

Country Infrastructure Briefs: Central America, Mexico, Panama, and Dominican Republic

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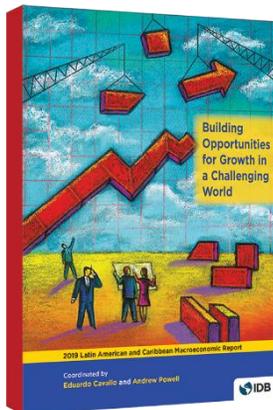


Abstract

This policy brief summarizes challenges in the infrastructure sectors of Belize, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, and Panama. It also includes recommendations to overcome these challenges, along with an overview of the PPP framework, national development plans, and ongoing initiatives.

Key Words: Infrastructure, Capital, Public Goods, Public-Private Partnerships, Economic Growth, Transportation, Water and Sanitation, Energy, Environment, Telecommunications

JEL Codes: D24, H41, H54, L32, L90, O18, Q53



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Contents

Belize	3
Costa Rica	8
Dominican Republic	14
El Salvador	18
Guatemala	23
Haiti	28
Honduras	32
Mexico	37
Nicaragua	41
Panama	45

Belize¹

Alejandra Mejía, Emmanuel Abuelafia and Jennifer Linares

1. INFRASTRUCTURE CHALLENGES

Belize invested approximately US\$67 million (3.9 percent of GDP) in infrastructure in 2015. Most of the infrastructure investment has been allocated to transportation (1.3 percent of GDP) and telecommunications (1.1 percent of GDP).

In general terms, given its level of income, Belize presents net positive gaps in energy and water. In sanitation, transport, and telecommunications, Belize presents negative gaps.

Transportation: The country shows an overall negative gap in transportation. The only positive gap is that associated with connectivity given that registered air carrier departures worldwide are above the number expected given Belize's GDP per capita. The negative gap in quality is consistent with the outcomes of the last global competitiveness report in which Belize participated (World Economic Forum, 2011). The report highlights weaknesses in quality of roads and port infrastructure, which affects the two main drivers of growth in the country, agribusiness and tourism, and at the same time can exacerbate the impacts of natural disasters on the economy. Similarly, there is a negative gap in safety given that there are more accidents in Belize, on average, than in other Central American countries.

The transportation Master Plan for Belize (2018) identified the following challenges in road infrastructure: deficiencies in the road maintenance system, lack of alternative routes in the road network, and capacity weaknesses in public and private transport sector. Additionally, given that road designs have not adequately incorporated extreme weather events and risk mitigation measures, roads become unsafe during flooding events (World Bank, 2016).

Energy: Belize shows positive gaps in energy. In terms of access, the country is above the expected given its GDP per capita. The country reports a 97 percent rate of electrification in urban areas and 88 percent in rural areas (World Bank, 2018). Furthermore, the number of electrical outages in a typical month, their duration and the commercial losses as percentage of annual sales that result from these outages are lower than the world average (World Bank, 2010), leading to a positive gap in quality. Similarly, Belize outperformed its peers in energy intensity, which contributes to the large positive gap depicted in the sustainability dimension.

Even though the methodology proposed by Borensztein et al. (2014) resulted in positive gaps for the Belizean energy sector, according to the 2010 Enterprise Survey, 36.4 percent of enterprises still identify electricity as a major constraint. Some of challenges identified include: the high electricity rates for residential consumers—which, despite being similar to those found in the Caribbean region, are still higher than those found in Central American countries. In addition, the lack of resilience to climate change and the characteristics of the transmission and distribution

¹ This document describes the infrastructure development challenges that the country faces in four specific sectors: (i) energy, (ii) telecommunications, (iii) transportation and (iv) water and sanitation. The identification of the challenges is based on the development gaps methodology described in Borensztein et al. (2014).



network (i.e., a single-circuit radial transmission network, which feeds various distribution systems) jeopardizes the national power supply (World Bank, 2016).

Water and sanitation: The country shows mixed results in the water sector, but an overall positive gap. In terms of access, Belize has plentiful surface and groundwater resources with coverage of 99 percent and 96 percent, respectively, of urban and rural population (UNICEF/WHO, 2017). Similarly, the quality dimension reflects a positive gap given that 97 percent of the population are using improved water, which is accessible on premises. The sustainability dimension shows a slightly positive gap attributed to the percentage of available freshwater, which is above the expected levels given the country's GDP per capita. On the other hand, the impact of business dimension shows a negative gap given that 20.7 percent of firms report experiencing water insufficiencies, which is 5 percent higher than the worldwide average (World Bank, 2010). Grau and Rihm (2013) highlight how water and wastewater services face constant operational, maintenance, and institutional challenges in the country.

In addition, Belize shows an overall negative gap in sanitation. The only positive gap is reflected in terms of access, with sanitation coverage of 97 percent and 91 percent, respectively, of urban and rural population (UNICEF/WHO, 2017). The quality and impact on the health dimension resulted in a negative gap given that sewerage coverage is limited mostly to a few urban areas, with only 11 percent of the population having access to the service.

The sector faces additional challenges such as the need for wastewater treatment in touristic areas of the country and the small size and number of systems, which makes it difficult to adequately staff the service providers with technical and financial capacity to ensure those systems' sustainability.

Telecommunications: Belize faces an overall negative gap in the telecommunications sector. In March 2018, the number of fixed broadband connections in Belize was equivalent to a household penetration rate of 38 percent, below the regional average of 45 percent (García, 2018).

Quality shows a positive gap due to the country's internet servers, which are better than those found in countries with similar GDP per capita levels. However, the Digital Subscriber Line (DSL) network has not expanded significantly for some time, which affects quality of service and prices. On the other hand, digital adoption reflects a negative gap, given that only 28 percent of the population makes or receive digital payments and only 1 percent of the population paid utilities using a mobile phone.

The high cost of internet services is still a challenge, which is linked to the low number of service providers. This translates into an elevated cost of high-speed internet, which is one of the highest in the Latin America and the Caribbean (U.S. Department of Commerce, 2018). Additionally, the country has not yet taken advantage of e-commerce opportunities, as evidenced by the fact that only 27.7 percent of businesses had their own website in 2010, compared to the regional (LAC) average of 47.3 percent and a global average of 44.2 percent (Vivid, 2018).

2. RECOMMENDATIONS TO OVERCOME CHALLENGES

Based on the challenges mentioned above, the following interventions should be considered:



Transportation:

- Devote more resources to road maintenance to avoid costly deterioration of roads.
- Promote resilient infrastructure designs.
- Update legislation and promote favorable conditions for public-private partnership (PPP).

Energy:

- Implement the National Sustainable Energy Strategy, including actions to diversify the energy matrix toward renewable sources, and promote energy efficiency programs.
- Bolster climate-resilient energy infrastructure.
- Promote off-grid solutions for rural electrification.
- Promote efforts to interconnect the country electricity system to the Regional Electricity Market (SIEPAC).

Water and sanitation:

- Increase coverage of water and sanitation services.
- Increase the percentage of wastewater collected and treated.
- Achieve financial sustainability for water and sanitation service providers as well for solid waste sector providers.
- Improve the access to sewer and treatment networks.

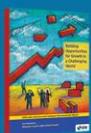
Telecommunications:

- Definition of a digital agenda with specific policies and regulations that contribute to increasing the quality of the service and the price level.
- Increase market competition.
- Increase penetration and deployment of infrastructure.
- Promote PPPs.

The expected benefits of implementing these interventions could include positive impacts on development of the country's agriculture and tourism sectors, as well as a more socially inclusive, cohesive, climate change-adaptable and resilient country. Additionally, it could give rise to the emergence of new business sectors and economic activities.

3. PUBLIC-PRIVATE PARTNERSHIPS FRAMEWORK: QUALITY AND IMPLEMENTATION

Currently, Belize does not have any PPP laws in place or PPP-specific institutions. The country has a PPP environment classified as “dormant” according to the Public-Private Infrastructure database. The absence of a PPP framework risks shutting off potential new sources of investment funding. The few experiences with private investment have focused in the energy, telecommunications, transport, and water sectors, with energy having the largest proportion of private participation at 37 percent (World Bank, 2018). However, some of these investments were reversed by the government. In 2012, the Prime Minister requested a private-sector liaison officer to help increase private sector investment in infrastructure, as well as the number of PPP projects in the country. Nevertheless, the effects are still not tangible.



4. NATIONAL DEVELOPMENT PLANS ON INFRASTRUCTURE

The country's main planning document is the Growth and Sustainable Development Strategy (GSDS) which builds on previous documents including Horizon 2030 and is also linked to the master plans for transport, tourism, the national investment policy, and export strategy. GSDS outlines four critical success factors and details the necessary conditions to implement them. The objective is to create optimal national income and investment, and among the necessary conditions, adequate infrastructure (roads, port, energy, water and telecommunication) is prioritized. While the plan specifies the required increased in capital expenditure, it is important to keep in mind that the slow pace of tax reform and high public debt could limit expansion in productive infrastructure.

5. POLICIES AND INTERVENTIONS UNDER CONSIDERATION

Some of the current policies and interventions carried out in the different sectors include the following:

- **Transportation:** Public Transportation Reform, which intends to improve efficiency, greater productivity, improved end user conditions and enhanced opportunities for the private sector in the national public transportation system.
- **Energy:** Sustainable Energy Action Plan 2014-2030, National Energy Policy (NEP), and the National Sustainable Energy Strategy. These plans aim to make Belize a net electricity and biofuels exporter, increase GDP energy intensity, triple energy recovery from waste streams, reduce fossil fuel imports, and generate over 50 percent of electricity from renewable energy.
- **Water and sanitation:** Belize Water Services (BWS) business plan review report 2015-2020, which seeks to ensure that the company can meet the investment needs of population growth, handle emergency/disaster situations, provide fair return to shareholders and ensure the overall viability of BWS.
- **Telecommunications:** Extension of fiber-optic connectivity to the north side, with the south side still pending.

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Costa Rica²

André Martínez Fritscher, Ana Laura Torrentes García and Jennifer Linares

1. INFRASTRUCTURE CHALLENGES

In 2015, Costa Rica invested approximately US\$2.148 billion (4.1% of GDP) in infrastructure (Infralatam, 2017). More than 60% of these investments were in the hands of the public sector. The majority were in the transport (2.3% of GDP) and energy (1.1% of GDP) sectors.

The country's main lags in the four infrastructure sectors are:

- **Transport:** Quality of port infrastructure and paved roads.
- **Energy:** Diversification of the energy matrix towards cleaner sources; cost of electricity.
- **Water and sanitation:** Wastewater treatment and sewerage.
- **Telecommunications:** Coverage of fixed broadband Internet services.

Transport: According to the Report on the State of the National Road Network 2014-2015, there is an estimated backlog of approximately 35 years in the sector and the budget allocated is less than a third of what is needed.³ In addition, although Costa Rica has one of the densest road networks in LAC,⁴ the quality of roads is the worst in the Central America and the Dominican Republic subregion (CARD). Of the country's total public network, 72.7% is ballast and soil, while 62.1% of the National Paved Road Network is of "poor" or "very poor" quality.⁵ The country also lacks a high capacity road network which connects the main foreign trade nodes with the GAM,⁶ the main consumption and production node. A quarter of the population spends two hours a day traveling to their destinations; loss of time due to vehicular congestion represents 2% of GDP, and traffic accidents represent 0.4% of GDP.⁷

Energy: Although Costa Rica is one of the countries with the highest penetration and diversification of renewable energy in its electricity matrix, its energy matrix is still highly dependent on imported fossil fuels (around 63%), which means the country is vulnerable to the volatility of international oil prices. For its part, the electricity matrix depends on hydroelectric generation, so seasonal availability of water resources and the long-term impact of climate

² This document describes the challenges the country faces in infrastructure development in four specific sectors: i) energy, ii) telecommunications, iii) transport and iv) water and sanitation. Identification of the challenges is based on the development gap methodology of Borensztein et al.(2014).

