such as: Net Present Value (NPV), Internal Rates of Return (IRR), and break-even point given the estimated cash flows for each of the options identified. This analysis will be done on a regional basis and then consolidated for the whole country.

**Activity 4.2. Adoption and Usage Financial Analysis:** For the financial analysis of the adoption and usage component, the analysis will be analogous and should include: (i) an estimation of the required investments and operating costs (CAPEX and OPEX) for each of the modules and the totals for the entire component; (ii) business model for those services; (iii) estimation of the revenues; (iv) financial estimates of the sustainability and feasibility conditions of the project, such as: Net Present Value (NPV), Internal Rates of Return (IRR), and break-even point given the estimated cash flows for each of the options identified. This analysis will be done on a regional basis and then consolidated for the whole country.

**Activity 4.3. Consolidated Financial Analysis:** The combination of both financial analyses (technical and adoption & usage) into a single one will have an analogous structure and will consider only the most cost-efficient technological alternative. For that purpose, the analysis should include: (i) an estimation of the required investments and operating costs (CAPEX and OPEX); (ii) estimation of the revenues; (iii) financial estimates of the sustainability and feasibility conditions of the project, such as: Net Present Value (NPV), Internal Rates of Return (IRR), and break-even point given the estimated cash flows. Obviously, the analysis will be consolidated on a region basis and then consolidated for the whole country.

**Activity 4.4. Development of a governance model:** The goal of this activity will be to develop a governance model that assigns responsibilities and promotes coordination and concerted efforts among the various stakeholders involved in the implementation of the proposed network deployments and adoption and use strategy, and specifically for the network bidding and exploitation phases.

**Products**

The product from this component will be both the detailed financial analysis and the governance model.

**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 adding them to the cash flows that have been identified and quantified in the Financial Study described in Component 4.

**Activity 5.1. Cost-Benefit Analysis:** This activity will focus on developing the CBA Analysis, by firstly reviewing the IDB’s current methodology for the CBA, and proposing changes that adapt it to the particular case of Argentina including detailed references to published papers and recent literature regarding impact evaluation of broadband development programs.

Once the methodology is set and agreed, the CBA will have to consider (i) the financial costs and revenues calculated as a result of the financial study in Component 4; (ii) estimate and calculate the quantitative benefits that can be incorporated to the cost˗benefit analysis; (iii) cost-benefit analysis with specific indicators such as: ERR (economic rate of return) and economic NPV; (iv) Identification of the qualitative benefits (i.e. indirect benefits and positive externalities) that, although not incorporated to the numeric study, are relevant.

It is important to note that the CBA will have to take into account the demand curves estimated in Component 1.

**Component 6: Revision of the regulatory framework and support to ENACOM**

The objective of this component is to revise and propose updates to the regulatory framework and legislation in order to boost broadband development. This component is particularly relevant as the decision of investing in the deployment of broadband 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.

**Activity 6.1. Regulatory Recommendations:**The goal of this activity will be to come up with a set of recommendations customized to the reality of Argentina. Examples of regulatory recommendations are: (i) efficient use of spectrum; (ii) interconnection and unbundling regulation; (iii) cost accountability frameworks; (iv) market analysis; (iv) generation of sector sustainable economic models; (v) efficient use and structuring of universal service funds; (vi) regulation of rights of way; (vii) infrastructure sharing regulation; or (viii) regulatory and policies on price, coverage and quality. All the regulatory recommendations will be condensed in a plan that will contain the budget and timing per proposed activity (e.g. if one activity recommended is to develop regulation of infrastructure sharing, then the effort will have to be estimated in monetary and timing terms)

Particular attention should be paid to the interconnection regulation between networks (including the development of a draft for RIO and RUO[[7]](#footnote-8)), sharing infrastructure schemas, open/equals access formulas and rights of way since the deployment of the backhaul and last-mile networks may require crossing private properties.

The regulatory support will also include tasks to strengthen ENACOM in regulation of wholesale services to foster competition not only by reviewing the existing regulatory framework but also by providing technical support and capacity building.

**Products**

The product from this component will be a set of regulatory recommendations.

**Component 7: Support to the preparation of a possible 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 a possible loan proposal with Argentina. This component includes the following activities:

**Activity 7.1. Environmental and social impact studies:**Elaboration of environmental and social impact studies related to the proposed investments, including a detailed methodology. To complete the environmental and social impact studies, the firm will be asked to make field trips and public consultations

**Activity 7.2. Execution and governance mechanism*:*** Elaboration of a study to design the execution and governance mechanism for the loan operation.

**Activity 7.3. Administrative, financial and technical inputs:**Preparation of administrative, financial and technical inputs for the preparation of the loan operation according to the templates and guidelines defined by the IDB.

1. **Method of Payment**

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

1. **Schedule of payments**
2. 30% upon contract signature;
3. 30% upon approval of draft report; and
4. 40% upon approval of final report
5. **Qualifications**

The firm and the individual consultants 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 but not limited to 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 4 of the project.

1. **Characteristics of the Consultancy**

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

**Starting date and duration:** maximum of 12 months

**Working place / travels:** Although the tasks may be carried out in the country of origin, the firm will be required to travel at least twice to Argentina, one at the beginning of the consultancy for the kick-off of the project and one at the end to present and disseminate the results. That being said, the Bank expects the firm to travel as much as necessary to the country to guarantee the best quality of the work.

**Coordination:** The supervision and coordination of this consultancy will be the responsibility of Antonio García Zaballos (IFD/CMF), Team Leader of this operation ([antoniogar@iadb.org](mailto:antoniogar@iadb.org)).

1. García-Zaballos, A. / López-Rivas, R.: Governmental control on socio-economic impact of broadband in LAC countries. IDB, 2012. [↑](#footnote-ref-2)
2. ICT World Indicators Database, International Telecommunications Union (June, 2012). [↑](#footnote-ref-3)
3. Galperín, H.: Broadband prices and quality in Latin America (2012) .Data for 2010. [↑](#footnote-ref-4)
4. Ibid. [↑](#footnote-ref-5)
5. According to the ICT utilization indicator by the World Economic Forum (2012) usage by government, businesses and individuals is well below the average levels found in LAC and OECD countries. [↑](#footnote-ref-6)
6. García-Zaballos, A. / López-Rivas, R.: Governmental control on socio-economic impact of broadband in LAC countries. IDB, 2012. [↑](#footnote-ref-7)
7. RIO stands for Reference Interconnection Offer and RUO stands for Reference Unbundling Offer [↑](#footnote-ref-8)