



Mid term Review of the implementation of the Vienna Programme of Action for the Landlocked Developing Countries for the Decade 2014-2024 in Latin America and the Caribbean

UN-OHRLS and UN-ECLAC

Background report for the Latin America regional review meeting on the implementation of the Vienna Programme of Action for the Landlocked Developing Countries for the Decade 2014-2024.

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Acronyms

ALADI	Latin American Integration Association
ANH	National Hydrocarbon Agency
ANNP	National Navigation and Ports Administration
ATIT	Agreement on International Road Transport
BRI	Belt and Road Initiative
CAN	Andean Community of Nations
CEBAF	Binational Border Service Centers
DGMM	Directorate General of the Merchant Marine
DINAC	National Directorate for Civil Aeronautics
DINATRAN	National Transport Directorate
ECLAC	Economic Commission for Latin America and the Caribbean
ECI	Economic Complexity Index
FDI	Foreign Direct Investment
GDI	Gross Domestic Income
IADB	Inter-American Development Bank
ICA	Integrated Control Areas
ICM/CTD	International Cargo Manifest / Customs Transit Declaration
ICT	Information and Communication Technology
INE	National Statistics Institute
ITA	Information Technology Agreement
ITU	International Telecommunications Union
KOICA	Korean International Cooperation Agency
LLDC	Landlocked Developing Countries
LPI	Logistics Performance Index
MERCOSUR	Common Market of the South
MOPC	Ministry of Public Works and Communication (Paraguay)
MOPSV	Ministry of Public Works, Services and Housing (Bolivia)
NDP	National Development Plan
OAS	Organization of American States
OHRLLS	Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and the Small Island Developing States
PDES	Economic and Social Plan of Paraguay
PMT	Transport Master Plan
PPW	Paraguay-Paraná Waterway
SDG	Sustainable Development
SINTIA	International Customs Transit Computerized System
SME	Small and Medium Enterprise
STI	Science, Technology and Innovation
TFA	Trade Facilitation Agreement
VPoA	Vienna Programme of Action
VUCE	Single Window for Foreign Trade
WCO	World Customs Organization
WTO	World Trade Organization

Executive Summary

This report was prepared by the Office for the High Representative for Least Developed Countries, Landlocked Developing Countries and the Small Island Developing States (UN-OHRLS) and the Economic Commission for Latin America and the Caribbean (ECLAC) in preparation for the midterm review meeting of the Vienna Programme of Action (VPoA) for Landlocked Developing Countries for the Decade 2014-2024 in the Latin American and Caribbean region.

The report is structured as follows: the first section assesses the alignment between the objectives and priorities set forward in the 2030 Agenda for Sustainable Development, the VPoA, and the National Development Plans of the Plurinational States of Bolivia and Paraguay; the second section analyzes connectivity and transport infrastructure in landlocked developing countries in Latin America; the third section reviews and analyzes the status of implementation of the VPoA in these countries; and the fourth and final section outlines conclusions and formulates recommendations to accelerate the implementation of the VPoA in the Latin American region.

The implementation of the Vienna Programme of Action in landlocked developing countries in Latin America has built on the progress achieved during its predecessor, the Almaty Programme of Action (APoA), particularly as it pertains to the awareness generated surrounding important development issues, and the importance placed on the coordination of assistance within the United Nations System and with the international community. During the period under review (2014-2018), the Plurinational States of Bolivia and Paraguay have aligned their social and economic development plans with the priorities defined in the VPoA and the 2030 Agenda for Sustainable Development.

Bolivia and Paraguay have made important strides to improve connectivity. As central elements of their respective National Development Plans, both countries have invested heavily in transport and services infrastructure according to one of the VPoA's main objectives, reducing travel times and associated costs. To leverage these gains, guaranteeing domestic connectivity through national transport networks and assure its function in all seasons especially those located in rural areas, remains an area for further improvement. This would help decrease logistics costs and increase the competitiveness of exports, facilitating the fully achievement of the SDGs associated to the coverage and quality of infrastructure networks in both countries.

Improvements in inland water transport infrastructure along the Paraguay-Paraná Waterway have also taken place, leading to a rise in the number of ports and the size of the available merchant fleet. Despite this progress, certain challenges persist along shared international watercourses, most notably because of natural restrictions on navigation, regulations, and coordination between landlocked developing countries (LLDCs) and transit countries.

In the sphere of rail transport, projects and agreements with great potential to strengthen the sector are currently under discussion. The Bi-Oceanic Railway Corridor is among the most critically important projects for Paraguay and Bolivia, since it would enable the connection between the mainland, ports on the Atlantic and Pacific coasts and destinations overseas. Plans to reactivate the railway system in Paraguay are also under way, with private sector initiatives being proposed to rehabilitate and operate certain segments of the rail network. In Bolivia, the connection between the Western and Eastern rail networks is being examined, as is the important rehabilitation of the C-15 Segment connecting Argentina's

Belgrano Cargo Railway and Bolivia's Eastern Rail Network, with the aim of reducing the distance and travel time of Bolivian cargo to maritime transshipment ports.

In light of the current and projected expansion in the demand for air travel in years to come, the strengthening of air transport has also been a focus of efforts in both countries. Necessary investments are being identified and earmarked to the construction of new airports and the expansion or enhancement of existing structures that enable the transport of passengers and cargo.

To further reduction logistics costs and the negative externalities of the transport services, infrastructure aimed at supporting intermodality is also needed. Supporting economic infrastructure, mainly transport, energy and telecommunications is required not only along major freight corridors but also in the rural areas where important part of the current production is in place. Improvement in customs facilitation and processes with transit countries that ensures streamlined coordination and leverages the advantages of each mode of transport would also help reduce operation costs, social and environmental negative externalities.

Another area to be strengthened is the development of complementary financing mechanisms to those traditionally used for infrastructure, especially given the current economic cycle that limits available fiscal resources in numerous countries. Technical assistance to reinforce the regulatory framework for public-private partnerships and to leverage innovative financing mechanisms such as climate change funds or other international funds could help Paraguay and Bolivia fully take advantage of their potential.

Regarding the implementation of specific VPoA priorities, Bolivia and Paraguay have made significant progress between 2014 and 2018. Under Priority 1: Fundamental Transit Policy Issues, both countries have ratified the World Trade Organization's (WTO) Trade Facilitation Agreement (TFA). To fully implement its provisions and benefit from its measures, both countries require additional technical assistance and capacity building. The results of the efforts carried out by Bolivia and Paraguay can be observed through global reference indicators such as the Doing Business Report's Logistics Performance Index and Cross-Border Trade Index. To strengthen their positions on such indices, Bolivia and Paraguay will need to continue improving connectivity and processes with transit countries.

Under Priority 2b: Development and Maintenance of Energy and Information and Communications Technology Infrastructure (ICT), both Paraguay and Bolivia have made significant progress in broadening domestic access to electric power, increasing power generation, territorial distribution and population concentration. On the other hand, Bolivia and Paraguay lag behind in the development and use of ICTs, with large disparities between urban and rural access, despite recent investments made in fiber optic technology, the expansion of broadband and the use of internet services and intelligent communication equipment. In both countries, much like most of Latin America and the Caribbean, e-commerce finds itself in initial stages of development, with the high cost of access to digital infrastructure and the absence of competitive international services playing a part in slower uptake.

Under Priority 3: International Trade and Trade Facilitation, Bolivia and Paraguay have made important efforts to add value to their exports, even though exports continue to largely be characterized by a concentration in a narrow number of low value-added products issued from the primary sector, and a limited participation of manufactured products. Even though the relationship with transit countries has improved in recent years, as illustrated in the signing of several bilateral and multilateral agreements, important barriers persist in the fluid transit of goods through transit countries, which is marked by high export times, costs and uncertainty surrounding the total processing time of transit operations.

Under Priority 4: Regional Integration and Cooperation, progress has been achieved on dimensions such as trade, investment and labor regulations in spite of the political transitions experienced throughout the region. These elements have been promoted in the context of the regional agreements in which Bolivia and Paraguay actively participate, including the Latin American Integration Association (ALADI), the Andean Community of Nations (CAN) and the Southern Common Market (MERCOSUR). Trade agreements among countries of the region have also helped propel exports, generating an increase in interregional trade in accordance with the ebbs and flows of global economic cycles and trade fluctuations.

Under Priority 5: Structural Economic Transformation, the period between 2014 and 2018 gave way to positive economic performance for the economies of Bolivia and Paraguay, which fared better than the average of other Latin American countries. Despite this performance, both countries' productive structures continue to rely on raw materials and manufactures based on natural resources with low added-value. It is necessary that both countries undergo structural economic transformation that moves them towards being digital and knowledge-based economies so that Bolivia and Paraguay experience economic growth that is uncoupled from negative externalities, leading to better social conditions and quality of life for their populations.

Under Priority 6: Means of Implementation, Bolivia and Paraguay maintained economic and service infrastructure investment levels above regional averages despite decreases in the world demand and prices of raw materials. Creating the conditions to maintain and expand those levels of investment is essential to achieving the objectives outlined in Bolivia and Paraguay's respective National Development Plans (NDP), the priorities set forth in the VPoA, and the commitments made in the context of the 2030 Agenda for Sustainable Development. Financial and technical support from the international community by means of concessional loans and donations, technical assistance to prepare bankable projects, and foreign direct investment contracts, are key to achieving these priorities.

It is also important to note that the reality of climate change has already begun affecting infrastructure and the quality of transport systems in the region, in particular in landlocked developing countries. The severity of potential damages will largely depend on the vulnerability and resiliency of each country, and the measures taken in the short term to address these challenges. Increasing investment in resilient, efficient, and sustainable infrastructure is fundamental to long term development.

In summary, Bolivia and Paraguay have made significant strides to advance VPoA priorities during the 2014 – 2018 period. Their achievements, which will be outlined in greater detail in chapters to come, would further be accelerated should important issues, such as greater adaptation and the facilitation of goods in transit through transit countries, be addressed and solved. Such matters would not only improve the situation of landlocked countries but would also benefit transit countries by increasing their domestic flows and overcoming current regulatory and logistical failures that drive up prices and lower their international competitiveness. Finally, sustained financial support and technical assistance provided by the international community will continue to play a vital role in improving institutional capacity in the areas of logistics and institutional development, and in leveraging investments to achieve greater productive transformation in Bolivia and Paraguay to improve the quality of life of their inhabitants.

1. Guiding frameworks and principles to achieve sustainable development in landlocked countries

The 2030 Agenda for Sustainable Development and the Sustainable Development Goals provide a global framework for countries worldwide to achieve sustainable development, all the while addressing some of the specific challenges faced by landlocked developing countries. The United Nations System coordinates actions to support the development of landlocked developing countries through the Vienna Programme of Action 2014-2024 (VPoA) whose full and effective implementation is critical to achieve the Sustainable Development Goals (SDGs). This chapter briefly outlines the programmes of action that aim to support landlocked developing countries and assesses their alignment with the priorities set forth in Bolivia and Paraguay's respective National Development Plans.

The 2030 Agenda for Sustainable Development

The 2030 Agenda for Sustainable Development was adopted by the United Nations General Assembly Resolution A/RES/70/1 of 25/09/2015 "Transforming our world: The 2030 Agenda for Sustainable Development." This agenda is the successor to the Millennium Development Goals (MDGs) and seeks to establish a transformative vision towards the economic, social and environmental sustainability of the 193 signatory Member States. The Agenda outlines a collection of 17 Sustainable Development Goals (SDGs) and 169 specific targets to be reached by 2030. The 17 goals include the following:

Goal 1. End extreme poverty in all forms by 2030.

Goal 2. End hunger achieve food security and improved nutrition and promote sustainable agriculture.

Goal 3. Ensure healthy lives and promote well-being for all at all ages.

Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Goal 5. Achieve gender equality and empower all women and girls

Goal 6. Ensure availability and sustainable management of water and sanitation for all.

Goal 7. Ensure Access to affordable, reliable, sustainable and modern energy for all.

Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

Goal 10. Reduce inequality within and among countries.

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable.

Goal 12. Ensure sustainable consumption and production patterns.

Goal 13. Take urgent action to combat climate change and its impacts.

Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.

All of the goals contained in the 2030 Agenda are relevant to landlocked developing countries, yet it is important to underscore that the international community made specific reference to these countries under a number of SDGs [Pérez-Salas, Nunes (2016) and UN-OHRLLS (2016)], such as Goals 7, 9, 10, and 17 which contain specific references to landlocked developing countries and aim to address the issues of: ensuring access to affordable, reliable, sustainable and modern energy for all; building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation; reducing inequality within and among countries; and strengthening the means of implementation and revitalizing the global partnership for sustainable development. Thus, the timely and effective implementation of the Vienna Program of Action can greatly contribute to the implementation of the sustainable development agenda.

The Vienna Programme of Action (VPoA)

To address the challenges faced by landlocked developing countries, the United Nations General Assembly approved the Resolution A/RES/69/137 “Vienna Programme of Action (VPoA) for Landlocked Developing Countries for the Decade 2014-2024,” in 2014, which is also known as the Vienna Programme of Action (VPoA) for the Decade 2014-2024. The VPoA presents a renewed vision of the Almaty Programme of Action (APoA) in force between 2004 and 2014 which aimed to address in a coherent way the specific challenges faced by landlocked developing countries as a result of their lack of territorial access to the sea and their remoteness and isolation from world markets, thus contributing to accelerating sustainable and inclusive growth to put an end to extreme poverty.

The VPoA emphasizes the importance of 1) renewed and strengthened partnerships between landlocked developing countries, transit countries and their development partners; 2) strengthened partnerships within the context of South-South and triangular cooperation; and 3) strengthened partnerships with the relevant international and regional organizations, and between public and private sector actors. To this end, the VPoA aims to bolster the capacity of landlocked developing countries to design and implement policies and provide tangible solutions to promote transport connectivity to achieve the SDGs, placing special attention on developing and expanding efficient transportation systems, developing transport infrastructure, improving competitiveness, expanding trade, promoting structural transformation, and encouraging regional cooperation for inclusive economic growth and sustainable development.

The specific goals and objectives of the VPoA are:

- a. To promote unfettered, efficient and cost-effective access to and from the sea by all modes of transport, on the basis of freedom of transit, and other related measures, in accordance with applicable rules of international law;

- b. To reduce trade transaction costs and transport costs and improve international trade services through simplification and standardization of rules and regulations, so as to increase the competitiveness of exports of landlocked developing countries and reduce the costs of imports, thereby contributing to the promotion of rapid and inclusive economic development;
- c. To develop adequate transit transport infrastructure networks and complete missing links connecting landlocked developing countries;
- d. To effectively implement bilateral, regional and international legal instruments and strengthen regional integration;
- e. To promote growth and increased participation in global trade, through structural economic transformation related to enhanced productive capacity development, value addition, diversification and reduction of dependency on commodities;
- f. To enhance and strengthen international support for landlocked developing countries to address the needs and challenges arising from landlockedness in order to eradicate poverty and promote sustainable development.

To achieve these specific goals and objectives, priority action areas are defined as follows: Fundamental transit policy issues; Development and maintenance of transport, energy and information and communications technology infrastructure; International trade and trade facilitation; Regional integration and cooperation; Structural economic transformation; and Means of implementation. The VPoA invites Member States in particular the LLDCs and transit countries to mainstream the VPoA into their national and sectoral development strategies. Mainstreaming of the VPoA and the 2030 Agenda into national and sectoral development strategies is important as it will allow incorporation into budgetary allocations and effective implementation.

National Development Plans and their Alignment with the 2030 Agenda and the VPoA

Bolivia and Paraguay support the 2030 Agenda for Sustainable Development and the VPoA for Landlocked Developing Countries. Each country's National Development Plan (NDP) serves as a tool to guide the medium- and long-term policies of the State to achieve sustainable development and are largely aligned with the objectives, priorities and commitments both countries have made with the international community through the United Nations. The alignment between the NDPs and the 2030 Agenda has been reviewed by the Regional Observatory on Planning for Development at the Economic Commission for Latin America and the Caribbean (ECLAC)¹ and can be summarized as follows.

¹ The Regional Observatory on Planning for Development was created by ECLAC in an effort to support the countries of Latin America and the Caribbean to strengthen planning and public management processes and help link the 2030 Agenda for Sustainable Development with national and subnational priorities and realities. It was created by virtue of the Resolution 700 approved in May 2016 during the 36th Session of ECLAC. Available at: <https://observatorioplanificacion.cepal.org/en>

Table 1: Convergence between the 2030 Agenda and the Development Plans of Bolivia and Paraguay

AGENDA 2030	BOLIVIA Agenda Patriótica 2025 and PDES 2016-2020	PARAGUAY NDP Paraguay 2030
1. No poverty	3	20
2. Zero hunger	6	9
3. Good health and well-being	3	14
4. Quality education	4	15
5. Gender equality	3	7
6. Clean water and sanitation	2	4
7. Affordable and clean energy	2	9
8. Decent work and economic growth	8	14
9. Industry, innovation and infrastructure	7	12
10. Reduce inequalities	5	13
11. Sustainable cities and communities	5	14
12. Responsible consumption and production	1	8
13. Climate action	1	2
14. Life below water	0	1
15. Life on land	4	5
16. Peace, justice and strong institutions	6	14
17. Partnerships for the goals	3	10

Source: Regional Observatory on Planning for Development, ECLAC, 2019

Note: The values in the table above correspond to the number of objectives contained in each country's Development Plan that converges with the SDG of the 2030 Agenda.

The National Development Plan of the Plurinational State of Bolivia

Bolivia participates in the Forum of the Countries of Latin America and the Caribbean on Sustainable Development but has not yet presented its Voluntary National Review Report on the Implementation of the 2030 Agenda for Sustainable Development. Bolivia has two guiding planning instruments: the Bolivia Patriotic Agenda 2025 (*la Agenda Patriótica Bolivia 2025*)² and the Economic and Social Development Plan 2016-2020 (*Plan de Desarrollo Económico y Social 2016-2020, or PDES 2016-2020*)³ approved by Law No. 786 of March 9, 2016.

Making reference to the upcoming 200th anniversary of the founding of the Plurinational State of Bolivia to be celebrated in 2025, the Patriotic Agenda 2025 was launched by the presidency in January 2013. It sets forward 13 pillars with the aim of building a Dignified and Sovereign Bolivia and establishing a more inclusive, participative and democratic society and State. Each pillar is composed of several dimensions that amount to a total of 68 objectives forming the backbone of the Economic and Social Development

² http://vpc.planificacion.gob.bo/uploads/recursos/AGENDA_PATRIOTICA2025_QUIEN_HACE_QUE.pdf

³ <http://vpc.planificacion.gob.bo/pdes/>

Plan (*PDGES* hereinafter) and medium-term plans to contribute to the achievement of the PDGES. The pillars of the Patriotic Agenda 2025 are the following:

1. Eradication of extreme poverty
2. Socialization and universalization of basic social services with sovereignty for Living Well
3. Health, education and sport to train the whole human being
4. Scientific and technological sovereignty with our own identity
5. Community financial sovereignty without subservience to financial capitalism
6. Productive sovereignty with diversification and comprehensive development without the dictatorship of the capitalist market
7. Sovereignty over natural resources through nationalization and marketing in harmony and balance with Mother Earth
8. Food sovereignty by building nutritional knowledge for Living Well
9. Environmental sovereignty with comprehensive development; respecting the rights of Mother Earth
10. Complementary integration of peoples with sovereignty
11. Sovereignty and transparency in managing public affairs according to the principles “Don’t steal, don’t lie, and don’t be lazy.”
12. Full Enjoyment of Our Holidays, Our Music, Our Rivers, Our Forests, Our Mountains, Our Snow-capped Peaks, Our Clean Air, Our Dreams
13. Sovereignty Reunion with Our Joy, Our Happiness, Our Prosperity and Our Ocean.

The Economic and Social Development Plan, which falls under the scope of the framework for Integral Development for Living Well 2016-2020, is a strategic plan based on the essential pillars of the Patriotic Agenda 2025 and the 2015-2020 Government Programme, both of which are aligned with the 2030 Agenda and the VPoA.

[Bolivia: Transport legal and regulatory frameworks, and transport system policies](#)

To achieve growth and sustainable development, the Economic and Social Plan 2016 – 2020 (PDES) and the Patriotic Agenda 2025 define the transport sector as being of high priority. The PDES aims to make progress towards improved integration and the creation of appropriate conditions to promote productive development, territorial management and population flows between regions by 2020.

Transport governance is led by the Ministry of Public Works, Services and Housing (MOPSV), the public institution in charge of proposing policies, plans and programs to establish and strengthen the country’s internal linkages and external integration. The Vice Ministry of Transport and the Bolivian Highway Administration (ABC) fall under its jurisdiction and are the bodies in charge of executing transport policy in Bolivia.

The Vice Ministry of Transport, through the General Directorate of Land, Fluvial and Lacustrine Transport, is the regulator of land transport and is responsible for the registration and authorization of interdepartmental or international passenger and freight transport operators. The Vice Ministry of Transport is also the entity responsible for carrying out negotiations related to the International Land

Transport Agreement. The technical inspections of vehicles and the issuance of driver's licenses fall under the responsibility of the Traffic Operation Unit.

The planning of air transport infrastructure and air traffic control fall under the responsibility of the Administration of Airports and Air Navigation Auxiliary Services (AASANA), a decentralized public institution under MOPSV which is responsible for the administration of the majority of the country's airports, to the exception of the international airports located in the cities of Cochabamba, Santa Cruz and La Paz, which are managed by the company Servicio de Aeropuertos Bolivianos SA (SABSA) Nacionalizada. Aviation authority is exercised by the General Directorate of Civil Aviation, which falls under the control of the MOPSV through the Vice Ministry of Transport and the General Directorate of Air Transport. Being the highest operational technical authority, it has the power to manage, regulate, supervise, inspect and control air activities.

Maritime, fluvial and lacustrine matters fall under the portfolio of the General Directorate of Maritime, Fluvial, Lacustrine and Merchant Navy Issues which falls under the oversight of the Vice Ministry of Defense, which ultimately has the responsibility of directing, coordinating and executing water transport related activities in coordination with the General Directorate of Land, Fluvial and Lacustrine Transport under the Vice Ministry of Transport.

The Administration for Port Services (ASP-B) was created in 1996 to replace the Autonomous Administration of Bonded Warehouses (AADAA). It has the responsibility of implementing national policies for trade and development and carries out its activities in numerous ports, supervising and supporting trade activity and transit facilitation, as well as monitoring the application of trade agreement guidelines. The ASP-B oversees reception, verification, storage, monitoring and certification services for imported and exported freight.

The Ministry of Hydrocarbons heads the pipeline transport sector⁴. The Vice Ministry of Hydrocarbon Industrialization, Commercialization, Transport and Storage falls under its oversight and is responsible for defining the sector's priorities along with formulating, monitoring and evaluating hydrocarbon plans and/or policies. Through its Strategic Institutional Plan 2016-2020, it aims to guarantee the country's energy supply for basic services, among other things.

The powers of the MOPSV are defined in the Institutional Strategic Plan 2016 - 2020⁵, which is aligned with the guidelines and goals of the Patriotic Agenda 2025 and the PDES 2016 – 2020⁶. The MOPSV's main strategic objectives focus on transport policy and aim to develop multimodal transport systems and services that ensure internal and external linkages to provide holistic accessibility and contribute to socio-economic development.

Policies to improve the road network

Construction policy has focused on increasing and improving the quality of the road network and ensuring the maintenance and rehabilitation of highway stretches that form the core of the "Essential Road Network." An average of 95% of overall public investment in infrastructure has been spent on highways.

⁴ <https://www.hidrocarburos.gob.bo/index.php/transparencia/plan-estrat%C3%A9gico-institucional.html>

⁵ https://www.oopp.gob.bo/uploads/PEI_2016_-_2020_-_mopsv.pdf

⁶ The actions of the MOPSV are under Pilar 2, Objective 4, of the Patriotic Agenda 2025, which aims to ensure that 100% of Bolivians are integrated through road, inland water, air, and satellite communication systems.

The MOPSV Institutional Strategic Plan 2016-2020 sets out the goal of building 4,806 km of roads by 2020 with the following list of priorities:

- Dual-carriage ways
- Bi-oceanic Corridor
- North - South Corridor
- West - North Corridor
- Jaime Mendoza diagonal artery
- Connection between Departmental Capitals
- Integration of Productive Regions and the "Y" of Integration
- Bridges and points of access

The construction and rehabilitation of the Essential Road Network requires the participation of the Bolivian Highway Administration (ABC) and corresponding departmental and municipal government partners. Departmental and municipal governments must also invest in the maintenance and improvement of highways that fall within their jurisdictions.

Policies to improve the railway network:

The Bolivian State is also responsible for defining policies to help develop and modernize the railway sector as defined in the PDES 2016 - 2020 framework and the Agenda 2025, which specify the need to construct, maintain and replace existing infrastructure to provide strategic connection to different parts of the national territory. The MOPSV 2016-2020 Strategic Institutional Plan sets forward the following action areas:

- Carry out negotiations and participate in the concretion of the Bi-oceanic Railway Corridor which will connect the Pacific and Atlantic Oceans through 3,700km of railway networks that cross through Brazil, Bolivia, Peru and Paraguay.
- Construct the Motacucito - Mutún - Puerto Busch railway stretch to support strategic ventures, notably: the development of Bolivia's steel industry around the Mutún deposit; and the development of Puerto Busch to enhance inland water transport of Bolivian freight along the Paraguay - Paraná Waterway.
- Construct the Montero-Bulo Bulo railway stretch to establish connection with the Eastern Railway Network (*Red Oriental*) and establish a transport route to export urea and ammonia to the markets of Brazil, Argentina, and Santa Cruz.

Policies to improve air transport infrastructure

To spur economic and social development in intermediate cities and integrate remote regions of the country, the PDES 2016 - 2020 sets forward the priority of strengthening and promoting air transport as a mode of mass transportation. To achieve these objectives, the maintenance of existing airports and the construction of new national and international airports must be carried out. The MOPSV 2016-2020 Institutional Strategic Plan has set forward the following priorities:

- Construct, expand and equip six international airports: three have already been completed (Oruro, Alcantarí in Chuquisaca, and Chimoré in Cochabamba), and three airports are to be expanded and equipped (Santa Cruz, La Paz and Cochabamba).

- Construct, expand, and equip 12 national and tourist airports: build and equip five airports, expand and equip seven airports, and complete pre-investment study for one airport.
- Create an intercontinental hub at the Santa Cruz Viru-Viru airport.

Policies to improve inland water transport

The PDES 2016-2026 and the 2025 Agenda emphasize the importance of leveraging water resources to improve communication, and inland water navigation and transport. In line with PDES 2016-2020, the MOPSV Strategic Institutional Plan sets forth a plan to invest in inland water transport infrastructure to achieve the following by 2020:

- Carry out construction work to enable navigation along the Amazon and Plata basins, including waterways on the Ichilo-Mamoré and Beni rivers and the dredging of the Tamengo Canal.
- Build ports along the Amazon and Plata basins to expand and optimize loading and unloading processes to improve the competitiveness of inland water transport relative to other modes of transport. Three new ports would initially be built in the Amazon basin: Puerto Villarroel, Trinidad and Guayaramerín.
- Develop agreements to establish free trade zones in ports located on international waters, to benefit international ports, port areas, and freight terminals.
- Put into operation the freight terminal at Puerto Busch.

The government has also set the priority of constructing and putting into operation a multipurpose port at Puerto Busch with the support of private sector partnerships.

Policies to improve pipeline transport

As outlined in the PDES 2016-2020, by 2020 the Bolivian State set out to make important progress in consolidating and guaranteeing energetic sovereignty and security, as well as strengthening its role in regional energy integration and the industrialization of hydrocarbons.

To achieve these ambitions, the leadership of YPFB and YPFB Corporate Enterprise dependent companies will drive the sector and build the necessary capacity to transport hydrocarbon volumes that will be produced in the industrialization plants being planned and built in the country, which will require at least 746 kilometers of new oil pipelines.

The National Development Plan of Paraguay

In 2018 Paraguay presented its Voluntary National Review Report on the implementation of the 2030 Agenda for Sustainable Development⁷, which summarized progress on the commitments made by Paraguay to achieve the Sustainable Development Goals (SDGs). Through Decree 2794 of December 16, 2014, Paraguay approved a National Development Plan (NDP) entitled “Paraguay 2030”⁸ which specifically ties itself to the 2030 Agenda and creates an Interinstitutional Coordination Committee to implement and

⁷ https://sustainabledevelopment.un.org/content/documents/19877IVN_ODS_PY_2018_book_Final.pdf

⁸ <http://www.stp.gov.py/pnd/wp-content/uploads/2014/12/pnd2030.pdf>

monitor international commitments made within the framework of the SDGs. The correlation between the SDGs and the NDP is partly a result of having been conceptualized and drafted during the same period.

“Paraguay 2030” sets forward three strategic axes: 1) Poverty reduction and social development, 2) Inclusive economic development, and 3) Paraguay’s integration in the world. It also includes four cross-cutting themes: 1) Equal opportunity, 2) Efficient and transparent public management, 3) Territorial planning and development, and 4) Environmental sustainability. The intersection between the three strategic axes and four cross-cutting themes produce a set of 12 objectives, summarized in the table below.

Table 2: Strategic Framework of the National Development Plan “Paraguay 2030”

	Cross-cutting themes			
Strategic axes	Equal opportunity	Efficient and transparent public management	Territorial planning and development	Environmental Sustainability
Poverty reduction and social development	Equitable social development	Quality social services	Participative local development	Adequate and sustainable habitat
Inclusive economic development	Employment and social security	Competitiveness and innovation	Regionalization and productive diversification	Appreciation of environmental capital
Paraguay’s integration in the world	Equal opportunity in a globalized world	Attracting investments, foreign trade, and harnessing country’s image	Regional economic integration	Sustainability of global habitat

Source: National Development Plan “Paraguay 2030”

The objectives defined in the Strategic Framework are closely related to the objectives and priorities of the VPoA, emphasizing fundamental themes to achieve sustainable development such as infrastructure development, innovation and competitiveness.

Paraguay: Transport legal and regulatory frameworks, and transport system policies

The National Development Plan “Paraguay 2030” (PND 2030) also defines the transport sector as being of high priority to achieve proposed developmental goals. The vision set forward in the PND 2030 is one where Paraguay transforms itself in a competitive country that is among the most efficient global food producers, with thriving and innovative industries that employ a trained workforce to produce products and services that are at the forefront of technology to bolster a knowledge-driven economy that is open and connected to its neighbors and the world.

Connecting itself internally and externally means it is necessary for Paraguay to consolidate transport into an efficient multimodal network (inland waterway, air, land, rail) that contributes to reduce average logistics costs to internationally competitive levels. To do so would imply adopting a multimodal perspective of integrated logistics where the criteria of universality and accessibility is streamlined throughout three focus areas: 1) Transport infrastructure, 2) Transport services, and 3) Freight logistics.

Other plans are intimately linked to the PND 2030, notably the Transport Master Plan 2011-2031 (PMT), the updated version of the PMT, and the National Logistics Plan Paraguay 2013. The purpose of the Transport Master Plan 2011-2031 is to organize and instruct the development of transport and logistics services and infrastructure in the short, medium and long term. The updated Master Plan for Transport Infrastructure and Services of Paraguay was presented in November 2018. It provides an assessment of the status of transport, with a special focus on road and inland waterway transport and projects in their initial stages of execution.

In Paraguay, the Ministry of Public Works and Communication (MOPC) is the institution in charge of designing and implementing national development policies for transport infrastructure and services, alongside the Vice Ministry of Transport, which is the body in charge of implementing transport policies.

The specific road transport regulatory agency is the National Transport Directorate (DINATRAN). It is an autonomous entity in charge of authorizing and monitoring vehicle fleets, and responsible for negotiating international transport treaties, such as the Agreement on International Road Transport (ATIT). Vehicle technical inspections and the issuance of driver's licenses fall under the purview of Municipal Transit Directorates.

As for air transport, the National Directorate for Civil Aeronautics (DINAC) ensures the development of civil aviation and the administration of the national airspace, guaranteeing its security, efficiency, and alignment with governmental policies, plans and programmes.

Inland water and maritime transport fall under the scope of the Directorate General of the Merchant Marine (DGMM) which is the state entity responsible for the development of policies and planning to promote and advance the interests of the national merchant marine and connected industries. The National Navigation and Ports Administration (ANNP) is responsible for managing ports and ensuring waterway navigability year-round to facilitate the transport of barges and their freight through inland waterways to the oceans beyond.

Policies to improve the road network

The PND 2030 and the National Logistics Plan Paraguay 2013 articulate the need to strengthen road transport and cross-border interconnections, in addition to identifying projects of high priority to improve productive and logistical operations in Paraguay, including:

- The Central Highway which requires the upgrade of current routes 2 and 7 to form a central corridor to improve road connectivity between the two main nodes of Paraguay: the cities of Asunción and Ciudad del Este.
- The Asunción Ring Road project that would connect the Central highway (roads 2 and 7) with the city of Asunción.
- The Villeta – Alberti Highway that is expected to have a great impact by connecting the Central Highway, the Asunción Ring Road, and the port in the town Villeta and the hinterland.

