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**Review of the Implementation of the Vienna
Programme of Action for the Landlocked Developing
Countries for the Decade 2014-2024 in the Latin
America Region**

UN-OHRLLS and ECLAC

**Background report for the High-level Latin America Regional Review of the Vienna
Programme of Action for the Landlocked Developing Countries for the Decade
2014–2024 to be held 27-28 July 2023 at Hotel Crowne Plaza, Asunción,
Paraguay.**

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TABLE OF CONTENTS

<hr/>		
	Acronyms	iii
	Executive Summary	iv
<hr/>		
I	Introduction	1
<hr/>		
II	Overview of the socio-economic development in the Latin America Region	2
<hr/>		
III	The status of implementation of the Priority areas of the Vienna Programme of Action	9
A	Priority 1: Fundamental transit policy issues	9
B	Priority 2a: Development and maintenance of transport infrastructure	14
C	Priority 2b: Energy, and Information and communications technology infrastructure	27
D	Priority 3: International trade and trade facilitation	32
E	Priority 4: Regional integration and cooperation	42
F	Priority 5: Structural economic transformation	44
G	Priority 6: Means of implementation	51
<hr/>		
IV	Emerging Challenges	61
<hr/>		
IV	Conclusions and recommendations	64
<hr/>		
V	References	75
<hr/>		

DRAFT

Acronyms

ACI	Integrated Control Areas
ALADI	Latin American Integration Association
ATIT	International Land Transport Agreement
CONACYT	National Council for Science and Technology
CAN	Andean Community of Nations
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
IADB	Inter-American Development Bank
ICT	Information and Communication Technology
INE	National Statistics Institute
ITA	Information Technology Agreement
ITU	International Telecommunication Union
LLDCs	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)
MSME	Micro, small and medium-sized enterprises
ODA	Official Development Assistance
PDES	Economic and Social Plan of the Plurinational State of Bolivia
PMT	Transport Master Plan
PND	National Development Plan (Paraguay)
PNL	National Logistics Plan
PPW	Paraguay-Paraná Waterway
SDGs	Sustainable Development Goals
SMEs	Small and medium-sized enterprises
SSC	South-South Cooperation
STI	Science, Technology and Innovation
TC	Triangular Cooperation
TFA	Trade Facilitation Agreement
UN-OHRLS	United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and the Small Island Developing States
VPoA	Vienna Programme of Action
VUCE	Single Window for Foreign Trade
WCO	World Customs Organization
WTO	World Trade Organization

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Executive Summary

Landlocked developing countries (LLDCs) face specific challenges related to their lack of territorial access to the seaports or geographical remoteness from international markets. Higher trade costs compared to their transit neighbors undermine their economic competitiveness and limit their trade volumes. This situation limits their ability to access investment, finance, technology and services needed to improve their productive capacities, which is necessary for the structural transformation of their economies. The socio-economic crisis caused by the COVID-19 pandemic accompanied by the war in Ukraine and impacts of climate change have exacerbated these challenges. These difficulties adversely affect LLDCs' ability to promote economic development, human and social progress and environmental sustainability.

The Vienna Program of Action (VPoA) for Landlocked Developing Countries for the decade 2014-2024 was adopted at the Second United Nations Conference on Landlocked Developing Countries, held in Vienna, Austria, in November 2014, with the aim of addressing the special development needs and challenges faced by these countries. The VPoA is an integral part of the 2030 Agenda, and its full and effective implementation is critical for LLDCs to achieve the Sustainable Development Goals (SDGs).

In its resolution 76/217, the UN General Assembly decided to convene the Third United Nations Conference on Landlocked Developing Countries in 2024 to, inter alia, to undertake a comprehensive review of the implementation of the VPoA with a view to formulating and adopting a renewed international support framework to address the special needs of LLDCs. It also requested that regional-level reviews be held as part of the preparations for the Conference.

This report reviews the status of implementation of the VPoA since 2014 by identifying the progress made, best practices and lessons learnt as well as obstacles, and constraints encountered and actions needed to overcome them. It also provides recommendations and considerations on emerging challenges. It builds on the report prepared for the High-level Midterm Review conducted in 2019.

In the 2014-2022 period, Latin American LLDCs, the Plurinational State of Bolivia and Paraguay, sought to align their national economic and social development plans with the priorities defined in the VPoA and the 2030 Agenda and the Sustainable Development Goals. In advancing the execution of these plans, various public policies related to the Programme were implemented.

For a better understanding of the issues addressed in this report, two aspects are emphasized. First, it is important to note the importance of logistics performance as one of the main explanatory variables of economic development. Second, it is necessary to identify certain structural characteristics of the Plurinational State of Bolivia and Paraguay, in addition to the particular challenges and bottlenecks they face as landlocked countries.

This report reviews the status of implementation of the Vienna Programme of Action in the Latin America and Caribbean region focusing on the priority areas of the Vienna Programme of Action including: socio-economic development of LLDCs; Priority 1: Fundamental transit policy issues; Priority 2: Infrastructure

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development and maintenance focused on transport infrastructure, and energy and information and communications technology infrastructure; Priority 3: International trade and trade facilitation; Priority 4: Regional integration and cooperation; Priority 5: Structural economic transformation; and Priority 6: Means of implementation.

Overview of the Socio-Economic Development of Latin American LLDCs

Both countries remain heavily reliant on exports of raw materials and resource-based manufacturing, making them highly vulnerable to developments in the international environment, external shocks and climate change.

During the period under review, both LLDCs in the region experienced interruption to economic growth due to the COVID-19 pandemic in 2020. Following the pandemic, however, both countries achieved significant economic recoveries (although lower than the regional average), and poverty reduction due to easing confinement measures and improvements in the commodity prices.

Although the Plurinational State of Bolivia and Paraguay have made significant social progress in terms of poverty reduction and income distribution, both countries are still behind in relation to the Latin American average. Using the Human Development Index (HDI), which depicts the quality of life of citizens in any country (by narrowing on life expectancy, expected years in schooling and per capita income), and is directly linked to SDGs implementation, this report shows that, between 2014 and 2021, the HDI increased for both countries. Paraguay's HDI value for 2021 is 0.717, positioning the country in the High human development category at 105 out of 191 countries and territories. Bolivia (Plurinational State of)'s HDI value for 2021 is 0.692, placing the country in the Medium human development category at 118 out of 191 countries and territories.

In this report, Latin America and Caribbean region LLDCs are called for a resolute response to the immediate needs of the population, while preventing further well-being losses that would have lasting impacts over time. Additionally, there is an emphasis on strengthening human capacities to overcome developmental challenges.

On Priority Area 1: Fundamental transit policy issues, both nations have taken measures to bolster the implementation of the Agreement on Trade Facilitation (TFA) within the framework of the World Trade Organization (WTO) and other trade treaties that support smooth transit. Through collaborative efforts in regional integration processes, they have successfully enhanced the efficiency of their transit systems by adopting common standards to facilitate transportation services across different modes and harmonize technical regulations. While there have been slight declines in the overall Logistics Performance Index (LPI) score by the World Bank for both countries (2023 vs. 2014), improvements have been observed in the Quality of Transport Infrastructure component.