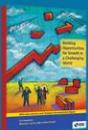
³ National Laboratory of Materials and Structural Models (2015).

⁴ The density of 76 km/100 km² is higher than the LAC average of 30 km/100 km².

⁵ International Roughness Index (IRI) of the National Laboratory of Materials and Structural Models (LANAMME), UCR.

⁶ GAM refers to a central portion of the country between the cities of Cartago (east) and San Ramón (west), which concentrates approximately 1.8 million people, 30% of the total population.

⁷ Loría Salazar (2014).



change are sources of risk. Finally, the cost of electric power is an obstacle to business competitiveness, which is related to its rate model and opportunities for improvement of competency in the sector. The average price of electricity in Costa Rica in 2015 was US\$0.16kWh⁸, the second lowest in the Central American region, but 33% higher than the average price in the United States.

Water and sanitation: the country performs well in terms of potable water and basic sanitation coverage, but not in sewage and wastewater treatment; in this area it ranks in the lowest positions in the Central American region. Sewerage services cover only 23.3% of the population; only 8% of wastewater receives treatment, while 76.4% of the population has a septic tank and 0.27% does not have a sanitary system.⁹ While the state of the storm drainage infrastructure also presents problems.

Telecommunications: Infrastructure for access to telecommunications¹⁰ and broadband penetration are at similar levels to those of its regional peers, but below OECD levels. Fixed broadband penetration is 10%, higher than the Central American average (9%), in line with LAC (10%) but below the OECD (28%).¹¹ The deficit in broadband infrastructure particularly affects rural areas.

2. RECOMMENDATIONS TO OVERCOME CHALLENGES

Transportation: Improving coverage and quality in a sustainable and resilient way is crucial for the competitiveness of critical value chains and urban mobility. The main recommendations are aimed at implementing expansion, conservation and maintenance policies to prevent the rapid deterioration of existing infrastructure; and at supporting implementation of an integrated, efficient and inclusive metropolitan mobility system.

Energy: In this sector it is necessary to diversify the energy matrix and modernize the electricity grid to promote efficient, competitive and environmentally sustainable energy development. In this respect, the country needs to diversify its energy matrix, as well as introducing new financing instruments and strengthening the technical area of the Public Services Regulatory Authority (ARESEP) in evaluation and definition of its tariff structures.

Water and sanitation: The country must reduce the lag in wastewater treatment and guarantee provision of potable water with water infrastructure adaptable to climate change to ensure the sustainability of the quality of service. To this end, master plans for potable water and wastewater need to be prepared to rationalize and prioritize resources for investment and the sustainable operation of sector infrastructure.

Telecommunications: The country needs to expand coverage of telecommunications services, promote regulatory improvements and new financing schemes for areas with the most serious deficiencies in order to achieve last-mile coverage. The recommendation is to develop and

⁸ Average electricity tariffs obtained from the detailed review in ECLAC (2015).

⁹ AyA; MINAE; MS (2016).

¹⁰ The market consists of 135 authorized telecommunications operators and service providers.

¹¹ Inter-American Development Bank (2016a).



execute rural connectivity programs, based on the main lines defined in the Telecommunications Infrastructure Action Plan.

Implementation of transport infrastructure solutions, along with water and sanitation, would generate benefits in terms of competitiveness and productivity, without neglecting their social impact. Deficiencies in transport infrastructure (as well as management of border crossings) increase transport costs between 4% and 12%¹², affecting the value chains that require specific routes to get from production nodes to local, regional and international consumption nodes (GAM). At the same time, the lack of water infrastructure has slowed development of municipalities by 34%.¹³ It also is necessary to deal with the gaps in energy and telecommunications since they create synergies with the rest of the infrastructure and with its economic and social impact. For example, in the case of the energy sector, the price of electricity not only creates an obstacle for companies currently operating, but also limits attraction of FDI. Finally, in the case of the telecommunications gaps, it is necessary to promote last mile coverage to improve the productive inclusion of the most vulnerable population.

3. PUBLIC-PRIVATE PARTNERSHIPS FRAMEWORK: QUALITY AND IMPLEMENTATION

The General Law of Concession of Public Works with Public Services is the main concession law in the country.¹⁴ However, since its passage and changes, few projects have materialized. At the beginning of 2018, the Executive Decree "Regulations for Development, Promotion and Management of Public-Private Partnerships for Development in the Public Sector" was signed with the objective of supplementing the existing framework applicable to the public sector to facilitate the development, promotion and management of public-private partnerships (PPPs) and their proper formalization.¹⁵ The Legislative Assembly is now discussing the Public-Private Partnership General Bill.

The country faces difficulties in taking advantage of PPPs which could solve budget constraints on financing infrastructure needs. Experience with them has been limited and the concession of the San José-Caldera highway (Route 27)¹⁶ is the only experience in implementation of PPP in the road infrastructure sector.¹⁷ Most of the PPP initiatives have not progressed, after failing to get through the initial stages of structuring the project.¹⁸ Problems of coordination among the

¹² *Ibidem*.

¹³ Salazar (2014).

¹⁴ However, the energy and telecommunications sectors are excluded. Also, the Law that Authorizes the Autonomous or Parallel Electricity Generation (7200) and its Expansion (7508) have served as a framework for the partnerships set up by the Costa Rican Electricity Institute (ICE) in the electricity sector.

¹⁵ A project is currently being analyzed to deal with the backlog of PPPs with the aim of reforming articles 1, 7, 9 and 14 of the General Concessions Law.

¹⁶ The services of design, planning, financing, construction, rehabilitation, expansion, repair, maintenance and conservation of the route, as well as its operation and exploitation were granted as a concession. The term of the concession is 25.5 years which began in 2008.

¹⁷ Others that can be mentioned are Moín Container Terminal (TCM), Puntarenas Granelera Terminal and Daniel Oduber International Airport.

¹⁸ Vargas Cullell (2018).



agents involved have been identified, combined with the government's limited capacity for structuring and supervising PPP projects.

Institutional and regulatory fragmentation of PPPs partially explains their low degree of execution. Costa Rica is ranked 16 out of 19 countries in environment for facilitating projects under the PPP modality,¹⁹ although it ranks first in conciliation schemes, PPP selection criteria, facilities for project preparation and competition environment in local industry. The biggest challenges are in the regulatory and institutional aspects, followed by financing facilities. Strengthening these aspects would expand the range of infrastructure projects suitable for PPPs.

4. NATIONAL DEVELOPMENT PLANS ON INFRASTRUCTURE

Costa Rica has its National Transportation Plan 2011-2035, National Policy on Potable Water Costa Rica 2017-2030, National Energy Plan 2015-2030 and National Telecommunications Plan 2015-2021, which govern the actions taken in each of these sectors. The transport plan ranges from structural reforms (enacting or changing laws), to modernization, improvement and expansion of works. Water policy, in the area of investment in infrastructure and services, establishes as main guidelines optimization and modernization of infrastructure, investment in resilient infrastructure and management of the potable water service. In energy, four areas of action are introduced focused on energy efficiency, optimal generation, sustainability of the electricity matrix, and sustainability of electricity development. For each of these areas, the plan sets out specific objectives and actions. For telecommunications, there are three pillars - digital inclusion, digital economy and electronic and transparent government - which list specific objectives and lines of action.

5. POLICIES AND INTERVENTIONS UNDER CONSIDERATION

The Bicentennial National Plan for Development and Public Investment 2019-2022 establishes specific interventions in the area of transport infrastructure, related to construction, expansion and rehabilitation of strategic routes, improvement of port infrastructure, and creation of conditions for urban planning and land-use management. Also included as one of the most important interventions is the Integrated Water Supply Program for Guanacaste-North Pacific, and expansion of coverage and provision of sewerage services at specific points, such as Palmares, Quepos, Jacó and Golfito, among other works. It is also considered critical to promote the use of alternative fossil fuels, and the interventions are aimed at promoting the (rational) use of renewable energy. In telecommunications, one of the main interventions is the digital transformation of the country through development and evolution of international mobile telecommunications systems, to generate innovative services and promote competitiveness.

¹⁹ Economist Intelligence Unit (2017).



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Dominican Republic

Joaquín Zentner, Fanny Vargas and Jennifer Linares

1. INFRASTRUCTURE CHALLENGES

In 2015, the Dominican Republic invested approximately US\$1.289 billion (1.9% of GDP) in infrastructure (Infralatam, 2017). More than 80% of these investments were in the hands of the public sector. The investments were concentrated in the energy (0.9% of GDP) and transport (0.8% of GDP) sectors.

Transportation: According to the development gap analysis, the values of transport sector indicators are well below what would be expected based on the country's income level. The dimension in which the country has a larger gap than expected is transport safety (-43.8 points), which is evidence of a high mortality rate from traffic accidents. Even so, road quality and maritime connectivity is considered acceptable.

There are serious challenges in transport and logistics infrastructure, especially commercial infrastructure. The primary road network is considered to be in good general condition (36% of cases) or regular condition (32%), although it suffers from congestion problems due to capacity limitations and lack of separation between long- and short-distance distribution channels. In contrast, the secondary road network and the network for access to productive agricultural areas require rehabilitation (MEPyD, 2015). Transport and logistics services are costly and inefficient as a consequence of the cartelization of land transport prices by union organizations which control 80% of total traffic (IDB, 2016). Port costs are also high due to lack of infrastructure for customs and phytosanitary checks, and for cold chains (IDB and ADOEXPO, 2016).

The recent reform of the legal and regulatory framework created an entity with authority to lead the sector, the National Institute of Traffic and Land Transportation (INTRANT), which replaced the multiplicity of existing regulations and institutions. However, full implementation of the law is pending, held up by institutional weakness, lack of human resources with technical skills and resistance from private interest groups.

Energy: Expansion of electrification at the national level and use of renewable sources mean that the country has positive gaps in the dimensions of access (15.9) and sustainability (7.8); that is, the values of the indicators in these dimensions are higher than expected, given the GDP per capita of the Dominican Republic. However, there is a large negative gap in quality (-14.5) explained by frequent and prolonged power cuts.

The Dominican electricity sector is characterized by unstable supply, as a consequence of structural failures at various levels of the national electricity system. Electricity generation is costly and vulnerable to external shocks, given the large share of imported fossil fuels (35%) in the generation matrix. The current tariff scheme does not adequately reflect generation costs and has been unchanged for long periods. Distribution suffers from high levels of technical and commercial losses caused by the operational inefficiency of the electricity distribution companies (EDEs), whose management indicators are rated below the standards for similar companies in the region. Collection levels for billed energy reach 90%, a figure lower than the expected 98%; and the average electricity losses of the EDEs is around 30%, almost double the



LAC average (16.5% in 2014). The inefficiency of the EDEs results in recurring deficits which require significant transfers of public resources.

Despite the creation of the Ministry of Energy and Mines as the governing body of the sector, significant institutional and regulatory weaknesses persist. There are inconsistencies in the separation of the functions of sectoral planning, supervision and regulation; likewise, the monitoring of the various actors in the sector is ineffective.

Water and sanitation: Despite significant achievements in expanding access to water and sanitation services, the country's performance on quality and stability indicators is below expectations, especially sanitation (-25.4), a situation that has a negative impact on human health and business.

This sector is characterized by low quality and limited service coverage. Ninety percent of households receive water from the public network, although 33% of this coverage takes place outside the home. There are also large differences in coverage by income quintile and area of residence. Coverage of improved sanitation systems reaches 83% of the population, also with strong regional and income inequalities (MEPyD, 2017).

The challenges of the sector are associated with financial and regulatory deficiencies. Water companies are highly dependent on state subsidies due to high volumes of unbilled water (from 70% to 89% of production) and the low tariff level. Investments have focused on increasing production rather than rehabilitating or expanding networks, so the service suffers from low quality and instability. The legal framework is obsolete and there is no governing entity responsible for strategic planning, intersectoral coordination and resource allocation (IDB, 2016).