Policies to improve the railway network

The National Logistics Plan Paraguay 2013 envisions the integration of the railway system with neighboring countries to enable the annual movement of approximately 5 million tons of grains such as soybeans, as well as other commodities such as wood, fuels, cement, bovine meat, and sugar, among others. The rehabilitation and extension of the rail network is vitally important to expand Paraguay's

international trade as it diversifies transport corridors for imports and exports, establishes better access to ports on the Atlantic and Pacific coasts, and creates complementary elements to the east-west road network that would help reduce cost and increase the volume of transported goods.

The national railway network is managed by the Paraguay Railway Company S.A. (FEPASA) as per Law No. 1615 of October 31, 2000.⁹ It is responsible for managing the network and promoting the revitalization of passenger and freight transport. The main rail revitalization projects include:

- The reestablishment of the connection between Alto Paraná-Caazapá-Asunción to fortify the transport of high grain volumes and other freight;
- Investments towards the reestablishment of train service between Encarnación and Posadas (which has recently become operational); and
- The establishment of a Commuter Train network that connects Asunción and the city of Ypacaraí. FEPASA launched a Call for Proposals for the design, financing, construction, equipment, operation and maintenance of this line during the second semester of 2018.

Further, a private initiative has launched the complete rehabilitation and future operation of the Paraguari – San Salvador and San Salvador – Abaí railway lines, which includes the construction of the infrastructure, superstructure, overall facilities, provision of rolling stock and activation of the Artigas Encarnación railway segment (Department of Itapúa), which connects with the Urquiza railway line of the Republic of Argentina through the bimodal “San Roque González de Santa Cruz” bridge.

Policies to improve air transport infrastructure

Through the leadership of the National Directorate for Civil Aeronautics (DINAC) in collaboration with the International Development Agency of the Republic of Korea (KOICA), a Master Plan to update current airport facilities and infrastructure has been developed. The Master Plan covers all twelve airports managed by the government: Asunción, Encarnación, Ciudad del Este, Pedro Juan Caballero, San Pedro, Mariscal Estigarribia, Pilar, Concepción, Coronel Oviedo, Saltos de Guairá, Villa Hayes and Caazapá. KOICA has also proposed the development of air terminals at the Mariscal Estigarribia, Encarnación, Minga Guazú and Pedro Juan Caballero airports.

Policies to improve inland waterway transport

To overcome the limitations imposed by Paraguay’s landlockedness, the PND 2030, the National Logistics Plan Paraguay 2013, and the Transport Master Plan agree on the importance of inland waterway transport, and the need to prioritize and accentuate efforts that aim to improve navigability along the Paraguay and Paraná rivers and reinforce port infrastructure. Among the objectives set forward in the PND 2030:

- Strengthen Paraguayan road and inland waterway transport, including border interconnections;
- Increase port transit capacity; and
- Create efficiency in existing port centers and multimodal logistics nodes along navigable rivers to integrate different regions of the country and markets overseas.

⁹ http://www.fepasa.com.py/legal/Ley_1615_2000.pdf and by SD No. 17061 of 30/04/2002, http://www.fepasa.com.py/legal/decreto_17061.pdf

2. The status of implementation of the Vienna Programme of Action in Bolivia and Paraguay

This section provides an overview and analysis of the progress and development that has taken place in Bolivia and Paraguay since the adoption of the Vienna Programme of Action. Keeping a special focus on the challenges both countries have had to address as a result of their landlockedness, this chapter organizes results in accordance with VPoA priority areas.

2.1 Priority 1: Fundamental transit policy issues

2.1.1 Transit policy agreements and institutional reforms

2.1.1.1 Ratification and implementation of conventions and agreements

Paraguay and Bolivia have signed several conventions and agreements for transit and trade facilitation. This section outlines the multilateral and regional agreements signed by both countries, including those of the World Trade Organization (WTO) and World Customs Organization (WCO). The most significant agreements include the Latin American Integration Association (ALADI), MERCOSUR, Andean Community (CAN) and the Paraguay-Paraná Waterway Agreement of Fluvial Transport.

a) Multilateral agreements:

a.1 World Trade Organization (WTO)

Both Paraguay and Bolivia have ratified the WTO Trade Facilitation Agreement (TFA), which came into force on February 22, 2017, following ratification by two thirds of WTO members. The agreement sets forward provisions to facilitate the movement, release and clearance of goods in transit, to ensure effective cooperation between customs authorities and other authorities responsible for trade facilitation and compliance of customs procedures, in addition to dispositions for technical assistance and capacity building.

Bolivia is currently in the process of establishing its Supreme Decree to create a National Trade Facilitation Committee and has requested support from the World Bank to implement the TFA. Paraguay, on the other hand, has already created its National Trade Facilitation Committee which participates in the WTO Trade Facilitation Committee. Paraguay's National Committee has made transparency, access to trade information, public-private dialogue mechanisms, and the improvement of customs processes a priority. It has also taken measures to implement category "C" commitments which require a transition period and technical assistance to build capacities.

The TFA will become a positive instrument for landlocked countries once transit countries ratify the agreement and work on necessary reforms.

a.2 World Customs Organization (WCO)

The World Customs Organization (WCO) is an independent intergovernmental body whose mission is to improve efficiency of customs administrations and has among its strategic objectives the promotion of international trade facilitation and security, and the simplification and harmonization of customs procedures to improve economic competitiveness.

Bolivia and Paraguay both participate in the WCO's Customs Cooperation Council which cooperates with the WTO in several spheres, such as the Information Technology Agreement (ITA), customs valuation, rules of origin, trade facilitation, and access to markets.

The Customs Cooperation Council is a forum to discuss ways to streamline customs procedures between landlocked and transit countries in order to reduce the disadvantages and costs landlocked countries bear as a result of not having sea ports.

With the support of the WCO, the Authorised Economic Operator (AEO) programme has also been launched. The AEO implements new customs process approaches that facilitate international trade and ensure the security of the international trade logistics chain.

b) Regional agreements

b.1 Latin American Integration Association (ALADI)

The 1980 Treaty of Montevideo (TM80) signed on August 12, 1980, is the legal and regulatory framework of ALADI. Bolivia and Paraguay are original members of ALADI and signatories to TM80. Countries with the lowest relative economic development in the region (Bolivia, Ecuador, and Paraguay) enjoy preferential measures aimed at facilitating their integration, and offsetting some of the disadvantages that Bolivia and Paraguay specifically face as a result of their landlockedness. These preferential measures include special cooperation programs (business roundtables, pre-investment, financing, and technological support) and lists of products that are exempt of customs tariffs and trade restrictions, among others.

A broad range of topics are covered by the regional agreement and partial scope agreements signed under the framework of ALADI. They include such matters as: tariff reduction and trade promotion; economic complementarity; agricultural trade; financial, tax, and customs cooperation; environmental preservation; health, scientific and technological cooperation; tourism promotion; and technical standards, among others.

To support trade facilitation, ALADI seeks to identify customs procedures that can be simplified and harmonized, in accordance with the World Trade Organization (WTO) Bali Agreement on Trade Facilitation, instruments of the World Customs Organization (WCO) and other relevant bodies. As for transport, the Agreement on International Road Transport (ATIT) was signed within the framework of the Montevideo Treaty. It serves as the legal framework that regulates the provision of road and rail transport services (passenger and cargo) throughout ALADI's seven member countries (Argentina, Bolivia, Brazil, Chile, Paraguay, Peru and Uruguay).

b.2 MERCOSUR

MERCOSUR is a regional integration process initially established by Argentina, Brazil, Paraguay and Uruguay. Venezuela¹⁰ and Bolivia are currently in the process of joining MERCOSUR,¹¹ and Chile, Colombia, Ecuador, Guyana, Peru and Surinam are associated States.

MERCOSUR's main objective is to create a common space that promotes trade and investment opportunities to foster the competitive integration of national economies into the international market. To this end, MERCOSUR has signed commercial, political, and cooperation agreements with nations and organizations that span across five continents. The four founding members of MERCOSUR have manifested their will to subscribe to the WTO Trade Facilitation Agreement (TFA) that came into force on February 22, 2017.

Like other MERCOSUR member countries, Paraguay subscribes to ATIT and applies its regulations. As a full member of the Andean Community of Nations (CAN), Bolivia, fully implements Decision 399 on the international transport of goods, Decision 617 regarding customs transit with other Andean Community countries, as well as ATIT to which it subscribes alongside Argentina, Brazil, Chile, Paraguay and Uruguay.

Under ATIT, a unified form named International Cargo Manifest / Customs Transit Declaration (ICM/CTD), is used. It contributes to streamlining the registration process and its validity is recognized in authorized customs offices beyond the national jurisdiction. As a result of recent technological advances, the control and monitoring of ICM/CTDs in MERCOSUR founding States, Chile, and Bolivia, is carried out using the International Customs Transit Computerized System (SINTIA).

More than 25 Common Customs Rules are regulated and harmonized under MERCOSUR. The MERCOSUR Customs Code (Decision CMC 27/2010), the body of laws that regulate and harmonize fundamental customs matters, is awaiting approval. After it is endorsed by the respective Congresses of all block members, it will enter into force and regulate the entry and exit of goods to and from MERCOSUR. Only Argentina and Brazil have endorsed the MERCOSUR Customs Code to date, and they await the approval of Paraguay and Uruguay.

MERCOSUR also contains other customs and trade facilitation resolutions and agreements, including the following:

- Integrated customs: The Recife Agreement regulates integrated border controls between signatory countries, facilitating trade and transport by simplifying customs procedures.

At main border crossings, Integrated Control Areas (ICA) have been established, bringing together officials of both jurisdictions to jointly carry out their activities. These areas offer unified service hours, continuous service provision, harmonized and simplified administrative procedures and operational practices.

¹⁰ The Bolivarian Republic of Venezuela is suspended in all the rights and obligations inherent to its status as a State Party of MERCOSUR, in accordance with the provisions of the second paragraph of Article 5 of the Protocol of Ushuaia.

¹¹ The Protocol of Accession of Bolivia to MERCOSUR was signed by all of the States Parties in 2015 and is currently in the process of being incorporated by the congresses of the States Parties.

- Information Exchange. On the basis of decisión CMC 1/97, the Mercosur Customs Cooperation Agreement came into effect. Subsequently, information exchange through an online system was contemplated, and by means of decision CMC 26/06 gave rise to the Information Exchange of Customs Records (INDIRA) system which enables real time access to a database that helps effectively analyze risk while improving controls along the international logistics chain.
- The “Plan of Action – Mutual Recognition of Authorized Economic Operator of the State Parties of MERCOSUR Draft Agreement” is a trade facilitation measure with the potential of having significant impact. Paraguay and Bolivia have already established Authorized Economic Operator systems within their respective domestic customs administration, and agreements with neighboring countries are in the process of being signed.

b.3 The Andean Community of Nations (CAN)

CAN is a regional integration body composed of various entities and institutions that conform the Andean Integration System. By integrating the Andean region, it aims to achieve integrated, balanced and autonomous development, with the view of further integrating the South American and Latin American regions. Member countries include Colombia, Ecuador, Peru and Bolivia, and associated countries include Argentina, Brazil, Paraguay, Uruguay and Chile, with Spain joining as an Observer.

Within CAN, the World Trade Organization’s Trade Facilitation Agreement (TFA) is used as the frame of reference for trade facilitation matters. Its provisions aim to streamline the movement, release, and clearance of goods, including goods in transit. They aim to ensure effective cooperation among customs administrations and other customs authorities that work on trade facilitation issues and customs procedure compliance, further addressing matters of technical assistance and capacity building in these realms.

Relevant topics falling under the scope of CAN customs regulation include the following:

- Community Customs Transit: Solidifies the free circulation of goods between member countries, enabling their transport from origin to destination without compulsory transshipments and unnecessary shipments at the border, ports or airports. Unified documentation, information exchange systems, and supplemental controls are used to achieve this.

Community customs transit are regulated by Decision 617 and modified by Decisions 636 and 787. The framework enables merchandise to travel between member countries by crossing one or more borders under the same operation, and further lifts applicable taxes.

- Harmonization of Customs Procedures: Common rules help simplify and optimize business transactions, which is why the establishment of provisions for uniform customs procedures contribute to fostering international trade.

To this end, the Single Customs Document (DUA) was adopted following Decision 670 and its revisions. The aim of DUA is to harmonize customs procedures, unify the declaration of goods at customs, standardize data required to conduct trade operations, and streamline the data required from foreign trade operators throughout member countries.

CAN has adopted a series of community rules to facilitate and liberalize transport services under their various modalities. International road transport is regulated by Decision 398 (passengers) and 399 (cargo), both of which aim to ensure service efficiency, specify contract conditions and outline the responsibility of carriers and users. The International Transport of Goods by Road (TIMC) is an effective instrument to consolidate the subregional economic area. It is also a valuable integration tool that supports commercial exchanges, competitive expansion of the productive base, and the dynamization of foreign trade.

CAN and ALADI intend to further simplify procedures and stimulate land transport in South America, which is why they are conducting comparative analyses of current international regulations applicable to the sector. Alternatives that are currently under consideration include the signature of a regional standard, the harmonization of rules, and the reciprocal recognition and adherence of all CAN and ALADI countries to the Agreement on International road Transport (ATIT).

b.4 The River Transport Agreement for the Paraguay-Paraná Waterway (PPW)

The five countries that compose the Plata River Basin are Argentina, Bolivia, Brazil, Paraguay, and Uruguay. In June 1992, they subscribed to the River Transport Agreement for the Paraguay-Paraná Waterway, the common normative framework they developed with a view of ensuring fluid trade and efficient river operations.

The agreement seeks to ensure effective transport, communication, and services along the waterway by creating the conditions and guarantees that enable broad freedoms for the transport of people and goods along the waterway. The agreement contains provisions on the following matters, among others:

- Freedom of Navigation for ships that bear the flags of signatory countries;
- Equality of treatment in all operations regulated by the Agreement;
- Non-discrimination and identical treatments for all ships regardless of their flag on matters such as taxes, fees, charges, procedures, pilotage, and port services;
- Freedom of Transit for ships, goods, and persons from signatory countries;
- Regional Cargo Reserve: the transport of goods and people is restricted to shipowners of signatory countries, under equal rights, treatment and conditions;
- Transport and Trade facilitation;
- Port Services and Auxiliary Navigation Services.

Participating countries have recently signed the River Transport Agreement's VIII Additional Protocol, ensuring the Agreement's indefinite validity. The ratification of this document is of great significance given that it strengthens institutionality and the commitment of the countries in the Plata River Basin to advance regional physical integration along this natural corridor, further contributing to the predictability, stability, and legal security of investments made along the PPW.

2.1.1.2 National programmes, projects and reforms for international trade operations

Several public entities are involved in foreign trade operations, notably those that carry out inspection, registration, and verification functions, including customs, exporter registration services, authentication of origin services, and sanitary, phytosanitary, and food safety certification and control.

National custom offices are autonomous entities in charge of overseeing foreign trade, collecting corresponding customs duties, and facilitating operations. In Bolivia, the agency is called National Customs, and in Paraguay, the National Customs Directorate. Both countries have district offices within their territory and at border crossing points where trade takes place.

Bolivian Customs currently use the Automated System for Customs Data (ASYCUDA++, or SIDUNEA++ for its Spanish acronym), which is also used in several other countries. In recent years, Bolivian Customs have been developing a new computer program called the Customs Modernization System (SUMA) which is currently used for exports and is in the process of being adopted for imports, with the full transition expected to be completed by the end of 2019.

In Paraguay the Fiscal Organization of Customs Levies (SOFIA) was developed by the National Customs Directorate. SOFIA is a computerized system of customs clearance that interacts directly with Customs brokers, transport companies, depositaries and national Customs. Promoted by the Ministry of Industry and Commerce, another technological platform that has been developed and used to facilitate export procedures is the Exporter's Single Window (VUE). The SOFIA and VUE systems are integrated with one another.

Paraguay's National Customs Directorate developed the International Customs Transit Computerized System (Sintia) which is used by Mercosur countries. The system registers and monitors progress of customs transit. Another initiative has been the implementation of the Electronic Seal Monitoring System that monitors in real time the location and seals on transport that go through international transit operations. Further, it has implemented the Authorized Economic Operator Programme.

The National Customs of Bolivia have also implemented two interesting initiatives, the Authorized Economic Operator Programme and the Customs Modernization System (SUMA).

Through Decision 502, the Andean Community of Nations have instituted the Binational Border Service Centers (CEBAF) and the regulatory framework that outline their development, operations and the implementation of controls. CEBAFs aim to avoid the duplication of procedures and records for the entry and exit of people, merchandise, and vehicles through Member Countries land borders. Three CEBAF centers have been planned between Bolivia and Peru. The first has been completed in the town of Desaguadero. Two others have yet to be built and are planned at Extrema (Bolivia) and San Lorenzo (Peru), and Thoilla Kollo (Bolivia) and Collpa (Peru).

Lastly, in 2005, Protocol 22 of Mercosur which is part of the Economic Complementation Agreement for Trade Facilitation established Integrated Control Areas at the borders between Mercosur State Parties and Bolivia.

2.1.2 Progress and achievements in transit and trade facilitation

This section analyzes the efforts and progress made by landlocked developing countries and transit countries in Latin America with regards to the VPoA objective of *reducing transport time and costs in the export and import process*. Progress in this sphere would suggest improvements in areas such as travel time along corridors, time spent on formalities and border crossings, and intermodal connectivity.

2.1.2.1 Logistics performance and trade facilitation

To assess logistics performance and trade facilitation in Bolivia and Paraguay, the World Bank's Logistics Performance Index (LPI) and Doing Business Report were used, both of which are based on local research and surveys.

LPI measures the efficiency of each country's supply chain and its performance in conducting trade with its business partners. Inefficiency in logistics lead to increases in the costs of trade, whereby impacting the competitiveness of developing countries and their integration in the global market.

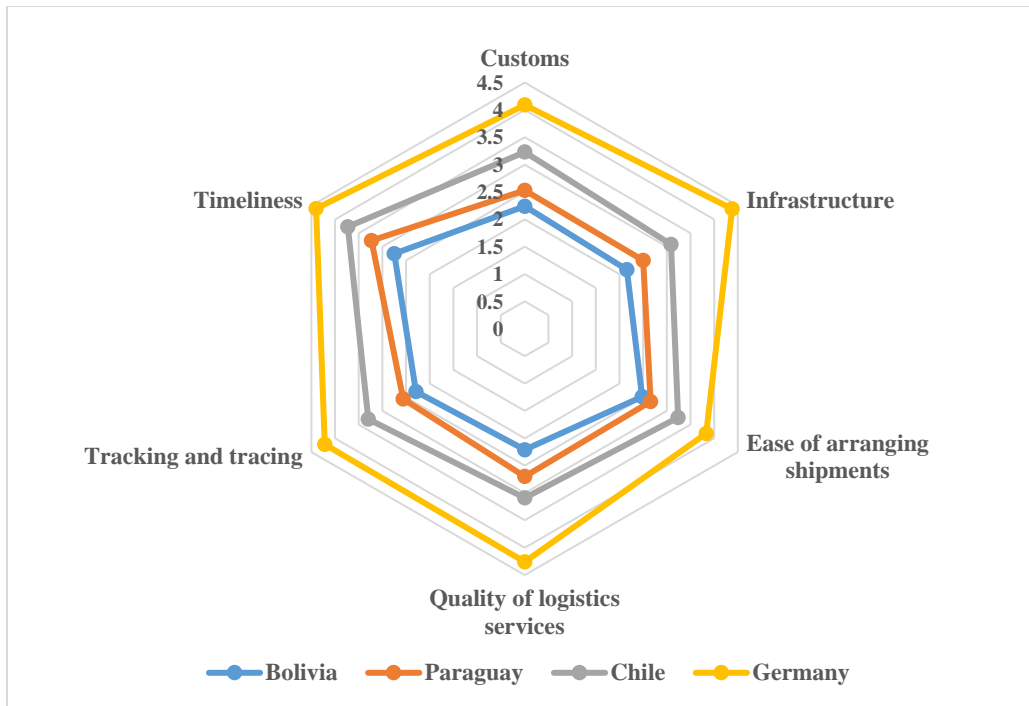
The index takes into account several components such as Customs, Infrastructure, Ease of arranging shipments, Quality of logistics services, Tracking and Tracing, and Timeliness. Measurements for each of these components is rated on a scale of one to five, where one represents low efficiency, and five represents high efficiency. The average country scores computed for the time period between 2012 and 2018 places Germany at the top of the ranking, Chile as the highest ranked country in South America, Paraguay at approximately the midpoint of the 167 listed economies, and Bolivia in a lower position on the ranking (see Table 14). Figure 6 illustrates the results of Bolivia and Paraguay on each LPI component, reflecting lower scores on the components of infrastructure, customs, and quality of logistics services.

Table 3: LPI Average for the years 2014, 2016 and 2018

Country	Ranking	Rating
Germany	1	4,19
Chile	40	3,28
Brazil	56	3.02
Argentina	62	2.93
Peru	74	2.78
Uruguay	75	2.78
Paraguay	83	2,7
Bolivia	136	2,36

Source: LPI 2018, World Bank

Figure 1: Rating of LPI components by country



Source: LPI 2018, World Bank

The Ease of Doing Business Report provides a complementary picture to the LPI. The Ease of Doing Business is measured through a set of 12 indicators, and one of those metrics is *Trading Across Borders*, which measures the time and cost of importing or exporting a product. In 2018, Chile is the highest ranked country in South America, holding the 71st position among 190 economies. Between 2015 and 2018 Bolivia moved up from the 124th position to the 96th position, thus holding the second position in South America, and Paraguay moved from the 135th to the 127th position during the same time period.

Table 15 below presents cross-border formalities and red tape for Bolivia and Paraguay, both of which demonstrate overall improvements in the cost and time to export. As for imports, improvements have been made in the time to achieve documentary compliance, while times and costs for border compliance have remained largely unchanged.

The table also compares these figures with the average of Latin American and Caribbean countries, OECD countries, and best performers in 2018. While Bolivia and Paraguay score better than the average of Latin American countries for certain categories, in others they fare worse. The results of OECD countries and best performers also serve as aspirational figures.

Overall, results in both countries reflect the persistence of bureaucratic structures that impose additional costs and time to complete international trade operations. For this reason, continued efforts must be made to reduce the cross-border facilitation gap and achieve greater degrees of efficiency.

Table 4: Characteristics of cross-border trade: Bolivia and Paraguay

Indicator	Bolivia		Paraguay		Latin America and Caribbean	OECD	Best Performer	
	2015	2018	2015	2018	2018	2018	2018	
Time to export								
Documentary compliance (hours)	192	144	72	24	52.5	2.4	1 (26 Economies)	
Border compliance (hours)	216	48	144	120	61.9	12.5	1 (19 Economies)	
Cost to export								
Documentary compliance (USD)	25	25	200	120	110.4	35.2	0 (20 Economies)	
Border compliance (USD)	65	65	815	815	529.8	139.1	0 (19 Economies)	
Time to import								
Documentary compliance (hours)	96	72	36	36	79.1	3.4	1 (30 Economies)	
Border compliance (hours)	114	114	48	24	62.6	8.5	0 (25 Economies)	
Cost to import								
Documentary compliance (USD)	30	30	135	135	116.3	24.9	0 (30 Economies)	
Border compliance (USD)	315	315	500	500	647.2	100.2	0 (28 Economies)	

Source: Doing Business 2016 and 2019

Additional trade facilitation indicators listed in Table 16 complement findings on the import and export process. With similar outcomes for Bolivia and Paraguay, these indicators outline the average road transport speed of 47 to 56 kilometers per hour, and inland water transport speed of 2.6 kilometers per hour. The cost of domestic transport is also similar, ranging from 2.4 to 2.7 dollars per kilometer.

As outlined in Table 5, the average circulation speed is higher in Bolivia and Paraguay in comparison with transit countries (Chile, Argentina, Brazil, and Uruguay). Average import costs are similar to those of Chile and Uruguay, higher than in Brazil and lower than in Argentina. Average export costs are higher than in Argentina, and lower than in Brazil and Uruguay. To avoid misleading conclusions, these figures must not only be compared numerically, but rather carefully analyzed in accordance with each country's trade and export structure.

Table 5: Trade facilitation indicators

Indicators	Bolivia		Paraguay	
	Exports	Imports	Exports	Imports
Distance (kms) ¹	280	280	370	337
Domestic transport (hours)	6	6	144	6
Cost of domestic transport (USD) ²	750	750	1000	800
Speed of domestic transport (Km/h)	46.7	46.7	2.6	56.2
Cost of domestic transport (USD/km)	2.7	2.7	2.7	2.4
Customs	Tambo Quemado	Tambo Quemado	Puerto Pilar	Ciudad del Este

Indicators	Chile		Argentina		Brazil		Uruguay	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Distance (kms)	121	121	1007	10	84	1560	26	420
Domestic transport (hrs)	9	9	22	2	9	48	1	12
Cost of domestic transport (USD)	345	345	1700	600	763	1900	300	1175
Speed of domestic transport (Km/h)	13.4	13.4	45.8	5.0	9.3	32.5	26.0	35.0
Cost of domestic transport (USD/km)	2.9	2.9	1.7	60.0	9.1	1.2	11.5	2.8
Customs / Port	Port of San Antonio	Port of San Antonio	Paso de los Libres Customs	Port of Buenos Aires	Port of Santos	Uruguaiana Customs	Port of Montevideo	Río Branco Customs

Source: Doing Business Report for Bolivia and Paraguay, 2016 and 2019

¹ In Bolivia: La Paz to the border. In Paraguay: Asunción to the border

² For a 15 tons container

2.1.2.2 Trade facilitation and the transit of goods

Landlocked developing countries have been making clear efforts to improve the transit of goods to bolster trade. These efforts have yielded improved travel time in transit corridors as a result of reducing red tape and the time necessary for goods to cross the border.

To compare and assess the evolution of transit processes in Bolivia and Paraguay, ECLAC and other studies that measure transport times and costs in export corridors were analyzed¹². These studies utilize the same methodologies to estimate the costs and cost overruns for select products along the export logistics chain, enabling comparative analysis. To this report, data from 2006, 2012 and 2016 were selected, and a set of products and corridors for which abundant data was available and were characteristic of each country were analyzed.

In the case of Bolivia, the overseas export of soybean flour through the Atlantic Ocean (by rail, river and maritime transport), and through the Pacific Ocean (by road and maritime transport) was analyzed. For Paraguay, the overseas export of soybean seeds through the Atlantic Ocean (by river and maritime transport) and to Brazil (by road transport) was analyzed. In both cases, goods must cross through transit

¹² Reference is made to the following studies: CARANA Corporation (2006); Pérez-Salas, Sánchez and Wilmsmeier (2014) and Suárez, D. (2018).

countries in order to arrive to a maritime port. Table 6 outlines the respective corridors and average travel times under normal conditions.

Table 6: Travel distances and time

Corridor	Mode of Transport	Distance (Kms)	Estimated Time	Average (kms/day)
Ciudad del Este – Ponta Grossa	Road	560	1 día	560
Asunción - Rosario	River	1,210	10 días	121
Asunción - Montevideo	River	1,475	12 días	123
Santa Cruz-Puerto Quijarro-Rosario	Railway-River	650 by rail	1 day by rail	650
		2,360 by river	25 to 30 days by river	77 to 94
Santa Cruz-Tambo Quemado-Arica	Road	1,325	3 days	442

Source: Suárez, D. (2018)

These studies have quantified the time delays and costs overruns resulting from transit inefficiencies which are classified according to stages of transit: pre-boarding, ground transport, ports, paperwork and border crossings, water transport, and the collection process. Table 7 and Figures 2 and 3, illustrate export process inefficiencies in Paraguay and Bolivia, highlighting noteworthy improvements.

Table 7: Evolution of export inefficiencies (in hours)

Process	Soybeans by road and inland water transport on the PPW			Soybeans by road through Arica		
	2012	2016	Diference	2012	2016	Diference
	Bolivia					
	Soybean cake by inland water transport (PPW)			Soybean cake by road through Arica		
Pre-boarding	27	14	13	27	14	13
Road Transport	0	0	0	54	27	27
Port	48	48	0			
Crossborder formalities	672	312	360	732	366	366
Water Transport	48	48	0	0		
Collection	48	48	0	48	48	0
Total hours	843	470	373	861	455	406
	Paraguay					
	Soybeans by inland water transport (PPW)			Soybeans by road through Ciudad del Este		
Pre-boarding	8	4	4	8	4	4
Road Transport	0	0	0	12	3	9
Port	8	4	4			
Crossborder formalities	24	24	0			
Water Transport	48	48	0			
Collection	6	6	0	6	6	0
Total hours	86	86	8	26	13	13

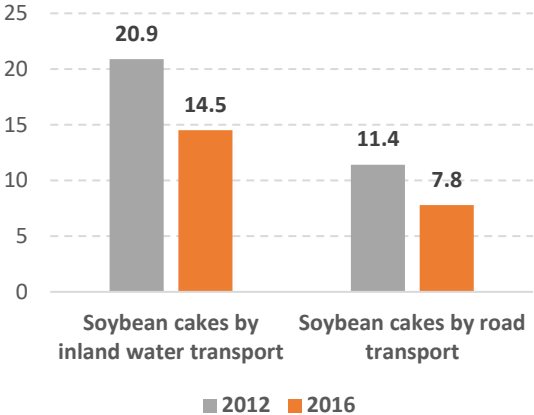
Source: Elaborated by the authors on the basis of Pérez-Salas, Sánchez and Wilmsmeier (2014) and Suárez, D. (2018)

Between 2012 and 2016, Bolivia has seen a sizable reduction of 373 hours to exports along the Paraguay-Paraná Waterway (PPW) towards the ports of the Atlantic, and 406 hours along roadways to the ports of the Pacific. These results can largely be associated to changes in regulation surrounding the Certificate of Internal Market Supply (Export Permit) that is processed through the Ministry of Productive Development and Plural Economy, and the reduction in time necessary for export companies to process their release.

Paraguay has also experienced marked reductions in the time required for exports to reach ports on the Atlantic by both inland water transport and road transport.

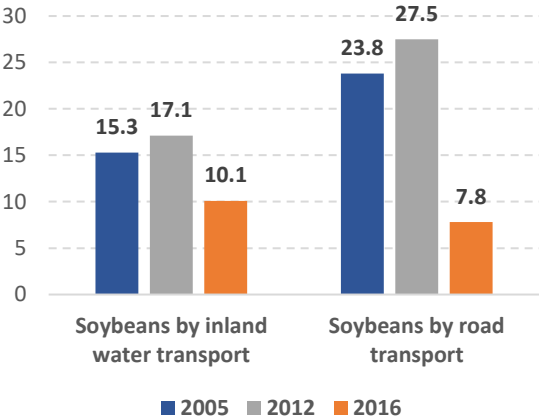
Paraguay and Bolivia both utilize the PPW and the same transshipment ports, thus persistent challenges imposed by water flows along the waterway, and the deterioration in loading and unloading services in transshipment ports affect both countries’ exports uniformly. Reductions in inland water transport logistic inefficiencies can therefore be associated primarily to changes in the domestic pre-boarding process. Between 2012 and 2016, the reduction in cost overruns was equivalent to 5.4% of total cost for Bolivia, and 7% for Paraguay. Private sector investments to improve the loading and unloading process in company silos and ports have yielded improvements in domestic pre-boarding.

Figure 2: Bolivia: Evolution of cost overruns due to inefficiencies (cost inefficiencies as % of total costs)



Source: Suárez, D. (2018)

Figure 3: Paraguay: Evolution of cost overruns due to inefficiencies (cost inefficiencies as % of total costs)



Source: Suárez, D. (2018)

Reductions in road transport logistic inefficiencies have also gained ground in Bolivia and Paraguay with reductions in cost overruns equivalent to 3.6% in Bolivia, and 19.7% in Paraguay. Much like in inland water transport, improvements for road transport were also linked to changes in the domestic pre-boarding process, specifically the loading and unloading process in company silos. Paraguay has also experienced a reduction in the time to export as a result of the agreement reached between the Customs Agencies of Paraguay and Brazil to implement overnight customs clearance at the Ciudad del Este – Foz de Iguazú border crossing.

Bolivia has also made investments to improve the secondary road network. Limitations imposed by geographically unstable terrain along the Santa Cruz – Cochabamba highway at El Sillar continue nevertheless to pose problems, particularly during the rainy season when transit can be cut for hours or days at a time. To achieve a lasting solution to these recurrent problems, construction work began in the second semester of 2018 and is expected to finish by March 2021.

Results demonstrate that significant progress has been achieved on specific VPoA objectives, notably: (a) Reduce travel time along corridors, with the aim of allowing transit cargo to move a distance of 300 to 400 kilometres every 24 hours; (b) Significantly reduce the time spent at land borders; (c) Significantly improve intermodal connectivity, with the aim of ensuring efficient transfers from rail to road and vice versa and from port to rail and/or road and vice versa.