To further improve transit, it is essential that LLDCs and transit countries continue to assess their internal processes to promote movement in a streamlined and coordinated manner. To enhance their position in

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international trade, Bolivia and Paraguay will need to continue improving connectivity and processes with transit countries. Addressing bottlenecks goes beyond the scope of unilateral interventions, it requires coordinated management across integrated borders, along with introduction of robust transit regimes, the implementation of technology and adoption of best practices on a global scale.

In **Priority Area 2: Development and Maintenance of Transportation, Energy, and ICT Infrastructure**, significant efforts have been made by LLDCs in investing in transportation infrastructure, supported by improved institutional capacity, predictability, and planning tools. The length and density of roads have consistently grown since the adoption of the VPoA in both countries. While these advancements have positively impacted connectivity in recent years, there still exists a marked difference in accessibility, coverage, and road development among different zones or regions. In terms of transportation, the challenge lies in continually assessing the extraordinary logistical costs associated with their LLDC status and understanding their impact on overall development. By pinpointing the underlying causes, LLDCs can effectively prioritize and optimize allocated resources for further improvements. The Bi-Oceanic Corridor is among the most critically important transport projects for Paraguay and Bolivia, since it would enable the connection between the mainland, ports on the Atlantic and Pacific coasts and destinations overseas.

The national development plans of the Plurinational State of Bolivia and Paraguay emphasize the importance of continuous efforts to integrate and strengthen regional economies through air transportation. To this end, several actions have been identified, such as the construction, improvement and expansion of international and domestic airports; the strengthening of the flag airlines; the acquisition of new aircraft; and the development of a new airline network. The development of this means of transport is expected to contribute to the growth of tourism, commerce and other business activities.

River transport holds significant importance for the LLDCs in the region. Paraguay heavily relies on its system of river ports and waterways, which form the backbone of the country's foreign trade, with more than 80% of exports being transported through this means. In Bolivia (Plurinational State of), the Paraguay-Paraná Waterway (PPW) plays a critical role as the primary river access. Several regional projects are underway to strengthen management and cooperation in transboundary water resources. River transport through the PPW continues to face challenges, including weather conditions, and continued efforts are needed to address the challenges.

Overall, while transport infrastructure projects are part of both countries' recovery plans, their implementation continues to present challenges in the face of increased resource scarcity due to global economic difficulties. It is essential to direct investments towards quality infrastructure in all modes of transportation to achieve integrated transport and logistics systems that improve connectivity with transit countries and facilitate international trade.

Regarding **energy infrastructure**, the availability of electricity services to the population has shown favorable progress from 2014 to 2022 in both LLDCs. This advancement is further complemented by the increasing utilization of non-renewable energy sources like wind and solar power, which present significant

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opportunities. Continued efforts to close the rural-urban gap are essential.

As for **Information and Communication Technologies (ICTs)**, there has been a steady rise in the percentage of the population using the internet since the implementation of the VPoA, accompanied by improved mobile phone coverage. However, both countries still face challenges in terms of connectivity, with relatively low percentages compared to the rest of the subregion. The Plurinational State of Bolivia and Paraguay must continue their efforts to narrow the gap in accessibility to energy and ICT services for the population, particularly between urban and rural areas. They should continue develop broadband infrastructure throughout the country; to facilitate Internet access; and to reduce tariffs through greater competition in the sector.

Regarding **Priority Area 3: International Trade and Trade Facilitation**, both Bolivia and Paraguay have made noteworthy efforts to enhance the value of their exports. However, these exports remain concentrated in a limited number of sectors, mainly related to the primary sector. To add more value to their exports, a strategic shift towards productive diversification is essential, wherein technological innovation plays a fundamental role.

In terms of transit, both LLDCs ratified the WTO Trade Facilitation Agreement (TFA). The establishment of National Trade Facilitation Committees (NTFC) in both countries and the signing of various bilateral and multilateral agreements have been significant steps. Despite these efforts, significant barriers to the smooth transit of goods through transit countries persist and further implementation of the WTO TFA is important. To strengthen their position, both nations must continue working on standardizing processes with transit countries, addressing regulatory and logistical deficiencies that result in prolonged export times, increased costs, and uncertainty. These factors negatively impact the competitiveness of landlocked economies.

In relation to **Priority Area 4: Regional Integration and Cooperation**, over this period, despite facing challenges in the political, social, and economic landscape that haven't always been supportive of regional integration, the LLDCs have shown a strengthened commitment. This determination enabled them to reach consensus and approve numerous agreements and treaties covering a broad spectrum of topics related to the VPoA priorities. Trade agreements have played a significant role in fostering export growth during the analyzed period, leading to increased interregional trade and proving crucial in overcoming the economic and commercial difficulties brought on by the COVID-19 pandemic. Transport corridors play a pivotal role in improving LLDCs' connectivity to markets, ensuring efficient transit, reducing costs, and providing benefits for all stakeholders. The current complex regional situation presents an opportunity to expedite actions that promote trade facilitation and enhance regional transit conditions. Additionally, a coordinated approach and effective implementation of agreed-upon legal frameworks for establishing and maintaining transportation corridors will be vital for success.

In **Priority Area 5: Structural Economic Transformation**, despite experiencing economic growth between 2014 and 2022, Bolivia (Plurinational State of) and Paraguay still heavily rely on raw materials and natural

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resource-based manufacturing (such as mining, hydrocarbons, hydroelectric power, soy and its derivatives, and livestock). This heavy concentration on these products makes them highly dependent on external prices and climatic factors. It is crucial for landlocked developing countries to shift their resources towards more productive sectors. To achieve structural economic transformation, improving science, innovation, and technology becomes vital, ensuring that research and technological development meet the population's needs. Additionally, both countries face significant challenges in adopting and integrating ICTs, especially in a context marked by rapid global expansion. In view of insufficient progress in science, technology and innovation, LLDCs should form a strategic alliance involving various sectors and societal actors to effectively promote research and technological development in response to the population's needs.

Under Priority 6: **Means of Implementation**, the Plurinational State of Bolivia and Paraguay have persistently enhanced their investments in economic and service infrastructure, even amidst a notable decline in commodity prices that was further exacerbated during the initial months of 2020 by the disruptions in international trade caused by the pandemic. There is a need for LLDCs to come up with innovative financial instruments and modalities, including blended finance, infrastructure investment funds and other cooperation modalities such as South-South and triangular cooperation.

FDI and intra-regional investment play a key role in the proper integration of transport infrastructure networks and communications between LLDCs and neighboring countries. In this regard, LLDCs must make concerted efforts in attracting foreign direct investment to key sectors which are crucial for the structural transformation of their economies.

Finally, it is crucial to further strengthen international support, both in terms of technical assistance and financial resources to fill the gaps in physical and soft infrastructure and other development needs. Assistance from the international community plays a fundamental role in helping landlocked developing countries enhance their logistics capacity and institutional development and in ensuring that infrastructure is climate resilient and sustainable. In terms of resources, while it is necessary to continue directing them towards infrastructure improvements, it is also essential to promote the development of science, technology, and innovation. These areas are key to achieving export diversification, productivity, efficiency, and competitiveness in economic sectors. In summary, they are fundamental for achieving structural economic transformation. The need to articulate a synergetic relationship between development finance and climate finance has become even more pronounced, in view of financing green structural transformation in LLDCs.