Telecommunications: The country's performance in the indicators of access and quality of telecommunications services is higher than expected, but there are still gaps related to access to mobile telephony (-17.8). Adoption of digital technologies still lags far behind expectations, with large gaps in use of Internet banking (-49.5) or mobile payments (-41.7) by households.

Technological penetration is low: less than 30% of the population uses mobile Internet, although 50% of the population has a single mobile subscription. An estimated 80% of the population has mobile broadband coverage (3G and 4G) but does not subscribe. Among the causes of limited penetration is the cost of mobile equipment, which is unaffordable for the poorest population. Also fixed broadband services are considered costly and low speed, due to lack of connectivity of trunk network and fiber optic aggregation network.

2. RECOMMENDATIONS TO OVERCOME CHALLENGES

Energy: The severe deficiencies in the Dominican electricity sector are one of the main structural obstacles to growth, since they undermine the productivity and competitiveness of the economy. Achieving a stable and sustainable service would have a large multiplier effect in the medium and long term: it would reduce production costs and allow the emergence of new productive opportunities, thus increasing the general level of employment.

The key interventions in this sector would be to achieve sustainable energy distribution and diversify the generation matrix. Investment is needed in expansion and maintenance of electricity distribution networks and installation of meters, and in management and operational improvement of the EDEs, setting management targets and regimes of consequences in the event of failure to meet commitments. With respect to generation, the sector requires greater



diversification of the matrix away from imported fossil fuels, which would reduce the costs and vulnerability of the system during international oil price shocks.

3. PUBLIC-PRIVATE PARTNERSHIPS FRAMEWORK: QUALITY AND IMPLEMENTATION

According to the indicators of the *Infrascope* 2018 index (EIU, 2018), the legal and regulatory framework for PPPs in the Dominican Republic has room for improvement. Although PPP contracts are included as a modality in public procurement processes and there are protocols for their application, there is no institution dedicated to dealing with PPPs or specific legislation,²⁰ so multiple government entities are responsible for a range of processes with differences in the quality of design and in dealing with the agreements. As a result, there are persistent problems in selection of projects, implementation, monitoring, evaluation and accountability.

Business climate and macroeconomic stability remain as the country's advantages, with moderate sovereign and exchange risks compared to the regional average. Although formally not opposed to PPPs, the government has recently focused on traditional investment in infrastructure; in civil society, levels of opposition to PPPs are considered moderate.

There are funding constraints that create an obstacle to private sector participation in infrastructure. The local capital market is underdeveloped and the alternatives for sustainable financing or funds guaranteed by multilateral institutions have not yet been implemented. Recently there has been some participation by institutional investors in PPP projects, but this is still an incipient trend.

Recent PPP experience in the country has been mixed: only five projects have been developed under a PPP in the last five years, and although there have been no cancellations in this period, the government has previously failed to meet financial commitments, and made unilateral changes to the prices of the services provided through PPP.

4. NATIONAL DEVELOPMENT PLANS ON INFRASTRUCTURE

Within the framework of the National Development Strategy 2010-30 there is a Multiannual Public Investment Plan whose content is not publicly available, but which is integrated into the four-year Multiannual National Plan for the Public Sector (PNPSP).²¹ This Plan is a summary of the investment plans of the entire national scope, and details the number and type of infrastructure to be built and the geographical area. However, the plan does not include the results of any cost-benefit analysis or information on consultations with the private sector or communities. Investment amounts are presented only in program summaries and indicative tables.

²⁰ Congress is studying an PPP bill which is expected to be passed before the end of 2019.

²¹ PNPSP 2017-2020 is currently in force, updated to 2019.



5. POLICIES AND INTERVENTIONS UNDER CONSIDERATION

Energy: Significant progress has been made in diversifying the matrix. The share of liquid fossil fuels was reduced from 80% to 35% between 2010 and 2017, thanks to the development of new technologies with natural gas. Entry of new thermoelectric plants into the system²² in 2019 will further reduce this percentage.

In terms of distribution, since 2009, the EDEs have implemented a program to reduce loss levels, with the support of several multilateral bodies, including interventions on national distribution circuits. These programs have been continued and tied to targets for improving their efficiency and operational and financial sustainability. The goal is to reduce total losses to 15% by 2022.

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²² The coal plants of the Punta Catalina Thermoelectric Power Plant will enter the system in 2019, with a potential 750 MW generating capacity, equivalent to 20% of current system capacity.



El Salvador²³

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1. INFRASTRUCTURE CHALLENGES

In 2015 El Salvador invested approximately US\$474.3 million (1.8% of GDP) in infrastructure (Infralatam, 2017). More than 60% of these investments were in the hands of the public sector. The investments were concentrated in the energy (0.9% of GDP) and transport (0.8% of GDP) sectors.

Between 2008 and 2015, El Salvador invested an average of 2.2% of GDP in infrastructure, lower than the LAC average (3.5% of GDP) in the same period (Infralatam, 2017). In addition to showing marked differences with the region, this result reduces the country's competitiveness, as shown by the Global Competitiveness Index (GCI) 2018 where, in the infrastructure pillar, the country has a negative performance (ranked 90 out of 140 countries). There are gaps in different dimensions in the transport, energy and water sectors, and in telecommunications:

- **Transportation:** Customs efficiency, quality of port infrastructure, percentage of paved roads, and logistics performance.
- **Energy:** El Salvador has no significant challenges in this sector.
- **Water and sanitation:** Water quality, quality of sanitation in rural areas and wastewater treatment; service interruption. All of these have a direct impact on health and competitiveness indicators.
- **Telecommunications:** Percentage of Internet user population, broadband subscription and 3G coverage.

Transportation: Total investment in transport in El Salvador has been decreasing since 2012, falling to 0.8% of GDP in 2015 (Infralatam, 2018), which is less than half the LAC average (2% in 2015). This has been financed entirely by public investment. The Logistics Performance Index (LPI), calculated by the World Bank (2018), which identifies the quality of transport infrastructure and efficiency of customs processes to facilitate trade, gives the country a 2.58 score, below the LAC average of 2.66. Currently 40% of the national road network is unpaved (MOPTVDU, 2016) which limits the connectivity of rural areas with high agricultural and tourist potential. The country's main interurban roads are also facing capacity problems and are mostly in poor condition (62% of all paved roads are in poor or abnormal conditions).

In terms of financing needs, the country does not have roads under concession and the current inventory has a 56% road backlog (unmaintained roads) which means that, to meet the needs of the road network for the next 20 years, FOVIAL requires at least an additional US\$5.533 billion for conservation and rehabilitation (*El Mundo* newspaper, 2017). In maritime transport, the Autonomous Executive Port Commission (CEPA) reports that, to ensure capacity at El Salvador

²³ This document describes the challenges the country faces in infrastructure development in four specific sectors: i) energy, ii) telecommunications, iii) transportation, and iv) water and sanitation. Identification of the challenges is based on the development gap methodology of Borensztein et al. (2014).



International Airport in the coming years, modernization works for approximately US\$70 million need to be executed.

Energy: El Salvador has a total energy coverage of 96.7%, with a level of 93.2% in rural areas and 98.8% in urban areas (MINEC, 2017). There are places where it will be difficult to expand the distribution network due to their level of isolation or where such expansion is neither economically nor financially viable due to the national fiscal situation.

Water and sanitation: According to the Multipurpose Household Survey (MPHS) 2017 at national level, households with piped water account for 79.4% (65.4% in rural areas), leaving more than 1.4 million inhabitants without potable water service. In addition, 48% of the supply has been classified as intermittent and 50% of the population reports poor quality of the water supplied.

At level of sanitation, the MPHS (MINEC, 2017) finds that the percentage of households with sanitary service (inside or outside the home) is 94.6% nationally, 98.2% in the urban sector and the 88.9% in rural areas. However, in urban areas, access to sanitary services with a toilet connected to the sewerage network is only 54.5%. With respect to wastewater, more than 95% of domestic wastewater is discharged without any treatment.

In terms of financing, according to the Potable Water and Sanitation National Plan, presented by ANDA in 2018, investments of more than US\$12.000 billion are required to achieve universal access to potable water and sanitation, which is why private sector participation is critical.

Telecommunications: Lack of infrastructure and broadband networks is the most important gap identified in El Salvador. Lack of coverage and upgrading of networks places the country among the lowest ranking (19 out of 26) in broadband development in the region (DIGILAC IDB).

This lag explains the situation of the country in terms of service penetration levels. The Information and Communication Technology Development Index (2018), published by the International Telecommunication Union (ITU), ranks El Salvador 119 out of 176, mainly due to low consumption of cellular broadband (28 subscriptions per 100 inhabitants vs. CARD average of 39), and fixed band (6 subscriptions per 100 inhabitants), and a low percentage (17%) of households have access to the Internet and computers (32% for CARD).

2. RECOMMENDATIONS TO OVERCOME CHALLENGES

Transportation:

- i) Strengthen the planning instruments of the transport and logistics sector, from a perspective of intermodal networks and services which respond to the country's productive characteristics and address the challenges of poverty and inequality. These instruments must not overlook innovation and digitization, incorporation of Intelligent Transportation Systems, or technologies such as Building Information Modeling (BIM), LIDAR surveys, big data management, use of telephone data to conduct origin-destination surveys and master transport plans. These trends are already gaining momentum in the rest of LAC.
- ii) Identify and prioritize a portfolio of investments in which the private sector can participate.



- iii) Increase the competitiveness of port and airport nodes through improvements in infrastructure and adoption of initiatives such as coordinated management of borders applied to ports (Port Community System) and airports.
- iv) Implement a city model based on productivity and efficiency which strengthens urban transport planning, particularly public transport.

Energy:

- i) Design a plan to expand levels of electricity coverage in urban areas, and especially in rural areas, to achieve the goal of universal service.
- ii) Reduce insecurity²⁴ levels to cut the costs of providing services, and allow greater private investment.
- iii) Strengthen the institutions in the sector in order to promote long-term policies making it possible to diversify the energy matrix with renewable and low carbon energy.
- iv) Develop processes of government dialogue with the private sector with the aim of improving efficiency in distribution and introducing modern technologies for control of energy, which will reduce loss levels and bring service up to the levels of OECD countries. Also integrate more non-conventional renewable energy into the energy matrix.

Water and sanitation:

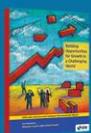
- i) Develop a priority short-term investment plan to generate significant impact on the quality of the service and support the strengthening of the technical, administrative and financial capacities of ANDA
- ii) Make large investments in the sector to allow improvements in efficiency and cost savings through replacement, rehabilitation and technological upgrading of obsolete and inefficient infrastructure, which requires private sector involvement.
- iii) Strengthen the existing legal and institutional framework to guarantee the sustainability of the investments to be made.

Telecommunications: Support deployment of private telecommunications infrastructure, particularly last mile networks and in rural areas, also potentially under the PPP modality.

3. PUBLIC-PRIVATE PARTNERSHIPS FRAMEWORK: QUALITY AND IMPLEMENTATION

According to the Infrascope Index (EIU, 2017), which evaluates countries' capacity to implement PPP projects in five stages of a project's life cycle, El Salvador is above the LAC average and leads the CARD region in terms of regulatory framework (score 90 vs. 69, LAC average) and institutional (91 vs. 55 for LAC). However, in terms of operational maturity, investments and business climate, and financing facilities for infrastructure projects, the country faces significant challenges with a score below the average of LAC and CARD.

²⁴ According to the IDB report (Pérez Arbelaez and Marzolf, 2011) there is a close correlation of non-technical electricity losses in places with poverty and high rates of insecurity.



El Salvador is currently working on the launch of its first private-sector participation initiatives in development of infrastructure projects through the PPP modality; so its operational experience in this area is limited.