Challenges to improve transit and facilitate trade along these export corridors persist in both Bolivia and Paraguay. As outlined in Suárez, D. (2018), the main challenge related to road transport is the condition of rural and secondary road infrastructure. Customs procedures also generate significant cost overruns due to the quantity of formalities and red tape, notably: certificates of origin, port taxes, transshipment fees, merchandise removal delays, photocopies, inspection, and security seals, among others. A detailed analysis of the purpose of each of these services and charges should be carried out to ensure that they are not merely bureaucratic formalities that hinder rather than facilitate trade. Any unnecessary fee or step should be eliminated to streamline the process and ensure competitiveness. The agreement between Paraguay and Brazil to conduct overnight customs clearance at the Ciudad del Este – Foz de Iguazú road border crossing has been an important development for Paraguayan exports and should be replicated at other border crossings. Other improvements to make the process more expeditious and to service a greater number of units are needed and should be explored.

As for inland water transport, the main limitations lie in the lack of dredging and beaconing along the PPW, resulting in delays, barge capacity underutilization, and freight rate increases. Certain areas of the Waterway, such as the water intake of the city of Corumbá and the Tamengo Canal, also require barges to carry out tight maneuvers, reducing speed and creating delays and subsequent cost overruns. Further, low water levels that occur during approximately four months of the year generate additional costs (Low Water Fee) of about 10 USD/Ton. Once freight makes its way to maritime transshipment ports, delays to access platforms, limited loading and unloading capacity, and social unrest, such as demonstrations and strikes, create added layers of time and financial costs. This is true of ports both on the Atlantic and Pacific coasts. Customs procedures along waterways, however, have shown some improvements are a result of the upgrade of the information system used by the National Customs Directorate (Paraguay) and SENASAG (Bolivia).

While significant progress has been achieved in both countries, there remains substantial room for improvement in domestic infrastructure and processes, and in transit country customs facilitation and international transit.

2.2. Priority 2a: Development and maintenance of transport infrastructure

2.2.1 Review of transport connectivity in the Plurinational State of Bolivia

This section of the report examines Bolivia's current state of connectivity to assess the country's progress in developing and preserving transport infrastructure since its adoption of the VPoA. Historical data contained in ECLAC's report on the "State of Implementation of the Almaty Programme of Action in South America" (Pérez-Salas, et al, 2014) is used as a baseline.

During this period, Bolivia has developed transport and logistics infrastructure, and improved its internal and external connectivity, further creating the conditions for investments in various modes of transport. Connections with transit countries is of paramount importance given the indirect trade relationships they help create with countries overseas. On the Pacific coasts, Bolivia carries out its international trade through three ports in Chile: Arica, Iquique and Antofagasta, and two ports in Peru: Matarani and Ilo. On the Atlantic coast, Bolivia carries out its international trade through the ports of Santos and Paranaguá in

Brazil, the port of Buenos Aires and ports located in the area of Rosario – San Lorenzo in Argentina, and the ports of Nueva Palmira and Montevideo in Uruguay.

The Patriotic Agenda 2025 and PNDS 2016-2020 have assigned public resources to the construction of transport infrastructure as detailed in Table 8.

Table 8: Bolivia: Public investment in transport infrastructure (2013-2016)

Type	2014		2015		2016	
	USD (millions)	% of GDP	USD (millions)	% of GDP	USD (millions)	% of GDP
Air	43.84	0,18	29.73	0.12	24.73	0.09
Road	1,118.16	4,57	1,339.38	5.22	1,573.96	5.88
Railway	51.52	0,21	49.08	0.19	57.50	0.21
Inland water and maritime	1.53	0,01	2.48	0.01	0.31	0.00
Total	1,215.05	4,97	1,420.67	5.54	1,656.50	6.18

Source: Elaborated by the authors on the basis of data obtained from INFRALATAM (<http://infralatam.info/>), 2019

Public investment in transport infrastructure has increased during the period under review, reaching 581 million dollars, or 6.18% of GDP in 2016, as compared to 4.97% in 2014. The road transport sector also accounts for the largest proportion of public resource investment, accounting for 95% of overall investments in 2016.

Current status, progress and challenges in road transport

Road transport infrastructure in Bolivia is centered on the essential East-West corridor which crosses three out of the country's nine administrative departments: La Paz, Cochabamba and Santa Cruz¹³. The North and South corridors have developed and expanded in more recent times. The main road corridors are as follows:

- **The East-West corridor:** Connects ports located in the north of Chile and the south of Peru on Pacific coast with the ports of Santos and Paranaguá in Brazil on the Atlantic coast. This corridor also connects with the Eastern and Western railway networks.
- **The Northern corridor:** Connects the State of Rondonia, Brazil with the East-West corridor.
- **The Southern corridor:** Connects with East-West corridor; links Buenos Aires, Argentina with Lima, Peru; and provides Paraguay access to the Pacific Ocean.

The road system is classified according to Article 192 of Law No. 165 of August 16, 2011, and falls under the purview of the following governmental bodies: a) Essential Road Network (Primary), under the responsibility of the Central Government, b) Departmental Network (Secondary), under the responsibility of Departmental Governments, c) Municipal Network (Local), under the responsibility of Municipal Governments and d) Community Network. Table 9 outlines the length of roadways according to this breakdown:

¹³ In Bolivia, departments are the largest administrative territorial subdivisions.

Table 9: Bolivia: Road length by type of network and surface (in kilometers)

Description	2014	2015	2016
TOTAL	86,855	89,426	89,613
Cobblestone	1,046	994	1,020
Under construction	2,583	2,747	3,445
Paved	7,134	7,756	7,959
Gravel	29,881	32,975	31,823
Dirt	45,605	44,349	44,221
Length of new segments under assessment	606	606	1,146
ESSENTIAL NETWORK	15,982	15,982	16,343
Under construction	2,253	2,253	3,141
Paved	6,064	6,500	6,618
Gravel	7,059	6,623	5,624
Length of new segments under assessment	606	606	959
DEPARTAMENTAL NETWORK	29,183	31,754	31,580
Cobblestone	1,046	994	1,020
Under construction	330	494	303
Paved	1,005	1,190	1,277
Gravel	9,869	13,400	13,246
Dirt	16,933	15,677	15,548
Length of new segments under assessment	0	0	186
MUNICIPAL NETWORK	41,690	41,690	41,690
Paved	65	65	65
Gravel	12,953	12,953	12,953
Dirt	28,672	28,672	28,672

Source: National Statistics Institute of Bolivia (INE), the Bolivian Highway Administration and Departmental Road Services.

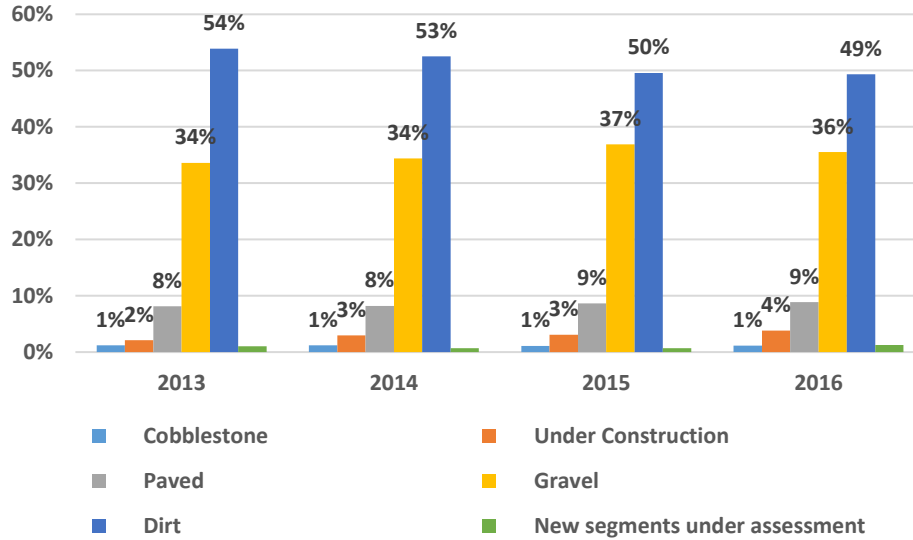
Between 2014 and 2016 the length of the road network increased overall by 2,758 kilometers, adding 1,942 kilometers of gravel roads and 825 kilometers of paved roads. Additionally, 3,445 kilometers of road that were classified as “under construction” since 2016 will soon be completed and will fall under the categories of gravel and paved roads. The quality of the road surface of the Bolivian network has remained largely unchanged during the period under review, with dirt roads representing roughly 50% of the overall network, gravel roads 35%, and paved roads a mere 8.5%. Other benchmark indicators have shown slight improvements, such as the kilometers of road per 100 square kilometers of territory, which increased from 7.9 to 8.2 between 2014 and 2016. Similarly, kilometers of paved road per 100 square kilometers of territory increased from 0.65 to 0.72 during the same period. With regards to the length of the road network per number of inhabitants, the indicator has experienced a slight drop overall (8.4 km/1,000 inhabitants in 2013 to 8.2 km/1,000 inhabitants in 2016), while demonstrating a slight improvement when looking specifically at the length of paved roads per number of inhabitants (0.68 km/1,000 inhabitants in 2013 to 0.72 km/1,000 inhabitants in 2016.)

Table 10: Bolivia: Evolution of road density, 2014 - 2016 (In km/100 km²)

Description/Year	2014	2016
Total length of road in kms	86,855	89,613
Total kms paved	7,134	7,959
Total km ² in territory	1,098,581	1,098,581
Total inhabitants	10,507,789	10,985,059
km total/100 km ²	7.9	8.2
km paved/100 km ²	0.65	0.72
km total/1,000 inhab	8.4	8.2
km paved/1,000 inhab	0.68	0.72

Sources: Prepared by the authors on the basis of data from the National Statistics Institute of Bolivia (INE)

Figure 4: Bolivia: Characteristics of the road network (2014-2016)



Source: Prepared by the authors on the basis of data from the National Statistics Institute of Bolivia (INE)

Despite improvements in connectivity, insufficiencies in the national coverage of the road network persists. Secondary and rural feeder road networks are primarily composed of dirt and gravel roads which restrict transit and make certain roadways impassible during the rainy season which runs each year between the months of December and March/April. This is particularly relevant to the eastern part of the country dominated by agricultural and seasonal production and where the rainy season and the harvest season overlap (March-April-May). Given the country's varying topography, the rainy season affect regions differently: in the western region characterized by mountains and the high plateau and dominated by mining activity, roads close as a result of landslides, collapse and river erosion; in the eastern region characterized by valleys and dominated by agro-industrial production, rain tends to lead to flooding and waterlogging. In the north, which is characterized in part by the Amazon region dominated by chestnut and timber production, and plains dominated by cattle herding, the rainy season leads to river flooding and torrential rains that inundate roads.

Bolivia has three predominant topographical divisions: a) the Andean highlands that cover 28% of the national territory at an average altitude of 3,000 to 4,000 meters above sea level, b) sub-Andean valleys that cover 13% of the territory at an average altitude of 1,500 to 2,000 meters above sea level, and c) the Eastern plains which cover 59% of the territory at an average of 200 to 400 meters above sea level. The country's topography thus plays an important part in the higher investment and road maintenance costs, and in the costs borne by motorized units that must cover routes that can go from 200 meters above sea level to more than 4000 meters to cross the Andes¹⁴, thus reducing optimal travel conditions, reducing speed and engine power, decreasing the optimum load, and increasing travel times and transport costs.

The East-West corridor, which forms the essential bi-oceanic corridor, is marked by a critical segment in the area of El Sillar, located between kilometers 100 and 128 of the Santa-Cruz-Cochabamba highway. El

¹⁴ I.e: to reach the main ports on the Pacific Ocean, vehicles must pass through Bolivia-Chile border crossings such as Chungará-Tambo Quemado (4.680 meters above sea level) and Colchane-Pisiga (3.695 meters above sea level).

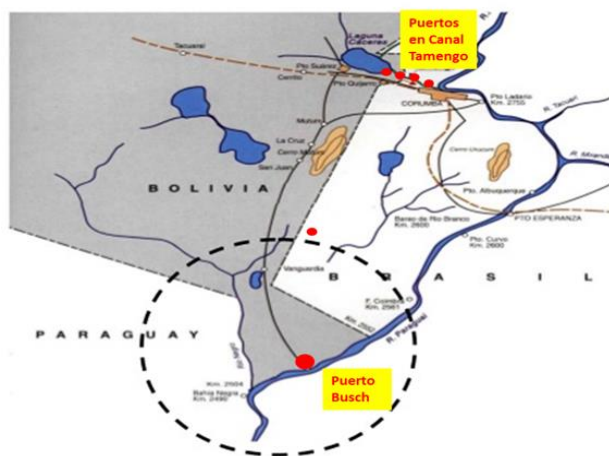
Sillar is marked by geographically unstable terrain that is often impacted by mud and stone landslides and collapses during the rainy season, generating significant delays or even cutting off roads for several days. To overcome these problems and provide long term solutions, significant construction work is currently underway, including the construction of a two-way highway, two tunnels measuring 1,025 meters and 675 meters in length respectively, in addition to 28 bridges and 6km of contention walls. The budget for this investment is estimated at 426 million dollars and is financed by China's EXIMBANK and local partners. The portion of the work carried out by the Chinese enterprise Sinohydro Ltd. was launched in the second semester of 2018 and is planned to be concluded by March 2021.

Current status, progress and challenges in inland water transport

Bolivia has two major water systems that are leveraged for transportation, the Amazon and the Plata river basins, in addition to a high-altitude lake shared with the Republic of Peru. In the central and northern region of the country, inland water transport is carried out on the Amazon river basin, and in the south-east edge of the country, on the Plata river basin. The Amazon basin holds a longer network of navigable rivers on Bolivian territory (5,728 km) as compared to the Plata basin (56 km). The rivers of the Bolivian Amazon, traditionally used to transport Bolivian exports such as rubber and elastic rubber to the Atlantic Ocean through the Madera river and other tributaries of the Amazon river to Manaus, Brazil, continue to be a principal means of internal mobility for passengers, freight and the cabotage of merchandise. Despite its shorter length in Bolivian territory, and due to its integration with the Paraguay-Paraná Waterway (PPW), The Plata basin is the most important inland waterway for the transportation of freight destined for import and export.

The scale of inland water transport through the PPW has increased in recent years in large part due to the increase in soybean production in the department of Santa Cruz. The main exports to pass through the PPW are grains, and cement and iron ore, while the main imports include fuels (gasoline and diesel), iron bars and wire for construction, and barley malt. Along the PPW, ports have emerged in two strategic locations. The first is the Tamengo Canal which measures 10.5 km in length and connects Laguna Cáceres with the Paraguay river next to the city of Corumbá, Brazil, where the Aguirre Port Complex (Central Aguirre Portuaria S.A. CAPSA and the Sociedad Administradora de Puertos Continental SAPCON S.R.L.), Puerto GRAVETAL and Puerto JENNEFER, have emerged as a result of private investment, along with the naval base of the Bolivian Navy in Puerto Tamarinero. The second site is located downstream and known as the Dionisio Foianini Triangle (formerly Corredor Man Césped) which is an area with 48 km of banks along the Paraguay river where Puerto Busch has been established. At the time of writing Puerto Busch had one state-owned freight terminal, illustrated on Map 1. Of the infrastructure detailed above, two were completed after 2013, Puerto Jennefer and the Puerto Busch Freight Terminal.

Map 1: Bolivia: Ports in the Paraguay-Paraná Waterway



Source: Infrastructure Services Unit, ECLAC, 2019

Note: The limits and names on this map do not imply official support or acceptance by the United Nations.

In 2018 a resolution was made to further stimulate transport through the PPW by prioritizing public and private sector partnerships to complete the Puerto Busch project. The ports of Aguirre, Gravelal, and Jennefer have been declared international ports, investment in infrastructure and services have been made, and public and private institution offices opened to help streamline operations, trade and migration along the PPW. The revival of the Madera-Amazonas route through Porto Velho in the State of Rondonia, Brazil, as an intermediate point to reach Manaus, a major port of transshipment to the Atlantic, is also being promoted.

Despite this progress, inland water transport in Bolivia continues to face a number of challenges that range from environmental constraints to navigation, the development of port infrastructure and subsequent coordination with countries involved. Environmental constraints can largely be addressed through technical solutions, most notably the dredging and beaconing of the PPW. Further, the water intake of the city of Corumbá (Brazil) restricts the passage of barges to and from the Tamengo Canal. Problems also persist in the ports of transfer, where excessive loading and unloading times and social problems such as strikes result in delays¹⁵.

Current status, progress and challenges of railway transport

The railway network is composed of the Andean Network and the Eastern Network which are separated by approximately 500 km and are not connected with one another. Two companies are responsible for their management under 40-year concession contracts, the Ferroviaria Oriental S.A. (FOSA) for the Eastern Network and the Empresa Ferroviaria Andina S.A. (FCA) for the Andean Network.

¹⁵ Transshipment ports are located in Argentina (in the areas of Rosario and Buenos Aires) and in Uruguay (Nueva Palmira and Montevideo).

The Andean Network is 2,274 kilometers long and crosses through the departments of La Paz, Oruro, Potosí, Chuquisaca, and Cochabamba, and connects to the railway networks of neighboring Argentina, Chile, and Peru. At present, however, only the railway network to Antofagasta, Chile, is operational, and its use is limited to the transport of mineral freight.

The Eastern Network is 1,424 kilometers long and connects the departments of Chuquisaca, Tarija and Santa Cruz. This network connects to the railway networks of neighboring Argentina and Brazil through two border crossings, one in Yacuiba in Argentina, and Puerto Suárez in Brazil. The Eastern network is responsible for the biggest share of export and import freight and is crucial for the transport of soybean derivatives and other products that transit through the PPW and makes use of Bolivian ports in the Tamengo Canal to load and unload goods.

Table 11: Bolivia: Functional railway length by network (In kilometers)

	2014	2015	2016	2017
Eastern Network	1,834	1,834	1,834	1,834
Andean Network	1,244	1,244	1,244	1,244
Total	3,078	3,078	3,078	3,078

Source: National Statistics Institute of Bolivia (INE) - Red Ferroviaria Andina S.A. - Red Ferroviaria Oriental S.A.

Currently the construction of the Montero-Bulo segment to facilitate the transportation of urea and ammonia from their plants in Bulo, Cochabamba, to the local market of Santa Cruz, and the foreign markets of Brasil and Argentina will grow the length of the Eastern network by 150 kilometers. The extension of the network is expected to be completed by April, 2019¹⁶.

Bolivia, alongside Brazil and Peru, has taken the lead in promoting the Bi-Oceanic Railway Corridor that would initially connect all three countries, from the port of Santos, Brazil, on the Atlantic coast, through Bolivia, and to the port of Ilo, Peru, on the Pacific coast. Paraguay has also joined the project and plans to build a feeder line connecting Puerto Carmelo Peralta, Paraguay, with Roboré, Bolivia.

The Bi-Oceanic Railway Corridor is listed as one of the major strategic projects of the Patriotic Agenda 2025 with the view of reactivating and consolidating the railway system and making available an integrated, modern, and sustainable method of transportation for Bolivia. Feasibility studies have been underway since 2014, and estimate project costs to amount to 10 to 14 billion dollars. Agreement by all the countries involved in the project is necessary for it to move forward.

Another important railway project is the Motacucito-Mutún-Puerto Busch feeder line that will extend the Eastern Network by approximately 130 kilometers towards Brazil. This project is currently in the definition stage and is being drawn as an alternative connection to Puerto Busch located in the Dionisio Foianini Triangle along the Paraguay River.

One of the main constraints of railway transport in Bolivia is the lack of connectivity between the Eastern and Western (Andean) Networks, effectively disarticulating the railway corridors between the agricultural and agro-industrial regions of the east from the western markets of Bolivia and the ports on the Pacific coast. While government infrastructure projects have consistently recognized the imperative need for

¹⁶ Construction work began in 2013 and was originally planned to be completed by 2015.

linkage and have estimated the investment to amount to 250 million dollars, no clear progress has been made towards the execution of this project.

Another constraint for railway transport has been the halt of operation of the C-15 feeder line that connects Argentina’s Belgrano Freight railway and Bolivia’s Eastern Network. The rehabilitation of the segment north of the C-15 feeder line is approximately 80 kilometers long and would require the restoration of seven bridges for a total cost of 60 million dollars, 35 million which would be financed by FONPLATA, and 25 million by the Argentine Government. The Ministerial Resolution No. 1033/2018 of November 21, 2018 of the Ministry of Transport of Argentina, however, suspended the International Public Bidding process to rehabilitate the feeder line¹⁷.

Current status, progress and challenges for air transport

The PNDS 2016-2020 establishes the strategic importance of strengthening air transport to promote the economic and social development of intermediate cities, and to further massify transport and integrate remote regions. Since 2014, investments have been focused on the construction, maintenance and provision of equipment to national and international airports. A total of 245,418 square meters of platform and 160,201 square meters of buildings have been constructed between 2014 and 2017, as detailed in the table below:

Table 12: Bolivia: Airport infrastructure built and expanded (In square meters)

Description	Historical Endowment (1)	2014	2015	2016	2017	Total
Platform	194,671	142,764	76,694	25,960	0	440,089
Building	37,668	103,136	45,636	6,148	5,281	197,869

Source: National Statistics Institute of Bolivia (INE)

Note: (1) Infrastructure built and amplified until 2013

Bolivia has four international airports located in the cities of La Paz (El Alto), Cochabamba (Jorge Wilsterman), Chuquisaca (Alcantarí), and Santa Cruz (Viru Viru), and 39 airports of varying characteristics located in the country’s nine administrative departments, some of which operate non-scheduled international flights as in the case of El Trompillo in Santa Cruz, Cap. Oriel Lea Plaza in Tarija, Cap. Aníbal Arab in Cobija, and Chimoré in Cochabamba. The Santa Cruz Viru Viru airport has a landing strip that measures 3,500 meters in length and 45 meters in width, which makes it usable for all airplane sizes. Given its infrastructure and strategic location within Bolivia, Viru Viru is considered Bolivia’s main airport for the distribution of freight and passengers and has made its renovation and conversion into a freight and passenger Hub a priority of the PDES 2016-2020 and the Patriotic Agenda 2025.

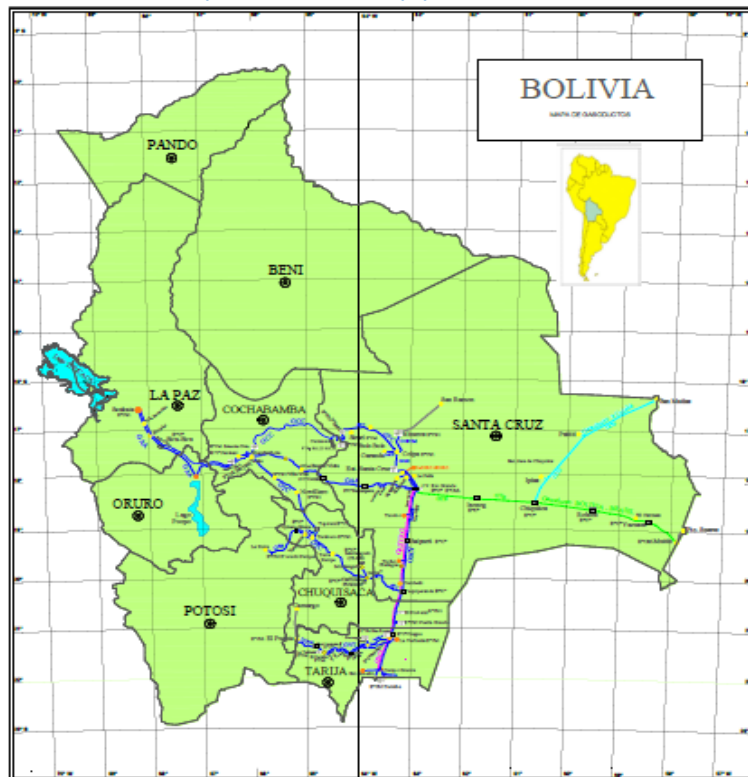
While Bolivia’s central location within South America offers several competitive advantages to consolidate its position as an air transport hub, the main bottleneck resides in securing financial capital to carry out expansion projects, as has been the case with the Viru Viru air terminal hub project that has experienced delays pending the materialization of better financial proposals.

¹⁷ <http://servicios.infoleg.gob.ar/infolegInternet/anexos/315000-319999/316873/norma.htm>

Current status, progress and challenges of pipeline transport

Bolivia is an important producer and exporter of petroleum, natural gas and derivatives. In addition to covering the needs of its internal market, Bolivia has developed a robust pipeline system (gas pipelines, oil pipelines, and multi-purpose pipelines) that covers two-thirds of the territory and seven out of the nine departments. According to Bolivia's National Hydrocarbon Agency (ANH), the country has 2,605.6 kilometers of oil pipelines, 1,512.1 kilometers of multi-purpose pipelines, and 6,133 kilometers of gas pipelines of varying dimensions and capacity, as illustrated in Map 2:

Map 2: Bolivia: Gas pipeline network



Source: National Hydrocarbon Agency of Bolivia (ANH)

Note: The limits and names on this map do not imply official support or acceptance by the United Nations.

Bolivia's gas pipelines transport contracted volumes of gas to Brasil and Argentina, and also cover local demand. The pipelines used to transport gas to Brazil are the Río Grande-Mutún pipeline measuring 557 kilometers, and the San José de Chiquitos-San Matías-Cuiabá pipeline measuring 360 kilometers. The pipelines used to transport gas to Argentina are the Río Grande-Yacuiba pipeline measuring 441 kilometers, and the Juana Azurduy Integration pipeline measuring 13 kilometers on Bolivian soil.

Bolivia also exports liquefied petrol gas (LPG) to Peru and Paraguay. These exports are currently being transported by tanker trucks, yet planning is under way to construct two pipelines, one towards each country. In the case of Paraguay, the pipeline is projected to transport up to 4 million cubic meters of LPG per day through the Bolivian and Paraguayan Chaco regions.

Gas and multi-use pipelines provide important national coverage for the distribution of liquid hydrocarbons throughout the country, with the exception of the departments of Beni and Pando located in the north of Bolivia, which is supplied through road and river tankers. In early 2016 the virtual pipeline system was inaugurated, which includes a liquefied natural gas plant, a fleet of cryogenic cisterns, a mobile regasification plant, and satellite regasification stations to supply areas of the country that conventional gas pipelines do not reach.

A natural gas purchase agreement was signed between YPFB and Petrobras in 1996 for a 20-year duration, from 1999 to 2019. This contract initially established the shipment of 16 million cubic meters per day of natural gas and was expanded following two addendums to reach the maximum contractual sales volume of 30.08 million cubic meters per day, currently in force. In 2006, a contract for the supply of natural gas and a bilateral energy integration framework agreement between ENARSA and YPFB, companies of Argentina and Bolivia respectively, were signed for a 20-year period. Under this agreement, YPFB progressively supplies 27.7 million cubic meters per day of natural gas, under the following modality: 7.7 million cubic meters per day in 2007 and 2008, 16.0 million cubic meters per day in 2009 and 27.7 million cubic meters per day from 2010 to 2026.

2.2.2. Review of transport connectivity in Paraguay

Paraguay has also focused on expanding its transport infrastructure with the objective of strengthening internal linkages and increasing connectivity with neighboring transit countries and markets overseas. Paraguay's principal means of connectivity are road and inland water transport which links the country with the ports of Paranaguá, Brazil, Buenos Aires and Rosario, Argentina, and Nueva Palmira and Montevideo, Uruguay. The National Development Plan "Paraguay 2030" has set clear priorities to enhance infrastructure development in all sectors. The country has consequently been making public investments in transport infrastructure, as detailed in Table 13 below:

Table 13: Paraguay: Public investment in transport infrastructure (2014-2016)

Type	2014		2015		2016	
	USD (millions)	% of GDP	USD (millions)	% of GDP	USD (millions)	% of GDP
Air	10.89	0.04	12.48	0.05	6.92	0.03
Road	690.84	2.80	514.54	2.03	572.53	2.17
Railway	0	0	0	0	0	0
Inland waterway and maritime	5.15	0.02	3.90	0.02	13.80	0.05
Total	706.89	2.86	530.92	2.10	593.25	2.25

Source: Elaborated by the authors on the basis of data obtained from INFRALATAM (<http://infralatam.info/>), 2019

Public investment in infrastructure has oscillated between 2.1% of GDP to 2.86% of GDP during the period under review. In 2016, this represented a total value of just under US\$600 million, a large proportion of which was concentrated in road infrastructure (97%).

Current status, progress and challenges in road transport

Paraguay has road network measuring 75,120 kilometers in length, amounting to 3,616 kilometers of national roads, 13,838 kilometers of departmental roads, and 57,660 of rural feeder roads. Between 2013¹⁸ and 2017 the road network expanded by a total of 42,913 kilometers, with the addition of 42,484 kilometers of rural feeder dirt roads, and 1,309 kilometers of paved and concrete roads. The composition of the road network has shown an increase in the share of dirt roads, from 75% in 2013 to 89% in 2017, and a reduction in the share of paved and concrete roads, from 17% in 2013 to 9% in 2017, as a result of the expansion of the dirt rural feeder road network.

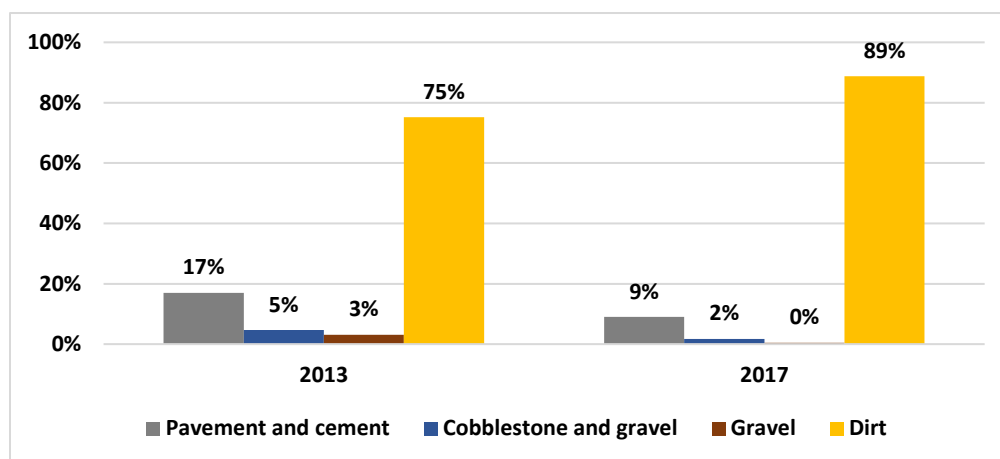
¹⁸ Given that 2014 road network data is not available, comparative analysis is based on 2013 data.

Table 14: Paraguay: Evolution of the road network, 2013 - 2017 (In Kilometers)

Description	2013	2017	Variation
Paved	5,459.16	6,768.00	1,308.84
National	2,956.64	3,199.00	242.36
Departmental	2,502.52	3,496.00	993.48
Rural Feeder Road	0.00	73.00	73.00
Cement	14.96	15.00	0.04
National	14.96	15.00	0.04
Cobblestone	9.72	26.00	16.28
Departmental	9.72	26.00	16.28
Gravel	1,504.39	1,289.00	-215.39
Departmental	946.67	656.00	-290.67
Rural Feeder Road	557.72	633.00	75.28
Gravel / Dirt	1,012.48	331.00	-681.48
Departmental	286.31	252.00	-34.31
Rural Feeder Road	726.17	79.00	-647.17
Dirt	24,206.71	66,691.00	42,484.29
National	656.91	402.00	-254.91
Departmental	10,927.67	9,408.00	-1,519.67
Rural Feeder Road	12,622.13	56,881.00	44,258.87
Total	32,207.42	75,120.00	42,912.58

Source: Elaborated by the authors on the basis of data from the National Logistics Plan of Paraguay 2013, and public data of the Ministry of Public Works and Communications (MOPC).

Figure 5: Paraguay: Characteristics of the road network per year



Source: Elaborated by the authors on the basis of data from the MOPC of Paraguay

Density indicators, expressed in the length of the road network per 100 square kilometers of territory, show a substantial increase between 2013 and 2017: the overall road network jumped from 7.9 to 18.5 km/100km² as a result of the large expansion of dirt rural feeder roads; the paved and concrete road network increased from 1.35 to 1.67 km/100km² during the same period. Further, the length of the road network per number of inhabitants follow the same trend, with the overall road network jumping from

4.9 to 10.8 km /1,000 inhabitants, and paved roads from 0.83 to 0.98 km/ 1,000 inhabitants between 2013 and 2017, as outlined in table 15 below:

Table 15 : Paraguay: Evolution of road density, 2013-2017 (In km/100 km2)

Description	2013	2017
Total km road	32,207	75,120
Total km paved road	5,474	6,783
km2 territory	406,752	406,752
Total inhabitants	6,559,027	6,953,646
km total/100 km2	7.9	18.5
km paved/100 km2	1.35	1.67
km total/1,000 inhab	4.9	10.8
km paved/1,000 inhab	0.83	0.98

Sources: Elaborated by the authors on the basis of data from the MOPC and the Directorate-General of Statistics, Surveys and Census of Paraguay.