LLDCs and transit countries in the region should continue to strive to deepen the process initiated by the VPoA and its predecessor, the Almaty Programme of Action (ApoA), in order to move towards the establishment of efficient and coordinated logistics and mobility systems at the regional level. As with any policy involving different actors and resources, this requires an institutional framework that allows for a planning horizon and the search for long-term systemic solutions, thus overcoming the immediacy of response that is usually generated by day-to-day needs.

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Emerging issues

It is also important to consider some emerging challenges and take them into account to the future, such as climate change, sustainability, environmental degradation, and gender equality, among others. Changes in weather are already affecting the infrastructure and transportation systems of the region. The LLDCs are highly vulnerable to the effects of **climate change** due to their geographical location, the territorial distribution of their populations, and their natural resource-based production patterns. The severity of the environmental damage faced by countries will depend on their vulnerability and resilience, and on the measures taken in the short term to address this challenge.

It is also necessary to include **gender equality** as an emerging challenge, as there are still significant gaps between men and women in terms of opportunities, access to resources, decision-making and rights, which manifest themselves in various areas such as education, employment, political participation and gender-based violence. Addressing gender disparities and inequalities leads to greater empowerment of women and promotes their participation in all spheres of society, which benefits the entire community.

The political declaration of the High-level Midterm Review of the VPoA emphasized the importance of **data collection for monitoring** the specific objectives of the Programme. It also reaffirmed the commitment to provide the necessary capacity-building support to LLDCs to strengthen their national statistical systems. National statistical systems play a fundamental role in the planning, implementation and monitoring of policies and programmes related to sustainable development. This is because it is necessary to have accurate, reliable and up-to-date information on various macro and micro aspects such as trade, production, investment, poverty, education, health, employment, environment among others. This data enables governments and decision-makers to understand the challenges and needs of society, identify gaps and formulate effective strategies to address them.

Strengthening national statistical systems involves improving the capacity to collect, analyze and manage data and ensuring the quality of the information produced. This includes developing statistical frameworks and methodologies, training staff responsible for data collection and analysis, investing in information and communication technologies, and promoting international cooperation and collaboration in the exchange of data and good practices. Furthermore, conducting continuous assessments of the substantial logistics costs encountered by LLDCs and their impact on development is crucial. This allows for the identification of root causes and the allocation of resources in a more effective manner to drive improvements.

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I. Introduction

This report has been prepared in accordance with UN General Assembly resolution 76/217, which decided to convene the Third United Nations Conference on Landlocked Developing Countries in 2024 to undertake a comprehensive review of the implementation of the VPOA with a view to formulating and adopting a renewed international support framework to address the special needs of LLDCs. To this end, it was necessary to conduct reviews at the regional level as part of the preparations for the Conference. Thus, this report analyzes the socio-economic situation of the Plurinational State of Bolivia and Paraguay in the context of the progress observed under the VPOA, based on the High-level Midterm Review conducted in 2019.

This report has been prepared using a wide variety of quantitative and qualitative sources and materials. These are mainly statistical sources, reports from regional organizations, official documents, academic papers and press articles. The content is organized into four sections, as detailed as follow:

Section II provides a brief description of the main socioeconomic development variables in the Latin American region during the period under review, with a special focus on the region's LLDCs. In analyzing the evolution of these variables, special attention is paid to the impact of the COVID-19 pandemic, the war in Ukraine and the surge in global inflation. It also includes the progress made by both countries in relation to the monitoring and ratification of their commitments to achieve the SDGs.

The VPoA is organized around six priority areas: transit policy; infrastructure development and maintenance (transport, energy and ICT); international trade and trade facilitation; regional integration and cooperation; structural economic transformation; and means of implementation. Section III provides an assessment of the status of implementation and results achieved in each priority area, identifying progress made, best practices and lessons learned, as well as obstacles or constraints encountered and actions needed to overcome them.

Section IV includes the development of the emerging challenges identified, among which two key aspects are considered for their impact on both structural transformation and the achievement of the SDGs in the countries of the region. These aspects are climate change and gender equality. In addition, the political declaration of the High-Level Mid-Term Review emphasizes the improvement of statistical systems. This section identifies the main progress made by LLDCs in this area during the period under review.

Finally, Section V highlights the progress as well as identifies the main challenges that have emerged in each of the VPOA priorities. Based on these points, recommendations are offered for actions (at the national, regional and international levels) needed to overcome the bottlenecks identified in the report. Considering the recommendations, key actions and areas for further work are identified to contribute to the achievement of the SDGs in the region.

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II. Overview of the socio-economic development in the Latin America Region

A. The socio-economic development

The period that started in 2014 was characterized by the slow rate of development of global economy and international trade, with a contraction of demand and a price reduction of raw materials. Prominent among these are the hydrocarbons, mining and agricultural products, which are the productive and export structural base of most of the countries in Latin America and the Caribbean (ECLAC, 2015).

The general economic slowdown in the countries and in the different sectors, a lower dynamism of domestic demand, the low foreign aggregate demand and the fragility of the international financial markets were already signs of a complex economic and social context, prior to the COVID-19 pandemic. The dynamics of the price of raw materials, a very important factor for the Latin American and the Caribbean economies, showed a general reduction of about 5% in 2019. (ECLAC, 2019). The region went into the pandemic having already racked up a six-year run of weak growth —0.3% on average over 2014–2019 and in 2019 in particular the growth rate was only 0.1% (ECLAC, 2020).

These structural problems were worsened by the sanitary, economic, productive and social crises caused by the pandemic. In the region, this represented the worst economic crisis of the last hundred years, with a GDP average contraction of 6.8% in 2020. In addition to the generalized decline in economic activity, there was also a contraction in international trade, strong fluctuation in the price of commodities and high financial market volatility. The labour markets were also compromised by the interruption of certain production and commercial activities. At the same time, this situation affected the capacity of immigrants to send remittances to their home countries (ECLAC, 2020).

Moreover, the extension of the confinement and social distancing measures adopted worldwide to curb the spread of the pandemic had a long-lasting impact on tourism and other related activities. Global connectivity was also highly affected with important effects —though differentiated- in the trade and logistics and transport industries in the region. In this way, those countries where transport and IT infrastructures were not very developed had to face new challenges, with obstacles to competitiveness in the international markets, and obstructed the monetization of these flows, harming the local communities (Rivera, 2020).

Another factor that negatively impacted global trade was the war between Russia and Ukraine. Both countries are key suppliers of energy, food, metals and fertilizers, and these supplies have been affected by the war. The impact of the war in the Latin American and the Caribbean economies takes place through several channels: a trade —lower external demand for the region, — commodity prices— because of its effect in terms of the exchange rates and the problems derived from the rising global and regional inflation, —and the financial channel— as a consequence of the worsened global financial conditions (ECLAC, 2022a).

To face the effects of the crisis, as it occurred in other regions of the world, unprecedented fiscal and monetary packages were implemented, and they helped cushion the fall in economic activity, but they also caused global indebtedness. This left the regional economies with a tight fiscal situation and an increase in the sovereign debt.

The economic activities of the Latin American countries and the Caribbean during 2021 and 2022 clearly showed differences in recovery levels between developed and developing economies. In the beginning,

DRAFT

the easing of pandemic measures and the favourable external conditions provided some dynamism to the regional economies, which reached their highest peak (16.1%) in the second quarter of 2021 (ECLAC, 2021b).