The Public-Private Partnerships Special Law (PPP Law) was passed by the Legislative Assembly in May 2013, amended in 2014, and its regulations approved and published in 2015. The first PPP projects promoted under this Law - and which, with advice from FOMILENIO II, PROESA has structured and will shortly start bidding processes - include the cargo terminal at the Oscar Arnulfo Romero y Galdámez International Airport and the Road Lighting and Video Surveillance project. Other projects that are part of the PROESA PPP portfolio in process of implementation are: El Salvador Government Center, the Technological Park in Zacatecoluca, the North Metropolitan Corridor and the Southern Peripheral Ring.

Given the advanced state of progress of the PPP project portfolio, and the imminent start-up of projects, there is an urgent need to set up and start operations of the Public-Private Partnerships Audit Body (OFAPP) proposed in the PPP Law, which will regulate service levels and the tariff regime, as well as safeguarding the rights of users. It is equally important to issue the necessary regulations to enable the Ministry of Finance to carry out its functions under the PPP Law, especially in relation to the fiscal implications of PPP Contracts, the fiscal consistency of firm and contingent future payments arising from each project, and evaluation of fiscal risk.

As a result, there are ample spaces for promoting PPP projects. To do this, it is necessary to design a prioritized and concerted portfolio based on the country's long-term sectoral planning exercise, and improve the analysis framework and institutional capacities for the timely and effective identification and structuring of PPP projects through transparent and competitive processes.

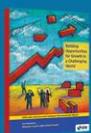
4. NATIONAL DEVELOPMENT PLANS ON INFRASTRUCTURE

El Salvador lacks long-term infrastructure planning tools to guide prioritization of sector investments and recognize needs in this area in accordance with the productive capacity of the different regions of the country, and reflecting the concept of infrastructure as a means of economic and social development. Absence of planning instruments is also the case in urban areas where transport management entities suffer from limitations related to human capital formation, capacity and technology for implementing real-time transport management which optimizes the operation of urban mobility systems, moving toward a city model based on productivity and efficiency.

In 2017 the government launched the Integrated Policy for Mobility and Logistics for Development with the objective of promoting a productive transformation and facilitating commerce in an effort to speed up growth and human development. Given that investments to close these gaps would substantially improve the prospects for the country's economic development, the IDB has begun to develop an infrastructure master plan with a road map which goes beyond the five-year plans and provides for long-term integrated programming.

5. POLICIES AND INTERVENTIONS UNDER CONSIDERATION

El Salvador is in a stage of political transition: in June 2019 the new government will take office under the leadership of Nayib Bukele. Consequently, the plans and strategies that could be put



in place have to be considered in the light of this electoral result and the priorities of the new administration.

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Guatemala

Arnoldo López, Jorge Luis Coj Sam and Jennifer Linares

1. INFRASTRUCTURE CHALLENGES

In 2015, Guatemala invested some US\$362.7 million (0.6% of GDP) in infrastructure (Infralatam, 2017). More than 90% of this amount was invested by the public sector. Most of the investment went to the transportation and energy sectors (0.6% and 0.1% of GDP, respectively).

The infrastructure indicator from the 2018 Global Competitiveness Index (GCI) elaborated by the World Economic Forum (WEF) for transportation, telecommunications, and energy-related infrastructure, ranks Guatemala in 96th place among 140 economies. This score is slightly lower than what would be expected, given its income level and the average for LAC. The largest gap (in terms of the level expected according to *per capita* GDP) is seen in transportation, followed by telecommunications.

Transportation: The quality of transportation infrastructure is uneven within the country. Specifically, the areas within the country where poverty is highest register low road density for vehicle-accessible roads (ICEFI, 2012). The special significance of this characteristic is highlighted by the evidence indicating that low availability of accessible roads correlates with less access to such public services as education, health, and justice, as well as to potential markets for local products, which in turn lessens the opportunity to escape poverty.

Road density in per capita terms is 1.2 km/1,000 inhabitants, which is low as measured against neighboring countries (3 km/1,000 inhabitants); and which in conjunction with logistics at the border, hinders access to foreign markets. According to the Logistics Performance Index, Guatemala ranks 125 of 160 economies; on a scale of 5.0, its score is 2.4, as compared to the average for LAC (2.7) and the average for lower middle-income countries (2.6). The poor quality of the infrastructure and of customs and border services is the main reason for the lag in performance. The condition of the infrastructure and equipment at border crossings, together with inefficient control processes, raises costs and reduces the predictability of the international movement of goods over land.

Energy: Important strides have been made in the supply of electricity, but gaps persist in rural areas. In 2016, 92.1% of homes had access to electricity, 9.4 percentage points higher than the level recorded a decade ago. This dynamic has brought Guatemala close to the average for Latin America (95% coverage). However, the increase in coverage has been uneven. As Jiménez has noted (2016), the gaps in electrical service are concentrated in the poorest sectors of the population. In 2014, among the poorest one-fourth of urban and rural homes, access was 90% and 67%, respectively, which are far lower proportions than the average in Latin America. Geographically speaking, the departments with the lowest coverage are Alta Verapaz and El Petén (with 44% and 67%, respectively, in 2016). By contrast the urban departments of Sacatepéquez and Guatemala City boast 100% coverage.

Scarce electrification in rural areas of Guatemala is a function of structural factors. According to the Latin American Energy Organization (2013), these areas share a number of common traits; they lack good road access, have low population density, and their populations are broadly dispersed (which requires more investment and higher *per capita* costs). Furthermore, it is estimated that between 15% and 20% of the population in the rural departments with lower



electrical coverage are unable to pay for the service. Guatemala has seen the price of electricity fall (without accounting for taxes or subsidies) for residential, commercial and industrial consumers. In 2015, it was below the average for Central America (ECLAC, 2017). By contrast, figures for 2010 show the country had at that time the highest costs among the same group of countries (Armendáriz, et al., 2012). The price drops were due mainly to two factors: i) a more diverse electrical grid; and 2) the fall in international prices for oil.

Water and Sanitation: Guatemala has made important strides in improving access to water and sanitation, but gaps remain. In the past 15 years, although the population with access to improved water and sanitation has risen from 72.6% to 78.1%, it is still important to maintain investment in the sector. Sanitation coverage saw a 14 percentage point increase in this period, reaching 58.3% of the population in 2014, which still lags in relation to *per capita* income for the country. In both cases, the extent of coverage differs between urban and rural zones. Even though this gap has lessened it is shrinking more slowly than in the average country in LAC. The rural population has 24 percentage points less coverage than its urban counterpart. The rural-urban gap for sanitation is 54 percentage points; far greater than the 24 percentage points registered for LAC as a whole. The gaps in services is also marked along ethnic lines; the percentage of the indigenous population having access to water supply and to sanitation, compared to the nonindigenous population, lags by 34 and 8 percentage points, respectively.

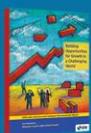
Telecommunications: In the past 15 years, telecommunications coverage in Guatemala has expanded significantly, especially for telephone access. In the year 2000, 6 of 100 inhabitants had land line telephone service, while 8 of 100 had mobile telephone subscriptions. By 2017, coverage had risen to 15 land lines and 118 mobile telephones, which is consistent with income level. In 2014, internet access had risen to 35 of 100 persons, 32 times the figure recorded in 2000. This increase notwithstanding, the figures are lower than the average for the Latin American region (49), and for what is expected given the national income level.

2. RECOMMENDATIONS TO OVERCOME CHALLENGES

Failure to appreciate the gaps described above could perpetuate inequalities. The disparities between urban and rural sectors are most severe in the areas of roads and sanitation. Consequently, the following recommendations are proposed:

Transportation: It would be advisable to improve connectivity in rural areas (trails, rural roads, secondary roads); build basic economic infrastructure for agriculture logistics systems, such as centers for distribution, storage, and packaging of agricultural products, and invest in border crossings, and systems and procedures to facilitate commerce.

Water and Sanitation: Expansion of water and sanitation services is essential in coordination with increased health services to improve mother and child health. To this end, implementation of an appropriate legal and institutional framework is needed, as is the promotion of clear and explicit financing and subsidy mechanisms. It is also essential to create an information system for urban and rural areas that allows for the monitoring of service delivery indicators and helps in decision-making.



3. PUBLIC-PRIVATE PARTNERSHIPS FRAMEWORK: QUALITY AND IMPLEMENTATION

Infrascope (EIU, 2018) has found that the country demonstrates good performance, in terms of public-private partnerships [PPP], in regulation and institutional framework, but it also noted a lag in the capacity for implementation. To an extent, this reflects financing. The report ranks the country 13 of 19 LAC countries and cites it as an emerging country in its capacity for infrastructure implementation with PPPs. In terms of regulation and institutional framework, Infrascope ranks the country among the top five in the region.

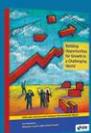
With Decree 16-2010, the Congress of the Republic enacted the Law of Alliances for the development of Economic Infrastructure, containing 113 articles. The specialized institution of the State responsible for ensuring compliance with the Alliance Law and its regulations is the National Agency of Alliances for the Development of Economic Infrastructure (ANDIE), whose current portfolio contains six PPP projects in different phases of development. Altogether, these projects are estimated to have received an initial investment of US\$1.51 billion and encompass public building construction, transportation, and road, port, and airport infrastructure. The project on which implementation has advanced the most is the State Administrative Center; Puerto Seco Tecún Umán II Intermodal Transport, the Northeast Expressway, and the Modernization of La Aurora International Airport are in the preparatory structuring stage.

The project for the Escuintla-Puerto Quetzal Highway, which will lead to one of the country's major ports, will include highway rehabilitation, administration, operation, and maintenance along a 60 km toll road. Once the Congress of the Republic gives approval to the alliances contract to develop economic infrastructure (PPP Contract), its signing will inaugurate the three-year rehabilitation stage of the project, followed by operation and maintenance during a 25-year period. This project will require an investment of US\$80 million. This project, along with the other five pilot projects in the pipeline, are expected to boost the pace of maturation and the market-related learning curve for PPP financing and management.

In the future, a larger number of PPP projects are expected to be proposed to the market; specifically, those promoted by the National Agency for Public-Private Alliances (ANADIE) and for urban mobility. The former will consist of the portfolio of the aforementioned PPP projects that are in the preparatory and implementation stage. The Metroriel ("Metrorail") transportation project is expected to be continued with feasibility and structuring studies. These will pose technical challenges for the State Railway Enterprise of Guatemala (FEGUA), the contracting agency, which will have to adjudicate the PPP contract for the construction, operation, and maintenance of the State Administrative Center. Together, these two projects will represent an investment of almost US\$1 billion. In connection with urban mobility, the major municipalities of the country have proposed a series of urban transportation projects. Noteworthy among them is the Guatemala City metro proposal, for which prefeasibility studies will be performed in 2019, and the East-West Corridor, running 5.6 km between two points of the capital.

4. NATIONAL DEVELOPMENT PLANS ON INFRASTRUCTURE

The country has launched a number of national and sector-level plans geared toward infrastructure investment. In 2014, in the wake of a consultation involving departmental and municipal actors, the government approved the K'atun National Plan 2032, which presents 36 priorities along five axes. The Plan looks to medium-size cities to channel the demands and needs of the Guatemalan people, which will require that the cities link up through infrastructure networks.



In the transportation area, the Plan gives special attention to improved road infrastructure to boost national competitiveness by connecting production and market areas with population centers. In the area of water and sanitation, the improvements for the rural population would require establishing an infrastructure of basic sanitation and waste treatment systems. Another consideration would be to upgrade access to telephone services and energy with which to support a growing inclusive economy.

In addition to this, there are several national plans at the ministerial level; noteworthy among them, is the National Logistics Plan, 2015-2030. This plan assigns priority to four logistical subsystems (agriculture, assembly and light manufacture plants, intra-regional trade, and tourism). The energy sector has a plan for 2017-2032 with three strategic axes: sustainable use of renewable resources, saving energy and energy efficiency, and reducing greenhouse gas emissions. These are assigned indicators for performance and to gauge impact. Other sectors have also drafted national plans that consider general lines of action.