The development of paved roads in recent years has improved connectivity, even if the quality of the road surface is moderate. Road development is uneven and concentrated in certain parts of the territory where population density and economic activity require greater coverage and access levels. The road network is primarily unpaved, and rural feeder roads are generally open paths in the bush that are used to transport agricultural production from the farming fields to the storage silos. During the rainy season, these roads become impassable and result in cost increases and delays along the logistics chain.

During the harvest season (March through May), transport moves from the production areas of the east to the grain ports located on the banks of the Paraguay river in the west, creating significant congestion along roadways, posing danger to smaller vehicles and passenger vehicles, and further damaging road surfaces as a result of the weight of freight being transported.

Current status, progress and challenges of inland water transport

Paraguay gains access to the Atlantic coast through the Paraguay and Paraná rivers, which connect two primary ports along the Plata river: Buenos Aires and Montevideo. The intersection of both rivers forms the Paraguay-Paraná Waterway (PPW) which is Paraguay's primary import and export channel. Measuring 3,442 kilometers, the PPW begins at Puerto de Cáceres in Brazil and travels all the way to the port of Nueva Palmira in Uruguay. The maritime ports of entry and exit from products are those of Montevideo and Nueva Palmira (Uruguay) and Buenos Aires (Argentina) through the PPW, and the port of Paranaguá (Brazil) by land.

Several agreements to develop and facilitate inland water transport were signed as part of the Cuenca del Plata Treaty (23/04/69), the main intergovernmental treaty that authorizes inland water transport on the Paraguay and Paraná rivers. One of these agreements is the *Acuerdo de Transporte Fluvial por la Hidrovía Paraguay-Paraná*,¹⁹ which sets itself apart due to the important number of actions and coordinated measures it contains pertaining to inland water transport.

¹⁹ <http://www.hidrovia.org/userfiles/acuerdo-de-transporte-fluvial-por-la-hpp.pdf>

Two hydroelectric power plants are located on the 850 kilometer stretch of the Paraná river in Paraguay: Yacyretá, located 225 kilometers from the mouth of the Paraguay river and which has a navigation lock, and Itaipú, located 700 kilometers from the mouth of the Paraguay river. The navigability of the Paraná river is restricted by the reservoir of the Binacional Itaipú dam, which does not have a continuous river corridor that would enable connectivity between the Tieté basin and the Alto Paraná. The navigation lock at the Binacional dam of Yacyretá between Argentina and Paraguay faces the same problem, enabling the passage only of small containers.

Map 3: Paraguay – Paraná Waterway



Source: ECLAC and FONPLATA (2018)

Note: The limits and names on this map do not imply official support or acceptance by the United Nations.

Paraguay has 51 privately-owned ports and three state-owned ports (Asunción, Encarnación y Pilar). Paraguay's major ports are found along the Paraguay river between Concepción and Villeta, and the country's main grain exporting ports are found along the Paraná river. Between 2011 and 2018, five new privately-owned ports have been built²⁰ as a result of the creation of incentives for private investment established by Law No. 419/1994 of December 8, 1994²¹, which authorizes and establishes the legal framework for the construction and operation of private ports. A marked rise in the construction of ports started in 2003 as a result of the rise in grain exports, particularly soybeans. Paraguay's merchant fleet has expanded progressively, and in 2018 it possessed 2,294 units equipped for inland water transport, of

²⁰ Source: National Logistics Plan "Paraguay 2013", Table 4: List of Ports in Paraguay (2011).

²¹ http://www.mic.gov.py/mic/site/comercio/dgcs/pdf/ServiciosConstruc_y_Servicios/ley419.pdf

which 171 were tugboats and 2,006 were barges.²² The Paraguayan fleet also meets the regional inland water transport needs for Bolivian and Brazilian imports and exports.

One of the main problems of inland water transport along the Paraguay and Paraná relate to its navigation condition. Overcoming the lack of depth and deficient signalization in areas of the river would enable transport to occur year-round both during the day and at night. A study conducted by the Hidroservice-Louis Berger-EIH Consortium,²³ cited in numerous publications, has identified 37 sandy passages, 7 well-known rocky passages, and 11 curves with reduced radii. Such natural restrictions on navigation force convoys to reduce their drafts, and fraction barge convoys when approaching tight curves. Seasonal low water volumes along the PPW, which are prevalent during four months of the year, also significantly impact transport times and costs, imposing what is known as a Low Water Fee on transport.

Integrated and definitive solutions to address these naturally-occurring limitations require significant financial resources, and most importantly the involvement of all the countries along the PPW, which has not materialized to date. The most important improvements along the PPW have been carried out by individual countries and have mostly consisted in dredging and signposting efforts.

Congestion in transshipment ports, notably in Buenos Aires, also creates bottlenecks. While alternative ports of Montevideo and Nueva Palmira could help to alleviate the congestion, shipping companies continue to prefer the port of Buenos Aires.

Current status, progress and challenges in rail transport

Paraguay's railway system is very limited. Originally composed of a 400 kilometers network connecting the cities of Asunción and Encarnación, the construction of the Binational Yacyretá dam in the 1990's forced the destruction of a large majority of tracks, leaving only a six-kilometer segment of 1.435mm gauge operational. This segment connects the grain loading platform in Encarnación with the Argentine railway network. The grain platform is mostly used to export Paraguayan soybean through Argentinean and Brazilian ports.

²² Source: *Estadísticas fluviales y aspectos institucionales en países de FONPLATA*, Republic of Paraguay- ECLAC and FONPLATA (2018). Note: The Directorate General of the Merchant Navy has a total of 3,937 registered units, of which 2,294 are operational to perform inland water transport service.

²³ The International Commission of the Paraguay-Paraná Waterway, in collaboration with the Inter-American Development Bank, commissioned the basic survey of the PPW with the Hidroservice-Louis Berger-EIH Consortium in 1996.

Current status, progress and challenges in air transport

The National Directorate of Civil Aeronautics of Paraguay (DINAC) has a total of 28 registered airports, six of which operate international flights²⁴. However, only two airports *Aeropuerto Internacional Silvio Pettrossi* and *Aeropuerto Internacional Guaraní* operate regularly scheduled commercial flights responsible for the bulk of international travel: The past years have witnessed a rise in air traffic in both of these major airports, as passenger volumes and import freight have increased

Teniente Amín Ayub airport in the city of Encarnación is another international airport which began operations in 2013 to replace the old airport flooded by the waters of the Paraná river upon completion of the Binational Yacretá dam; other paved airports are also found in Itaipú, Concepción, Vallemí, Pilar, Ayolas, and Pedro J. Caballero, in the western part of the country, and Mariscal Estigarribia, in the east.

Paraguay's favorable weather conditions and flat topography allows the network to maintain a 98% operational level, allowing it to leverage its strategic and equidistant location among South America's principal cities.

2.2.3. Primary funds to develop and maintain economic and services infrastructure

Investment in economic and services infrastructure is particularly significant and generally embodied by large-scale projects requiring a long maturation process. As a result, different types of financing have emerged. Table 16 illustrates the amount of investment made in economic and services infrastructure by Bolivia and Paraguay during the period under review. In Bolivia, the volume of investment in economic and service infrastructure as a percentage of GDP has increased, representing an average of 9.05% between 2014 and 2016. In the case of Paraguay, this figure has decreased, representing an average of 5.06% during the same period.

Between 2013 and 2016, Bolivia invested an annual average of 8.34% of GDP on infrastructure, and Paraguay invested an annual average of 5.46% of GDP. Analyzing these figures through the lens of the investment parameters established by ECLAC (Perrotti and Sánchez, 2007), both countries are demonstrating clear efforts to improve their economic and services infrastructure. When comparing these investment levels with ECLAC's referential figures, Bolivia is currently investing at levels that would enable it to close the infrastructure gap, while Paraguay would need to bridge an investment gap equal to 2.34% of GDP to close the horizontal gap.

²⁴ Publication on Aeronautical Data Paraguay" (DINAC), available at:
http://www.dinac.gov.py/downloads/AIP_PY_WEB_AMDT_NR47_2018.pdf

Table 16: Bolivia and Paraguay: Investment in economic and services infrastructure (2014 – 2016)

Description	2014		2015		2016	
	USD (millions)	% of GDP	USD (millions)	% of GDP	USD (millions)	% of GDP
Bolivia	1,879.47	7.68	2,162.53	8.43	2,956.12	11.04
Public Investment	1,810.17	7.40	2,162.53	8.43	2,956.12	11.04
Water	348.00	1.42	412.11	1.60	348.50	1.30
Energy	212.90	0.87	310.18	1.21	868.97	3.25
Telecommunications	34.22	0.14	19.57	0.08	82.15	0.31
Transport	1,215.05	4.97	1,420.67	5.54	1,656.50	6.18
Private Investment	69.30	0.28	0,00	0.00	0.00	0.00
Telecommunications	69.30	0.28	0,00	0.00	0.00	0.00
Paraguay	1,662.22	6.73	1,117.92	4.42	1,066.19	4.04
Public Investment	1,519.72	6.15	1,117.92	4.42	1,066.19	4.04
Water	32.57	0.13	31.89	0.13	39.77	0.15
Energy	780.27	3.16	555.11	2.19	433.17	1.64
Telecommunications						
Transport	706.89	2.86	530.92	2.10	593.25	2.25
Private Investment	142.50	0.58	0.00	0.00	0.00	0.00
Telecommunications	142.50	0.58	0.00	0.00	0.00	0.00

Source: Elaborated by the authors on the basis of data from INFRALATAM (<http://infralatam.info/>)

To close the infrastructure gap and successfully implement the Vienna Programme of Action, investment levels in both countries must be sustained, thus all sources of infrastructure financing must be considered including public-private partnerships, official development assistance, and innovative sources of financing. In Bolivia and Paraguay, infrastructure development has traditionally taken place through conventional sources of financing, notably through public sector regular budgets and/or multilateral and bilateral development organization loans. Listed below are some of the conventional sources of financing for public sector projects:

- **Internal Resources:** Resources drawn from the public budget, managed by central and sub-national governments, and that are transferred to sub-national entities or public companies to finance construction work. The public budget is composed of revenues from taxes, fees, patents, the sale of goods and/or services, and royalties.
- **External Resources:** Resources obtained from Multilateral Financing Organizations, International Cooperation Agencies, Foreign Governments and Foreign Government Financial Institutions (Bilateral Organizations), Commercial Banks, Foreign Private Lenders, or by issuing Sovereign Bonds or Treasury Bills on the national and/or international markets. Resources are then transferred to public sector entities and companies to finance public investments.
- **Other financing mechanisms** have been used, but on a limited scale. In Bolivia and Paraguay more than 50% of external loans are earmarked for economic and services infrastructure projects.

In Bolivia, the main multilateral organizations whose loans make up 66.1% of the country's external public debt are the IADB, the CAF, the World Bank and FONPLATA. Bilateral lenders including the People's Republic of China, France, Germany, South Korea, Brazil and Spain, financed 10.9% of the debt. During the 2018 fiscal, Bolivia also obtained private financing by Danske Bank S.A. of Denmark to build three wind energy plants in Santa Cruz. Debt Securities were also issued through three sets of sovereign bonds in 2012, 2013, and 2017 respectively, for a total amount of \$US 2 billion, representing 20.1% of total debt. Other types of financing include the International Monetary Fund Special Drawing Right (SDR), and the assignment of Sucres, Andean Pesos, and deposits from international organizations such as IBRD, IADB, IDA, FONPLATA, IMF, and MIGA.

Paraguay's Multilateral Organization lenders are similar to those of Bolivia, and their loans make up 41.6% of external debt. The IADB has been the largest lender in recent years, representing 22% of debt, followed by IBRD, CAF, and FONPLATA. Bilateral lenders financed 3.8% of the country's overall external public debt, with Japan, Taiwan, Spain, and Germany providing most of this financing. Commercial Banks and private providers make up 54.6% of the total debt. Paraguay also successively released Treasury Bonds each year between 2013 and 2018 for a total value of \$US 3.41 billion.

Table 17: Medium- and long-term external public debt balance

Type of Lender	Bolivia (1)		Paraguay (2)	
	USD Millions	%	USD Millions	%
Multilateral	6,574.2	66.1%	2,596.1	41.6%
Bilateral	1,083.6	10.9%	235.9	3.8%
Private	21.4	0.2%	0.0	0.0%
Debt securities	2,000.0	20.1%	3,410.0	54.6%
Other	265.7	2.7%		0.0%
Total	9,944.9	100.0%	6,242.0	100.0%

Source: Elaborated by the authors on the basis of data issued by the Central Bank of Bolivia and the Central Bank of Paraguay

Note: (1) Balance as of 2018/11/30 - (2) Balance as of 2018/09/30

2.2.3.1 Financing economic infrastructure through public-private partnerships

Currently Bolivia does not have a regulatory framework for Public-Private partnerships, which could be an alternative mechanism to build economic infrastructure. A legal instrument to enable the concession of public works, Law No. 1874 of June 22, 1998, is in effect, yet despite its existence no transport public work concession has ever been granted to date. The concretion of two projects were assessed under this regulatory framework but were not approved for different reasons: the improvement of the roadway between “Pailón – Los Troncos” in 2001, and the construction of the Motacusito – Mutún – Puerto Busch railway in 2005.

Paraguay, on the other hand, has developed alternative financing modalities to complement traditional financing with the aim of encouraging and boosting public investment in essential infrastructure. These alternative financing modalities are expected to give sustained dynamisms to the economy. Paraguay has created the following legal regulations to this end:

- Law No. 1618/00 on “Concessions for Public Works and Services” under the Public Bids regulatory framework. The Law defines a Concession as a “legal act under public law, by virtue of which the three powers of the State, departmental governments or municipal governments contractually delegate through a concession won through public bidding, the faculty to deliver a service or carry out construction for general use. All concessions will be granted for a set period of time during which the concessionaire will reimburse and pay their investment.”
- Law No. 5102/13 on the “Promotion of Investment in Public Infrastructure, and the Expansion and Improvement of State Goods and Services” better known as the “Law of Public-Private Partnerships,” (PPP) and its amendment, Law No. 5567/16 which ensures that congress receives a semi-annual report. Law 5102/13 is regulated by Decree 1350/14.
- Law No. 5074/13, that modifies and expands Law No. 1302/98 which "establishes special and complementary conditions to Law No. 1045/83, which creates the Public Works System", better known as "Key in Hand Projects," regulated by Decree No. 2283/14.

These norms have enabled the following infrastructure projects to be added to the project portfolio:

- Under Law 5074/13, the project to asphalt 47.2 km of the San Cristóbal - Naranjal – Paso route in the department of Alto Paraná was adjudicated.
- Under Law 5102/13 (PPP Law), the contract for the adjoining of routes 2 and 7 was concluded.

Under the PPP Law, the following projects have also taken off:

- Design and construction of the access road leading to the second bridge over the Paraná river in the district of Presidente Franco, Mina Guazú, and Cedrales (Department of Alto Paraná);
- The bi-oceanic corridor. This road paving project aims to provide favorable conditions for production and transportation along the roadway that connects with Porto Murtinho and BR 267 in Brazil.
- The construction of a sewer system and wastewater treatment plant for the Yukyry creek;
- The construction of sewer systems and wastewater treatment plants for the Lambaré, Luque, and Mariano Roque Alonso basins, located in cities bearing those names.

- The (South) Waterfront road. Construction of 7.9km of coastal highway and the construction of 5,000 housing units to relocate families.

Records of private sector initiatives under Law No. 1618/00 “Concessions for Public Works and Services” include:

- The holistic rehabilitation and operation of the Paraguairí – San Salvador and San Salvador – Abaí railway segments; and
- The construction of infrastructure, the provision of rolling stock, and launch of the Artigas-Encarnación railway segment in the Department of Itapúa, to connect with the Urquiza railway crossing into Argentina at the bimodal San Roque González de Santa Cruz bridge.

With the support of the World Bank, a consultancy was carried out in 2010 to assess how a concession could improve navigability along the Paraguay river. The report²⁵ provides an overview of all the technical, financial, regulatory and procedural aspects necessary to develop a model that would grant a concession in i) the territory exclusively under jurisdiction of Paraguay, between the mouth of the Apa river (km 2,172.3) and Pilcomayo river (km 1,618), and ii) under the joint jurisdiction of Paraguay and Argentina between the mouth of the Pilcomayo river (km 1,618) and the city of Formosa (km 1,448).

2.2.3.2 South-South and Triangular Cooperation: A closer look at the potential benefits of the expansion of China’s Belt and Road Initiative in South America

South-South Cooperation and Triangular Cooperation, which support the political, economic, social, cultural and environmental cooperation between two or more developing countries, are increasingly important instruments to achieve the 2030 Agenda for Sustainable Development and have become important pillars of action to open new economic opportunities for landlocked developing countries. As described by the United Nations Office for South-South Cooperation “recent developments in South-South cooperation have taken the form of increased volume of South-South trade, South-South flows of foreign direct investment, movements towards regional integration, technology transfers, sharing of solutions and experts and other forms of exchanges.”²⁶ Fundamentally it holds great potential for harnessing developing countries’ capital, natural, and human resources to overcome developmental challenges.

In the aspiration of landlocked countries to improve their integration in global value chains, one of the most significant and broadest reaching South-South Cooperation initiatives in recent years has been spearheaded by China through its ambitious undertaking aimed at increasing physical and financial connectivity between China and its partners by focusing on the construction of new infrastructure and the mainstreaming of transport to strengthen economic ties and trade across countries and regions. In its initial vision “One Belt One Road” unveiled in 2013, China set its ambition on reviving and upgrading the ancient Silk Road Economic Belt and creating a XXI century Maritime Silk Road focused on Eurasian continental ties.

²⁵ <http://documentos.bancomundial.org/curated/es/348461468285001370/pdf/690050pt020and030ESW0P122325000PUBLIC0.pdf>

²⁶ United Nations Office for South-South Cooperation (2019)

During the same year, President of the Plurinational State of Bolivia, Evo Morales, conducted an official visit to China where he discussed the possibility of improving infrastructure linkages and market access with his counterpart, President of the People's Republic of China, Xi Jinping, through the construction of a bi-oceanic railway corridor that crosses the South American continent and connects the Atlantic and Pacific coasts. With the idea of providing an alternative to current maritime shipping routes through the Panama Canal and around Cape Horn, such a corridor has the potential to improve connectivity for the economies of Bolivia, Paraguay, as well as inland neighboring territory, with global trade networks by reducing the transit time and cost for goods to reach international markets, notably the Asia-Pacific markets, and more specifically the Chinese market.

The framework is now referred to as the “Belt and Road Initiative” (BRI) and has evolved to include a more expansive reach to establish a broader network of linkages that includes Latin American countries. During the first ministerial meeting of the Forum of China and the Community of Latin American and Caribbean States (CELAC, for its Spanish and Portuguese acronyms) held in Beijing in January 2015, Mr. Jinping announced that during the five-year period between 2015 and 2019 China aimed to achieve \$500 billion in trade and \$250 billion in direct investment with the Latin American and Caribbean region.²⁷ BRI would be an important vehicle for such investments in the region.

Flows of foreign direct investment from China to Latin America have grown exponentially in the last ten years, with cumulative flows reaching over US\$110 billion distributed across sectors.²⁸ Given fall in commodity prices around 2015, large investments in the Latin American extraction sector experienced a decline and gave way to a rise in investments aimed at the services sector which comprise areas such as transportation, distribution and logistics.²⁹ According to the 2018 edition of ECLAC's flagship publication *Foreign Direct Investment in Latin America and the Caribbean*, 5% of China's overall Foreign Direct Investment (FDI) announcements in 2016-2017 were aimed at the LAC region, 20% of which were in the transport sector, and the remaining 80% in energy.³⁰

Bolivia has been at the forefront on leveraging FDI for infrastructural projects, and has been a promoter of the bi-oceanic railway corridor project. Under the Initiative for the Integration of the Regional Infrastructure of South America (IIRSA) and its Council for South American Infrastructure and Planning (COSIPLAN) a number of competing proposals have taken shape, notably:

- The *Antofagasta – Salta – Paranaguá – Santos* bi-oceanic railway corridor that cross through Chile, Argentina, Paraguay and Brazil respectively; and
- The Central bi-oceanic railway corridor originating in the Atlantic coast in Santos, Brazil, crossing into Bolivia at Puerto Suárez, passing through the Bolivian city of Santa Cruz de la Sierra and further westward to the Peruvian border, finally reaching the Pacific coast at Ilo, Peru.

In more recent years, and largely through Bolivia's lead, the Central bi-oceanic railway corridor has emerged as the proposal with most steam. In July 2017 the COSIPLAN Railway Integration Working Group held a meeting where delegations from Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana,

²⁷ Dollar, D. (2017)

²⁸ Avendano, R., Melguizo, A. and Miner, S. (2017) p. 6

²⁹ Ibid

³⁰ ECLAC (2018) Foreign Direct Investment in Latin America and the Caribbean 2018. P. 30

Paraguay, Peru and Uruguay, along with railway and consulting firms, and the COSIPLAN-IIRSA Technical Coordination Committee gathered to discuss railway connectivity projects of which the Bi-Oceanic railway corridor remains one of the most prominent, particularly as a tool to engage and unleash the economic potential of landlocked developing countries and inland regions at the heart of South America which are currently prolific agricultural territory.³¹ While the railway is not stipulated to pass through Paraguay, discussions of integrating the country through a railway branch from Puerto Carmelo Peralta (Paraguay) to Roboré (Bolivia) is under study, thus making Paraguay's import and export sectors potential beneficiaries of the bi-oceanic railway. In addition, Paraguay aims to benefit from its participation in a complementary corridor, the Bi-Oceanic Roadway connecting the Atlantic and Pacific coasts through Brazil, Paraguay, Argentina, and Chile to markets beyond.

Infrastructure investment through the BRI and Chinese FDI holds great potential for Bolivia and Paraguay's economies to continue expanding their global trade presence and intensify trade with China. According to World Bank figures, in 2017 China was Paraguay's top import partner, with Paraguay importing US\$ 3.671 billion worth of Chinese goods, or an import partner share of 30.92%. The same year, Paraguayan exports to China amounted to US\$27.6 million, a fivefold increase from the year 2000, representing an export partner share of 0.32%.³² In 2017, Bolivia's top import partner was also China with US\$ 2.027 billion worth of goods being imported annually, representing 21.79% of Bolivian import shares. The same year, Bolivia's total exports to China represented US\$ 401.39 million, more than a 72 time increase from the year 2000, representing an export partner share of 5.11%.³³ Beyond the opportunities of increasing its presence in the Chinese market, the railway corridor has the potential of further opening up the Pacific and intensifying trade with Asia-Pacific in general. Over the years countries between the two regions have become important trading partners, with trade growing at an annual average rate of 20.5% since 2000, reaching a historic high of over US\$500 billion dollars in 2014, and which is projected to reach US\$750 billion by 2020.³⁴

For such infrastructural integration projects to yield greater market access, increase competitiveness and intensify Bolivia and Paraguay's regional and international trade, fundamental cooperation and transit facilitation issues are paramount. One of the key components to improve transit facilitation is improving customs procedures to ensure goods transit more efficiently through borders. According to the United Nations Global Survey on trade facilitation and paperless trade, Bolivia's implementation rate reached 31% of the maximum score in 2015, while Paraguay achieved 71% of the maximum score, indicating there is room for improvement. On the upside, by 2017 Paraguay's score had increased 8 percentage points, reaching 79% (data for Bolivia is not available for 2017)³⁵.

In addition to being a fundamental issue for landlocked countries whose goods are inevitably required to cross borders and customs in order to access ports, ECLAC's 2017 Trade Facilitation Report indicates that improving customs procedures can further encourage the internationalization of certain local firms that do not currently export, which in turn can promote export diversification for countries in the region that

³¹ IIRSA COSIPLAN (2017)

³² World Bank WITS (2019)

³³ World Bank WITS (2019)

³⁴ ECLAC (2018) The transport of natural resources, p. 9

³⁵ ECLAC Trade facilitation reports 2015 and 2017

are generally characterized by a high concentration of commodities.³⁶ Bolivia and Paraguay both fit this description. According to the Massachusetts Institute of Technology's Observatory of Economic Complexity, in 2017 Bolivia's top exports were Petroleum Gas (US\$2.59B), Zinc Ore (US\$1.34B), Gold (\$US1.04B), Precious Metal Ore (US\$521M), and Soybean Meal (US\$444M), while Paraguay's top exports were Soybeans (US\$2.19B), Soybean Meal (US\$741M), Frozen Bovine Meat (US\$592M), Bovine Meat (\$US577M), and Soybean Oil (US\$482).

Bolivia and Paraguay have both signed various regional agreements on transit and trade facilitation that greatly benefit and expedite trade across borders, notably the Latin American Integration Association (ALADI), the Common Market of the South (MERCOSUR), the Pacific Alliance, the Andean Community (AC) and the Paraguay-Paraná Waterway Programme (PHPP). For example, the AC "has a well-developed legal framework for transit facilitation matters that is of a supranational character. There is a common regulatory framework in place that governs transport of goods from a point of origin to a final destination, and all borders in between, when those points lie within the boundaries of AC member states. Moreover, the AC has adopted a Single Customs Document based on recommendations of the Kyoto Convention of the World Customs Organization."³⁷ These institutional agreements not only help facilitate trade, but can serve as determining factors in attracting foreign investment, such as China's BRI, in the first place given that it provides investors with a degree of assurance that following completion of projects, goods will flow more freely between countries thus yield more tangible economic benefits for all parties involved.

The possibility of fostering south-south cooperation through Chinese investment in infrastructure and transport projects has the potential to improve connectivity for Bolivia and Paraguay's economies and advance four Vienna Programme of Action priority areas, notably Priority 2: Develop transport infrastructure, Priority 3: Strengthen international trade, Priority 4: Regional integration and cooperation, and Priority 5: Structural economic transformation. The cross-border nature of the bi-oceanic railway corridor project is what holds both its greatest promise and challenge, that of requiring countries of the regions to mutually agree upon a unified project that may be presented for negotiation with BRI players that have pledged money but have yet to invest it. The empirical evidence of the region's success in negotiating regional trade and transit agreements, listed in greater detail in section 5.1.1, indicate that such a challenge is within reach.

2.2.3.3 Capacity for the development of regional infrastructure projects

Investments in infrastructure are made to drive solid and well-designed projects that can be firmly backed by governments, development institutions and private sector investors. In general, infrastructure projects require sizable investments and substantial efforts to prepare and execute over the span of many years. Improving performance in the implementation of such projects requires capacity building.

The capacity to carry out investment projects can be assessed by observing the IIRSA/COSIPLAN project portfolio and the stages of implementation of projects that compose it. Projects in this portfolio are listed according to stage of the life cycle in which they find themselves, which are divided as follows:

³⁶ ECLAC (2017) Trade facilitation report, p. 12

³⁷ ECLAC (2017) Trade facilitation report 2017 pg. 45

- Profiling: At this stage, background information is studied in order to assess the suitability and technical and economic feasibility of implementing the project idea.
- Pre-Execution: This stage includes projects in the following phases: (i) Pre-feasibility: In this phase, the alternatives regarded as the most convenient at the profiling stage are thoroughly examined. This analysis includes, among other elements, the factors that impact on the feasibility and on the investment return of such alternatives. (ii) Feasibility: The feasibility study must involve a detailed and accurate analysis of the alternative that was deemed feasible in the previous phase. This phase also includes the examination of all the aspects related to the physical works, the investment spending program, and project start-up and development. (iii) Investment: This phase includes two aspects: i) Financing, which involves all the actions, formalities and other activities aimed at securing the funds necessary to finance the investment; and ii) Engineering study, consisting of a series of detailed studies for the construction, erection and commissioning of the works.
- Execution: It refers to the set of activities required for the physical construction of the project, such as contract conclusion, purchase and set up of machines and equipment, miscellaneous installations, etc.
- Completed: This stage involves the entire completion of the physical work (for instance, if the work includes several sections and one or more of them have not been completed, the project will be considered in execution until the entire work is completed).

As of December 2017, 502 projects compose the IIRSA/COSIPLAN project portfolio, for a total estimated investment value of 198.90 billion dollars. Of these projects, 41.5% were in the Profiling and Pre-Execution phases, 31.3% were in Execution, and 27.2% were Completed³⁸, illustrating the challenges and capacity needed to carry out such infrastructure projects in the region.

Between 2012 and 2017, projects that involved Bolivia and/or Paraguay increased on average by 3.748 billion dollars per year, of those 65% pertained to Bolivia, and 35% to Paraguay, further demonstrating the importance both countries place on strategic integration project development. During this time period both countries evolved at a relatively similar pace, with less than 7% of projects classifying as Completed, just under 20% in Execution, and the remaining 74% to 77% in Pre-Execution or Profiling stages. Lower levels of performance in project execution in Bolivia and Paraguay compared to the average of South American countries illustrate the challenges and capacity gap experienced in both countries.

In 2017, Bolivia was in the process of implementing 52 infrastructure projects, and Paraguay 64 infrastructure projects under the IIRSA COSIPLAN portfolio. Table 18 and Figures 6, 7, and 8 detail the stages and progress of these projects, including progress as a percentage of investment, and as a percentage of the total number of projects.

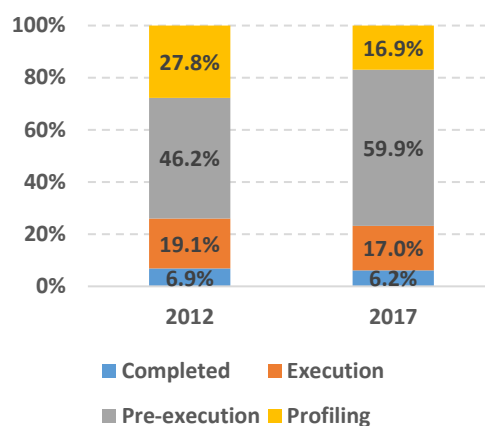
³⁸ Source: IIRSA/COSIPLAN (2017) – Project Portfolio 2017

Table 18: Degree of progress in project execution (millions of dollars)

Description	Bolivia		Paraguay		Total	
	2012	2017	2012	2017	2012	2017
Total Portfolio	7,392	19,612	11,858	18,380	19,250	37,992
Completed	13	342	1,308	1,997	1,321	2,339
Execution	2,218	4,112	1,467	2,360	3,685	6,472
Pre-execution	2,469	9,499	6,430	13,266	8,899	22,765
Profiling	2,693	5,659	2,653	757	5,345	6,416

Source: 2012 Data: Pérez-Salas, Sánchez and Wilmsmeier (2014).
2017 Data: IIRSA/COSIPLAN Project Portfolio 2017

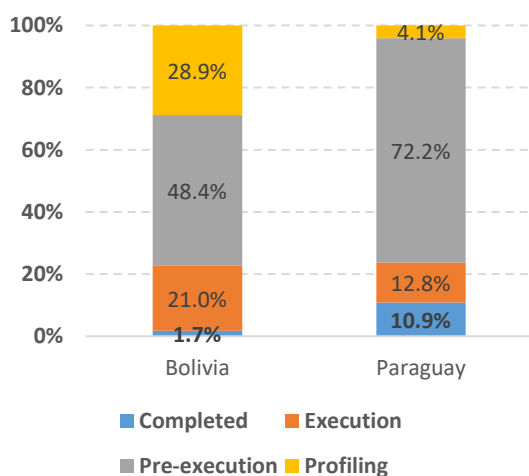
Figure 6: Degree of progress in project execution in Bolivia and Paraguay (percentage of total investment)



Source: 2012 Data: Pérez-Salas, Sánchez and Wilmsmeier (2014). 2017 Data: IIRSA/COSIPLAN Project Portfolio 2017

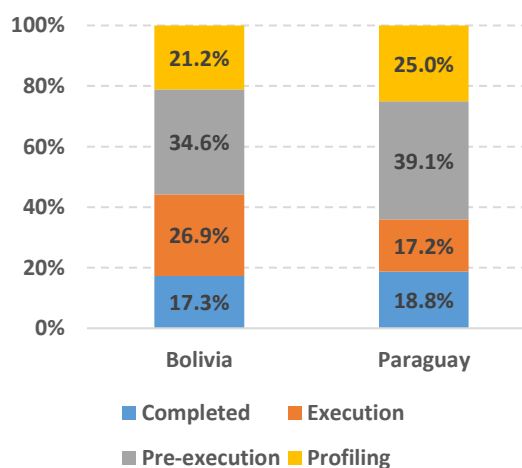
International development institutions assist in the analysis and proposal of measures and policies to bridge the capacity gap observed in many countries, particularly developing countries, in order to improve performance in the implementation of infrastructure project. Improving governance and strengthening the capacity of governments in logistics infrastructure and the design and implementation of sustainable infrastructure will promote changes in policies and regulations and lead to improved coordination among State, private and civil society actors. Fostering political dialogue and providing technical assistance to strengthen institutions are key to this process.