This expansion of economic activity was supported by external demand and private consumption. From the sectorial point of view, a key factor was the recovery of the sectors which had suffered the most from the impact of the pandemic, particularly construction, trade, manufacturing, transport, and communications. Commodity prices began to stabilize from 2021. In this context, energy and commodity prices are expected to fall by 23% and 21%, respectively, in 2023 compared to 2022 (Baffes and Mercer-Blackman, 2023).

The second half of 2022 was marked by a new slowdown, which is expected to deepen in 2023. Given the context of growing external uncertainties and internal constraints, the estimated growth rate for the region this year is 1.2% (ECLAC, 2023d).

In social terms, the region has not been able to advance toward recovery and return to pre-pandemic levels. The economic growth slowdown, in a global economic context marked by a lack of stability, has fully impacted on the recovery of high-quality employment (ECLAC, 2022j). The effects of inflation, which are particularly noticeable in the consumption basket, affect mainly the population with lower income. To this situation, it is necessary to add risk factors, such as the increase in the frequency of natural disasters and the impacts of climate emergency (ECLAC, 2021b).

In addition, the global interest rate hikes have been exacerbated by the financial turmoil in early March, which has increased uncertainty and volatility in financial markets. Although inflationary pressures have slowed, monetary policy rates in the major developed economies are expected to remain high throughout 2023 (ECLAC, 2023d).

B. The socio-economic development in the Plurinational State of Bolivia

During the period under review, the Plurinational State of Bolivia and Paraguay continued being the smallest economies in South America, despite the sustained growth of the countries in the subregion, mainly on account of the behavior of commodities. With an export basket concentrated on natural resources, the activity of these economies is highly dependent on factors such as external prices and, in some cases, adverse climate conditions.

According to the United Nations Program for Development (UNDP, 2023), the Human Development Index (HDI)¹ of the Plurinational State of Bolivia, increased from 0.684 to 0.717 between 2014 and 2019, the year in which it reached its maximum growth. This allowed the country to be placed in the High Human Development category. However, the most recent index (2021) fell to 0.692, so its current category is Medium Human Development.

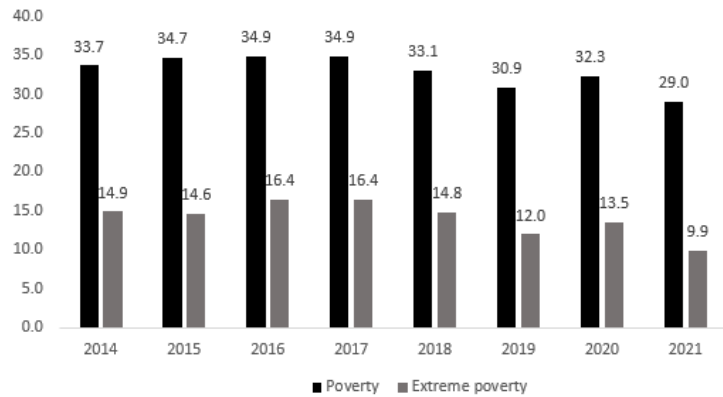
Although the Plurinational State of Bolivia has made significant social progress in terms of poverty reduction and income distribution, it is still behind in relation to the Latin American average. In 2014, 14.9%

¹ The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and having a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions (UNDP, 2023).

DRAFT

of its population was in extreme poverty and 33.7% in poverty. By 2021, the rate of inhabitants in extreme poverty was about 9.9% and the corresponding rate for the population in poverty decreased to 29%, which shows a substantial reduction in both indicators (Figure 2).

Figure 1
Bolivia (Plur. State of): poverty rate, 2014-2021 (As a percentage of the population)



Sources: the author based on CEPALSTAT, Statistical Databases and Publications, UNECLAC.

Between 2015 and 2020, social measures for vulnerable groups (women, mothers, the elderly, people with disabilities and children), consisting of cash transfers, have been strengthened. These have contributed to reducing poverty and extreme poverty by improving basic needs such as health, education and food. In aggregated terms, these transfers reach over 30% of the population in Bolivia (Gobierno del Estado Plurinacional de Bolivia, 2021b).

In terms of income distribution, interpreted through the Gini index, Bolivia (Plurinational State of) shows a positive evolution when comparing the years 2014 and 2021. For 2014, the Gini index had a value of 0.471, which decreased to 0.418 in 2021 (ECLAC, 2022j).

In the area of education, the regular school attendance rate of children between the ages of 4 and 17 increased by more than 4% between 2015 and 2020, from 86% to 90.8%. These improvements are the result of the implementation of the Productive Socio-Community Education Model, in which they defined specific objectives to achieve quality education, as a key element to reduce poverty in all its dimensions. Similarly, the enrollment rate in higher education of young people between the ages of 19 and 23 increased from 35.4% in 2015 to 43.5% in 2020 (Gobierno del Estado Plurinacional de Bolivia, 2021a).

These social outcomes were achieved and accompanied by sustained growth in recent years. Over the past decade prior to the pandemic, the country recorded an average annual growth of 4.5% (IDB, 2021), although the tendency has been declining since its peak in 2013, when it reached a GDP growth rate of 6.8% (Pérez and Sánchez, 2019). Available statistics indicate that by 2021, the GDP had recovered 96.8% of its pre-pandemic value, with an annual growth of 6.1% (ECLAC, 2022c). However, despite this performance, the indicator remained below the South American average (6.9%).

The GDP in 2022 witnessed a growth rate of 3.48% compared to the previous year, driven in part by the notable increase in the services sector and the transportation and storage industries (INE, 2023). According to projections by the Ministry of Economy and Public Finance, GDP growth will reach 4.86% in 2023. Among the variables that have affected the growth of economic activity in the recent period are, among others,

DRAFT

the lower dynamism shown by some of its main trading partners, the limited room for manoeuvre for economic policy in the face of high fiscal indebtedness, and the marked loss of international reserves.

The country's economy is based primarily on extractive activities, hydrocarbons and minerals in particular, and secondarily, on agriculture and manufacturing. Rising global prices and demand for commodities contributed to exports in 2022 reaching a year-on-year growth of over 58%, the highest value recorded since 2014 (INE,2023). In terms of sectors, more than half of this increase is due to the extraction of gold and tin, and soybean products. The mining of zinc, lead and silver come in second place.

In terms of fiscal performance, the country has maintained a deficit trend for the eighth consecutive year (9.3% of the GDP in 2021, one of the highest on record). This structural behavior impacts negatively on fiscal sustainability and risk perception. In addition, the net domestic credit in 2021 was 8.2% of the GDP, duplicating the one in 2014. Aggregate public debt exceeds 80% of GDP, with shares of 61.9% for the domestic component and 38.1% for the external component (ECLAC, 2022c).

Between 2014 and 2019, the national minimum wage increased by nearly 18%, whereas the growth from 2019 to 2022 was 6%. In 2022 the salary was nearly 325 dollars (INE,2023). Regarding exchange rate policy, the buying and selling exchange rates for the dollar have remained stable throughout the period from 2014 to 2022. This orientation makes it possible for the Plurinational State of Bolivia to reduce the inflationary pressures of external origin, in detriment of the international reserves.