5. POLICIES AND INTERVENTIONS UNDER CONSIDERATION

There is currently under discussion in the Congress a bill for the General Law of Road Infrastructure, which would set up a Superintendent Agency for Road Infrastructure as an autonomous, decentralized entity. The Superintendent Agency would be responsible for planning, calling for public bids, and contracting projects, with participation from private investors. The expectation is that this initiative would allow for the construction of 2,000 km of roads.

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Haiti²⁵

Agustín Filippo and Jennifer Linares

1. INFRASTRUCTURE CHALLENGES

The key results of the gap analysis applied to the infrastructure and telecommunications sectors in Haiti are given below together with an analysis of the main deficiencies.

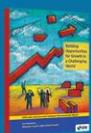
Transportation: In this sector, Haiti has a negative gap in indicators of paved roads and ports of -0.8 standard deviations. For paved roads, the gap is -0.6 standard deviations, and for ports -0.9 standard deviations. The infrastructure quality indicator has a gap of -1.4 standard deviations, partly explained by the mountainous terrain and the high frequency of natural disasters, but also by poor planning and supervision processes of public works. Haiti has low connectivity of territory and modes of transport, with severe congestion and low levels of safety.

The main challenges faced by the sector in reversing the negative gaps are underdevelopment of the construction company market and the incipient development of State planning, management and maintenance capacities for public works. These limitations are as much or more important than the country's natural and social conditions (rugged terrain and conflicts involving expropriations and compensation along the route of the roads).

Energy: Haiti has a negative gap of -0.9 standard deviations in electricity. The electricity sector is inefficient and not very transparent, and reports serious losses which are absorbed by the Treasury (2% of GDP, annually). It is a structural phenomenon, anchored in prolonged bad management of the public electricity company - which bills less than 50% of the electricity produced - and aggravated by oil price volatility, since the energy matrix has a large hydrocarbon component, and by contracts with private generators which are very onerous for the public sector. The quality of service is very poor: few hours of electricity per day, frequent power cuts, unstable supply and high prices. Users with more resources choose to disconnect from the grid and use their own generation systems, which exacerbates the financial problems of the state electricity company. Grid supply is concentrated in a few urban centers, while rural populations are not connected to the national grid. Total electricity consumption is low in relative terms, and the gap is strongly negative (-3.2 standard deviations). The scale of this challenge is immense, since 70% of the country's population (about 7 million people) do not have electricity service.

Water and sanitation: The water and sanitation gap in Haiti is negative with 0.9 standard deviations (so not significant at usual confidence levels). This gap consists of a gap in access to water of -1.3 standard deviations and a gap in sanitation services of -0.5 standard deviations. The deficient development of water and sanitation systems results in low levels of quality of life and high incidence of diseases. For example, at this time 25% of the population of Port-au-Prince, the capital, practices open defecation. The main problems are to increase coverage and achieve sustainability in places that already have services. The institutional weakness in the

²⁵ This document describes the challenges the country faces in infrastructure development in four specific sectors: i) energy, ii) telecommunications, iii) transportation and iv) water and sanitation. Identification of the challenges is based on the development gap methodology of Borensztein et al.(2014).



sector (which includes DINEPA, the state regulator of the service, as well as other state provincial units) is a key element among the challenges that have to be overcome.

Telecommunications: In terms of Internet users, Haiti has positive gaps totaling 0.2 standard deviations; the case is the same for cellular telephony subscriptions, with 0.3 standard deviations, which means the country is roughly at the same level as others with similar GDP per capita, although its position is lower than other LAC countries.

This recognition is partly based on the fact that, in recent times, investments have been made in the sector. The country has an international connectivity infrastructure with two submarine cables and a third planned, linking it through the Caribbean nations to the Miami hub, and a national fiber optic network that connects the large urban centers providing connectivity service for the internal market. Despite this, there are great opportunities for growth. According to an IDB study (García Zaballos and López-Rivas, 2012), an increase in broadband penetration in LAC is associated with an increase in GDP and productivity gains. Likewise, according to reports from the OECD and the European Commission, ICTs provide more than 40% of the productivity gains of the European Union (75% in the United States), and contribute about 25% of GDP growth in the EU-5 countries.

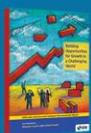
2. RECOMMENDATIONS TO OVERCOME CHALLENGES

Transportation: Overcoming the weakness of the sector and creating and maintaining an adequate transport infrastructure requires efforts in several areas: modernization of the legal and regulatory framework, adaptation of the public entities that regulate and operate in the sector, development and maintenance of other sectors of the economy to encourage private sector participation (financing and improvement of the business climate in general terms).

Water and sanitation: New water and sanitation systems need to be built and started up, and management models improved both in urban environments (main and intermediate cities) and in rural areas.

Energy: The sector needs to bring about improvements in generation and interconnection infrastructure, as well as in governance and quality of institutions. The installed generation capacity must be expanded, and dependence on fossil fuels reduced. Despite international support, and publication of recent decree-laws aimed at modernizing the sector, institutional capacity is still limited. The management capacity of the Ministry of Public Works, Transport and Telecommunications, particularly the state electricity company (EDH), constitutes a major limitation to improving service and financial sustainability; there has to be a radical change in this area. Finally, the sector has to deal with lack of confidence - which makes many opt to disconnect from the grid and generate their own energy, and creates difficulty in collecting bills - by providing convenient and reliable services.

Telecommunications: Expansion of the sector is crucial, given that improvements in the digitization index, which gives telecommunications an important weight, lead to increases in GDP and productivity. Expansion of connectivity faces challenges of infrastructure and governance. Moreover, there are restrictions on the shared use of the infrastructure that need to be addressed, since they result in unnecessary duplication of investments in some areas of the country, and in lack of coverage in others. It would also be advisable to expand the market to add an operator to the two existing ones and improve the competitiveness and quality of the service. Finally, CONATEL - the regulator of the sector - has sometimes shown itself to be institutionally and financially weak and limited for leading the growth of the sector in a robust



manner, and its capacity needs to be reinforced along with modernization of the old legal framework (dating from 1977, the oldest in LAC).

3. PUBLIC-PRIVATE PARTNERSHIPS FRAMEWORK: QUALITY AND IMPLEMENTATION

Haiti does not have a framework for public-private partnerships (PPP), so it does not appear in *Infrascope* and is among the least developed countries in the region in the World Bank public sector procurement indicator. However, the country has recently made progress in this area in terms of modernization. In particular, the following documents have been issued, in part with IDB support:

- Legislative bill and regulations.
- Procedures manual, with examples, financial and eligibility models.
- The PPP Sector Policy Document, which includes an analysis of the transport sector (ports, highways and airports), and energy.
- Draft protocol on collaboration between the investment promotion agency (CFI) and the PPP project unit of the MEF (UCGPPP-MEF).

These tools provide the government with the basis for carrying out transactions in the framework of PPPs.

The government has also successfully explored private participation in the water and sanitation sector, and plans to deepen operational technical assistance relations and generate results-based operating contracts. The announcement of a new PPP scheme with more private sector participation is expected in 2019.

4. NATIONAL DEVELOPMENT PLANS ON INFRASTRUCTURE

Transportation: The country has a national plan, but it was prepared in 2008 and an update is expected for 2019.

Energy: Haiti has prepared an energy plan covering the period 2007-2017, but has not followed up on it; as a result the sector lacks an identifiable long-term path. At present, leadership in this sector is weak, characterized by a broad dispersion and variety of intervening authorities, which provide partial solutions with short-term scope.

Water and sanitation: The country has a national plan for the sector, the Strategic Sectorial Plan (PES), which is in operation and published on the government website. However, its application is plagued with delays.

Telecommunications: CONATEL has a plan for the sector which covers institution building, regulation and the telecommunications ecosystem in general. The plan is recent, but no substantial progress has been made on what constitutes its main elements.



5. POLICIES AND INTERVENTIONS UNDER CONSIDERATION

Transportation: Several important bills are awaiting processing by parliament, such as that governing cargo routing control, road works maintenance and financing, and port reform. On the other hand, the government is implementing a program to improve rural infrastructure, which includes building and renovation of rural roads, with the aim of increasing agricultural production and reducing food insecurity.

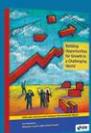
Energy: This sector works with a 1989 law which is inadequate for dealing with current reality. Of the three decrees published in February 2016 aimed at liberalizing the sector, only one has been partially activated. The present government is giving priority to a massive rural electrification program, but there is still no concrete plan in this respect. The new regulator, set up more than a year ago, has taken several actions but has not been able to show concrete results.

Water and sanitation: The country's policy in recent years has been to improve the sector's institutional strength at various levels, including training for regulatory entities and service providers in rural and urban areas. The private sector participates increasingly through provision of financial and management advice, and also through direct provision of some services. The government intends to increase the use of public-private formats in the sector.

Telecommunications: CONATEL has a concrete and feasible plan in place, which gives priority, among other things, to digital conversion (which would allow more efficient use of the spectrum and expansion of broadband), the bidding process for 4G and radio spectrum licenses, and portability of cell phone numbers.

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Honduras

Giselle Del Carmen, Jordi Prat, and Jennifer Linares

1. INFRASTRUCTURE CHALLENGES

Honduras invested approximately US\$753.1 million (3.7 percent of GDP) in infrastructure in 2015 (Infralatam, 2017). In contrast to neighboring countries, most of Honduras' infrastructure investment has been undertaken by the private sector (69 percent of the total) and allocated to the energy (2.6 percent of GDP) and transportation (1.1 percent of GDP) sectors.

Honduras has relatively favorable infrastructure conditions, with areas for improvement described below. The country has a positive development gap in water and sanitation due to substantial access to improved drinking water (91 percent) and sanitation facilities (83 percent). The country also performs relatively well in energy, as electrification rates, energy use, consumption, and investments are higher than expected. Nevertheless, Honduras presents lower-than-expected levels of technological innovation and communications. This is partly driven by lower-than-expected internet and broadband subscriptions (20.4 and 2.4 per 100 inhabitants, respectively), although cellular subscriptions slightly compensate with higher-than-expected usage (95 per 100 inhabitants).

Transportation: Honduras presents weaknesses in transportation and logistics that compromise its competitiveness. In fact, according to the 2018 Logistics Performance Index, Honduras is among the worst performers in Latin America and the Caribbean (LAC). This is mainly due to infrastructure gaps and lack of service quality. It also has the lowest road density in Central America (0.30 km/km²), and only 24 percent of the road network's 15,000 kilometers are paved. This affects both international and domestic commerce, as most overland freight is transported by road. Moreover, at 0.07 US\$/km, Honduras has one of the highest road freight costs in the region. Despite its importance, public investment in road infrastructure has been limited, as have resources for road maintenance.

Moreover, public investment in infrastructure averages 1.2 percent of GDP, the third lowest in Latin America, compared to the regional average of 2.6 percent of GDP. Similarly, territorial coverage is not balanced, with significant inequalities across departments and limited connectivity in rural areas. This imbalance reflects the sector's institutional weaknesses, including issues related to planning, prioritization, execution and maintenance of investments and allocation of resources.

Energy: Honduras has one of the lowest electrification coverage rates in Latin America and some of the highest electricity costs. As of 2017, over a quarter of the rural population did not have access to electricity (28 percent), compared to 12 percent at the national level and less than 3 percent in LAC. Similarly, 55 percent of Honduran households (88 percent in rural areas) use firewood as their primary cooking fuel.²⁶ The inclusion of other energy sources, such as wind, solar, biomass, and hydropower, has helped improve the energy matrix, with renewable sources now representing over 60 percent of electricity generation in 2018²⁷ relative to 45 percent in 2013. Nonetheless, the country still relies on thermal generation (39 percent) and is thus greatly affected

²⁶ World Development Indicators. Data for 2016.