Figure 7: Degree of progress in project execution in 2017 (percentage of investment)



Source: IIRSA/COSIPLAN Project Portfolio 2017

Figure 8: Degree of progress in project execution in 2017 (percentage of total number of projects)



Source: IIRSA/COSIPLAN Project Portfolio 2017

Given the magnitude and complexity of the complementary work required to advance viable projects in the world's poorest countries, the IADB recommends additional support and investments be made in the areas of research, capacity building and grants. Government counterparts further need support to structure financial transactions, negotiate contracts, communicate with stakeholders, extend markets and enact legal and regulatory reforms, among others³⁹.

2.3 Priority 2b: Infrastructure development and maintenance: Energy and information and communications technology

This section analyzes progress made in the fields of energy, and information and communications technologies (ICT) in Bolivia and Paraguay since the implementation of the VPoA. These areas are essential to ensuring efficiency in transport and transit systems and spurring economic and social structural transformation. To delve deeper in the matter, data from the Latin American Energy Organization (OLADE), International Telecommunications Union (ITU) and public and private organizations of both countries have been examined.

2.3.1 Electric energy in Bolivia and Paraguay

The OLADE report *Panorama energético de América Latina y el Caribe 2018*, outlines important strides made to broaden access to electricity in recent years. If the rate of access to electricity experienced over the past five years were maintained over the next 13 years, the region would achieve universal access to energy, thus achieving Sustainable Development Goal 7.

The report also highlights the increasing presence of natural gas in the primary energy matrix from 29% in 2012 to 34% in 2017. The integration of renewable and other non-renewable sources have also been incorporated to the matrix, yet to a lesser degree.

2.3.1.1 Electric energy capacity and generation

Two electric systems co-exist in Bolivia: The National Interconnected System (SIN) and the “isolated electric system” made up of local generation capacity aimed at satisfying energy needs in areas beyond SIN service provision. SIN is composed of facilities for generation, transmission and distribution of electric current, meeting most of the needs for eight out of the country's nine departments, and covering approximately 90% of domestic electrical energy demand.

Bolivia's electric energy generation capacity in 2017 was 2,610 MW, a more than a 400 MW increase since 2014. Sources of energy generation are primarily non-renewable thermal energy, and hydropower. Maximum domestic daily demand in 2017 reached 1,500 MW, thus Bolivia had a surplus of approximately 600 MW daily for export or reserve.

³⁹ Source: IADB (2018). *Mejor gasto para mejores vidas*.

The thermoelectric sector consists in open-cycle natural gas turbines, one combined-cycle steam turbine, natural gas and diesel engines and dual-fuel units. The hydroelectric sector consists of run-of-river power plants, reservoir plants and a power plant whose operation is dependent upon the supply of drinking water to the city of Cochabamba. The alternative energy sector is composed of two steam turbines that operate with sugarcane bagasse, and one through wind generation.

Table 19: Installed energy capacity by source (MW)

Detail	2014	2015	2016	2017
Bolivia				
Hydro	493.7	494.9	494.5	619.4
Thermal (non-renewable)	1,653.1	1,794.3	1,785.8	1,812.0
Wind	3.0	3.0	27.0	27.0
Solar	0.0	5.3	5.3	10.8
Thermal (renewable)	60.0	118.5	133.5	141.0
Total	2,209.8	2,415.9	2,446.0	2,610.2
Paraguay				
Hydro	8,810.0	8,810.0	8,810.0	8,810.0
Thermal (non-renewable)	14.7	14.7	0.5	0.5
Total	8,824.7	8,824.7	8,810.5	8,810.5

Source: Elaborated by authors on the basis of OLADE data

Paraguay is a major producer of electric power almost exclusively generated through hydropower. The national electric company, the vertically integrated National Electric Administration (ANDE), is responsible for generating, transmitting, distributing and marketing electrical power. Through ANDE, the public sector holds a 50% stake in two companies jointly owned with neighboring countries: the ITAIPÚ hydroelectric plant which produces 14,000 MW and is owned by Paraguay and Brazil, and the YACYRETÁ hydroelectric plant which produces 3,200 MW and is owned by Paraguay and Argentina. ANDE also holds several small thermal generators and a third hydroelectric plant, Acaray, located in the eastern part of the country, which produces 210MW and is solely owned by Paraguay.

Paraguay generates close to 60,000 GWh of electric power per year making it one of the world economies with the highest rates of electric power generation per inhabitant (9,000 kWh/inhabitant). The country's overall energy consumption needs reach only 16% of its production, making surplus power a significant and valuable export.

Table 20: Electric power generation by source (GWh)

Detail	2014	2015	2016	2017
Bolivia				
Hydro	2,251.4	2,463.1	1,719.8	2,233.5
Thermal (non-renewable)	6,174.7	6,439.2	7,466.7	7,229.9
Wind	8.2	11.5	34.9	60.4
Solar	0.4	4.8	5.7	6.9
Thermal (renewable)	125.8	202.0	176.2	166.4
Total	8,560.5	9,120.5	9,403.3	9,697.0
Paraguay				
Hydro	55,276.4	55,742.8	63,770.2	59,683.8
Thermal (non-renewable)	5.9	1.4	1.3	1.5
Total	55,282.4	55,744.2	63,771.4	59,685.3

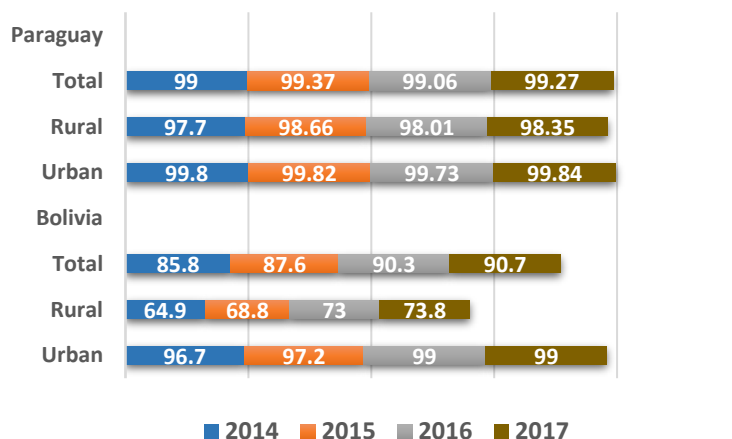
Source: Elaborated by authors on the basis of OLADE data

2.3.1.2 Electric coverage

Between 2014 and 2018, electric coverage in Bolivia and Paraguay demonstrated clear progress, particularly in the areas of generation potential, geographical coverage and population access. In Paraguay, coverage is nearly universal, with only a small percentage of the population without access, primarily in rural areas. In 2017, the number of people without access was estimated at 51,000. Access to electricity in Bolivia is marked by lower rates and different degrees of access along urban-rural lines, amounting to a 25.2% gap. In 2017 the level of coverage was at 90.7% of the overall population, with approximately 1,036,557 people lacking access to electricity, mostly in rural areas. Between 2014 and 2018 overall coverage increased by 5%.

Bolivia has implemented a government policy entitled “Electricity Programme to Live with Dignity” which has the objective of granting universal access to electric power by 2025. The Programme focuses on a variety of supply technologies, financing and coordination mechanisms between different territorial entities to ensure access, improve quality of life and the income of rural populations.

Figure 9: Electric coverage (percentage of the population)



Source: Elaborated by authors on the basis of OLADE data

Bolivia is also forging forward to cooperate and seek complementarity with neighboring countries to achieve energy integration. The following bilateral agreements have been signed in recent years:

- Bolivia – Argentina: Agreement for the sale of excess electricity supply equivalent to approximately 1,000 MW/day.
- Bolivia – Brazil: Joint feasibility study of the hydroelectric power potential of a binational project on the Madera river.
- Bolivia – Peru: Commitment to carry out studies to implement the necessary infrastructure to establish electric interconnection between both countries and develop the supporting regulatory framework.
- Bolivia – Paraguay: Conducting of joint studies regarding the potential interconnection of both countries’ electrical system, and agreements to exchange experiences, treaties and other instruments and information regarding photovoltaic power generation.

2.3.2 Information and Communication Technology (ICT) in Bolivia and Paraguay

To measure progress in the development and implementation of an effective broadband and ICT policy, data published in the annual “Measuring the Information Society Report” produced by the United Nations International Telecommunications Union (ITU) along with studies published by ECLAC’s Observatory for the Information Society in Latin America and the Caribbean (OSILAC) and the Regional Broadband Observatory (ORBA), were analyzed.

The 2017 ITU report highlights important gains in connectivity and utilization of ICTs throughout the past decade. The availability of communications, most notably mobile phones and more recently broadband, has expanded both the access and use of internet services. While progress has been achieved overall, a digital gap among regions and between different countries persists.

ITU has developed an ICT Development Index (IDI)⁴⁰, that compares the evolution of ICTs across countries and over time. In 2017, leading positions were held by Iceland, the Republic of Korea and Switzerland. In the Americas the leading positions were held by the United States and Canada, and in South America, the leading positions were held by Uruguay, Argentina, and Chile, with Bolivia and Paraguay occupying low ranks. Despite investment in technologies such as fiber optic, the expansion of broadband, internet use and smart communication equipment has been insufficient to maintain or increase their position in the IDI ranking.

Table 21: Bolivia and Paraguay: Evolution of ICT Development Index, 2013-2017

	2013	2015	2016	2017
Bolivia				
Regional ranking	25	26	27	26
World ranking	107	107	115	112
IDI Score	3,78	4,08	3,84	4,31
Paraguay				
Regional ranking	26	27	26	27
World ranking	109	112	111	113
IDI Score	3,71	3,79	4,02	4,18
Number of participating economies	166	167	176	176

Source: Elaborated by the authors on the basis of ITU data (Measuring the information society report 2014 to 2018)

To evaluate the degree of access to communication technologies and the degree of penetration of these technologies in Bolivia and Paraguay, the following indicators used to calculate the IDI have been analyzed: fixed broadband subscribers, mobile broadband subscribers, internet users, mobile telephone subscribers and fixed-line telephone subscribers.

In landlocked developing countries such as Bolivia and Paraguay, indirect access to submarine cables and dependency on neighbors to gain and provide access to fixed broadband networks is an important factor in the low usage rate. While the average utilization of fixed broadband services in the Americas is 19.1

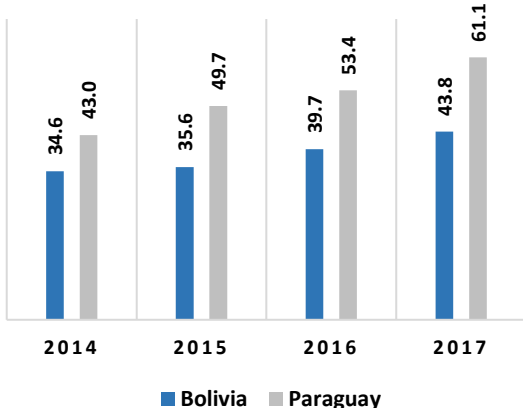
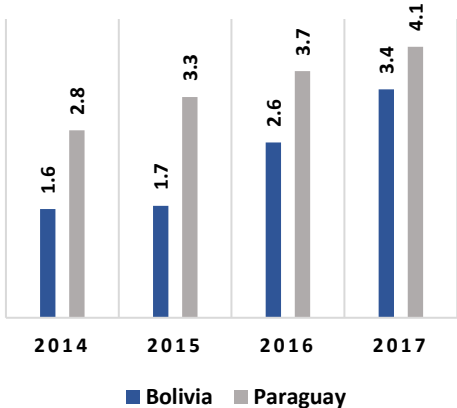
⁴⁰ The ICT Development Index (IDI) is a composite index that merges 11 indicators into one referential measure meant to monitor and compare the evolution of ICTs across countries and over time.

users per 100 people, Bolivia reaches a rate of 3.4 and Paraguay 4.1. Between 2013 and 2017, Bolivia more than doubled its number of subscribers and expanded the length of its fiber optic network from 3,500 km and three international linkages in 2013, to 18,000 km and nine international linkages by 2017.

Given limited fixed broadband services, mobile broadband services have experienced a sharp rise in subscribership reaching 55 subscribers per 100 people in Bolivia, and 46.5 subscribers per 100 people in Paraguay in 2017. While these figures are on the rise, they continue to be below the average of the Americas at 82.7 subscribers per 100 people. The development of fixed and mobile broadband infrastructure has also given rise to internet usage in both countries between 2014 and 2017, and although figures demonstrate a rise in utilization, figures in both countries remain below regional averages: Bolivia 43.8 users per 100 people and Paraguay 61.1 users per 100 people, as compared to the average in the Americas at 64 users per 100 people.

Figure 10: Fixed broadband subscribers (per 100 people)

Figure 11: Internet users (per 100 people)

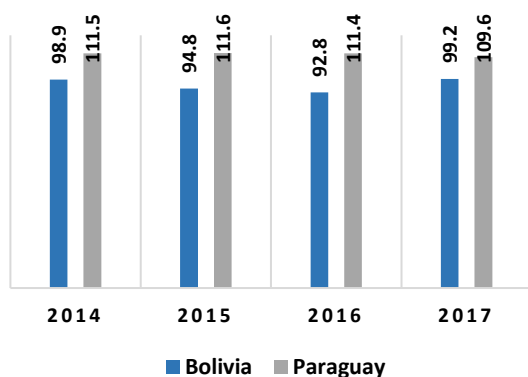


Source: Elaborated by the authors on the basis of data from <https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx> - Accessed on: 15/02/19

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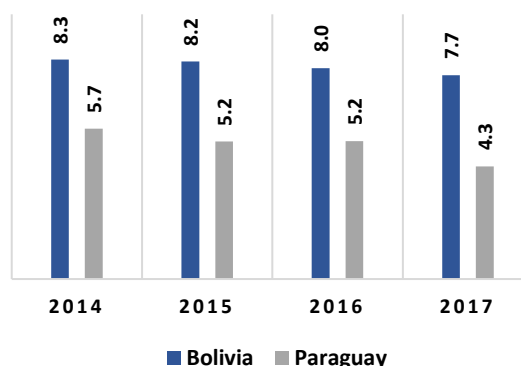
The predominance of mobile service over fixed-line service in Bolivia and Paraguay is clear. Subscribers to mobile services is around 100% of people in both countries, as compared to the average of the Americas at 114,2 subscribers per 100 people. In contrast, subscribers to fixed-lines are fewer and decreasing. In 2017 Bolivia had 7.7 subscribers per 100 people and in Paraguay 4.3 subscribers per 100 people.

Figure 12: Mobile phone subscribers (per 100 people)



Source: Elaborated by the authors on the basis of data from <https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx> - Accessed on: 15/02/19

Figure 13: Fixed-line phone subscribers (per 100 people)



Source: Elaborated by the authors on the basis of data from <https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx> - Accessed on: 15/02/19

In recent years, the governments of Bolivia and Paraguay have implemented a number of ICT-related policies on matters that include: digital signatures, broadband planning, free software development, digital terrestrial television, and electronic government. With rates of penetration on the rise and with continued public and private efforts to reduce service price, increase adoption rates, and continuously expand relevant infrastructure, Bolivia and Paraguay show great promise in their ability to leverage the potential of ICTs for development.

According to Rojas, E. and Poveda, L. (2018) internet access continued to expand in Latin America and the Caribbean, yet despite these advances, issues related to connection quality continue to persist. The two best ranked countries in the region merely have 15% of connections achieving speeds above 15 Mbps, and the lowest ranked country with only 0.2% of connections at this speed. To put these figures in a global context, the ten most advanced countries in this area have over 50% of their connections at speeds above 15 Mbps. Equal access is also a problem, with large and persistent differences in access between rural and urban areas, and between quintiles of income distribution.

As detailed in the International Telecommunications Union’s publication *Connectivity Challenges and Opportunities (Bolivia, and Paraguay)*, private sector participation in technological upgrading through private enterprise initiatives or public-private partnerships has the potential of accelerating technological change. Updating the telecommunications laws and regulations in Bolivia and Paraguay is important to creating strong frameworks for such investments and partnerships to take place.

The Sixth Ministerial Conference on the Information Society of Latin America and the Caribbean was recently held in Cartagena Colombia. During this meeting, the eLAC 2020 Digital Agenda was approved by the participating countries, with the objective of establishing greater regional cooperation to move towards the digitalization of production, the promotion of open governance for cooperation between countries, and the inclusion and development of skills among populations. The eLAC 2020 Digital Agenda is composed of seven areas of action: digital infrastructure; digital economy and transformation; digital government; culture, inclusion and digital skills; emerging technologies for sustainable development; a regional digital market; and governance for the information society.

In terms of infrastructure, countries have agreed to promote public policies to develop broadband systems and viable alternatives to local and community access networks. In the area of digital economy and transformation, special focus is placed on supporting small and medium enterprises (SMEs) and entrepreneurship. Open government initiatives and digital services are also being promoted to give way to digital government services, all the while proposing the revision and update of school curriculums to enable students and citizens to adopt new digital skills and massify access to digital services for greater inclusion in the digital economy. Countries also agreed to promote digital financial services to prioritize the development of inclusive financial systems.

2.3.3 E-Commerce

In Bolivia and Paraguay, similarly to the majority of countries in Latin America and the Caribbean, e-commerce finds itself in initial stages of development. The UNCTAD Business-to-Consumer (B2C) E-commerce Index is used as a point of reference and comparison. The Index focuses on a series of business-to-consumer trade parameters, including consumer internet access, order reception by servers, payment method, and order delivery method. In 2018, Bolivia ranked 105th and Paraguay 97th among the 151 economies, placing both countries below the average index value held by the Latin American and the Caribbean region as a whole, and further sliding a few positions down the rank between 2017 and 2018, as illustrated in Table 22 below:

Table 22: B2C E-commerce Index, 2018

Description	Bolivia	Paraguay	LAC
% of people who use the internet	40	60	54
% of people with credit cards	54	49	53
Internet server security (for one million people)	46	50	54
% of people who receive packages at their address – reliability of postal services	12	6	24
Index Value	38,1	41,7	46
Rank in 2018	105	97	
Rank in 2017	102	93	

Source: Elaborated by authors on the basis of UNCTAD B2C E-Commerce Index 2018

Despite their position in the ranking, Bolivia and Paraguay’s e-commerce sectors hold great potential for development in light of the ever-expanding use of the internet and the needs of companies to leverage the benefits of e-commerce as part of their business strategies. For progress to be made, certain limitations or challenges will need to be addressed, such as: the reliability and security of internet transactions, the creation of an integrated delivery system for online purchase, and the transferal of cost-efficiency to the consumer.

ECLAC’s “International Trade Outlook for Latin America and the Caribbean 2018” report estimates that overall B2C e-commerce in Latin America and the Caribbean will grow by 19% annually, with the share of crossborder trade expanding at a rate of 44%. As a result, the region’s share in global crossborder e-commerce would double, from 2.6% (approximately US\$ 6 billion) in 2014 to 5.3% (approximately US\$ 53 billion) by 2020.

Increasing the involvement of the region's businesses and consumers in crossborder e-commerce, requires a four-pronged approach. First, the region must boost the regional digital market. To do so, necessary legal and technical conditions to facilitate the electronic exchange of trade-related information, the interoperability of digital regulations between countries, and the generation of greater confidence among consumers by improving cybersecurity and consumer protection must be achieved. Second, the digitization and simplification of trade finances must be encouraged, including the support for alternative financial providers. Third, customs and postal services must be modernized to meet the demands of new and expanding crossborder e-commerce. And fourth, the costs of crossborder financial transactions and payments must be reduced so that they become affordable.

According to Patiño J. and Rojas E. (2018) who reference private consulting firm estimates, the market for retail e-commerce has the potential to experience substantial growth in Latin America in the years to come given the massive potential of the market; retail e-commerce currently makes up approximately 3% of retail sales in the region, as compared to North America, and Asia and the Pacific where retail e-commerce represents approximately 8% and 12% of retail sales respectively. The proposal to move towards a digital economy regional block could help reduce barriers that hinder the exchange of online goods and services, thereby increasing quality and reducing costs.

To monitor the implementation of trade facilitation measures at the global level, and identify best practices and outstanding needs for training, technical, and financial assistance, the five Regional Commissions of the United Nations periodically carry out a study on Digital and Sustainable Trade Facilitation (previously called the Global Survey on Trade Facilitation and the Implementation of Paperless Trade). The analysis, which is carried out through a survey, examines nine main categories: General Trade Facilitation Measures, Paperless Trade Facilitation, Cross-Border Paperless Trade, Cooperation among Border Agencies, Transit Facilitation, Trade Facilitation and SMEs, Agricultural Trade Facilitation, Trade Facilitation and Women, and E-Commerce Facilitation. The 2015 and 2017 surveys have been completed and published, and the 2019 survey is currently in process.⁴¹

Paperless trade measures that are assessed in the study include: i) electronic requests for the reimbursement of customs payments; ii) electronic payments of tariffs and charges; iii) the request and issuance of electronic certificates of origin; iv) the electronic submission of air cargo manifests; v) the electronic application and issuance of licenses and permits; vi) the electronic submission of customs declarations; vii) Internet connection at border crossings; viii) electronic / automated customs system; ix) electronic Single Window for Foreign Trade (VUCE); and x) electronic customs reimbursements.

To carry out paperless crossborder trade, bilateral and multilateral cooperation measures must include: i) the establishment of laws and regulations on electronic transactions; ii) the recognition of an authority to authenticate digital trade certificates; iii) cross-border exchange of trade-related data; iv) electronic exchange of certificates of origin; and v) the electronic exchange of sanitary and phytosanitary certificates.

Results from the 2017 survey indicates that Latin America and the Caribbean as a whole has made considerable progress in the application of trade facilitation measures. Progress, however, has been uneven among countries and throughout the region. With an implementation rate of 79% of trade facilitation measures in 2017, Paraguay improved by 8% its performance relative to the 2015 survey (71%),

⁴¹ Paraguay participated in the 2015 and 2017 surveys. Bolivia participated in the 2015 survey.

and surpassed the average of 21 participating countries, which stood at 69%. In 2015, Bolivia's level of implementation of these measures was low, at 25%.

As observed in the 2017 survey, essential elements to facilitate the exchange of trade-related electronic information and documents is the existence of a set of rules and regulations that frame electronic transactions, and the recognition of digital trade certificate issuing authorities. The study also highlights the importance of countries promoting the electronic Single Window for Foreign Trade (VUCE) and upholding the laws and regulations on electronic transactions for paperless trade between States. Governments must also recognize the legitimacy of digital certificate authentication authorities to carry out crossborder business transactions and should promote the exchange of electronic trade data with other countries, particularly electronic certificates of origin, and sanitary and phytosanitary certificates.

Data on ICT adoption is also produced by governmental institutions in Bolivia and Paraguay, including: the Agency for Electronic Government and Information and Communication Technology (AGETIC) under the Office of the President of the Plurinational State of Bolivia, and the National Secretariat for Information and Communication Technologies (SENATICs) under the Office of the President of the Republic of Paraguay. Both of these institutions monitor the development of ICTs in their respective country through periodic surveys⁴². These studies provide complementary information to the B2C Index, highlighting certain particularities and offering a holistic picture of the state of ICT development domestically. Some of these survey results are detailed below as average figures for Bolivia and Paraguay:

- Individuals who have made online purchases: 12% of the population
- Individuals who have sold items online: 6.5% of the population
- Businesses that have made orders or purchases online: 36% (large) – 48% (small)
- Businesses that have sold items online: 8% (large) – 16% (small)
- Primary reasons why individuals have not made online purchases:
 - Do not trust online offers: 62%
 - Do not have a debit or credit card: 22%
 - High commissions: 10%
 - Insufficient offers: 10%
- Primary reasons why businesses have not sold items online:
 - The product type is not suited to online sales: 27%
 - It is not a sales tactic: 20%
 - The company does not have e-commerce digital marketing: 6%

To forge forward, the main challenges to be addressed are: the lack of information, fear of individuals and business regarding online transaction fraud, broadening the limited supply of goods and services to stimulate limited demand, and improving distribution and delivery logistics.

⁴² AGETIC has carried out the “National opinion survey on information and communications technology – TIC” 2017, a survey completed by 5,033 internet users and 503 non-internet users above the age of 14, among a group of 7,112,631 people. SENATICs has carried out the “Survey on internet access and use in Paraguay” 2017 reaching 900 people between the ages of 13 and 65 and the “Research on companies that are consumers of information and communication technology” 2017, a survey completed by 50 large companies and 25 SMEs.

2.4 Priority 3: International trade and trade facilitation

Support through the VPoA has helped Bolivia and Paraguay reduce the costs of trade and stimulate the export sector. To further explore results on trade performance, this section will specifically analyze each country's export sector, and the regional, sub-regional, and national initiatives that have been implemented with the aim of increasing the added value of exports and improving trade facilitation.

2.4.1 International trade of Bolivia

2.4.1.1 Scope of international trade

Between 2011 and 2018, international trade represented approximately 63% of Bolivia's GDP, with its highest figure at 75.3% of GDP in 2012, reflecting the degree of openness of the Bolivian economy, its dependency on external markets, and volatility to external events. During this time period, exports represented 33% of GDP and imports approximately 30% of GDP.

During the time period under review, the impact of the world economic situation on Bolivia followed two trends: between 2011 and 2014, an increase in the demand and price of Bolivian exports allowed Bolivia to have a positive trade balance, while the period between 2015 and 2018 presented a contraction of exports, thus leading to a deficit.

Table 23: Bolivia: International Trade Indicators (2014-2018)

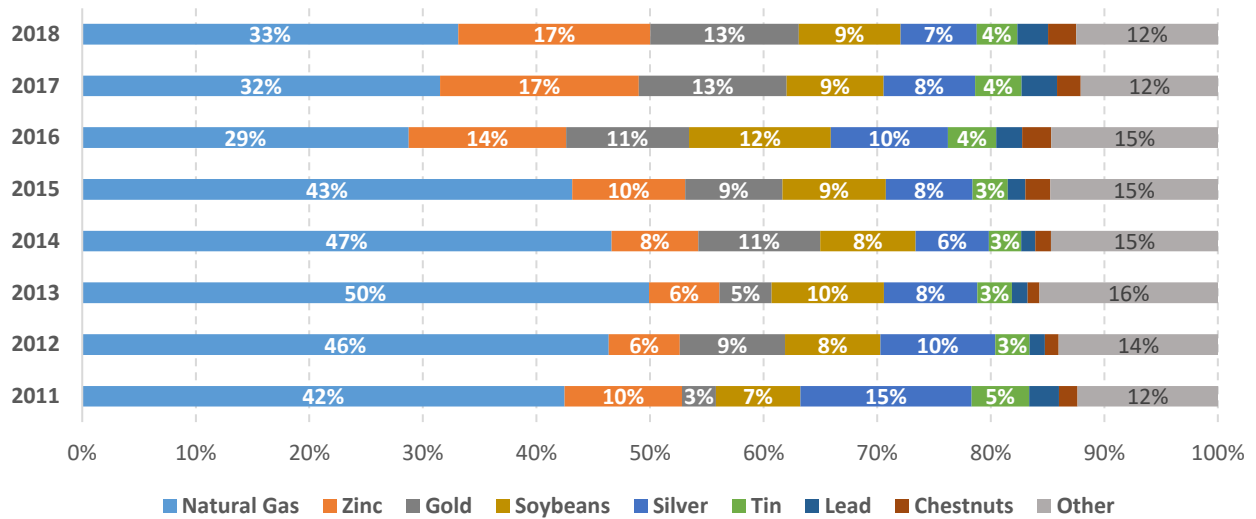
	2014	2015	2016	2017	2018
Exports (USD millions)	12,899	8,737	7,126	8,194	8,965
Exports (% of GDP)	39.1%	26.5%	21.0%	21.8%	
Imports (USD millions)	10,674	9,843	8,564	9,308	9,996
Imports (% of GDP)	32.3%	29.8%	25.2%	24.8%	
Trade Balance (USD millions)	2,225.0	-1,106.0	-1,438.0	-1,114.0	-1,031.0
GDP of Bolivia (USD millions, current Price)	32,996	33,000	33,941	37,529	

Source: Elaborated by the authors on the basis of data from the National Statistics Institute of Bolivia (INE) and CEPALSTAT

2.4.1.2 Composition of trade

Bolivia's export sector is mostly concentrated in a small number of primary products: natural gas, zinc concentrates, lead concentrates, soybeans and their derivatives, silver, gold, tin and chestnuts. Starting in 2015, a drop in the price of natural gas progressively led to a decrease in its share of exports. Given contractual fixed sales volume with Argentina (27 million cubic meters per day), and with Brazil (30 million of cubic meters per day, contract to be renegotiated in 2019), a drop in the share of natural gas as part of the export structure gave rise to other products, particularly zinc, lead, tin and silver, which are largely exported to Asian countries, soybean derivatives exported to Andean Community countries, and chestnuts destined for the markets of the European Union and the United States.

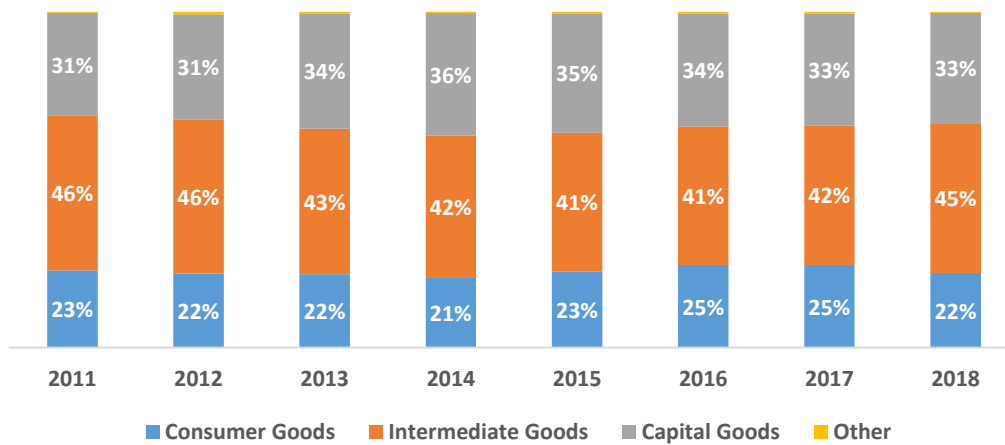
Figure 14: Bolivia: Main Exports (percentage of FOB value)



Source: Elaborated by the authors on the basis of data from the National Statistics Institute of Bolivia (INE)

Capital goods form the backbone of Bolivia’s primary imports, which have largely maintained the same structure between 2011 and 2014. Imported capital goods are mostly to meet the needs of industry, transport, and to a lesser degree machinery and equipment for agriculture. Imported intermediate inputs are also destined for industry, fuels, construction and agriculture.

Figure 15: Bolivia: Main imports by category (percentage of CIF value)

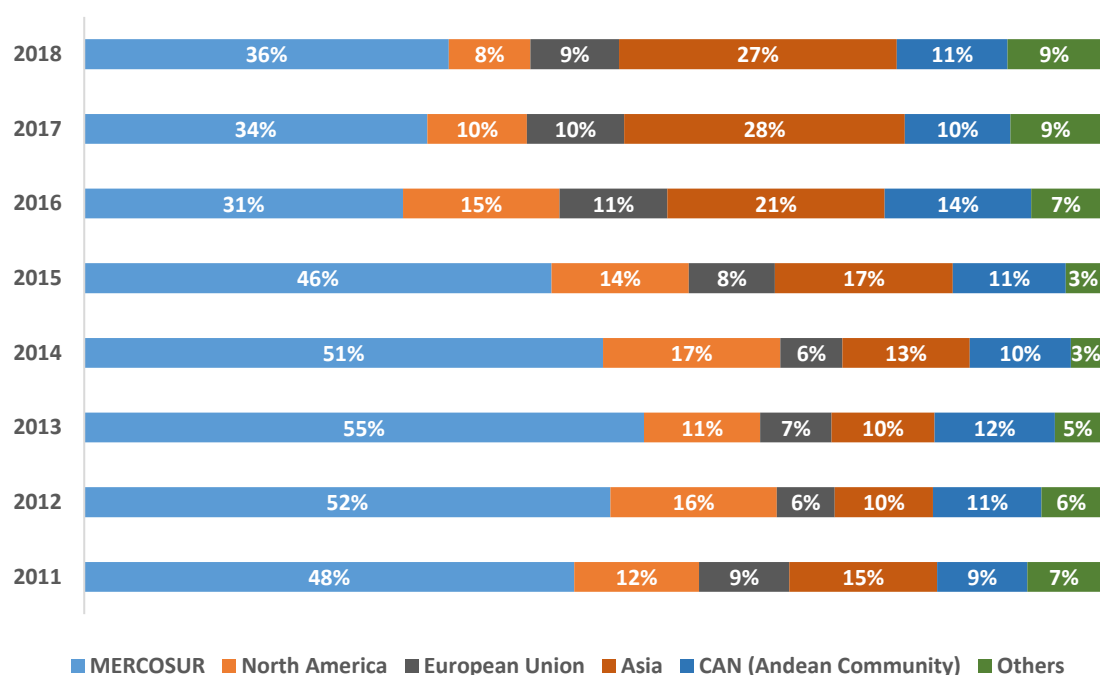


Source: Elaborated by the authors on the basis of data from the National Statistics Institute of Bolivia (INE)

2.4.1.3 Destination of exports

MERCOSUR is the main market for Bolivian exports, holding on average a 34% share over the past three years, 95% of which correspond to natural gas exports to the Brazilian and Argentinian markets. This share, however, has been diminishing in recent years as other economic areas, such as Asia, have been gaining ground. With South Korea and Japan as main trading partners, Asia has held on average 25.3% of export shares in the past three years, concentrated primarily in mineral products. Andean Community countries represent on average 11.5% of Bolivian exports, mainly agro-industrial products, while North America and the European Union represent on average 11% of Bolivian exports, mainly of mineral products, chestnuts, and new and emerging goods such as quinoa and chia, among others.