The Plurinational State of Bolivia ratified its compromise to reach the SDGs established in the 2030 Agenda, linking its Patriotic Agenda of the Bicentennial 2025, in its 13 pillars, with the SDGs. This Agenda constitutes a medium and long-term State policy, with a comprehensive vision of the country's development. In an initial stage, its implementation was achieved through the execution of the 2016-2020 Economic and Social Development Plan, and then through the new 2021-2025 Development Plan, which defines objectives, goals, and expected results for the year 2025 (Gobierno del Estado Plurinacional de Bolivia, 2021a).

In this respect, the Plurinational State of Bolivia published its first Voluntary National Report in 2021, which describes the goals reached up in the fulfillment of the SDGs. This report shows significant progress in the reduction of poverty and inequality, children's nutrition and food production, access to health and education services, greater participation of women in the political decisions of the State, and the advances in the generation of energy from renewable natural sources, among others. It is noteworthy that, in the light of the Economic and Social Plan 2021-2025 (PDES), important challenges remain, particularly the impacts of the COVID-19 pandemic on the dimensions of sustainable development.

C. The socio-economic development in Paraguay

Over the last two decades, Paraguay has experienced some economic growth thanks to favorable terms of trade and sound macroeconomic policies, which have also been reflected as progress in the social field. However, there are still important challenges related to a context characterized by a high degree of informality in the main sectors and cities, which impacts on the production and commercialization chains and on fiscal revenue (IDB, 2021).

It is important to highlight, as a historical context, the conditions that differentiate Paraguay from its neighboring transit countries, especially those with larger domestic markets. Indeed, while in Argentina and Brazil the manufacturing sectors were consolidated (since shortly after the middle of the 20th century) based on their domestic markets and accompanied by an external protection process, in Paraguay, with a

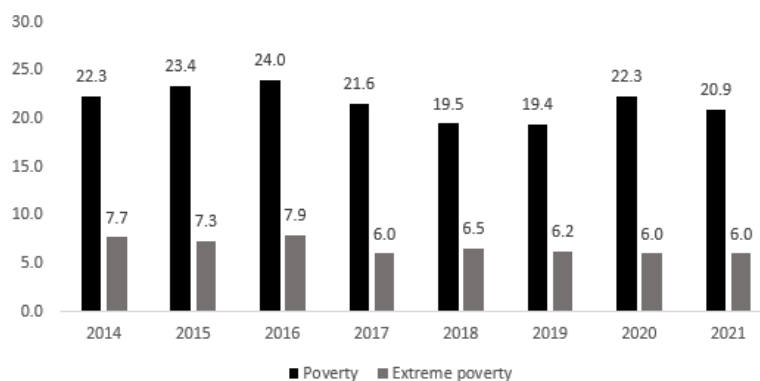
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reduced domestic market, a policy of openness to international trade was adopted. This reality marks significant differences in the development strategy and the effects on financing of public policies, but at the same time, stresses the importance of improved fluidity in international transit flows for Paraguay's development, given its landlocked status, and the support required to achieve this, including to a large extent the willingness of transit countries and regional coordination.

In terms of the HDI, Paraguay made the leap to the High Human Development classification in 2012 - when it surpassed the 0.7 benchmark - since the year the indicator began (1990) and until 2011, its rating had remained at Medium Human Development. In particular, for the period corresponding to the VPoA, it could be observed that since 2014 (with an index of 0.716) the indicator registered a slight upward trend, which reached its maximum in 2019 (0.732). In the following years and through the last measurement in 2021, when it obtained an index of 0.717, the HDI decreased until practically returning to the same values recorded in 2014 (UNDP, 2023).

About poverty indicators, the extreme poverty rate in 2021 decreased by 1.7 points concerning 2014 (7.7% and 6% of the population respectively). Meanwhile, 20.9% of the population is in poverty (close to pre-pandemic levels). Between 2014 and 2021, the poverty rate decreased by 1.4 points (Figure 3). Estimates for 2022 suggest that drought, inflation levels and the reduction in economic assistance related to the pandemic would have affected significantly the behavior of this indicator, mainly in rural areas.

Figure 2
Paraguay: poverty rate, 2014-2021 (As a percentage of the population)



Sources: the author based on CEPALSTAT, Statistical Databases and Publications, UNECLAC.

Regarding income distribution and the Gini index, Paraguay continues to show greater inequality than the average for Latin America. However, there was an improvement in the distribution both in 2020 and 2021. Comparatively, Paraguay's Gini index improved in 2021 (0.447) concerning the values in 2014 (0.522) (ECLAC, 2022j).

According to the recent results of the evaluation of the National System for the Evaluation of the Educational Process, more than 90% of Paraguayan children have not acquired the basic skills appropriate to their level of education, while between 7 and 8 out of 10 students are below the expected performance. In this context, the National Strategy for Educational Transformation 2030 project was born, with the aim of designing the National Plan through a participatory and multisectoral process that provides quality, inclusive and equitable education through the development of skills and competencies, emphasizing the challenges of greater access to connectivity, innovation and technology, and addressing the needs of children with different abilities (Gobierno Nacional del Paraguay, 2021c).

DRAFT

On the economic side, Paraguay's GDP growth in the decade prior to the pandemic was around 4.77%. There were significant variations by market, reaching growth peaks and falls of 9.3%, for example, as happened in 2015. After two years of contraction of economic activity, during 2021 the Paraguay's economy grew by 4.1% (ECLAC, 2022g), the year 2022 closed with a growth of 0.1% and as climatic conditions normalize, a growth of 4.5% is projected for 2023 (Central Bank of Paraguay, 2023).

After the lifting of mobility restrictions imposed to deal with the pandemic, the recovery in the economic activity in 2021 was driven by the services sector, particularly trade, restaurant and hotel sector and domestic services. The secondary sector, which showed a real growth of 4.6%, was driven by the recovery in manufacturing and construction. The primary sector contracted by 10.4% due to a drop of 16.5% in agricultural activity (ECLAC, 2022g).

Paraguay's economy has a clear agricultural orientation, making it highly vulnerable to climate conditions and external shocks. It is estimated that the severe and prolonged drought² in the region had a serious impact on Paraguay's 2021/2022 summer agricultural season, where it is estimated that up to 60% of the soybean crop may have been affected. Moreover, it is necessary to consider the effects of the conflict in Ukraine on international food and fuel prices, as well as Russia's significant share in the country's export market.

With regard to foreign trade, the year-on-year variation for 2022 showed a drop of -5.8% in exports, while imports increased by 16.5%. The number of countries to which Paraguay exported that year (144) was the same as in 2021. Nevertheless, there were differences between the extra- and inter-regional participation. The countries of origin of imports, were 162, only 4 more than the previous year (Gobierno Nacional del Paraguay, 2022). In Section III, Priority 3, the export matrix, markets, and export diversification, among other topics, are developed in depth.

As regard wages, in 2021 there was an average increase of 4.1% in nominal terms which was insufficient to maintain purchasing power. In fact, in real terms, it implied a contraction of 1.4% (ECLAC, 2022g). Large wage contractions were observed in the sectors of communications, services, hotels and restaurants. Since mid-2021, the country has shown an upward trend in inflation, with the year-on-year rate rising to 6.8%, and according to data from the Central Bank of Paraguay, inflation projections for the end of 2022 would be around 8% (ECLAC, 2022g). The main factor of the inflationary upturn continues to be the evolution of food and fuel prices.