²⁷ Empresa Nacional de Energía Eléctrica (ENEE). (2018).



by changing oil prices. Despite recent reforms, the energy sector continues to experience inefficient transmission and distribution systems that result in significant losses and high electricity prices. The state-owned electricity company (ENEE), responsible for transmission and distribution, has decreased its fiscal deficit (from 1.8 percent of GDP in 2013 to 1.3 percent of GDP in November 2018) and total electricity losses (from 30 percent in 2013 to 27.3 percent in 2017),²⁸ though the latter remains the highest in Central America. These inefficiencies reduce the government's fiscal space for investment in other sectors, as ENEE requires substantial capital transfers to ensure a stable power supply.

Water and sanitation: Even though coverage of water supply and sanitation services has gradually increased, access remains highly unequal. As of 2017, approximately 90 percent of Honduran households had access to a water network and 82 percent to improved sanitation services, though there are important differences. While 95 of urban households had access, nearly a quarter of rural households did not. At the same time, 80 percent of the poorest quintile have access to basic sanitation and 25 percent to water services, compared to nearly universal access among the richest income quintile. Nonetheless, continuity of water service is limited (approximately 60 percent), only 45 percent of households are connected to a sewage network and only 65 percent have access to water sources when needed.²⁹ This negatively affects tourism, particularly in the Bay Islands.

Telecommunications: Honduras presents gaps in digital connectivity: according to the 2017 Information and ICT Development Index, Honduras has one of the lowest rankings in LAC (32 out of 35 countries) and ranked 129 out of 176 countries globally. Less than a third of Honduran households use the Internet relative to 57 percent in LAC and 43 percent in Central America and the Dominican Republic (CADR).³⁰ Similarly, the number of active mobile-broadband subscriptions is the lowest in CADR. Nonetheless, the telecommunications company Tigo initiated construction of one of the most modern data centers in Central America, which should strengthen the country's digital economy.

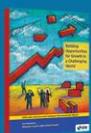
2. RECOMMENDATIONS TO OVERCOME CHALLENGES

Transportation: Investments to improve, expand, and conduct routine maintenance of the secondary road network should be a priority. This will guarantee a connection with agricultural production, trade, tourism and services with national and regional markets. In order to achieve greater effectiveness, institutional efficiency, and specialization of roles, Honduras needs to promote reforms that will define key institutional responsibilities for planning, construction, execution, operation, regulation, and road maintenance. Planning tools should also consider the adverse effects of climate change on roads. In addition, the sector needs to establish an efficient maintenance system to preserve past and future investments in road infrastructure. The sector would also benefit from training programs and/or certification with local universities to strengthen technical, administrative and operational capacities. The Ministry of Infrastructure and Public Services (INSEP) should also implement truck size and weight limits to ensure adequate highway infrastructure and road safety and to reduce maintenance costs.

²⁸ Technical losses are caused by inadequately designed installations, lack of maintenance or inadequate equipment, which respond to low investment and operation and maintenance failures. Non-technical losses are related to illegal connections, non-payment or billing errors.

²⁹ UNICEF/WHO (2017).

³⁰ World Development Indicators. Data for 2016.



Energy: To consolidate recent reforms in the energy sector, further institutional strengthening is necessary. Relevant reforms include: i) strengthening institutional capacity, regulatory frameworks and sectoral policies; ii) improving operational and financial sustainability; and iii) adopting energy policies aimed at guaranteeing electricity supply and further diversifying the energy matrix. Institutional development needs include technical assistance to strengthen capacities, the adoption of best practices and the professionalization of service in the sector. These reforms will be key to close current coverage gaps, improve quality, reduce ENEE's fiscal contingency and meet future electricity demands.

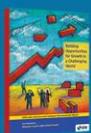
Interventions in the energy sector are essential to reduce operating costs and boost productivity in key industries. As high energy costs are a significant constraint on firm profitability, manufacturers have invested in biomass to generate their own electricity. Moreover, further investments in infrastructure could reduce distribution costs and technical losses.

Water and sanitation: At the institutional level, a series of weaknesses should be addressed regarding water and sanitation services. Since the approval of the Water Supply and Sanitation Framework Law (Ley Marco) in 2003, Honduras has made progress in decentralizing service provision to improve efficiency in the sector. Nonetheless, the process has been slow and uneven. As of 2018, Honduras has 75 urban providers, and SANAA, the National Water and Sewer Service, still operates four urban systems, including Tegucigalpa's. Most autonomous service providers have limited access to financing and often suffer from low managerial capacity at the municipal level. Even though the Framework Law established roles and responsibilities of key sector institutions, institutional weaknesses have prevented them from fulfilling their respective roles. In addition, the large severance payments needed to transfer services from SANAA to municipalities have delayed the process, especially in Tegucigalpa. To consolidate the reform, further institutional strengthening is necessary, particularly at the municipal level. Similarly, coverage and quality of water and sanitation services must improve to reduce inequalities in rural areas and across socioeconomic groups.

Telecommunications: Honduras must improve the integration of ICTs in different economic sectors to stimulate and boost the digital market. This can be complemented with private sector participation to promote the use of digital currencies in their businesses, which would help identify and promote the use of ICT in small and medium enterprises. Thus, it is necessary to expand coverage and connectivity in telecommunications infrastructure and develop incentives and mechanisms (including doing so through public-private partnerships) to expand broadband geographic coverage.

3. PUBLIC-PRIVATE PARTNERSHIPS FRAMEWORK: QUALITY AND IMPLEMENTATION

To address infrastructure gaps, Honduras has taken important steps toward putting in place an appropriate regulatory and institutional framework for public-private partnerships (PPPs). In 2010, Honduras approved the Law for the Promotion of PPPs that establishes the conditions under which PPPs can be developed in the country, empowering the Commission for the Promotion of the Public-Private Partnership (COALIANZA) to structure a broad range of projects through PPPs. An important characteristic of the Honduran "model" for PPPs is the structuring of projects and the development of pre-feasibility studies through agreements between COALIANZA and trusts managed by private banks. According to the government, these mechanisms have helped to provide greater certainty and transparency. To date, COALIANZA has developed and negotiated several projects involving PPPs. In 2014, the International Monetary Fund (IMF) suggested the



establishment of a solid institutional framework to allow the Ministry of Finance to safeguard public finances from excessive fiscal costs and PPP risks, including adequate quantification of contingent liabilities.

The framework has been effective in the 23 PPP projects have been implemented, valued at approximately US\$3.1 billion. These include two port terminals (Terminal de Contenedores y Carga and Terminal de Graneles Sólidos), four highways (Corredor Logístico, Corredor Turístico, Corredor Lenca and Siglo XXI) one public building (Centro Cívico) and 16 renewable energy projects. In addition, there are currently 15 projects in the preparation stage and 22 on a waiting list for which the Government of Honduras hopes to undertake the next generation of PPPs based on the lessons learned in the past decade.

In 2017, Honduras led the region with PPP investments representing 2 percent of GDP, followed by Nicaragua (1.5 percent), and Peru (1.6%). Infrascope (2018)³¹ classifies Honduras as a country with a “developed” PPP environment, with the highest score in CADR and the 7th highest in LAC. Nevertheless, the large number of projects approved to date and in processing involve greater demands for COALIANZA and the Ministry of Finance, which have limited capacity to evaluate and supervise PPP projects (Reyes-Tagle and Tejada, 2015). The country does not have a standardized approach to conduct value-for-money analysis to evaluate the suitability of PPP operations, which has resulted in questions about transparency in the bidding processes. To improve transparency and accountability and ultimately strengthen the PPP market, in 2018 the government launched an online platform that allows public access to detailed information related to these projects. Similarly, the government started an extensive review of all PPP projects in 2018.

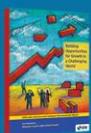
4. NATIONAL DEVELOPMENT PLANS ON INFRASTRUCTURE

The Government Plan (*Visión de País 2010-2038 y Plan de Nación 2010-2022*) identifies productive infrastructure as a strategic pillar to boost economic growth. The Plan identifies a series of interventions to make the country the most important interoceanic transport route for merchandise in Central America. By 2022, the country expects to have a renewed network of rural roads that will improve commercial opportunities for small agricultural producers and achieve investments in infrastructure of 7.5 percent of GDP. By 2034, Honduras aims to reach universal coverage in electricity in rural areas, a matrix with 80 percent renewable energy generation and universal access to adequate sanitation services.

In collaboration with the IDB, the Government has developed its National Logistics Plan. This long-term plan aims to improve the performance and development of the national logistics system. Based on extensive consultation with both public and private actors, the plan incorporates previous sector plans and government initiatives.³² It identifies a series of immediate action plans to be implemented within 5 years and improve several areas, most notably road infrastructure. The total investment required for these interventions is US\$796 million.

³¹ EIU (2017).

³² *Visión de País 2010-2038; Plan de Nación 2010-2022; Plan Estratégico de Gobierno 2014-2018; the National Competitiveness Strategy; and the Alliance for Prosperity Plan of the Northern Triangle.*



5. POLICIES AND INTERVENTIONS UNDER CONSIDERATION

Transportation: The government recently announced a series of changes in institutional and financial matters related to road maintenance to improve the current situation. An infrastructure fund was created to finance road maintenance and other infrastructure projects. The fund will obtain resources primarily from fuel taxes and vehicle registrations, as well as from local financing. With these resources, the government expects investment in infrastructure to total approximately U\$942 million for 2019-2021. Moreover, it will be administered by INVEST-H, the country's top management unit (planning, administration and implementation of development programs).

Energy: In 2018, the government and the private sector introduced measures to reform the country's electricity sector and solve ENEE's financial crisis. As a first step, electricity tariffs increased 20 percent in October and renewable energy contracts are currently being revised. In addition, the reform includes the division of ENEE into three business units: generation, transmission, and distribution.

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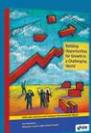
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Mexico

Ana Karen Díaz, Guillermo Lagarda and Jennifer Linares

1. INFRASTRUCTURE CHALLENGES

In 2016, Mexico invested approximately US\$22.875 billion (2.1% of GDP) in infrastructure (Infralatam, 2017). More than 80% of these investments were done by the public sector. The investments were concentrated in the energy (1.5% of GDP) and transport (0.5% of GDP) sectors.

In Mexico, the level of investment in infrastructure is low, representing half the average of Latin America and the OECD.³³ According to the development gap analysis proposed by Borenzstein et al. (2014), Mexico has the following gaps in the infrastructure sectors:

Water and sanitation: Mexico's water sector shows a positive gap in terms of service coverage in both urban and rural areas. International comparative data are scarce for service quality indicators, which is where Mexico faces the greatest challenges. In the case of sanitation, the gap is also generally positive, as a result of Mexico's performance in urban and rural access to sewerage. However, there are also negative gaps in this sector related to access by the rural and urban population to sanitation services.

In terms of coverage, in 2015 only 67% of the population received piped water on a daily basis, and 63% had access to piped water daily with drainage connected to the sanitary sewage network or a septic tank. Other problems include billing only 50% of the water produced,³⁴ which affects the efficiency of the water and sanitation service providers. There are also deficiencies in wastewater treatment (CONAGUA, 2017), and 29% of monitoring sites register water quality with some degree of organic pollution.³⁵

Energy: This sector has a negative gap because of losses in electricity distribution and transmission, and the quality of electricity as a productive input, resulting in higher business costs. About 34% of households in the country still use firewood as an energy source, mainly in the rural sector. Hydrocarbons account for 90% of primary source energy production - oil, condensates and liquefied gas - while the remaining 10% comes from nuclear energy and renewable sources.

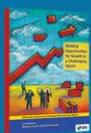
Transport: The biggest infrastructure challenge relates to roads and CO₂ emissions from the transport sector, 18% more than the average of countries with similar per capita income. Similarly, the quality of airports is slightly lower than in other economies.