Figure 16: Bolivia: Exports by Economic Zone (percentage of FOB value)



Source: Elaborated by the authors on the basis of data from the National Statistics Institute of Bolivia (INE)

2.4.1.4 Modes of transport and corridors

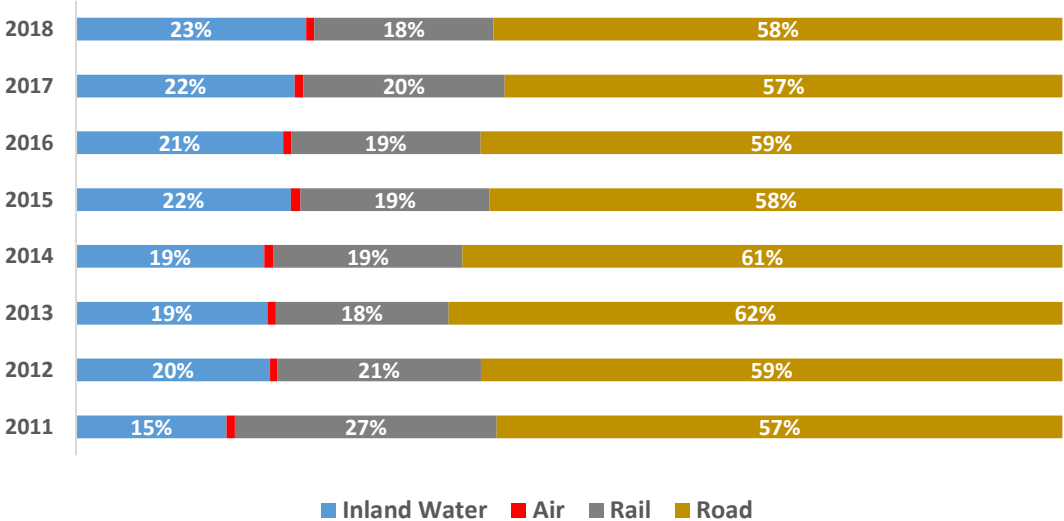
Between 2011 and 2018 the total average volume of transported exports amounted to 25,567 thousand tons, of which 21,054 thousand tons (82.3%) were transported by pipelines, and 4,513 thousand tons (17.7%) were transported by other methods (road, rail, river, and air).

To gain a better understanding of how export volumes were distributed among other transport methods, the transport of natural gas through pipelines is set aside. Of the remaining transport methods, the primary transport method for exports is by road, representing 59% of total export volumes, followed by rail transport and inland water transport which have gained ground and are responsible for transporting

20% of total export volumes respectively. Air transport comes in last position, transporting only 1% of total export volumes, mostly of gold and silver ingots, flowers and craft goods.

It is worth highlighting that if it were not for the low water volumes affecting the navigability along the Paraguay-Paraná Waterway during four months of the year, inland water transport would compete with road transport as a leading transport method for exports.

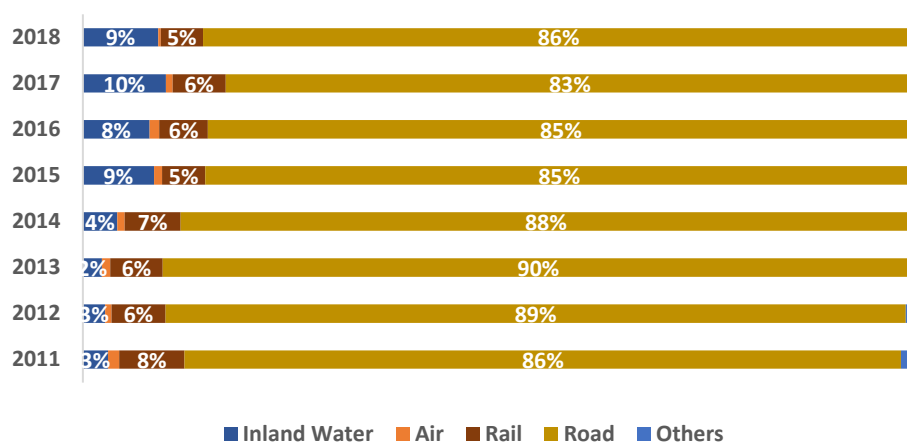
Figure 17: Bolivia: Exports by transport method, excluding pipelines (percentage of tons)



Source: Elaborated by the authors on the basis of data from the National Statistics Institute of Bolivia (INE)

Between 2011 and 2018, the average volume of imports was 5,308 thousand tons. The majority of these imports arrived by road (86%), many from the ports of Chile and Peru on the Pacific coast. Inland water transport through the PPW has been on the rise, enabling imports such as diesel, gasoline, malt and iron for construction to make their way to the Bolivian market. Further, rail transport has been responsible for transporting an average of 6% of imports to Bolivia, primarily through the Eastern Railway Network connected to MERCOSUR countries and countries overseas through the ports of Paranaguá and Santos in Brazil, and Buenos Aires in Argentina.

Figure 18: Bolivia: Imports by transport method (percentage of tons)



Source: Elaborated by the authors on the basis of data from the National Statistics Institute of Bolivia (INE)

Table 24 below outlines Bolivia's primary import and export products, along with the modes of transport and corridors used.

Table 24: Bolivia: Main traded products by mode of transport and corridor

PRODUCT	EXP/IMP	SHIPMENT METHOD	CORRIDOR MODE	ORIGIN	DESTINATION
Zinc and Lead (Rail)	Export	Wagon	Railway	Potosí - Uyuni - Ollagüe - Antofagasta	Korea, Japan, Belgium, Canada and Brazil
Zinc (Road)	Export	Truck	Road	Potosí - Tambo Quemado - Arica	Belgium, Sweden, China and Korea
Tin	Export	Truck	Road	Potosí - Tambo Quemado - Arica	USA, China and UK
Soybean cake (Road)	Export	Truck	Road	S. Cruz - Tambo Quemado - Arica	Andean Community countries and Chile
Soybean cake (Inland waterway)	Export	Barge	Inland waterway	S. Cruz - Puerto Suarez - N. Palmira	Venezuela, Colombia and Ecuador
Chestnut	Export	Truck	Road	Beni - Tambo Quemado - Arica	USA, UK, Germany and the Netherlands
Agrochemicals	Import	Sea-Road	Sea-Road	China	Santa Cruz
Home appliances	Import	Sea-Road	Sea-Road	China	Santa Cruz
Machinery	Import	Truck	Road	Brazil-Corumbá-Puerto Suárez	Santa Cruz
Transport vehicles	Import	Truck	Sea-Road	Japan, USA. China-Arica-Tambo Quemado	Santa Cruz
Iron and Steel (Rail)	Import	Wagon	Railway	Brazil - Corumbá - Puerto Suarez	Santa Cruz
Iron and Steel (Road)	Import	Truck	Sea-Road	Brazil- Matarani - Desaguadero	La Paz

Source : Pérez-Salas, Sánchez and Wilmsmeier (2014). State of Implementation of the Almaty Programme of Action in South America.

2.4.2 International trade of Paraguay

2.4.2.1 Scope of international trade

International trade is also an important feature of Paraguay's economy. Between 2011 and 2018, international trade stood on average at 52% of GDP, with exports representing 23% of GDP and imports 29% of GDP. During this period, Paraguay had a negative trade balance of 2,279 million US dollars, amounting to 6.2% of GDP. The trade imbalance is partly a product of the substantial volume of re-exportation carried out by Paraguay with its neighboring countries.

Table 25: Paraguay, International Trade Indicators (2014-2018)

	2014	2015	2016	2017	2018
Exports (USD millions)	9,636	8,327	8,501	8,680	9,045
Exports (% of GDP)	23.9%	23.0%	23.6%	22.1%	
Imports (USD millions)	11,299	9,529	9,042	11,027	12,434
Imports (% of GDP)	28.1%	26.3%	25.1%	28.1%	
Trade Balance (USD millions)	-1,663	-1,202	-541	-2,347	-3,389
GDP of Paraguay (USD millions, current Price)	40,277	36,164	36,054	39,300	

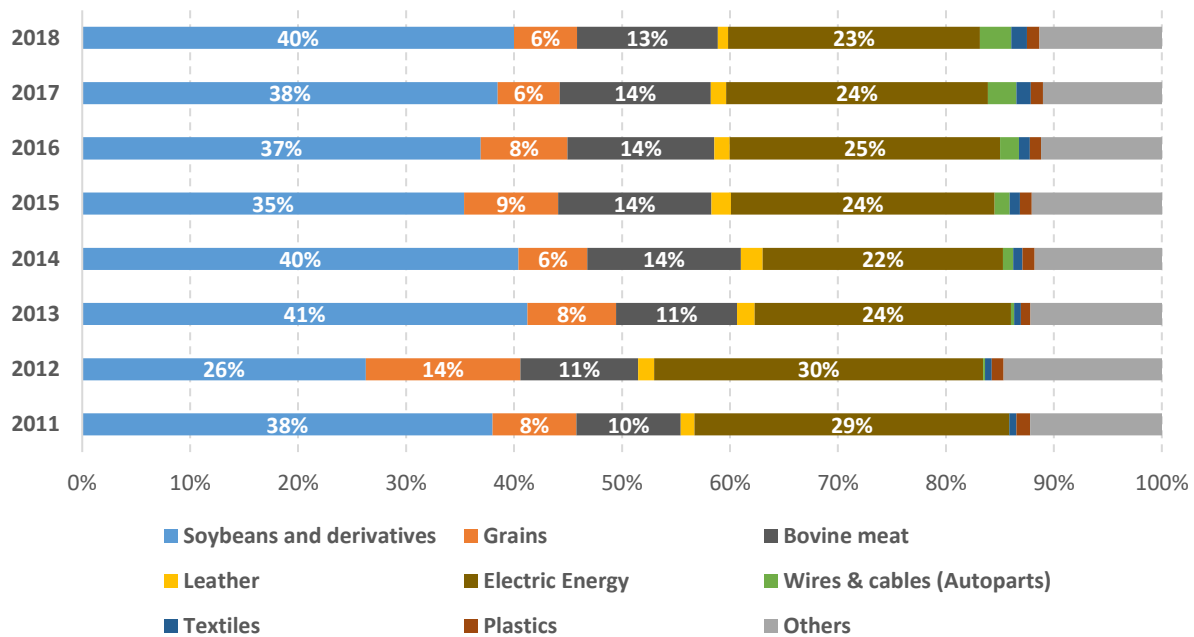
Source: Central Bank of Paraguay and CEPALSTAT

2.4.2.2 Composition of trade

Paraguay's export sector, much like Bolivia's, is highly concentrated in a few products, notably: soybeans and their derivatives, electrical power, bovine meat, and grains. When combined, they account for 83% of all exports. Soybeans are exported to the markets of the European Union, Russia, and to a lesser degree Turkey, Brazil and Argentina.

The markets for electrical power are Brazil, through the Itaipú hydroelectric plant (14,000 MW of energy), and Argentina, through the Yacyretá hydroelectric plant (3,200 MW of energy). Bovine meat is exported to Russia, and increasingly to Chile as well. Grain exports have gradually been increasing in recent years, with corn and wheat exports destined for the Brazilian market, and other emerging products such as chia and sesame seeds finding new markets.

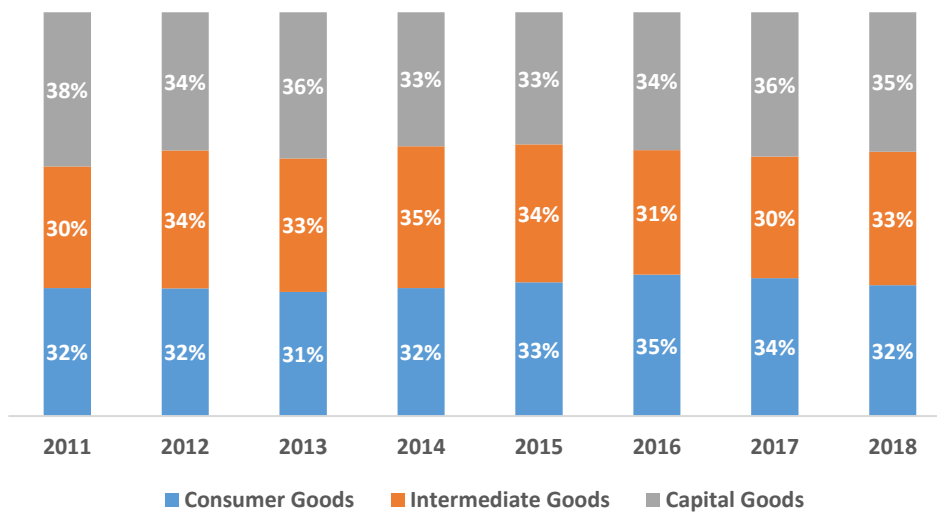
Figure 19: Paraguay: Primary Exports (percentage of FOB value)



Source: Elaborated by the authors on the basis of data from the Central Bank of Paraguay

The composition of imported products remained relatively the same between 2011 and 2018, and fairly evenly distributed among capital, intermediate and consumption goods. Capital goods mostly consist in machinery and equipment, and intermediate goods in fuels and chemical products.

Figure 20: Paraguay: Imports by type (percentage of CIF value)

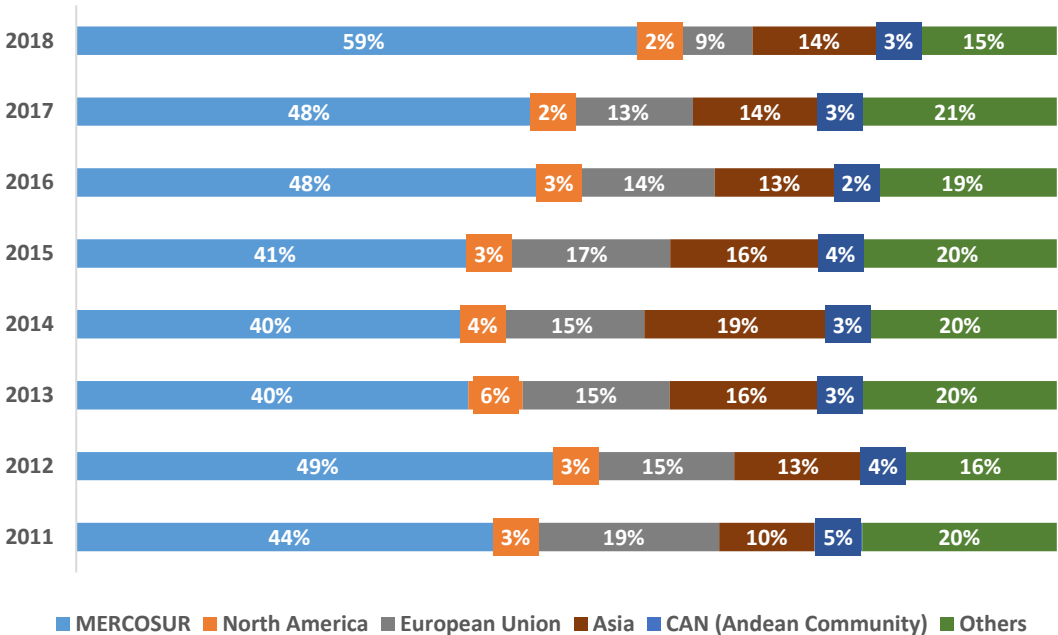


Source: Elaborated by the authors on the basis of data from the Central Bank of Paraguay

2.4.2.3 Destination of exports

MERCOSUR is the primary destination for Paraguayan exports. An increase in the export share to MERCOSUR countries occurred in 2014, and by 2018 this share represented 59% of total exports, which consist primarily in electric power, and soybeans and their derivatives. It is important to highlight that approximately 60% of soybean exports to MERCOSUR countries are considered goods in transit, transferred to grain barges and destined for re-export to the European Union (EU). Exports to Asia consist mostly in bovine meat and soybean grains, while exports to the EU consist in soybeans and their derivatives, bovine fats and leather.

Figure 21: Paraguay: Exports by Economic Zone (percentage of FOB value)



Source: Elaborated by the authors on the basis of data from the Central Bank of Paraguay

2.4.2.4 Modes of transport and corridors

Inland water transport is the main mode of transport used for exports (73%), followed by road (27%) and a small proportion by air. A total of 51 private river ports and three state ports (Asunción, Encarnación, and Pilar) form the backbone of inland water transport, a mode of transport which has undergone expansion in recent years with the completion of five newly constructed private ports launching operations between 2011 and 2018. Given the connection of the Paraguay and Paraná rivers with the Plata river that flows out the Atlantic Ocean through Buenos Aires and Montevideo, international trade is mostly carried out through river-maritime transport. Table 26 outlines the main import and export products, along with the modes of transport and corridors used.

Table 26: Paraguay: Main traded products by mode of transport and corridor

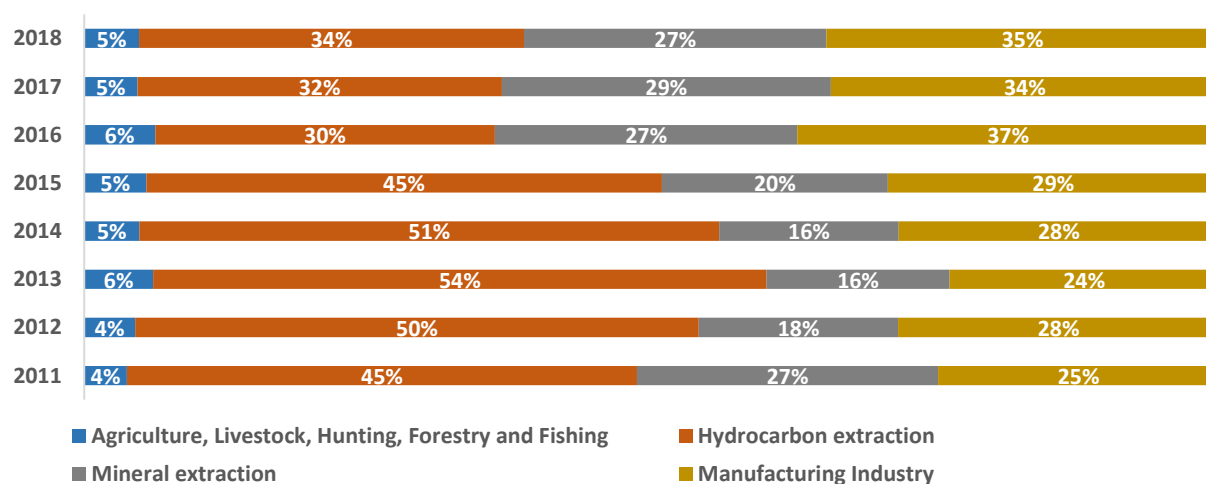
PRODUCT	EXP/IMP	SHIPMENT METHOD	CORRIDOR		
			MODE	ORIGIN	DESTINATION
Soybean (unprocessed)	Export	Truck	Road	Ciudad del Este	Cascavel (Brazil)
Soybean (unprocessed)	Export	Barge	River-Maritime	Asunción - Nueva Palmira/Rosario	Rotterdam (The Netherlands)
Cold meat	Export	Refrigerated truck	Road	Asunción	Santiago (Chile)
Frozen meat	Export	FCL 40'	River-Maritime	Asunción - Buenos Aires/Montevideo	San Petersburg (Russia)
Wooden moldings	Export	FCL 20'	River-Maritime	Asunción - Buenos Aires/Montevideo	Miami (USA)
Sesame seeds	Export	FCL 40'	River-Maritime	Asunción - Buenos Aires/Montevideo	Osaka (Japan)
Agro-chemicals	Import	Truck	Road	Brazil	Asunción
Corn	Export	Truck	Road	Asunción	Brazil
Information technologies	Import	1.200 Kg	Air	Miami	Ciudad del Este

Source : Pérez-Salas, Sánchez and Wilmsmeier (2014). State of Implementation of the Almaty Programme of Action in South America.

2.4.3 Value added of exports

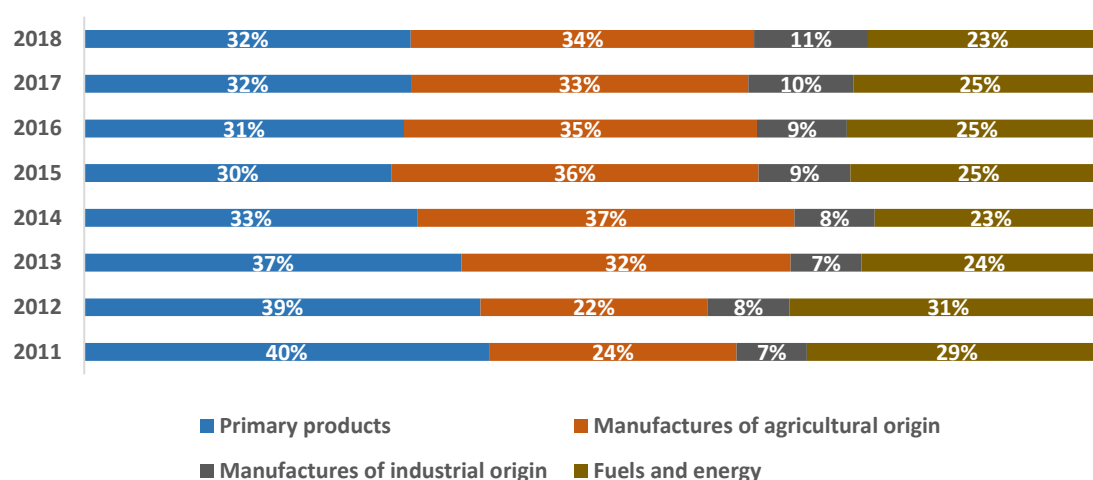
The exports of Bolivia and Paraguay are characterized by their concentration in a limited number of products, driven primarily by commodities with low added value. Manufactured goods hold a secondary position in the overall volume and value of exported goods. Between 2014 and 2018, Bolivia's manufacturing industry was responsible on average for 33% of total exports, growing from 28% in 2014 to 25% by 2018. In Paraguay, manufactured agricultural and industrial goods represented on average 44% of all exports during the same time period. Both countries have made concerted efforts to add value to their exports. In Bolivia, petrochemical and steelmaking industries are being developed. In recent years a liquid separation plant has begun operating and producing liquefied petroleum gas, also enabling the production of propane and ethane. A separate plant has also been opened to produce ammonia and urea. As for steelmaking, construction work was launched in January 2019 with the help of China's Sinosteel company to build a steel plant in the city of Mutún, which will be able to produce steel bars, flat steel and other special steels, and is projected to be ready in 42 months.

Figure 22: Bolivia: Exports by level of processing (percentage of FOB value)



Source: Elaborated by the authors on the basis of data from the Institute of National Statistics of Bolivia (INE).

Figure 23: Paraguay: Exports by level of processing (percentage of FOB value)



Source: Elaborated by the authors on the basis of data from the Central Bank of Paraguay

Paraguay has also been gaining a foothold in the bovine meat market. With the help of public-private partnerships and the support of international organizations, Paraguay has improved animal health, meat quality, reproductive technologies, logistics and marketing. The production of wires and cables for the automotive sector has also gained ground, representing 1% of exports in 2014 and 3% by 2018. Other items include textiles and plastics, each representing 1% of exports.

The Economic Complexity Index (ECI) is a valuable tool to measure and compare the added value countries integrate into their exports⁴³. ECI measures the relative knowledge intensity of an economy by considering the knowledge intensity of the products it exports. The index is calculated on the basis of two variables: 1) Diversity: measures the variety of products produced by a given country, and 2) Ubiquity: measures the number of countries that produced a specific product, in other words it quantifies the degree of specialization required to produce each product. Diversity is positively correlated with ECI: greater diversity means a higher ECI score, whereas Ubiquity is negatively correlated: greater ubiquity means a lower ECI score. Low economic complexity is associated with a poorly diversified productive structure focused on highly ubiquitous products. In contrast, countries with high economic complexity tend to produce and export a diversified array of goods, many of which are exported by relatively few other.

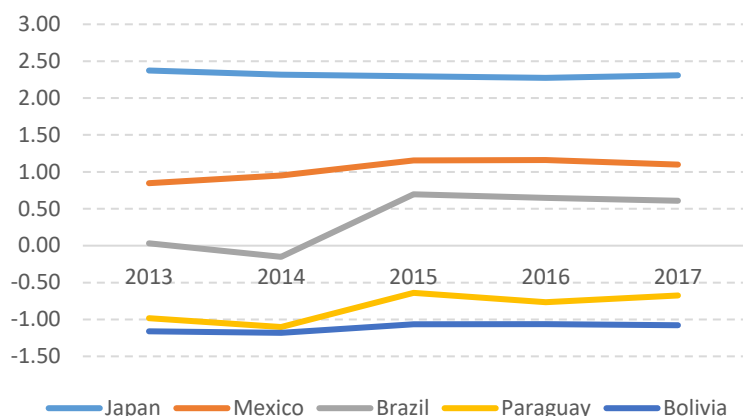
Table 27: Economic Complexity Index Ranking, 2017

Country	Rank	Country	Rank
Japan	1	Chile	61
Mexico	21	Venezuela	85
Brazil	37	Paraguay	86
Argentina	50	Ecuador	102
Uruguay	51	Bolivia	108
Colombia	53		

Source: Observatory of Economic Complexity - Media Lab – Harvard/MIT

⁴³ Desarrollado por César Hidalgo y Ricardo Hausmann, y trabajado en el Observatorio de Complejidad Económica de Harvard/MIT.

Figure 24: Evolution of the Economic Complexity Index



Source: Observatory of Economic Complexity - Media Lab – Harvard/MIT

In 2017, 129 countries were ranked on the index, with Japan, Switzerland and Germany in the lead. In Latin America, the country leading the ranking is Mexico (21), in South America, Brazil (37), with Paraguay (86) and Bolivia (108) in the lower part of the ranking.

With regards to the index value itself, both Bolivia and Paraguay have negative values meaning they have low economic complexity built on a poorly diversified export basket composed primarily of goods that are exported by a wide variety of countries and that incorporate low levels of knowledge and technology. Between 2013 and 2017, the index values for both countries experienced a small rise despite maintaining themselves below zero.

2.4.4 Enabling environment for trade facilitation

The World Trade Organization's (WTO) Trade Facilitation Agreement (TFA) which came into force on February 22, 2017, aims to reduce international trade costs by simplifying the circulation of merchandise across borders. As stipulated in the TFA, each country must establish a National Trade Facilitation Committee to promote internal coordination and implement its provisions.

Both Paraguay and Bolivia have ratified the TFA, the former on March 1st, 2016 through Law 5564 of January 25th, 2016, creating the National Trade Facilitation Committee by Decree No. 7102/17, and the latter on January 1st, 2018 through Law 998 of November 27th, 2017, currently in the process of forming its National Trade Facilitation Committee by Supreme Decree. Transit countries have also ratified the TFA: Brazil in March 2016, Uruguay in August 2016, Chile in November 2016, and Argentina in January 2018.

Bolivia has requested support from the World Bank Group to implement the TFA. The request has resulted in a field visit to assess Bolivia's alignment with TFA articles 1 through 12 and 23. Workshops have also been carried out to analyze priorities, key provisions, and the creation of the National Trade Facilitation Committee. These workshops were attended by representatives of the WTO, the World Customs Organization (WCO), and Bolivian public and private sector actors.

Paraguay's National Committee has made a priority of ensuring the transparency and availability of trade-related information to all stakeholders involved in trade processes, fortify mechanisms for public-private dialogue, and improve customs procedures to simplify, modernize and harmonize export, import and transit processes. The Committee is also implementing "C" category commitments which require technical assistance and a transition period to build capacity. Among these commitments are: the publication and availability of trade information; systems to consult and make observations surrounding customs regulation; the implementation of information systems for exporters and importers; single window; obstacles to transit; trade facilitation measures for 'authorized operators' to provide greater fluidity in the customs process; updated risk management protocols; and fostering cooperation among border institutions.

Bolivian Customs are currently using the Single Customs Modernization System (SUMA) computer tool developed by the National Customs Agency to replace SIDUNEA. In Paraguay, the Fiscal Organization of Customs Levies (SOFIA) system is in use, following development by the National Customs Directorate. Further, the Agreement for International Road Transport envisions the adoption and use of new technologies to exchange information and facilitate customs processes among countries, which is why Paraguay and Bolivia, like other MERCOSUR countries, have accepted and adopted the procedures of the International Cargo Manifest / Customs Transit Declaration (ICM/CTD) of the International Customs Transit Computerized System (SINTIA). The implementation of electronic ICM under SINTIA 2 is currently being pilot tested along the Paraguay-Paraná waterway.

Among trade facilitation measures, the implementation of the "Action Plan – Draft Agreement for the Mutual Recognition of Authorized Economic Operators of MERCOSUR States" also has the potential of producing substantial impact. The customs agencies of Paraguay and Bolivia already have instruments in place for authorized economic operators and are in the process of establishing mutual agreements with their neighboring countries.

2.5 Priority 4: Regional Integration and Cooperation

Since the 1960's, Latin America has followed an integrationist course, adopting a number of initiatives throughout the region to enable countries to build and work in partnership with one another. From the ALALC (Latin America Association for Free Trade, 1962) to CELAC (Community of Latin American And Caribbean States, 2011), joint initiatives have created a complex framework of trade agreements covering a broad spectrum of issues, from trade and investment to labor regulations. Four of these agreements cover more than half of the intraregional trade: Central American Common Market, the South American Common Market (Mercosur), the Andean Community of Nations (CAN) and the Caribbean Community (CARICOM). Bolivia participates in CAN and Mercosur, and Paraguay in Mercosur.

Trade agreements have undoubtedly supported the development of exports in these countries. Export trends have followed the general ebbs and flows of global economic and trade cycles. Section 5.3 of this report provides a detailed outline of Bolivia and Paraguay's international trade results during the 2014-2018 period. Outlined below is a brief summary of the most relevant characteristics:

- Since 2014, a worldwide drop in the price of raw materials has impacted the Bolivian and Paraguayan export sectors, leading to a slight recovery in 2017. Both countries have negative trade balances.

- Exports are limited to a number of commodities, primarily raw materials and natural resources. In Bolivia these are: natural gas, zinc concentrates, lead concentrates, soybeans and derivatives, silver, gold, tin, and chestnuts; and in Paraguay: soybeans and their derivatives, electric power, bovine meat, and grains.
- The largest proportion of goods are exported to Mercosur countries (34% of Bolivian exports, and more than 50% of Paraguayan exports). In order of magnitude, the other main markets for exports are: Bolivia: Asia, North America, and CAN countries; and Paraguay: the European Union and Asia.

The multiplicity of regional trade agreements, some of which are bound in protectionism, have yielded results that fall short of the promise of true regional integration. According to simulations, an integrated Latin American market would have the potential to duplicate the intra-regional trade of intermediate goods and further help develop value chains in the region⁴⁴. Gradual and pragmatic convergence towards a unified regional market built upon existing trade agreements is important given the nature of the world economy which is increasingly characterized by competition among large economic powers connected through comprehensive trade agreements. The current structure of the world market is making the fragmentation of the region's current integration system all that more apparent.

2.5.1. Transport and transit agreements between Bolivia and Paraguay:

Between 2014 and 2018, Bolivia and Paraguay have promoted VPoA priorities by formalizing agreements in sectors such as transport, energy and mining. They include among others:

- i) An Agreement to create a binational cabinet to address issues of cooperation, such as strengthening the Paraguay-Paraná Waterway, the construction of gas pipelines, and other agricultural-related matters. March 2019.
- ii) A Memorandum of Understanding for energy integration through pipeline development projects that connect both countries and establish gas networks in Paraguay. According to the document, exploration along the border will also be carried out. November 2018.
- iii) A Memorandum of Understanding to carry out preliminary studies to connect both countries' railway networks from Roboré (Bolivia) to Puerto Carmelo Peralta (Paraguay). January 2017.
- iv) Bilateral Agreements to exchange technical assistance on matters such as: mining, the development of the shipbuilding industry, assessment of electric interconnection, establishment of trade relations to sell liquified petroleum gas to the Paraguayan market, and the strengthening of regional integration. June 2015.

As discussed in section 4.1., Brazil, Peru and Bolivia have also been discussing and pushing forward the establishment of a Bi-oceanic Railway Corridor that would connect all three countries from the port of Santos, Brazil on the Atlantic coast, to the port of Ilo, Peru, on the Pacific coast. Paraguay has also joined this project and plans to construct a rail segment to transport freight from Puerto Carmelo Peralta (Paraguay) to Roboré (Bolivia).