With regard to the fiscal deficit, and after having reached a level equivalent to 6.1% of GDP in 2020, a reduction to 3.8% in 2021 was noted. This was due to the plan implemented by the authorities to reduce the deficit to the limit of 1.5% of GDP established in the fiscal responsibility law. Estimates for 2022 were around 3%. The public debt balance at the end of 2021 represented 35.1% of GDP, registering an increase equivalent to 1.3% of GDP with respect to 2020. Finally, the estimated growth for 2022 is barely 0.2% (ECLAC,2022g).

² The drought, caused by the La Niña phenomenon, began to manifest itself in 2019, affecting several countries in South America. However, the drought that affected the last summer/agricultural season in Paraguay (2021-2022) has been extremely significant and has led to a number of economic losses (UNDP, 2022)

DRAFT

In relation to currency, although throughout 2021 the nominal exchange rate of the guarani continued to appreciate against the Argentine peso and the Brazilian real, it depreciated against the American dollar. The real exchange rate depreciated by 9.8% over the same period (0.9% in 2020), reflecting inflation differentials (ECLAC, 2022f).

The Government of Paraguay also published the Voluntary National Report in 2021, the second after its publication in 2018. This report points out the commitment of all sectors of the country towards the 2030 Agenda and the achievement of the SDGs. At the same time, this report shows that the country has made enormous efforts to comply with the 2030 Agenda by introducing changes in the legal frameworks and installing and implementing public policies, as well as on the different initiatives led by the private sector, civil society, academia and citizens in general (Gobierno Nacional del Paraguay, 2021c).

Since 2014, the Republic of Paraguay has adopted the National Development Plan Paraguay 2030 (PND Paraguay 2030) as a long-term planning instrument and in response to the constitutional mandate, which is mandatory for the public sector and indicative for the private sector. The specific objectives of the updated PND Paraguay 2030 are highly integrated with the 2030 Agenda goals. According to what is reported in the Plan, a direct correspondence has been identified, either total or partial, of 63% of the goals of the SDGs; besides, if the contribution of the PND objectives to the SDGs is taken into account, there is a linkage of 92%, corresponding to 155 of its goals (Gobierno Nacional del Paraguay, 2021a).

As reflected in the Second National Voluntary Report of the National Government of Paraguay (2021), the country has been involved in a process of institutional strengthening of the 2030 Agenda. This is reinforced by the restructuring implemented in the Paraguay SDGs Commission, which oversees compliance with the international commitments adopted for sustainable development. This reengineering has become one of the most relevant milestones in the last year in this regard along with the creation of the new National Institute of Statistics (INE), considered key for the implementation of evidence-based policies.

Additionally, there have been different multisectoral initiatives that have made it possible to reach innovative solutions to national development challenges with a participatory vision. Some of them are PROEZA, a project that combines elements of poverty, reforestation, energy and climate change; Wendá, a platform for citizen initiatives; Integrated Social Information System, and e-Heka, a platform for social data visualization; ASU+B, initiative that seeks to position Asunción as one of the sustainable capitals on the world; OSD Mentorings, which seeks to raise greater awareness and appropriation/ownership of the SDGs; the SDGs Multisectoral Dialogue Spaces, among many others (Gobierno Nacional del Paraguay, 2021c).

It is worth mentioning that, as of the updating of the National Development Plan “Paraguay 2030”, a fourth strategic axis was incorporated, called “Institutional Political Strengthening”, which aims to focus public efforts on the dignity, well-being, freedoms and possibilities for the integral fulfilment of the people, generating and facilitating the necessary means for their compliance. The Plan also highlights the stability and soundness of the Monetary and Fiscal policies, which have generated the proper framework for economic agents to make decisions regarding productive investment, in a context where public indebtedness remains at very moderate levels compared to the rest of the Latin America countries (Gobierno Nacional del Paraguay, 2021a).

DRAFT

III. The status of implementation of the Priority Areas of the Vienna Programme of Action

A. Priority 1: Fundamental transit policy issues

Restrictions on cross-border and transit goods transport as a result of the COVID-19 pandemic further increased trade difficulties for LLDCs. This highlighted the need for urgent action to reduce transaction costs associated with export protocols; to promote the digitization and registration of border management processes; and to make transit systems efficient and resilient to crises. All of this, reinforcing the implementation of the Trade Facilitation Agreement (TFA) and other treaties favorable to transit.

The Plurinational State of Bolivia and Paraguay participate in an array of agreements and conventions on the facilitation of transit and trade. This section aims to explore these instruments, establishing a comprehensive framework for the treaties, while also shedding light on the notable strides made in institutional reform and the streamlining of customs processes. Section E will delve further into the latest developments concerning transit agreements within the context of regional integration and cooperation.

Both countries are original members of the Latin American Integration Association (ALADI), an organization that promotes the establishment of an area of economic preferences in the region. The regional agreements within ALADI, including partial scope agreements, encompass a wide range of topics. These agreements address matters such as tariff reduction and trade promotion, economic complementation, agricultural trade, financial, tax, customs, and sanitary cooperation, environmental preservation, scientific and technological cooperation, tourism promotion, and technical standards, among other fields.

ALADI pursues its goals in accordance with the World Trade Organization (WTO) and the instruments of the World Customs Organization (WCO), among other entities, to identify customs procedures that can be streamlined and standardized. Additionally, its effort aims to providing support for the implementation of trade facilitation measures. On the subject of mobility, the Agreement on International Land Transportation (ATIT) signed in September 1990³, serves as the legal framework for the provision of land transportation services in seven-member countries of the Association (Argentina, Bolivia, Brazil, Chile, Paraguay, Peru and Uruguay). It provides the primary legal framework for facilitating the movement of people and goods between countries through road and rail networks.

Notable agreements and conventions that merit mention due to their applicability in transit and trade facilitation include the Geneva Convention on Road Traffic (1949), the United Nations Convention on the Law of the Sea (1982), the Marrakesh Agreement Establishing the World Trade Organization (1994) and the WTO Trade Facilitation Agreement (2013). Developments in relation to the latter will be discussed in Section D.

The Plurinational State of Bolivia together with Colombia, Ecuador and Peru make up the Andean Community (CAN), with Paraguay, Argentina, Brazil, Uruguay and Chile as associate countries and Spain as an observer state. CAN is a regional integration organization that comprises diverse bodies and institutions forming the Andean Integration System (SAI). Its purpose is to achieve an integral, balanced and autonomous development through Andean integration, with a projection towards South American

³ Available at: <https://www.aladi.org/sitioaladi/facilitacion-de-comercio/acerca-del-tema-2/el-atit/>

DRAFT

and Latin American integration. The Andean Community has implemented a series of community rules to facilitate and liberalize transport services in their different modalities. International road transport is regulated by Decisions 398 (passengers) and 399 (goods), which aim to ensure the efficiency of the service, specifying the conditions of the contract and the responsibility that the carrier and the users must have.

Paraguay, along with Argentina, Brazil and Uruguay, make up the Southern Common Market (MERCOSUR), with Venezuela and Bolivia (Plurinational State of) in the process of joining, and Chile, Colombia, Ecuador, Guyana, Peru and Suriname as associate members. MERCOSUR is an instrument for regional integration whose main objective is to promote a common space for the promotion of trade and investment opportunities through the competitive integration of national economies into the international market. On the subject of MERCOSUR, the Recife Agreement is particularly noteworthy, regulating integrated border controls between the signatory countries, and facilitating trade and transportation by streamlining customs procedures.