Mexico's position in the area of transport infrastructure has been affected by an unfavorable perception of quality (of roads, railway, ports). In addition, airports have large areas of opportunity for improving quality, as well as important infrastructure deficiencies. Maritime policy

³³ According to the indicator *Total inland infrastructure investment*, percentage of GDP.

³⁴ According to an IDB analysis of microdata from the INEGI water collection, treatment and supply censuses from 1999 to 2014, water is not charged because of losses through leaks, or because of non-billing due to inadequate registers or billing systems, or because even when bills are issued users do not pay them.

³⁵ National inventory of municipal purification and wastewater treatment plants in operation (2016).



has been concentrated on foreign trade, favoring development of deep-water ports while neglecting maritime cabotage traffic which involves the internal market.

Telecommunications: This sector has a negative gap since Mexico's performance is lower than expected in mobile-phone-plan subscriptions per 1,000 inhabitants, also in availability of secure Internet servers. Despite this, the country has a favorable performance in broadband subscriptions per 100 inhabitants, as well as the percentage of population that uses the Internet.

At present, 92.1% of the population of Mexico has access to mobile broadband, leaving about 7.4 million inhabitants without access to this connection mode, mostly in the south-southeast of the republic, specifically in Oaxaca and Chiapas.

2. RECOMMENDATIONS TO OVERCOME CHALLENGES

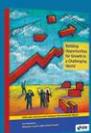
To combat these problems, it is necessary to act effectively on each of the contextualized areas:

Transportation: Revitalizing multimodal transport infrastructure, for both cargo and passenger transportation, is essential. Sustainable and intelligent investments are also required in maritime, air and land logistics transportation networks. Infrastructure that provides quality urban mobility requires close collaboration between federal and state governments in order to improve local capacities for financing, planning, implementation and evaluation of mobility and transport policies, thus guaranteeing implementation of Mexico's territorial, urban, regional and metropolitan development strategies.

Energy: Since energy resources are indispensable for Mexico's productive development, it is necessary to strengthen the institutions involved with energy efficiency, as well as promoting effective coordination of the three levels of government: federal, state and municipal. In addition, programs need to be implemented to promote use of renewable energy as a substitute for firewood, especially in rural areas. It is also necessary to develop a robust information system on end use in the main energy consuming sectors, to facilitate identification of areas of opportunity, as well as adoption of technologies and processes that promote optimal use of energy resources. In addition, Mexico is currently facing the great challenge of activating the use of renewable energy; consequently, policies need to be implemented to promote the use of this type of energy in the agricultural and residential sectors, through measures such as subsidies on electricity tariffs.

Water and sanitation: An intelligent water infrastructure needs to be developed which encourages the use of new measuring technologies - along with automatic reading and billing - including pressure regulating valves, monitoring, purification and effluent treatment.

Telecommunications: Finance is needed for the 7.9% of households without access to mobile broadband. Another suggestion is to design and implement a universal digital inclusion policy that will impact both households and the private sector - reaching at least 70% of households and 85% of micro-, small- and medium-sized enterprises - making the Internet available at an efficient speed. Likewise, a national fiber-optic system needs to be implemented to increase the capillary density of fiberlink coverage.



3. PUBLIC-PRIVATE PARTNERSHIPS FRAMEWORK: QUALITY AND IMPLEMENTATION

This report uses the *Infrascope* 2018 index to evaluate the framework and performance of Mexico's public-private partnerships (PPP), together with the World Bank Benchmarking Public Procurement indicator. According to the *Infrascope* 2018 index, Mexico ranks sixth in the 40 countries analyzed with a score of 68, higher than the Latin American average (58) and world average (56). This positions the country at developed level in terms of the strength of its environment for preparation and successful implementation of PPP programs and/or projects, behind countries such as Colombia, Chile, Peru, Brazil and Jamaica. Based on the five categories evaluated by the index (regulation, institutions, maturity, investment climate and financing), Mexico is a mature country in terms of availability and soundness of its regulatory framework, while - based on its score - it is a developed country in terms of its institutional framework, operational maturity, investment and business climate. However, the area where the country has most opportunities for improvement is provision of financing facilities for infrastructure projects being classified in this area as an emerging economy.

In the World Bank public procurement indicator,³⁶ Mexico ranks fourth worldwide (with 81 points), above the Latin American average (63) and world average (56): its best position is in project preparation, followed by - in order of importance - procurement and contract management, institutional framework and unsolicited proposals.

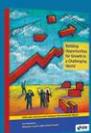
Mexico has 30 years' experience in developing investment projects in public infrastructure with private sector participation. Since the late 1980s and during all the 1990s, the country had its first experiences in the sectors of roads, energy, potable water and solid waste collection. During the period 1989-2012 more than 250 PPP projects can be identified, promoted by agencies and entities of the Federal Public Administration. Although they were contracted before the Federal PPP Law, based on their general characteristics they meet the conditions for classification, in a broad sense, under this contracting modality (Economist Intelligence Unit, 2017). The Federal Public-Private Partnerships Law (LAPP) was published in the Official Gazette of the Federation (DOF) on January 16, 2012 and its Regulations on November 5, 2012. Since publication, LAAP has had two reforms, focused mainly on streamlining the authorization and development processes of PPP projects. At subnational level, most Mexican states have legal frameworks with municipal scope, and have been aligned to the LAAP since its promulgation.

Currently the federal government has 23 PPP projects authorized under the 2012 LAAP, involving the communications and transportation, health, security, water and tourism sectors, with a total investment of MEX\$45,800, of which about 37% will go to the south-southeast region of the country. The 2019 expenditure budget does not include new infrastructure projects under the PPP scheme; however, according to the Ministry of Finance, the projects authorized by the Chamber of Deputies will continue to be developed before June 30, 2018.

4. NATIONAL DEVELOPMENT PLANS ON INFRASTRUCTURE

In view of the start of the new administration (December 1, 2018), there is not yet a development plan; however, since the election campaign, the new President Andrés Manuel

³⁶ Evaluates alignment of various economies with adoption of best practices in management of PPP projects. For more information, see <https://bpp.worldbank.org/en/BPP-data>.



López Obrador has mentioned the Mayan Train as the largest government infrastructure project. According to the economic package delivered to Congress on December 15, 2018, MEX\$6.000 billion will be allocated to start construction; however, this amount will not be enough to reach completion. Since the amount represents approximately 4% of the total investment of the project, the President has called on private initiative to participate in the works. Construction involves a 1,500 km circuit, of which 426 km will cross jungle areas; 446 km part of the Caribbean and 653 km areas near the Gulf of Mexico.

The second plan that the government has suggested in the infrastructure area is the Transoceanic Corridor. This project would connect the Atlantic and Pacific Oceans by means of ports and railways (about 300 km), and is expected to speed up trade with the United States, Canada, Asia and Europe. According to estimates suggested by the López Obrador government, with the support of the ports, merchandise will transit through the transoceanic corridor in less than 10 hours, compared with crossing through the Panama Canal which takes six more days. This project is expected to improve commercial conditions in the southeast of Mexico and Central America since international companies will have an option for improving their logistics and costs. According to the Economic Package 2019 proposal, a MEX\$900-million budget has been allocated for this project.

5. POLICIES AND INTERVENTIONS UNDER CONSIDERATION

In Mexico, a new government took office on December 1, 2018, so all the changes to be implemented from 2019 onwards in the various sectors are still in the planning stage. So far the Mayan Train and the Transoceanic Corridor are the only projects suggested for undertaking during the 2019-2024 six-year period in the transport sector.

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Nicaragua

André Martínez Fritscher, José David Solórzano and Jennifer Linares

1. INFRASTRUCTURE CHALLENGES

Nicaragua invested approximately US\$750.3 million (5.9 percent of GDP) in infrastructure in 2015.³⁷ Most of the infrastructure investment has been assumed by the public sector (60 percent of the total) and allocated to the telecommunications and transportation sectors at 2.4 percent and 2.1 percent of GDP, respectively.

This brief analyzes the country's overall infrastructure using the Development Gaps methodology, a metric for identifying the relative position of a country's sector indicator with respect to the expected value of that indicator based on its level of income. According to this methodology, Nicaragua has negative gaps in all four infrastructure sectors. The challenges are detailed as follows:

Transportation: Despite significant growth in public investment in transportation infrastructure, coverage is still low compared to the rest of Central American countries. Road density in Nicaragua is 184.3 km/1,000 km², less than half the regional average of 397.6 km/1,000 km². Moreover, only 13.3 percent of the national road network consists of paved roads. They are concentrated in the Pacific and central regions, as the Caribbean coast has been historically isolated. A gap analysis of the road network showed that Nicaragua requires investments of approximately US\$ 135 million yearly for the next 10 years, in addition to current investment in the sector, in order to meet growing demand for transportation services.

Energy: There have been advances in increasing electricity generation capacity and access to electricity, as well as in transforming the energy matrix. Nonetheless, energy prices are among the highest in Central America, due partially to high levels of energy losses, which in 2016 accounted for 23.0 percent of total generation, compared to the Central American average of 18.0 percent. Additionally, the country's share in the regional market is limited because of deficiencies in national transmission lines. In 2017, Nicaragua's share was 10.4 percent of the total energy traded in the Electric Interconnection System for Central American Countries (SIEPAC). There are also institutional challenges in the generation subsector due to lack of competitiveness in bidding procedures. Finally, there are concerns about the sector's financial sustainability because of high generation costs and high subsidies to consumers, which do not target the lowest-income households.

Water and sanitation: This sector faces challenges in both coverage and quality. At the national level, only 66 percent of the households have drinking water system access, with important differences between areas. While urban coverage reaches 91 percent, the comparable rural figure is only 30 percent. Furthermore, the quality of service remains problematic. For instance, in the capital, 37 percent of households have water service for less than 6 hours per day. Moreover, gaps in sanitation coverage are larger than in water access. In 2012, only 40 percent of urban houses were connected to the sewerage system, while the rest had individual systems with little maintenance.

³⁷ Infralatom (2017).



Telecommunications: The large digital divide is the main challenge of the sector. According to the Global Information Technology Report 2016, only 2.5 percent of the country's population has access to fixed broadband, and only 1.4 percent has access to mobile broadband. Additionally, the sector's legal framework is outdated, since the general law of telecommunications and postal services dates to 1995 and does not contain clauses for the promotion of infrastructure and broadband competition. In addition, fixed and mobile broadband services provision is limited to relatively few firms, thus leading to a concentrated market. These factors result in high prices for internet service.

2. RECOMMENDATIONS TO OVERCOME CHALLENGES

In general, infrastructure interventions in all four sectors will allow the country to close economic and social development gaps, with valuable effects on productivity, human capital and welfare. The Growth Diagnostics methodology employed in the Country Development Challenges of Nicaragua found that infrastructure represents an active constraint on economic growth, as gaps in this sector hinder current economic activities and limit the emergence of new activities. Promoting all types of productive infrastructure would reduce this restriction and contribute to economic development.

In the transport sector, several studies in Nicaragua show evidence on how interventions in the sector are related with benefits in other sectors. A general study of the impact of rural roads in Nicaragua indicates that improvements in those roads have a positive effect on well-being, including travel times reduction, new transport services development and better indicators of education and health.³⁸ Another analysis of IDB investments in rural roads in Nicaragua shows evidence of direct and indirect benefits, such as increases in agricultural production within the project's area of influence, tourism income, fishery production³⁹ and health and education services.⁴⁰

Water and Sanitation (W&S) is a sector with important relations to other sectors. For example, the positive relation between W&S and health is widely documented. According to UNDP (2006), inadequate W&S is the main cause of disease around the world, including the incidence of mosquito-borne diseases. This is particularly the case in children. Additionally, there is evidence of significant links with education. Improved W&S access in schools increases the attendance rate and children's learning abilities, which in turn results in better job opportunities, higher incomes and ultimately higher economic growth.⁴¹ Moreover, lack of access to W&S implies labor productivity losses as a consequence of worker absenteeism, as well as constraints to income generation due to time wasted in obtaining water.