⁴⁴ IADB report "Conectando los puntos: una hoja de ruta para una mejor integración de América Latina y el Caribe" and Monitor de Comercio e Integración report "El salto de la calidad," 2018.

2.5.1.1. Bolivia: Binational transport and transit agreements

Bolivia – Argentina: To provide continuity to the current energy contract that will expire in 2026, a Memorandum of Understanding was signed to launch negotiations for a new natural gas purchase-sale contract that will come into force in 2027. The agreement also establishes: new contractual amounts and pricing scheme for 2019-2020 with built-in seasonal variations in delivery, the exchange of knowledge and technologies for biofuels, and investment by YPFB (Bolivia) in Argentinian oilfields under development. February 2019.

Bolivia – Uruguay: Operational Agreement between the Administration of Port Services- Bolivia (ASP-B) and the National Ports Administration of Uruguay (APN). The agreement will strengthen Bolivian trade in three ways: by enabling the presence of ASP-B officials on Uruguayan soil, fortifying information exchange, and ensuring preferential treatment of Bolivian goods. January 2017.

Bolivia – Brazil: Addendum to the Memorandum of Understanding for the Energy Sector with the purpose of creating a Binational Technical Committee to integrate efforts with the aim of exporting a minimum of 8,000 MW of power daily to the Brazilian market. To reach this capacity and meet the demand of the Brazilian market, joint plans for the operation of two hydroelectric plants (Río Madera and Cachuela Esperanza), as well as thermoelectric plants, are underway. May 2015.

Bolivia – Peru: A Memorandum of Understanding was jointly signed by YPFB Corporation (Bolivia) and Petroleums of Peru (Petroperú) to distribute Liquefied Petroleum Gas to seven cities in the south of Peru. Both countries are also interested in building a binational electric transmission line which will be operated by the National Electricity Company of Bolivia (ENDE). August 2015.

During the Fourth Binational Cabinet Meeting held in September 2018, Bolivia and Peru signed 12 agreements and the Cobija Declaration. Several of the agreements and declarations are in line with VPOA priorities, including:

- The Interinstitutional Agreement between the National Meteorology and Hydrology Service of Peru and the National Meteorology and Hydrology Service of Bolivia to develop mechanisms to improve hydro-meteorological information management in both countries.
- The Interinstitutional Cooperation Agreement in the hydrocarbons sector, established between the Ministry of Energy and Mines of the Republic of Peru and the Ministry of Hydrocarbons of Bolivia, with the purpose of promoting the exchange of best practices, experiences and knowledge in the field of rural electrification, renewable energy, and energy efficiency. The agreement also cements cooperation and the exchange of information, experiences, good practices, studies, and research on the hydrocarbon chain.
- The importance of the strategic Bi-oceanic Railway Corridor project as a fundamental pillar for South American integration, the promotion of international trade logistics, and regional social and economic development is reaffirmed. Bolivia, Brazil, Paraguay and Peru have signed the Internal Regulation of the Bi-Oceanic Operating Group to facilitate the coordination of tasks and work that must be carried out for project execution.
- Interest in the prompt implementation of the Ilo Agreement in force since January 1992. The Normative Agreement for Interinstitutional Cooperation between the National Ports Enterprise

and the National Port Services Administration – Bolivia stipulates the promotion of trade of Bolivian goods through the port of Ilo.

- Agreement reached to carry out electric interconnection studies.
- Enhancement of cooperation to foster development along both countries' Amazonian border has been promoted through the implementation of the "Integrated Development Plan for the Amazon Area along the Integrated Peru-Bolivia Border Zone" (*Plan de Integración para el Desarrollo del Sector Amazónico de la Zona de Integración Fronteriza Perú-Bolivia*).
- The launch of the Binational Border Crossing Center (CEBAF) in the Desaguadero community aimed at facilitating the transit of people and goods between both countries. Further, commitments have been made to carry out studies to construct a CEBAF center at the Thola-Kollo (Bolivia) – San Lorenzo (Peru) border.
- Joint initiatives to develop both countries' productive sectors, especially in agriculture and small industry, have been carried out through: exchange of experiences, technical and regulatory information, workshops and capacity building forums, the development of work plans, and expert field missions.
- Tourism has been promoted as a means of generating employment, economic growth and the empowerment of local populations.

2.5.1.2. Paraguay: Transport and transit binational agreements

Paraguay – Brazil: To encourage the harmonious co-existence of border towns, an agreement was signed with the purpose of improving integration and providing differential treatment and measures on such matters as work, social security, transit, access to public services and education. November 2017.

Paraguay – Brazil: Joint presidential declaration on physical integration and the construction of two international bridges financed by ITAIPU Binacional. December 2018. The bridges would be built over the Paraná and Paraguay Rivers, uniting Presidente Franco (Paraguay) with Foz de Iguazú (Brazil), and Carmelo Peralta (Alto Paraguay) with Puerto Murinho (Mato Grosso do Sul, Brazil). The first bridge will help alleviate the flow of heavy vehicles on the bridge *Puente Internacional de la Amistad* which was inaugurated in 1965 and continues to serve as the primary socioeconomic logistics corridor between Paraguay and Brazil. The second bridge over the Paraguay river will be essential to the bi-oceanic corridor connecting the Atlantic and Pacific coasts.

2.6 Priority 5: Structural economic transformation

This section examines Bolivia and Paraguay's main macroeconomic and social variables to assess the structural economic transformation that has taken place between 2014 and 2018. This structural transformation is key to expanding each country's trade potential, to create employment, reduce external shocks, and reduce the negative effects resulting from their geographical disadvantages.

2.6.1 The economic context

Between 2014 and 2018, the GDP growth rates of Bolivia and Paraguay was higher than that of other Latin American countries. On average Bolivia's annual GDP growth rate was 4.6%, and Paraguay 4.3%, while the average for Latin America was 0.5%.

During this time period, a global contraction in the demand for raw materials and a drop in their prices occurred, impacting hydrocarbons, mining, and agriculture, which effectively form the backbone of the productive sectors and the export base of the majority of Latin American countries, particularly Bolivia and Paraguay. Prices fluctuated during this time period, with slight price increases in the last two years, which have been accompanied by improvements in the production of agricultural outputs.

2.6.1.1 The economic context of Bolivia

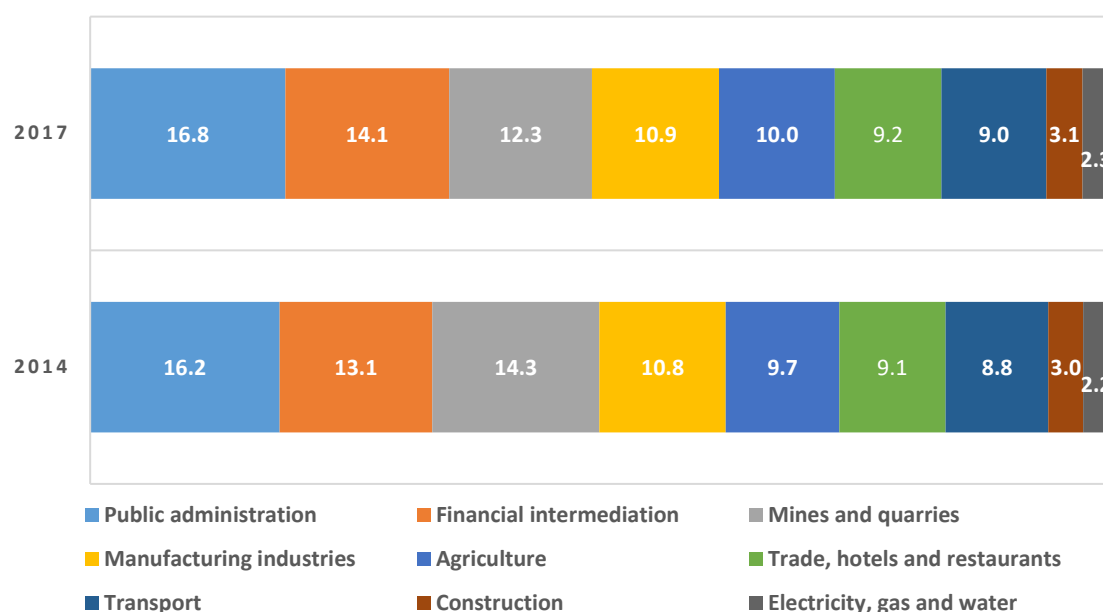
Between 2010 and 2013, the Bolivian economy experienced a gradual and sizable GDP growth rate, reaching 6.8% in 2013. This growth rate started to decrease in 2014 given the drop in global demand and the prices of raw materials, which particularly impacted the mining, hydrocarbon, and agricultural sectors. Nevertheless, the average annual GDP growth rate between 2014 and 2018 held strong at 4.6%, with the domestic market playing a key role in maintaining the high growth rate through household demand and public investment, the latter which was financed by external funding, thus impacting the external public debt which amounted to 26.8% of GDP in 2014, and 33.8% of GDP in 2017. As a result of the drop in oil revenues, the fiscal deficit was 2.5% of GDP in 2014, reaching 5.8% of GDP by 2018.

Table 28: Bolivia: Main macroeconomic indicators

Description	2014	2015	2016	2017	2018
			Rate of Annual Change		
Gross Domestic Product	5.5	4.9	4.3	4.2	4.4
GDP per Capita	3.8	3.2	2.7	2.6	2.9
Consumer Price	5.8	4.1	3.6	2.8	1.3
Real median salary	1.5	5.8	1.7	1.8	
			Dollars		
GDP (USD million, current price)	32,996	33,000	33,941	37,509	
GDP (USD million, constant 2010)	24,475	25,664	26,758	27,881	
GDP/Capita (USD, current price)	3,121	3,073	3,113	3,388	
GDP/Capita (USD, constant 2010)	2,315	2,390	2,454	2,518	
Exports (USD million, current price)	12,899	8,737	7,126	8,194	8,965
Imports (USD million, current price)	10,674	9,843	8,564	9,308	9,996
			Annual average percentage		
Central Government Balance/GDP	-2.5	-4.5	-3.4	-5.0	-5.8
Total external debt/GDP	26.8	29.7	31.5	33.8	
Nominal liable interest rate	1.1	0.5	0.5	1.3	1.9
Nominal asset interest rate	6.5	6.4	6.2	6	6.4
Net National Reserves/GDP (end of year)	45.8	39.6	29.7	27.4	

Sources: Elaborated by the authors on the basis of ECLAC data: *Balance preliminar de las economías de América Latina y el Caribe* – CEPALSTAT and the Central Bank of Bolivia

Figure 25: Bolivia: Economic activity as a share of GDP (percentage)



Source: Elaborated by the authors on the basis of data from CEPALSTAT

2.6.1.2 The economic context of Paraguay

As illustrated in Table 29, the economy of Paraguay fluctuated between 2014 and 2018, although to a lesser extent than in the past decade during which macroeconomic variables varied significantly from one year to the next. The average annual growth rate was 4.3%, exceeding the Latin American average, with notable improvements in GDP per capita.

Table 29: Paraguay: Main macroeconomic indicators

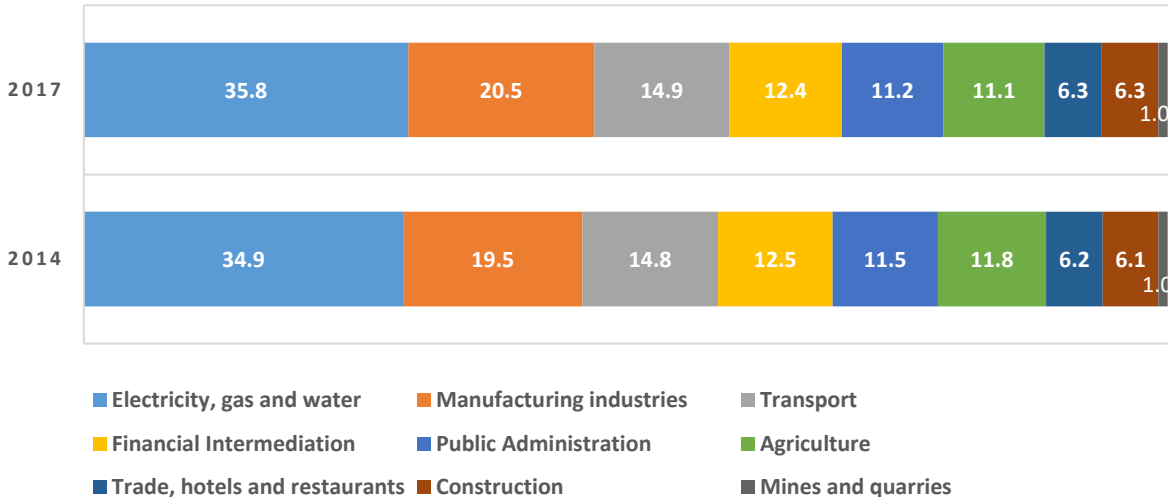
Description	Year	2014	2015	2016	2017	2018
				Rate of Annual Change		
Gross Domestic Product		4.9	3.1	4.3	5.2	4.2
GDP per Capita		3.5	1.8	3.0	3.9	3.0
Consumer Price		5.0	3.2	4.1	0.5	4.1
Real median salary		1.2	0.5	0.7	0.3	0.9
				Dollars		
GDP (USD million, current price)		40,277	36,164	36,054	39,300	
GDP (USD million, constant 2010)		32,109	33,098	34,526	36,325	
GDP/Capita (USD, current price)		6,145	5,447	5,363	5,775	
GDP/Capita (USD, constant 2010)		4,899	4,985	5,136	5,338	
Exports (USD million, current price)		9,636	8,327	8,501	8,680	9,045
Imports (USD million, current price)		11,299	9,529	9,042	11,027	12,434
				Annual average percentage		
Central Government Balance/GDP		-0.9	-1.3	-1.1	-1.3	
Total external debt/GDP		14.5	17.1	18.1	19.3	
Nominal liable interest rate		6.2	7.4	6.7	6.4	6.5
Nominal asset interest rate		15.5	14.3	15.5	14.3	12.9
Net National Reserves/GDP (end of year)		17.1	17.1	19.8	20.7	

Sources: Balance preliminar de las economías de América Latina y el Caribe – CEPALSTAT and the Central Bank of Paraguay

The services, manufacturing, and construction sectors experienced positive growth during the period under review, as did the agricultural sector following positive performance of soybeans, corn, cassava, and tobacco. On the other hand, the electricity and water sector did not perform as well given lower production in both bi-national hydroelectric dams as a result of a drop in production caused by climatic conditions. The fiscal deficit between 2014 and 2018 at 1.1% of GDP was within the boundaries established in the Law of Fiscal Responsibility which sets a maximum value at 1.5% of GDP. The average inflation rate was 3.4% during the time period, which falls below the maximum target of 4% established in early 2017. Further, national reserves increased from 17.1% of GDP in 2014 to 20.7% in 2018.

In Paraguay, the structure and share of the Gross Domestic Product (GDP) by sector have remained relatively the same between 2014 and 2017, with electric power, gas, and water maintaining approximately a 35% share of GDP. Manufacturing occupies second place, with a one percent increase in its share of GDP between 2014 and 2017, jumping from 19.5% to 20.5%. These figures illustrate the limited structural economic transformation during the time period under review, with a steady and important proportion of economic gains produced primarily by the generation of electrical power and agricultural raw materials.

Figure 26: Paraguay: Economic activity as a share of GDP (percentage)



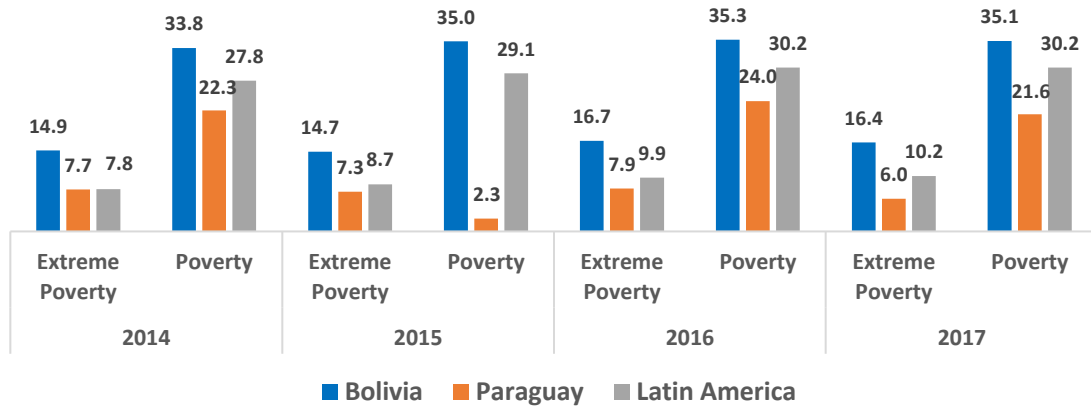
Source: Elaborated by the authors on the basis of data from CEPALSTAT

2.6.2 The social context

Economic structural transformation and economic outcomes are bound to impact the quality of life of a country’s inhabitants which is why the following section delves into key socio-economic indicators, such as the poverty rate and income distribution.

Between 2014 and 2017, the poverty rate in Bolivia was higher than that of Paraguay and the regional average, with figures slightly increasing over the time period. In 2017, the poverty rate reached 35.1% of the overall population, with extreme poverty affecting 16.4% of the population. Paraguay’s figures, on the other hand, were lower than the regional average, further reflecting a slight decrease over the time period. In 2017, the poverty rate was 21.6% of the overall population, and extreme poverty affected 6% of the population.

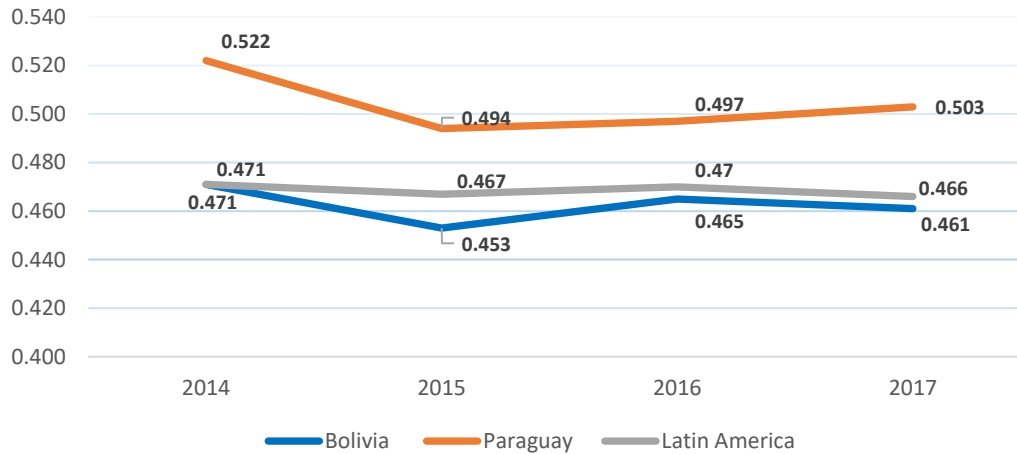
Figure 27: Bolivia and Paraguay, Poverty Rate, 2014 - 2017 (as a percentage of the population)



Source: Elaborated by the authors on the basis of data in the ECLAC report "*Panorama social de América Latina - 2018*"

The Gini index is used to analyze income distribution. Figures illustrate that Paraguay has a greater degree of inequality than Bolivia and the average for the Latin America region. While figures for Paraguay have deteriorated over the past three years, an important drop following 2014 has meant that the 2017 figure still represent an overall improvement since 2014. Such an improvement is also experienced by Bolivia and Latin American as a whole.

Figure 28: Income Distribution (Gini Index)



Source: Elaborated by the authors on the basis of data in the ECLAC report "*Panorama social de América Latina - 2018*"

2.6.3 Structure of exports in Bolivia and Paraguay

Although the share of primary commodities, precious stones and nonmonetary gold in merchandise exports in Bolivia decreased from 96.1% (2014) to 94.8% (2017) and in Paraguay from 91% to 89.6 showing some improvement, the dependency on primary commodities still high compared to a world average of 28%. The share of manufactured goods in merchandise exports increased from 3.5% in 2014 to 4.6% in 2017 in Bolivia and in Paraguay it also increased from 9% to 10.3% in the same years. Although this shows some improvement, both countries continue to have lower manufactured goods in their exports when compared to world average of 69.2%. Enhanced value addition and diversification and fostering productive capacities through industrial development and greater use of modern technology technological growth is crucial to drive structural economic transformation.

Table 30: Bolivia and Paraguay: Structure of exports

	Share of primary commodities, precious stones and non-monetary gold in merchandise exports (%)						Share of manufactured goods in merchandise exports (%)					
	1995-2002	2003-2013	2014	2015	2016	2017	1995-2002	2003-2013	2014	2015	2016	2017
Bolivia	79.6	91.2	96.1	95.0	94.6	94.8	19.6	8.3	3.5	4.4	5.2	4.6
Paraguay	87.5	91.4	91.0	90.3	91.0	89.6	12.2	8.4	9.0	9.6	8.9	10.3
Average for all LLDCs	74.8	83.4	86.6	83.7	82.0	82.3	21.9	15.7	12.9	15.5	17.3	17.3
World	22.8	29.5	32.3	27.7	26.4	28.0	74.0	67.0	65.0	69.4	70.4	69.2

Source: UNCTADstat database

2.6.4 Science, technology, and innovation

As observed in the previous sections, the economies of Bolivia and Paraguay have experienced limited structural economic transformation, largely dependent upon the traditional configuration of a productive sector centered on raw materials and manufacturing of natural resources. The lack of improvement in science, technology, and innovation (STI) partly explains both countries' inability to move beyond commodities and diversify the productive sector and exports and improve efficiency and competitiveness.

Both countries have a regulatory framework and guidelines with the potential of developing a critical mass and the necessary governance to advance in the fields of science, technology and innovation. Bolivia has a "National Science and Technology Plan" (2013) and Paraguay has a "National Science, Technology and Innovation Policy, Paraguay 2017-2030" approved by Supreme Decree 8420 on January 16, 2018. Both instruments have been developed under the guidelines established by each country's respective Social and Economic Development Plan, which in turn are aligned with the ODS.

These plans and development policies discern some of the weaknesses both countries face in promoting STI, among them the limited capacity of universities and research and technology centers to generate and transfer knowledge aimed at addressing and resolving challenges in the country's productive sector, low levels of investment in research and development, the lack of financing to carry out research, and limited public-private coordination. Strategic alliances and the continuous promotion of STIs are key to its development. Universities, the productive sector, and governments need to join efforts to address the needs of the population and provide economic support and capacity building to stimulate research and technological development.

2.7 Priority 6: Means of implementation

Financial resources and cooperation are necessary to achieve VPoA priorities and the objectives laid out in the 2030 Agenda for Sustainable Development. The mobilization of these resources remains a central challenge in Latin America and the Caribbean and globally, especially given the context and dynamics of regional and global growth marked by increasing financial risk and uncertainty which are not conducive to generating development financing, as described in the 2019 Financing for Sustainable Development Report developed by an interinstitutional working group within the United Nations.

According to this report, the financing landscape for development is experiencing a transformation. There is a growing participation of new actors and sources of funding to implement the 2030 Agenda, including philanthropy, non-governmental organizations (NGOs), climate funds, innovative financing mechanisms, and South-South cooperation. Private capital characterized by a diversified set of instruments have also emerged as an important source of financing for developing countries, as has the mobilization of national resources, the transfer of remittances, and the exchange of trade information, which are instrumental to achieving the aims of the VPoA.

The following section outlines in greater depth the diverse resources, mechanisms, and instruments available to Bolivia and Paraguay.

2.7.1 Internal resources and institutional capacity building

A decrease in the world demand for raw materials at the beginning of the period under review (2014-2018) had a direct impact on the public finances of Paraguay and Bolivia, nevertheless both countries continued to invest public funds in infrastructure. As outlined in Tables 3 and 8 of Chapter 2.1., Paraguay sustained infrastructure investment at around 2.4% of GDP, while Bolivia increased its investment in infrastructure from 4.97% of GDP in 2014 to 6.18% of GDP in 2016.

Table 30: Bolivia and Paraguay Economic Indicators

	2014	2015	2016	2017
	Bolivia			
General government fiscal balance/GDP	-2.5	-4.5	-3.4	-5.0
Total external debt /GDP	26.8	29.7	31.5	33.8
Non-financial public sector deposits (% of GDP)	11.8	8.9	9.3	8.7
GDP (USD millions)	32,996	33,000	33,941	37,509
	Paraguay			
General government fiscal balance/GDP	-0.9	-1.3	-1.1	-1.1
Total external debt /GDP	14.5	17.1	18.1	19.3
Non-financial public sector deposits (% of GDP)	5.0	3.4	3.7	3.9
GDP (USD millions)	40,277	36,164	36,054	39,300

Source: Elaborated by the authors on the basis of CEPALSTAT and the Central Banks of Bolivia and Paraguay

During this time period, Bolivia ran a fiscal deficit that increased in size, while Paraguay maintained a steady deficit below 1.5% of GDP as established in the domestic Law of Fiscal Responsibility (FRL). Public sector liquidity, measured through non-financial public sector deposits held in each country's Central Bank, diminished between 2014 and 2017. Further, external debt financing in both countries was made

possible through internal and external debt, although in Bolivia the external debt grew in greater proportion and represented a greater share of GDP than in Paraguay.

Multilateral and bilateral institution cooperation agreements and loans, along with the issuance of sovereign bonds, represent important sources of external financing for the construction and reconstruction of transport infrastructure. Generally, resources are allocated for infrastructure construction and not earmarked for maintenance of this infrastructure. To counteract this tendency, arrangements are increasingly being made with financing institutions so that maintenance costs are built in to the project to cover a set amount of time after the completion of the project.

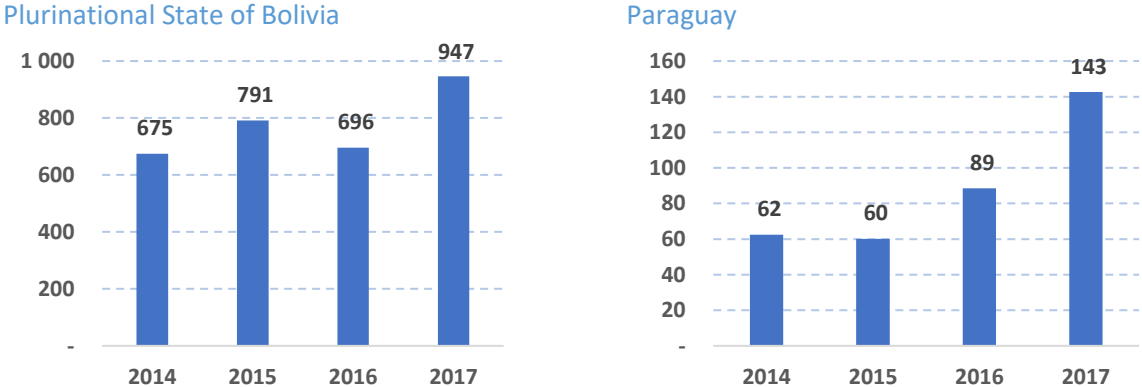
2.7.2 International support to advance VPoA priorities

The international community has been supporting landlocked developing countries through a number of mechanisms, including concessional lending, donations and the provision of technical assistance. The following section outlines the contributions made to advance VPoA priorities in landlocked developing countries in South America through Official Development Assistance (ODA), United Nations System entities, other development institutions, and South-South and triangular cooperation.

2.7.2.1 Official Development Assistance (ODA)

Official Development Assistance disbursements to Bolivia and Paraguay have increased between 2014 and 2017, with a 40.3% increase in Bolivia and a 131% increase in Paraguay (Figure 29). In relative terms, these disbursements have had a significant impact: in 2017, the disbursements made to Bolivia represented 2.6% of Gross Domestic Income (GDI) and were equivalent to \$US 86 per capita, while in Paraguay they represented 0.51% of GDI and were equivalent to \$US 21 per capita (Figure 30).

Figure 29: ODA Disbursements (USD millions)

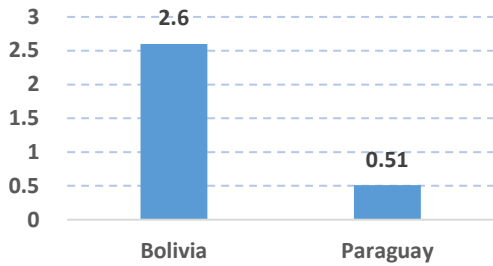


Source: Elaborated by the authors on the basis of data from the OECD, 2018

Source: Elaborated by the authors on the basis of data from the OECD, 2018

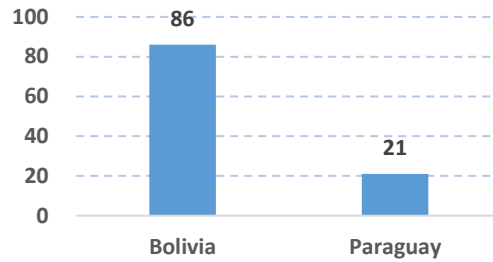
Figure 30: ODA disbursements with respect to GDI per capita (2017)

ODA as a percentage of GDI



Source: Elaborated by the authors on the basis of data from the OECD, 2018

Net ODA disbursements per capita (USD/pc)

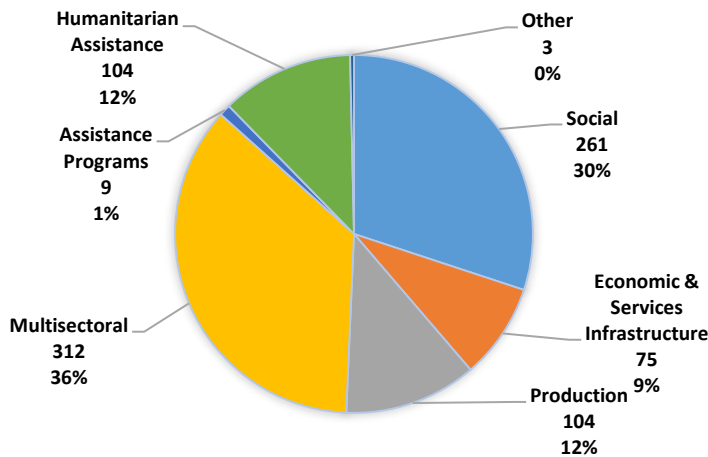


Source: Elaborated by the authors on the basis of data from the OECD, 2018

Figure 31 illustrates the breakdown of ODA resources by sector. The sectors are aligned with the 2030 Agenda for Sustainable Development and VPoA priorities, with a large portion spent on Economic, Services, and Productive Infrastructure. In Bolivia, the percentage of funds allocated to economic and services infrastructure is 9%, and 12% to productive infrastructure, while in Paraguay these figures are 43% and 6% respectively. ODA is an important source of external financing for landlocked developing countries in the region and efforts should be made to maintain and expand them, particularly as they pertain to the spheres of transport and transit infrastructure, and trade facilitation projects.

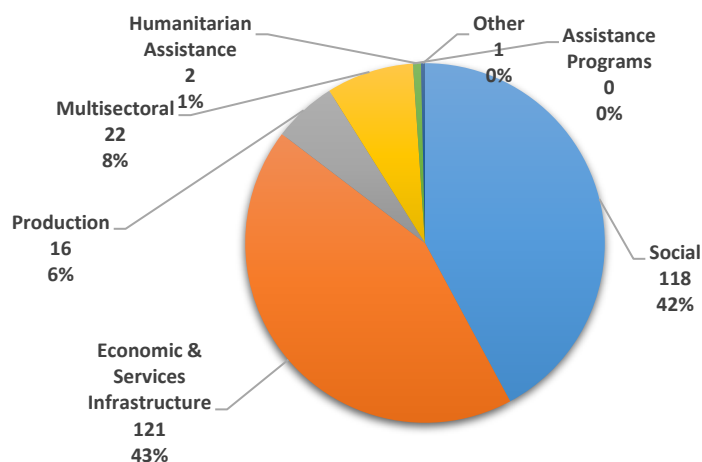
Figure 31: ODA commitments by Sector in 2016 (In USD millions, and as a percentage)

Plurinational State of Bolivia



Source: Elaborated by the authors on the basis of Development AID, Statistics per region, Americas, 2018 Edition

Paraguay



Source: Elaborated by the authors on the basis of Development AID, Statistics per region, Americas, 2018 Edition

2.7.2.2 Development support institutions

Countries throughout the region, and Bolivia and Paraguay in particular, receive financial support and technical assistance from a plethora of institutions whose objectives are to support economic and social development, including United Nations system entities, development banks, and other international and regional organizations. Improved coordination among these diverse programmes, projects and actions can contribute to advancing VPoA priorities.

However, in these countries as well as the rest of the region, is observed a fall in ODA flows since 1960, related to many countries in the region graduating to middle-income status, although per capita income did not reflect the heterogeneity between and within countries in the region. Public and private flows corresponded to different incentives, meaning that private flows did not necessarily follow the rationale of the SDGs.