The river is the mode of transport that handles the entry and exit of approximately 80% of the goods used in Paraguay (Gobierno Nacional del Paraguay, 2023). For this reason, the River Transport Agreement on the Paraguay- Parana Waterway (PPW) (1992) has a key impact on national trade. This Agreement was signed by the five countries of the Plata Basin: Argentina, Bolivia (Plurinational State of), Brazil, Paraguay and Uruguay, thus developing a common regulatory framework for agile trade and efficient river operations that provide all possible facilities and guarantees for freedom of transit.

In 2018, the VIII Additional Protocol to the River Transport Agreement was signed, which deferred the aforementioned Commitment for an indefinite period of time. This extension contributes to the predictability, stability and legal certainty necessary for the investments made in the PPW. As mentioned above, the prolonged drought is also having an impact throughout the basin, resulting in the lowest water levels in the last seventy years. These conditions of navigation caused losses that have not yet been calculated, due to the extra mooring time and the lower quantities transported, which increase the costs of shipping.

The National Customs of the Plurinational State of Bolivia, in accordance with Article 3 of Law No. 1990 of July 28, 1999, controls the passage of goods through the country's borders, ports and airports, subject to customs authority and Bolivian legislation. Of the country's 339 municipalities, 72 are border municipalities, comprising rural communities and small towns, eight of which are binational border towns, i.e. they are cross-border twin towns. These include the borders with the Republic of Chile and the Republic of Paraguay, where the National Customs Office exercises border control over exports, imports and customs transit.

In May 2023, the National Customs of Bolivia (Plurinational State of Bolivia) carried out a "Study of Customs Clearance Times", for the first time in the country. The aim is to improve border operations and measure the real-time import procedures across different modalities using methodology and software endorsed by the WTO. This study was carried out at the Yacuiba border crossing (Tarija), which holds significant importance in international trade with Argentina. Subsequently, it will be replicated at other border points such as Tambo Quemado, Pisiga, Puerto Suarez, and Desaguadero. While this study has been conducted in many countries, Brazil is the only Latin American nation to have implemented it.

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Preparation for the study required training in 2022 for customs personnel, technicians from the General Directorate of Migrations, the National Service of Agricultural Health and Food Safety (SENASAG, in Spanish), Customs Brokers, International Carriers, and Customs Warehouse Concessionaires, all under the auspices of the WCO – SECO Global Trade Facilitation Program. Experts from the General Directorate of Customs of Nicaragua and the National Customs Authority of Panama also participated.

In accordance with the Integrated Strategic Plan 2021-2025 (PEI), the Plurinational State of Bolivia has defined institutional strategic actions to improve border management. These include the modernization of foreign trade operations through simple and agile processes and services for the fulfillment of customs obligations; effective and intelligent control of the transit of goods through comprehensive risk management and the optimal disposal of goods; and the strengthening of administrative management, human resources, technology and infrastructure⁴.

In January 2023, the Plurinational State of Bolivia approved Supreme Decree No. 4857, which aims to establish the organizational structure of the Executive Branch of the Plurinational State, the powers of the President, Vice President and Ministers. The Vice-Ministry of Commerce and Internal Logistics is responsible for the development, strengthening and articulation of the logistic system for internal commerce in the Plurinational State of Bolivia. It carries out measures involving the elaboration of the Preventive Logistics Observatory and of the National Logistics Plan (PNL), as well as the implementation of the National Logistics Council.

With regard to the progress made in the formulation of national transit policies, Paraguay has made efforts, within the MERCOSUR framework, to harmonize several technical regulations, seeking solutions to unnecessary technical obstacles (Gobierno Nacional del Paraguay, 2023). Paraguay's main border crossings have Integrated Control Areas (ACI), which enable officials from both jurisdictions to carry out their activities jointly. These centers are characterized by the unification of working hours and continuous service provision, harmonization and simplification of administrative procedures and operational practices. Paraguay currently has seven Border Control Centers that differ in terms of the degree of implementation of coordinated controls with its three border countries and is currently negotiating the incorporation of three new ACIs, two with Brazil and one with Argentina.

The construction of two bridges with the Republic of Argentina is currently in the planning stage, one in the cities of Pilar (Paraguay) and Puerto Cano (Argentina), and another that will replace the one currently in use between the cities of Puerto Falcón (Paraguay) and Clorinda (Argentina). Both bridges will have the necessary infrastructure to accommodate the ICAs. Finally, the particular case of the ICA located at the Roque González de Santa Cruz International Bridge (Encarnación - Posadas), whose traffic flow between 2021 and 2022 increased by 156%, is highlighted. An ongoing analysis is carried out there in order to minimize delays and achieve an orderly border transit (Gobierno Nacional del Paraguay, 2023).

With the purpose of providing the logistics sector with a specific policy framework, the national government presented in 2021 the National Logistics Plan Paraguay 2030 (PNL), and in 2018 the Transportation Master Plan 2012-2032 (PMT). The PNL seeks to provide Paraguay with an efficient, multimodal and competitive national logistics system that will enable it to deliver products to their destination markets in a timely, cost-effective and quality manner, with cargo safety and environmental

⁴ Available at: <https://www.aduana.gob.bo/aduana7/content/propuesta-estrat%C3%A9gica-0>

DRAFT

protection. The PMT, on its behalf, aims at organizing, in the short and medium term, the development of transportation and logistics infrastructure and services, incorporating a diagnosis of the current transportation situation and including projects under development.

In 2022, Paraguay conducted a mapping process for the systematization of foreign trade processes involving 300 representatives from the private sector and 150 public officials from 27 institutions that are part of this process. As a result, 267 opportunities for improving foreign trade processes were identified, many of which are directly related to the transit of goods in import and export processes by air, land and river. Of these opportunities for improvement, at least 80 were included in the Work Plans of the four Working Groups of the National Trade Facilitation Committee to be addressed during that year (Gobierno Nacional del Paraguay, 2023).

In May 2022, the customs authorities of Bolivia (Plurinational State of) and Paraguay joined the "Regional Mutual Recognition Arrangement⁵ for the "Authorized Economic Operator" program and the exchange of information to expedite and facilitate trade in the Americas and the Caribbean, to which Argentina, Brazil, Colombia, Costa Rica, Chile, the Dominican Republic, Guatemala, Peru and Uruguay also subscribed. Among the main benefits for the Authorized Economic Operator are the prioritization and streamlining of procedures, reduction of inspection channels, elimination of guarantees in the transit of goods related to alcoholic beverages, dissemination of their AEO status nationally and internationally, and training, among others (Opinion, 2022).

The following sections describe the efforts and progress made by LLDCs and transit countries in Latin America in relation to the specific objectives of the VPoA to reduce transport costs and times and the time spent at borders in the export and import process. However, what follows is a description of the evolution of the logistics performance of these countries since the implementation of the programme.