Finally, energy and telecommunications support economic activities and improve wellbeing. There is evidence that rural electrification improves quality of life by augmenting study time and improving study environment for school children, extending hours for small businesses and increasing security.⁴² Regarding telecommunications, investment in this sector could contribute to the generation of new employment and increasing productivity. According to Katz (2009), in Latin American countries, including Nicaragua, addressing the broadband gap could have an important positive impact on job creation.⁴³

³⁸ COWI A/S (2008).

³⁹ PCR Acoyapa - CR border Road Integration Program (1796/SF-NI).

⁴⁰ World Bank (2008a).

⁴¹ Agénor (2013).

⁴² World Bank (2008b).

⁴³ Katz (2009).



3. PUBLIC-PRIVATE PARTNERSHIPS FRAMEWORK: QUALITY AND IMPLEMENTATION

The Public Private Partnership (PPP) law was approved in 2016 and regulates the joint participation of the public and private sectors in infrastructure. In 2017 the regulation of the law was approved. This legal framework establishes that the Ministry of Finance, through the Department of Public Investment, oversees the implementation of the law, while the Agency for the Promotion of Investments and Exports (PRONicaragua) is responsible for facilitating the coordination of institutions and alliances among the public and private sectors, civil society and academia. According to Infrascope, only three PPP projects have reached financial closure, with total PPP investment of US\$ 130 million.

Nicaragua scores above the Latin American and Caribbean average in the Infrascope index, which evaluates countries' capacity to implement sustainable and efficient PPP projects. The country's strengths include the dimensions of institutions, maturity and regulations. However, Nicaragua still faces challenges in investment and business climate and financing in order to ensure the implementation of PPP projects.

The Human Development National Program 2018-2021 includes as one of its pillars productive development, focusing on energy, technology, agriculture, industry, fishing, tourism and telecommunications, among other sectors. This plan contains general lines of action, but it does not provide details of the planned projects.

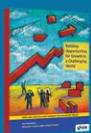
In 2016, PRONicaragua prepared a document titled "Policies and Development Projects" containing policies and a list of development projects to increase economic growth in the period 2017-2021 by improving productive and social infrastructure. The listed projects, mainly infrastructure, total US\$ 5.229 million and are mainly in agriculture and forestry, fishing, tourism, industry and energy. Many of these projects are expected to be implemented through PPP structures. However, the document contains neither additional details nor the expected economic and employment impact of those projects' execution.

4. NATIONAL DEVELOPMENT PLANS ON INFRASTRUCTURE

Transportation: In Nicaragua, the National Transport Plan 2013-2033 defines five major development policies: i) efficiency of the transport system at an international level, ii) reliability of the transport system at the national level, iii) improvement of mobility, iv) improvement of the sector's organization and v) resilience and environmental sustainability.

Energy: In the energy sector, the 2016-2030 plan for expanding electricity generation details the estimated investment needed to achieve an increase of 1.223 MW in generation capacity, in line with energy demand growth. The main source of the expansion would be renewable energy, and in 2030 such sources are expected to represent 73 percent that the proportion of generation from these sources will represent 73 percent of total energy production. The government additionally has a detailed investment plan for the expansion of transmission in the period 2016-2029.

Telecommunications: In the telecommunications sector, the principal guideline is the national broadband plan, which is focused on three lines of action: i) development of broadband infrastructure, ii) strengthening the regulatory framework and iii) promoting use of information and communications technology (ICT). This plan is mainly supported by the IDB and South Korea.



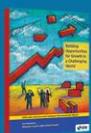
5. POLICIES AND INTERVENTIONS UNDER CONSIDERATION

Transportation: The 2018-2022 transport strategy called for interventions in: i) expansion of the rural and Caribbean road network, ii) improvement of transport services through the development of freight logistics, border crossings and ports, and, iii) development of multisector synergies through transport services interventions with higher impacts on access to health, education and safe water services. These interventions are currently being carried out.

Water and sanitation: The interventions in this sector are guided by the National Human Development Program 2018-2021, which includes as one of its pillars the universal and fair provision of drinking water and sanitation, but those guidelines are broad. The institutional plan of the Nicaraguan Company of Water Supply and Sewerage (ENACAL) focused on the improvement of water system, decreasing the sanitation deficit and reducing water losses and cost of production.

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Panama⁴⁴

Jhonatan Astudillo, Carlos Garcimartín and Jennifer Linares

1. INFRASTRUCTURE CHALLENGES

In 2015, Panama invested approximately US\$2.275 billion (4.5% of GDP) in infrastructure (Infralatam, 2017). More than 99% of these investments were in the hands of the public sector. The investments were concentrated in the transport sector (4.3% of GDP).

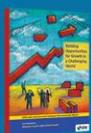
In transport in particular, Panama's results are above its income level, with positive gaps in all areas evaluated, especially connectivity and safety. In water and sanitation, and energy the country performs in line with expectations in almost all areas with the exception of sustainability. In this area, the gaps are related to the low percentage of treated water (13.3%) and low use of renewable energy (3.7%, excluding hydropower). Lastly, there are important gaps in the telecommunications sector, mainly in the areas of digital adoption and infrastructure quality, reflected in the limited use of digital banking services (12.3%) and low coverage of 4G high-speed mobile-phone services (0.1%).

2. RECOMMENDATIONS TO OVERCOME CHALLENGES

Transportation: Value added logistics services need to be developed to complement the Panama Canal: i) incorporate technologies for cargo follow up and tracking to improve customs processes; ii) promote private sector participation in infrastructure financing and iii) improve internal connectivity, prioritizing productive criteria. Development of services complementary to the Canal could have an impact on raising productivity and reducing territorial inequalities. With respect to urban transport, the role of PIMUS must be strengthened as planning hub, aiming at integrating the physical, tariff and operational efficiency of public transport. This would cut travel time in urban areas and have a positive effect on productivity.

Energy: To increase capacity and diversify electricity generation, as well as stimulate competition in the wholesale market, the recommendation is to update the regulatory framework to create incentives for renewable generation, promote use of natural gas and strengthen regional electricity integration through the Regional Electricity Market and the possible interconnection with Colombia. In terms of expanding electricity coverage in rural areas, the recommendation is to redesign the subsidies considering the specific conditions of the population and the area of operation. Under the existing regime, subsidies are focused on expanding the national integrated grid rather than on community or individual projects in isolated networks. An additional recommendation is that the Office of Rural Electrification (OER) should work toward direct execution of projects with market agents interested in directly developing rural electrification projects, after reviewing the costs and scope of the OER and the concession holders of the areas where the projects are to be carried out.

⁴⁴ This document describes the challenges that the country faces in infrastructure development in four specific sectors: i) energy, ii) telecommunications, iii) transportation and iv) water and sanitation. Identification of the challenges is based on the development gap methodology of Borensztein et al. (2014).



Water and sanitation: In conjunction with the strengthening and implementation of the National Water Security Plan, it is necessary to reinforce the institutional framework of the sector and explore alternatives for private participation, either in PPP schemes or others that increase water security and incorporate new technologies, given the operational and financial deficiencies of the Institute of Waterworks and Sewerage Systems (IDAAN).⁴⁵ These actions need to be accompanied by an improvement in operational and commercial management capacity, with implementation of demand management plans.⁴⁶

Telecommunications:

The municipal digital government plan needs to be strengthened, along with the digital government initiatives included in the Panama 4.0 Agenda to ensure incorporation of all state entities. In addition, the operational capacity of the National Government Innovation Authority (AIG) needs to be strengthened. In the area of cybersecurity, the dynamic nature of cyber risks and the extreme sensitivity of key economic sectors to them (such as the financial sector and the Panama Canal) require a strengthening of the technical and operational capacity of the National Computer Security Incident Response Center (CSIRT) and updating of the regulatory framework in the areas of cybercrime, data protection and regulation of critical cybersecurity infrastructure. It is also advisable to set up cybersecurity monitoring centers and national platforms to share information on cyber incidents.

3. PUBLIC-PRIVATE PARTNERSHIPS FRAMEWORK: QUALITY AND IMPLEMENTATION

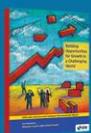
Panama does not yet have a specific legal framework for promotion of PPPs. It uses its public procurement framework to introduce private capital into infrastructure projects and sectorial frameworks to complete the legal arrangements of the water and sanitation sector and the electricity and transport sectors. The government is working on a new bill to give greater impetus to private investment in infrastructure projects. According to the key existing indicators for measuring the facilitating environment for PPPs, Panama is ranked 16 in the IDB *Infrascope* 2018 and 15 in the World Bank Benchmark Procurement PPP 2018, both out of 19 LAC countries. The main gaps are in the areas of PPP preparation, institutions and regulations, which highlights the importance of institutional strengthening for PPP in the country.

4. NATIONAL DEVELOPMENT PLANS ON INFRASTRUCTURE

Infrastructure and its components are included in the Government Strategic Plan 2015-2019 (PEG) as one of the priority areas for development. Although the Plan considers the need for making institutional changes, it focuses on infrastructure development with a US\$6.700-billion investment plan, which has had intermediate levels of execution and no cost-benefit estimates or consultation plans. It was also assumed that the plan would be executed under the existing institutional structure, which is characterized by inefficiency and the absence of an entity to

⁴⁵ In addition to the low levels of effective micro measurement (48%) and failure to update tariffs, the IDAAN has an unaccounted-for water index around 40% and a low level of billing collection (85%), all of which results in deficit financial results.

⁴⁶ For example, plans to reduce losses, update tariffs and improve macro and micro measurement.



coordinate, supervise and evaluate the strategic plans of the sector. Although there is no integrated infrastructure plan, the country has sectorial plans and strategies.

Transportation: This sector has two main plans: the National Logistics Strategy 2030 and the Integrated Plan for Sustainable Urban Mobility (PIMUS) 2015. The former focuses on converting Panama into a logistics hub, promoting value added services and the logistical integration of the country. The plan has four strategic pillars: strengthening the central hub of the inter-oceanic area, integrating national logistics, improving foreign trade logistics and building a consensus on institutions. The PIMUS aims to establish a transport and mobility policy for the city, focused on institutional restructuring, integration of urban transport and effective management of territorial policy.

Energy: There are three main complementary plans in the energy sector: the Indicative Generation Plan 2017-2031, focused on monitoring the evolution of electricity generation and recommending investments to meet demand; the Transmission Expansion Plan 2017-2031, which identifies the investments needed in transmission; and the Rural Electrification Program, focused on expanding access to electricity in rural areas. Policy actions in the sector have concentrated on supporting the Rural Electrification Program, and building up the capacities of the OER, the executing agency.

Water and sanitation: The main projects include execution of the Basic Health Plan 100/0 2014, which will expand sanitation coverage in rural areas, and the National Water Security Plan 2015-2050, aimed at linking and coordinating the actors in the water sector.

Telecommunications: The main plans in the sector are the Strategic Broadband Plan 2013, whose objective is to increase adoption and use of information technologies and the universality of the high-speed Internet service; and the Panama Digital Agenda 4.0 2014-2019, designed to strengthen the institutional and technical capacity of the AIG, responsible for modernizing public management.

5. POLICIES AND INTERVENTIONS UNDER CONSIDERATION

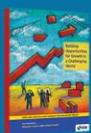
In addition to the abovementioned plans and strategies, the following interventions are particularly important:

Transportation: The Panama Canal Authority is developing a complementary business plan to add value to the Canal route, which includes concession for construction of container, transshipment, and liquefied natural gas terminals, along with use of surrounding areas to set up distribution and merchandise processing centers.

Water and sanitation: The government approved, with support and financing from the IDB, a US\$250-million project to improve the operational and commercial management of the IDAAN. This project, whose eligibility is still being analyzed, covers financing for infrastructure, as well as execution of a reengineering plan for processes and preparation of waterworks master plans by an international water management company over five years.

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