The financing for sustainable development architecture faces important future challenges

- Widening set of development objectives
- Regulatory/policy issues that arise from the growing importance of private financing
- Balance between foreign and domestic resource mobilization

Therefore, the public sector had an important role to play in creating an appropriate regulatory environment to channel flows to sustainable development priorities. New actors in financing for development included private philanthropic investors, institutional investors, social impact investors, regional development banks, South-South and triangular cooperation, and donor countries that were not part of the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD). New instruments included green bonds, project bonds and project financing. Lastly, it was important to improve the transparency and efficiency of available financing alternatives, and to ensure better coordination and strategies at the regional level to attract resources for sustainable development.

2.7.2.3 South-South and triangular cooperation

South-South Cooperation and Triangular Cooperation are becoming increasingly relevant to support collaboration to achieve the Sustainable Development Goals. Cooperation can help create jobs, strengthen trade, improve infrastructure, transfer technology, reduce asymmetries, and promote regional integration to benefit all countries involved.

The Ibero-American Programme to Strengthen South-South Cooperation (PIFCSS) aims to fortify and provide dynamism to Horizontal South-South Cooperation in Ibero-America. Bolivia, through its Ministry of Development Planning, and Paraguay, through its Ministry of Foreign Affairs, participate in this programme, which publishes an annual report outlining the evolution of these cooperation mechanisms. Bolivia and Paraguay have historically been receivers of significant support, yet they have also begun to position themselves as offerors, as outlined in Table 32.

Table 31: Bilateral South-South Cooperation (number of projects and actions)

	2013		2014		2015	
	Projects	Actions	Projects	Actions	Projects	Actions
	Bolivia					
Receiver	50	12	66	15	68	7
Offeror	1	3	1	7	2	3
	Paraguay					
Receiver	24	4	22	11	30	8
Offeror	0	2	0	0	3	2
	Ibero-America					
Total	576	339	552	333	721	155

Source: Elaborated by the authors based on the Report on South-South Cooperation in Ibero-America, SEGIB (2015-2016-2017).

When assessing sectors that are directly in line with VPoA priorities, 66 infrastructure and services project took place in Ibero-America in 2015, three of them were for Bolivia, and three for Paraguay. Of the 223 projects related to the productive sector, 25 were for Bolivia, and nine for Paraguay. These projects directly contribute to strengthening the productive sector, infrastructure and services which can be leveraged to achieve growth.

South-South cooperation, however, is not exempt from facing implementation challenges, which include:

- Coordination among actors, budgets, breakdown of roles and responsibilities, leadership and accountability;
- The quantity and quality of public information regarding South-South and Triangular Cooperation;
- Identifying the most acute and urgent needs, the greatest strengths, the most appropriate and highest impact strategies for sustainable development.

Despite such challenges, evidence shows that South-South and triangular cooperation are increasingly more specific, rich in working methods, and make substantial contributions to regional integration and the strengthening of national public policies for development. Consolidating these types of cooperation is of great importance to achieving development given that they are valuable tools to address shared sustainable development challenges and seek common and regionally driven solutions.

The United Nations Second High-Level Conference on South-South Cooperation was recently held in Buenos Aires (March 20-22, 2019) with a guiding theme of “The role of South-South Cooperation in the implementation of the 2030 Agenda for Sustainable Development: challenges and opportunities.” The Conference produced a political statement calling for renewed commitment towards these investments, which was agreed upon by more than 160 countries.

The final document recognizes the importance of South-South cooperation in the implementation of the 2030 Agenda for Sustainable Development and its 17 objectives, notably the eradication of poverty in all its dimensions. The agreement shares a comprehensive vision of development which includes economic, social and environmental aspects, and constitutes a new roadmap for South South cooperation. The document also underlines the importance of triangular cooperation and the involvement of development organizations and developed countries in south-south exchanges through the provision of resources and experience.

2.7.3 Contribution of Foreign and Private Sector Investments to VPoA Implementation

To assess the contribution of foreign and private sector investments to achieving VPoA priorities, a 2018 ECLAC study on Foreign Direct Investment (FDI) in Latin America and the Caribbean was reviewed. The study indicates that foreign direct investment in the region diminished for three consecutive years (2014, 2015, 2016), and account for an accumulated decrease of 20% relative to the historical high registered in 2011. The two driving factors behind these figures is the decrease in the price of export commodities which has led to a reduction in investments in extractive industries, coupled with the economic recession of 2015 and 2016. Nevertheless, foreign direct investment rebounded in Bolivia and Paraguay in 2017, reversing the trends of previous years.

Table 32: Bolivia and Paraguay: Evolution of Foreign Direct Investment, 2014-2017

	2014	2015	2016	2017
USD Millions				
Bolivia	657	555	335	725
Paraguay	412	306	320	356
Percentage of GDP				
Bolivia	2,0	1,7	1,0	1,9
Paraguay	1,0	0,8	0,9	0,9

Source: Elaborated by the authors on the basis of data from the ECLAC publication “La inversión extranjera directa en América Latina y el Caribe – 2018”

The growth of FDI in Bolivia during 2017 was mainly due to the reinvestment of profits. Natural resources exert a strong draw for foreign investors, and the hydrocarbon and mining sectors received half of gross flows of FDI (minus divestments), representing 31.6% and 20.7% respectively. The manufacturing sector also grew and received 21.1% of all FDI flows. The services sector, on the other hand, received lower investment levels.

One of the projects that is generating positive expectations involves the State entity “Bolivian Lithium Deposits” (YLB) and German firm ACI Systems, who was awarded a tender for the industrialization of lithium. According to a report by the Ministry of Energy of Bolivia published in 2018, the project foresees an investment of US\$ 1.3 billion by the German firm towards the installation of two lithium plants.

In 2017, US\$ 356 million of FDI entered the Paraguayan economy for an increase of 11.2% as compared to the previous year. This figure, however, is less than FDI volumes reached during the years in which raw material prices peaked, and when foreign capital was being pumped into the country’s agricultural sector. Growth can therefore be explained by the reinvestment of profits, while other components maintained similar levels.

Bolivia and Paraguay both have legal and regulatory frameworks to incentivize domestic and foreign investments, with the aim of creating employment, diversifying the economy, and supporting social and economic development in exchange for granting investors guarantees and tax incentives, among others. Specifically, Bolivia and Paraguay have laws in place to these effects, notably: in Bolivia, Law No. 516 of April 4, 2014, known as the “Investment Promotion Law”⁴⁵, and in Paraguay: Law No. 60/90 of March 26, 1991, known as the “Law of Investment”⁴⁶ and Law No. 5542 of December 11, 2015, known as “Law of guarantees for investments and the promotion of employment generation and economic and social development.”

The entity in charge of promoting investments and exports in Paraguay is the Network of Investments and Exports (REDIEX) under the oversight of the Ministry of Industry and Commerce. Bolivia has announced the creation of an agency for the promotion of foreign investments.

The domestic private sectors in both countries play a vital role to the economy. They impact production and the export of non-traditional products and the provision of transport and logistics services. The role of the private sector has been key to opening new markets and expanding exports. It has also been fundamental to the development of inland water transport through the Paraguay-Paraná Waterway as it has held an indispensable role in the creation of port infrastructure and the composition of the merchant fleet. Paraguay has built one of the world’s most important network of ports and inland water transport fleets, while Bolivia’s private sector investment in ports has been essential to its ability to increasingly leverage this mode of transport.

⁴⁵ <http://www.planificacion.gob.bo/uploads/marco-legal/LEY%20N%20516%20LEY%20DE%20PROMOCION%20DE%20INVERSIONES.pdf>

⁴⁶ Law No. 5542 “Ley de garantías para las inversiones y fomento a la generación de empleo y el desarrollo económico y social”, available at: <http://www.bacn.gov.py/archivos/4523/20160224081415.pdf>, and Law No. 60/90 “Ley de Inversiones”, available at: <http://www.mic.gov.py/mic/site/industria/ddi/pdf/Ley60-90.pdf>

3. Emerging Challenges: Climate Change and Innovation

Latin America and the Caribbean is a region that is particularly vulnerable to the effects of climate change. Given its geographical location, the territorial distribution of its population, and its dependency upon natural resources, changes in climatic patterns have already begun impacting the infrastructure and transport systems of the region, a course which is expected to intensify at a great economic cost in the near future.

According to international organizations, the severity of potential damages will largely depend on the vulnerability and resiliency of each country, and the measures taken in the short term to address these challenges. Vulnerability can be reduced through strategic investments in infrastructure that bolster the resiliency of systems, even when such infrastructure can be costly, as benefits will likely outweigh costs.

To face this reality, it has become necessary to innovate when conceiving projects and to create greater awareness about the benefits and opportunities that resilient and low emission infrastructure hold.

Given that infrastructure largely determines the patterns of production and consumption, choosing the adequate type of infrastructure and assessing how it is designed, operated and regulated significantly determines the subsequent quality of services, the expansion of economic activity, trade, and logistics, the delivery of basic services, and connectivity between communities and markets. This is why it has become essential for climatic scenarios to be considered when planning, designing, financing and operating infrastructure, both inside and outside of cities, so that resiliency is increased, vulnerability is decreased, and overall sustainable development is promoted.

In fact, the relevance of infrastructure and the central part it plays in the achievement of sustainable development is illustrated through its numerous mentions and underlying presence among the 17 Sustainable Development Goals (SDGs). For example, Goal 9 “Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.” Goals 6, 7, and 11 refer to different types of infrastructure when uncovering the need to “Ensure availability and sustainable management of water and sanitation for all,” “Ensure access to affordable, reliable, sustainable and modern energy for all,” and “Make cities and human settlements inclusive, safe, resilient and sustainable,” respectively. The eradication of hunger and poverty can only be achieved through the provision of economic infrastructure. Further, globalization itself would not be possible without the establishment and consolidation of trade routes which are the embodiment of infrastructure, primarily domestic transport and telecommunication infrastructure that connect to the rest of the world and take advantage of economies of scope and economies of scale.

An assessment carried out by ECLAC on infrastructure policy in Latin America (Jaimurzina, Perez, Sanchez, 2015) outlined the weak position the sustainability criteria currently holds in the design and implementation of policies. While establishing these criteria can be a complex exercise, several evaluation systems have been put into place, and when these systems are analyzed within the context in which they have been adopted, they make evident that sustainable infrastructure must be designed to specifically mitigate economic, social and environmental risks, and deliver economic, social and environmental co-benefits. To this end, sustainability considerations must be present in all stages of an infrastructure project, from the initial decision to build, through design, operations, and maintenance.

Finding a balance between efficiency, resilience and sustainability in infrastructure is one of the main challenges for the future. Infrastructure investments in Latin America and the Caribbean should reconcile these three elements to transform the development process in the region in search of structural change and equality. The Sustainable Development Goals, and in the case of landlocked developing countries, the Vienna Programme of Action, present possible ways for this balance to be reached and for achievements to be evaluated.

In addition, considering the potential or real losses resulting from climate change-related disruptions, shocks, and stresses should be considered. This would help strengthen decision making towards investing in more robust infrastructure assets that would recover more quickly, further exposing how resilient infrastructure has the potential of generating increased efficiency, productivity and competitive advantages.

The use of disruptive technologies, such as blockchain, the Internet of Things, artificial intelligence, automation, and robotics is very new to the region, which is of concern given that these developments will cause profound changes in the entire logistics chain. It is therefore essential that logistics planning, as well as regional sectoral actors promptly incorporate these tools to boost productivity, create new opportunities for business, promote productive transformation, and increase regional competitiveness. Failure to do so would extend the current development model, which has proven to be insufficient, into the future. To initiate change, the development of an institutional framework that ensures the adequate development and implementation of these technologies is necessary, so that information exchange and the interoperability of different domestic and subregional public and private initiatives is enabled for the coordinated development of these systems. This would not only reduce the cost of development but also diminish the uncertainty posed by technological change.

To advance towards more a productive transformation rich in research and development, infrastructure services in Latin America and the Caribbean set forward several challenges. According to a recent study published by the World Economic Forum (WEF, 2019) challenges can be grouped in three pillars: institutions, ICT adoption, and the capacity to innovate. Technological applications are the connecting thread that powers and connects an ever broader and more complex logistics chain, increasing the competitiveness of its users, and maximizing the productivity of available infrastructure and services. Logistics strengthen interconnection, the exchange of information, the optimization of time and resources, and creates the need for closer relationships between the government and private sector to increase competitiveness. These applications combine and coordinate different monitoring, transmission, and information process technologies to improve the efficiency, quality, security and sustainability of infrastructure services. They capture, process, and transmit information regarding commercial transactions, freight conditions and operations, vehicle traffic, and other operational variables to enable integrated logistics services and modal integration. For example, freight optimization technologies offer data collection tools that, when used optimally, can help reduce the need for transport, improve business operating margins, reduce the carbon footprint, and contribute to overall regional social and economic development.

4. Conclusions and Recommendations: The way forward

The implementation of the Vienna Programme of Action (VPoA) in Landlocked Developing Countries (LLDCs) in Latin America has built on the progress achieved during its predecessor, the Almaty Programme of Action (APoA), by generating awareness surrounding the most pertinent development issues faced by Bolivia and Paraguay and placing emphasis on the coordination of assistance within the United Nations System and with the international community and on its more comprehensive priority areas.

During the period under analysis (2014 – 2018) both Bolivia and Paraguay have largely aligned their national social and economic development plans with the 2030 Agenda, the Sustainable Development Goals, and the priorities defined in the VPoA. There remains, however, room for improvement in the internal coordination of national government entities, and the incorporation of technical assistance results linked to VPoA priorities within Bolivia and Paraguay, and with transit countries.

4.1 Areas of action for transport connectivity in Bolivia and Paraguay

Between 2014 and 2018 Bolivia and Paraguay made concerted efforts to improve transport infrastructure and connectivity to reduce the negative impacts that come as a result of their lack of direct access to a maritime coastline. Both countries defined clear priorities in their respective development plans, and subsequently made substantial investments in transport and services infrastructure.

1. Road Transport: Investment in road infrastructure has improved overall connectivity, yet full territorial coverage throughout both countries has yet to be achieved. Poor road surface quality and the low proportion of paved roads continue to pose limitations on transport, especially given the composition of the secondary and rural feeder road network (primarily gravel and dirt roads) that restrict transit during rainy seasons.

Connectivity with transit countries has improved significantly as a result of investments made. An important marker of this improvement is the reduced transport time along main import and export corridors. The VPoA objective of allowing freight to travel 300 to 400 kilometers every 24 hours has been surpassed along the Ciudad del Este (Paraguay) – Ponta Grossa (Brazil) corridor where an average of 560 kilometers are travelled during a 24-hour period, and the Santa Cruz (Bolivia) – Arica (Chile) corridor, where an average of 442 kilometers are covered during a 24-hour period.

Road infrastructure in transit countries is generally rated better than that of Paraguay and Bolivia. According to the Logistics Performance Index (LPI) of the Doing Business Report, Paraguay ranks 87th, and Bolivia ranks 138th, falling below the rankings of transit countries like Chile (45), Brazil (51), Argentina (60), and Uruguay (82), with Paraguay faring better than Peru (91).

Building, extending, maintaining, and rehabilitating the road network requires hefty investment of financial resources, which is why new financing mechanisms must be considered alongside traditional sources of financing, especially when economic downturns limit available fiscal resources. Funding should not be limited to road extension projects, but also incorporate road, bridge, and tunnel maintenance as well. To estimate the cost and financial means required for such work in Bolivia and Paraguay in years to come, infrastructure projects in the IIRSA/COSIPLAN portfolio that find themselves in the profiling and pre-execution stages in 2017 can be used as a reference. According to these figures, Bolivia would need US\$

15.16 billion (US\$ 5.66 billion in profiling, and US\$ 9.5 billion in per-execution); and Paraguay would need US\$ 14.02 billion (US\$ 757 million in profiling, and US\$13.27 billion in pre-execution.) The current political situation of IIRSA and its relationship with UNASUR is an important topic that needs to be solved soon, in particular for the importance that IIRSA has for the coordination and financing of regional infrastructure.

Road conservation policies and programs must be adopted and complied with, particularly in rural areas. Measuring maximum weight per axis and requiring frequent and improved weighing stations, are among the necessary elements of an intelligent transport systems.

National budget restrictions alongside the absence of programs to finance road construction and maintenance remain the largest obstacles hindering the development of the road network.

2. Inland Water Transport: Inland water transport is critical to the development of countries in the region. In Paraguay, a strong network of ports and a growing merchant fleet dominated by private sector actors are responsible for transporting 70% of the country's exports. In Bolivia, where a growing agricultural sector is taking shape in the eastern part of the country, inland water transport along the Paraguay-Paraná Waterway (PPW) continues to gain importance as a way of transporting necessary inputs such as diesel, barley, construction materials and container cargo. This has led to the recent development of private ports along the Tamengo Canal which connects with the PPW.

Despite the growing role and importance of inland water transport along the PPW, a number of difficulties continue to persist and are responsible for transport delays and interruptions, notably: natural navigation restrictions (lack of dredging and beaconing), loading and unloading capacity, strikes and social problems in transshipment ports, logistics, cooperation, and coordination along the waterway. To overcome these difficulties, Bolivia, Paraguay and neighboring countries must jointly address these issues, yet most efforts to improve navigation to date have been carried out bilaterally, thus no definitive solutions have yet been defined. One exception to this has been the signature of the River Transportation Agreement for the Paraguay-Paraná Waterway by the five countries that compose the River Plate Basin (Argentina, Bolivia, Brazil, Paraguay and Uruguay), that has the purpose of establishing efficient transport, communications and services that create the conditions for greater freedom of transport along the waterway.

In Bolivia, the idea of reactivating the former Madera-Amazonas waterway, crossing Brazil through Porto Velho, onward to Manaus, and flowing out to the Atlantic Ocean, has found support. Chestnuts and wood are currently being exported through this route which offers shorter transport times and reduced costs as compared to other corridors, such as Guayaramerín (Bolivia) – Arica (Chile). This route relies on intermodal transport (truck – barge – ship) and requires the construction and improvement of highway segments that connect the Bolivian administrative departments of Pando, Beni, and Santa Cruz, and the Guayaramerín (Bolivia) - Guajaramirim (Brazil) border crossing, among others. On the Brazilian side, improvements to the Guajaramirim – Porto Velho highway are also needed.

For these routes to truly become alternatives to existing routes, supportive actions must be taken. In Bolivia, road construction and improvements have been identified, while authorities in state of Rondonia in Brazil have pledged to promote more trade integration, especially to facilitate the transport of Bolivian exports through Brazilian ports. By virtue of the Treaty of Petropolis, Bolivia has obtained the right to use Brazilian rivers to transport merchandise to the Atlantic Ocean.

3. Railway Transport: In Bolivia, railways are responsible for transporting approximately 20% of exports. Export companies and river ports loading and unloading terminals have been improved in an effort to enhance intermodal transport. The lack of connection between the Eastern and Western railway networks, however, remain a persistent problem towards greater integration, and is among the priorities of Bolivia's development plan.

Rail transport in Paraguay continues to be virtually non-existent. Policies are being set forward to reactivate the network, and private sector involvement has been solicited to rehabilitate and operate specific segments of the rail network.

Of great promise to both countries, the Bi-Oceanic Railway Corridor project which would link Brazil, Bolivia, Paraguay and Peru, and connect the Atlantic and Pacific oceans, has the potential of increasing connectivity in a very significant way. The rehabilitation of the rain-ravaged C-15 segment of the Belgrano Railway connecting Bolivia and Argentina, and the reestablishment of service along this railway would also help shorten distances and travel times for Bolivian cargo en route towards maritime transshipment ports.

4. Air Transport: The national development plans of Bolivia and Paraguay have both identified the need to strengthen air transport in response to the expansion of air travel which is expected to continue in years to come. Both countries plan to invest in building new airports and ensuring the maintenance of existing airport infrastructure to meet growing demand, yet persistent challenges reside in the ability to acquire adequate financing to execute planned projects. For example, the Viru Viru Hub project in the city of Santa Cruz, Bolivia, continues to experience delays while stakeholders search for better financial proposals.

5. Capacity for the Development of Infrastructure projects: Projects under the IIRSA/COSIPLAN portfolio for Bolivia and Paraguay generally show levels of execution below the average of Latin American countries, reflecting some of the capacity limitations and difficulties faced in their implementation. In addition, the retraction in the political involvement of actors of UNASUR, the body through which these projects are articulated, create a more challenging environment for intergovernmental coordination, which is why there is a need to intensify institutional efforts to find coordinated investment alternatives between countries.

In general, infrastructure projects require sizable investments and substantial efforts to prepare and execute over the span of many years. Building capacity and providing support to countries such as Bolivia and Paraguay in spheres such as the structuring of transactions, contract negotiations, communication with stakeholders, market extension activities, and legal and regulatory reforms, are necessary to improve project execution performance.

6. Intermodal Transport: Given the distances, topographical characteristics and the hydrographic potential of the region, intermodality is present in most of the corridors used to transport merchandise. This is why transit infrastructure and intermodal transfer services have been improved in Bolivia, Paraguay, and transit countries. In fact, investments to make loading and unloading terminals more efficient have been made by export companies, ports, railway companies, and customs agencies. A long way remains, however, for the incorporation of technologies and for process facilitation to foster greater fluidity in information exchange and to enable the traceability of cargo at all times.

4.2 Areas of action to advance the priorities of the Vienna Programme of Action

Between 2014 and 2018, Bolivia and Paraguay made significant headway in implementing VPoA priorities. The following section summarizes progress while also outlining some of the outstanding challenges faced by both countries as a way of uncovering key recommendations to drive and support this programme of action moving forward.

Priority 1: Fundamental Transit Policy Issues: Progress in the attainment of VPoA priorities have been achieved as a result of the implementation of the Single Window for Foreign Trade, trade implementation committees, Authorized Economic Operators, and the digitalization of processes through the International Customs Transit Computerized System (SINTIA). ECLAC studies have demonstrated that the time and cost overruns related to customs and transit processes for exports have diminished in Bolivia, Paraguay, and transit countries. Similarly, global reference indicators, such as the Logistics Performance Index (LPI) and the cross-border trade indicators of the Doing Business Reports, are important measures of progress achieved by Bolivia and Paraguay during the 2014-2018 period. Bolivia and Paraguay have demonstrated improvement in their export processes, reducing the time and costs involved to achieve documentary and border compliance. Their import processes, however, show mixed results, with improvements in the time necessary to complete documentary compliance, and constant outcomes for the costs and time needed for border compliance. All in all, Bolivia and Paraguay's ratings on these indicators remain low compared to other economies due to persistent bureaucratic structures and red tape that are prevalent in both countries and that continue to negatively impact the costs and time necessary to carry out international trade operations. Coordinating and monitoring these actions through a logistical lens is essential to generate competitive advantages and reduce the time and cost necessary for trade.

Bolivia and Paraguay have both signed the World Trade Organization's (WTO) Trade Facilitation Agreement (TFA). This agreement contains provisions to expedite the movement, release and clearance of goods, including goods in transit. Technical assistance and capacity building channeled through the WTO and the World Customs Organization (WCO) would greatly support Bolivia and Paraguay in effectively implementing the TFA. The agreement includes special provisions for developing and least-developed countries, which provide them the opportunity, after having received technical assistance, to determine which measures they will implement and at what time. The establishment of A, B, and C notification categories have come as a result.

According to the TFA database, the most highly requested types of assistance in Latin America relate to Information and Communication Technologies (ICTs); legal and regulatory frameworks; human resources and capacity building; needs assessments; institutional processes; infrastructure and equipment; and sensitization. In addition, the most frequent Category C measures notified by Latin American countries requiring additional time and technical support to be implemented are: testing procedures; single window; authorized operators; monitoring or expanded inspection notifications; formalities; average terms of release; information services; and observations and information prior to the agreement entering into force.

In the area of transport, ECLAC, the Andean Community of Nations (CAN) and the Latin American Integration Association (ALADI) have been working towards the simplification of cross border land

transport throughout South America. To this end, they are carrying out a comparative analysis of current international rules and protocols that regulate the sector. The outcome of these efforts aspires to give way to a set of harmonized regional regulations based on mutual recognition and the adherence to the Agreement on International Road Transport (ATIT) for all CAN and ALADI member countries.

In the area of customs procedures, the MERCOSUR Customs Code (Decision CMC 27/2010) which regulates the entry and exit of merchandise to and from MERCOSUR countries through the incorporation of more than 25 Common Customs Statutes that define and harmonize fundamental customs rules, is in the process of being approved. To date, Argentina and Brazil have endorsed the MERCOSUR Customs Code, and are awaiting the Congressional approvals of Paraguay and Uruguay to come into force.

With regards to inland water transport along the Paraguay-Paraná Waterway (PPW), the River Transport Agreement's VIII Additional Protocol was recently signed, ensuring the Agreement's indefinite validity. The ratification of this document is of great significance given that it strengthens institutionality and the commitment of the countries in the Plata Basin system to advance regional physical integration along this natural corridor, further contributing to the predictability, stability, and legal security of investments made along the PPW.

The improvement of infrastructure, customs performance, and the competitiveness of logistics services are therefore essential. Landlocked developing countries and transit countries must review, assess, and if necessary, modify the regulatory frameworks that promote transparency, the mutual respect of existing transit regulations and treaties in order to ensure the expeditious transit of goods.

Priority 2b: Infrastructure development and maintenance for energy and ICTs: Between 2014 and 2018 the populations of Paraguay and Bolivia gained greater access to electric energy, with indicators such as energy generation, territorial extension, and population concentration evolving positively. In Paraguay, electricity coverage in urban areas became virtually universal, with minor gaps to incorporate pockets of the rural population. In Bolivia, electricity coverage continues to remain relatively low (90.7%) with a marked difference between urban and rural access levels, making universal electricity access one of the country's goals to be achieved by 2025.

Despite progress and investments made in technologies such as fiber optic, broadband, internet and intelligent communication equipment, the development and adoption of ICTs in Bolivia and Paraguay remain limited as compared to other countries in the region. The lack of access to submarine cables resulting from their landlockedness is an important factor to the low development and use of fixed broadband services in both countries. International Telecommunications Union (ITU) studies carried out in Bolivia and Paraguay have determined that fixed broadband prices are still relatively high compared to other Latin American countries, with low average internet speeds and marked inequity in access between urban and rural areas.

E-commerce also experiences this general lag given that Bolivia and Paraguay, much like other countries in Latin America and the Caribbean, find themselves in the first stages of development of this sector. It is important to note, however, that the governments of Bolivia and Paraguay have begun implementing key related policies including digital signatures, broadband planning, free software development, digital terrestrial television, and electronic government, among others. While e-commerce holds great potential, several challenges must be overcome to propel the sector, notably: information deficits, fear of fraud and

online transactions, limited supply of goods and services resulting from limited demand, and agile and responsive distribution and delivery logistic systems.

The development and adoption of ICTs also holds great potential in simplifying customs formalities and controls, which is why investing and leveraging the potential of the digital evolution is of great importance to Bolivia and Paraguay.

Priority 3: International trade and facilitation: The economies of Bolivia and Paraguay have a high degree of openness to international trade. Their main export markets in order of magnitude are MERCOSUR, followed by Asia, Europe and North America.

Exports are concentrated in a limited number of products, mainly primary products with low added value, complemented by a limited volume of manufactured products. Both countries are making concerted efforts to add greater value to exports and develop their manufacturing sector, notably Bolivia is developing petrochemical and steel sectors, while Paraguay is focusing on expanding its presence in the global bovine meat market by focusing on improvements in the health of animals, quality of meat, reproductive technologies and advances in logistics and marketing. A change in production strategy nevertheless is required to reduce dependency on the limited number of low value-added products and to penetrate the world market with a greater degree of competitiveness.

International, regional, sub regional conventions and bilateral agreements are the primary means to achieve simplified, standardized and transparent rules and procedures to facilitate trade, which is why Bolivia and Paraguay have signed the WTO Trade Facilitation Agreement, as detailed under Priority 1.

Priority 4: Regional integration and cooperation: Latin America has followed an integrationist course, adopting a number of initiatives to enable countries throughout the region to build and work in partnership with one another. Over time, important advances have been made to develop a complex framework of trade agreements that covers a wide range of issues, undoubtedly supporting the development of exports of participating countries. The current political climate and crises experienced by several of these integration initiatives should not be an obstacle to delay action to promote trade facilitation and improve transit conditions.

Gradual convergence towards a unified regional market built upon existing trade agreements is crucial given the current nature of the world economy which is increasingly characterized by competition among large economic powers connected through comprehensive trade agreements, and threats of global trade barriers. In this climate, the fragmentation of the region's current integration system is all that more apparent.

Regional integration is a process that must continue to be strengthened and will ultimately help advance VPoA priorities. Landlocked developing countries must therefore play a more active role in ensuring compliance with international transit agreements and promote foreign direct investment, particularly intraregional investments, to integrate economic and services infrastructure networks.

Priority 5: Structural economic transformation: Between 2014 and 2018, the economic performances of Bolivia and Paraguay fared relatively better than the average of Latin American countries, however, limited progress was made towards the structural economic transformation of their economies that continue to be centered on the production of raw materials and natural resource-based manufactures.

Positive impacts that would be derived from structural economic transformation is important as it would improve social conditions and the quality of life in both countries, where levels of poverty and inequality stand above the average of other Latin American countries. These outcomes can largely be attributed to moderate progress in the areas of science, technology, and innovation which are bedrocks to achieve greater export diversification, and the productivity, efficiency and competitiveness of domestic economic sectors.

By adding value and contributing to the diversification of exports, the industrial manufacturing sector spurs structural change in the economy and serves as an important driver of economic and social development, which is why developing countries must define industrial policies that not only grant economic incentives but further stimulates the accumulation of knowledge, information, and skills. Strategically channeling resources from low to high productivity sectors by providing incentives and training that enable the effective transition of workers is necessary, as is the promotion of human capital and the funding of joint actions between private and public sector entities.

In addition, global and regional value chains play an important role in industrial development and productive transformation. Global chains are based in large regional centers of economic growth and integration, while regional chains are based on productive linkages that involve two or more countries with productive affinity, territorial proximity and commercial complementarity. Regional chains form the basis of access to international markets for micro, small and medium-sized enterprises (MSMEs), helping to improve their competitiveness, inclusion and participation in these markets. This is why infrastructure integration is a fundamental pillar of growth and connectivity in the region. Making the region an integrated space through the building of economic infrastructure and the provision of high-quality services is essential not only to maintain and improve competitiveness, but also to reduce the cost of imported consumer products. To this end, ECLAC has been working on fostering regional integration and promoting coordinated, integrated, and sustainable infrastructure, logistics and mobility policies at the regional level to encourage costs reductions for greater efficiency and productivity, while aiming to reduce the impact of externalities on the population and the environment.

Barometers of economic and social development such as income per capita, and poverty and inequality levels demonstrate that most countries in the region, and Bolivia and Paraguay in particular, must devote efforts to increase human capital, physical capital, social capital, technological innovation, institutional, and commercial openness, among others.

The development of science and technology can be accelerated through continuous promotion and effective strategic alliances. Universities, research centers, the productive sector, and governments must therefore join force to respond to the needs of the population and be enhanced through economic support and training aimed at stimulating research and technological development.

Priority 6: Means of implementation: Between 2014 and 2018, the decrease in global demand and the drop in raw material prices exerted negative pressures on the public finances of Bolivia and Paraguay, yet despite these constraints both countries maintained their levels of investment in economic and services infrastructure. In order to ensure that investment levels are sustained, and that continuous efforts are undertaken to address the priorities of the VPoA and accelerate progress towards the achievement of the 2030 Agenda for Sustainable Development, the support of the international community is required.

Support under the form of technical assistance and concessional loans or grants in favor of investments and actions to build economic and services infrastructure and to develop institutional capacities related to logistics, falling under the umbrella of comprehensive development programs, should be prioritized. The mobilization of resources through alternative sources of financing such as public-private partnerships, infrastructure investment funds, and other types of cooperation such as South-South Cooperation and Triangular Cooperation, are bold, innovative, and thriving means to strengthen cooperation and achieve the Sustainable Development Goals.

4.3 Emerging challenges

Changes in weather patterns are already affecting regional infrastructure and transport systems, including those of landlocked developing countries in the region. Future impacts and economic losses are expected, but their size and scope will depend on the vulnerability and resiliency of each country, which is why measures taken in the short term to meet these challenges are important. Investments in infrastructure can help boost resilience, and while the immediate financial resources required may be high, they will generate greater economic return in the medium term, allowing countries to move towards more sustainable development.

Lastly, digitalization and technological innovation are transforming logistics in a profound way. While developed countries continue to accumulate technological and institutional capacities through endogenous learning processes conditioned by cooperation and the standardization of the use of technology, the Latin American and Caribbean region remains largely resistant to digitalization and innovation, influenced by fears of potential job loss and the lack of opportunities for digital learning. Implementing technological innovation to render trade logistics more productive throughout Latin America and the Caribbean, and especially in landlocked developing countries, is paramount. The opportune incorporation of technologies and the digitization of certain processes could help solve traditional problems in the logistics sector and can contribute to the creation of new business opportunities and value-added services, thereby increasing regional competitiveness.

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