The World Bank's Logistics Performance Index (LPI) is a benchmarking tool designed to identify the challenges and opportunities countries face in their trade logistics performance. This indicator, which has not been published since 2018, has recently been updated for 139 countries in its 2023 edition. The LPI is the weighted average of the country scores on the six key dimensions: 1) Efficiency of customs process (i.e., speed, simplicity and predictability of formalities) by border control agencies, including customs; 2) Quality of trade and transport related infrastructure (e.g., ports, railroads, roads, information technology); 3) Ease of arranging competitively priced shipments; 4) Competence and quality of logistics services (e.g., transport operators, customs brokers); 5) Ability to track and trace international shipments; 6) Timeliness of shipments in reaching destination within the scheduled or expected delivery time.

According to the latest LPI report, despite the challenges posed by the COVID-19 pandemic, the overall 2023 score profile has remained stable compared to the previous edition. This was explained by the structural nature of the indicators under analysis, directly related to the implementation of public policies and logistics reforms.

The LPI scores of LLDCs are historically low, as can be seen in Table 1, which shows the evolution of the

⁵ It is an accreditation that guarantees that a company that integrates the international trade supply chain complies with customs and security standards.

DRAFT

latest published results. Based on the overall score obtained in 2023 by the Plurinational State of Bolivia, the country is classified in the lowest of the four existing categories, called "Poor Logistics Performance". This grouping includes 43 of the 139 countries evaluated, which have been identified as having serious logistical constraints. Paraguay was placed in the second category, "Partial Performers", which corresponds to 46 countries with a level of logistics constraints typically found in developing economies.

Table 1
LLDCs⁶ and transit countries: LPI Ranking and Score, 2014 - 2023

Country	Score				Ranking		2023 vs 2014
	2014	2016	2018	2023	2014	2023	
Argentina	3.0	3.0	2.9	2.8	60	73	↓
Bolivia	2.5	2.3	2.4	2.4	121	115	↑
Brazil	2.9	3.1	3.0	3.2	65	51	↑
Chile	3.3	3.2	3.3	3.0	42	61	↓
Paraguay	2.8	2.6	2.8	2.7	78	79	↓
Peru	2.8	2.9	2.7	3.0	71	61	↑
Uruguay	2.7	3.0	2.7	3.0	91	61	↑

Source: the author based on LPI World Bank

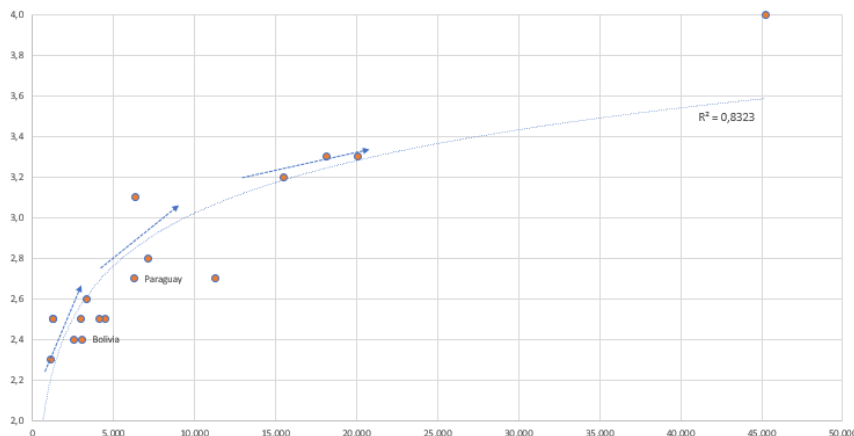
Some of the findings of the latest LPI study suggest that addressing bottlenecks in LLDCs is beyond the scope of unilateral action and requires coordinated action across borders, as well as the establishment of robust transit regimes. The following section looks in detail at the evolution of the indicators for each of the components that make up the global LPI.

The relationship between logistics performance and a country's economic development can be visualized in Figure 1, which links the World Bank's Logistics Performance Index (LPI) with GDP per capita (considered as a proxy for economic development). A cloud of points representing a set of landlocked countries is observed, together with the statistical fit between the two variables. On the horizontal axis is GDP per capita (constant 2010 USD), and on the vertical axis is the value of the LPI by its latest measurement (2022).

Figure 3
Landlocked countries: Relation GDP per capita and LPI, 2023

⁶ In tables and charts, the acronym LLDCs is used, as an exception, to refer to the Plurinational State of Bolivia and Paraguay.

DRAFT



Source: the author based on World Bank (2023) and the World Bank Economic databases.

It is observed that the relationship between logistics performance index (LPI) and the Latin American country's economic development proxied by GDP per capita shows that an improvement in LPI is associated with an increase in GDP per capita in all cases. In those that have surpassed the first stage of GDP per capita, the improvement is even more significant: an improvement of 0.2 points in LPI is associated with an expansion of GDP per capita of more than 20%. For LLDCs, the improvement in logistics performance results from the convergence of two aspects: the country's own efforts to achieve this performance and international collaboration and cooperation, including its transit countries.

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

The COVID-19 pandemic had a major impact on the development of transportation infrastructure, highlighting the importance of this aspect in recovery plans. While infrastructure projects were part of the recovery efforts in both countries, their implementation continues to present challenges in the face of increased resource constraints due to global economic difficulties. The current state of connectivity in the Plurinational State of Bolivia and Paraguay will now be reviewed in order to analyze the progress made in the development of transportation infrastructure and its maintenance since the adoption of the VPOA, focusing on the impacts and progress since the pandemic.

1. Review of transport connectivity in the Plurinational State of Bolivia

a. Progress and challenges in road transport

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 (Pérez, G. and Sánchez, R, 2019). Table 2 outlines the length of roadways according to this breakdown.

DRAFT

Table 2

Bolivia (Plur. State of): road length by type of network and surface (2014-2021) (In kilometers)

Description	2014	2015	2016	2017	2018	2019	2020	2021(p)
Total	86,855	89,441	89,397	152,455	184,726	192,396	194,949	202,037
Cobblestone	1,046	994	1,017	2,426	3,875	4,187	4,143	4,168
Under construction	2,583	2,747	3,460	5,287	4,036	2,883	2,657	2,350
Paved	7,134	7,756	7,950	16,689	27,688	30,199	31,653	31,080
Gravel	29,881	32,990	31,507	41,804	46,571	48,422	48,996	50,353
Dirt	45,605	44,349	44,318	84,581	100,977	105,578	106,477	113,068
Length new segments evaluated	606	606	1,146	1,669	1,578	1,128	1,022	1,018
Essential network	15,982	15,982	16,343	16,199	16,226	16,272	16,204	16,236
Departmental network	29,183	31,769	31,365	31,785	35,045	35,879	36,464	37,981
Municipal network	41,690	41,690	41,690	104,471	133,455	140,245	142,281	147,819

Source: the author based on National Statistics Institute of Bolivia (INE)

The length of roads shows a steady growth from 86,855 km in 2014 to 202,037 km in 2021 (133%), still in pandemic period. This expansion is, mainly, at the municipal level (Table 2). In terms of its composition, the Bolivian road network has maintained a preponderance of dirt roads (slightly more than 50%). However, over the years, the portion of paved roads increased from 8% to 15%. This was in addition to the reduction in the construction of gravel roads, which decreased from 34% to 25%.

Benchmark road density indicators show a significant improvement (Table 3). The territory road indicator went from 7.9 in 2014 to 17.7 total km/100 km² territory in 2020. The same is true for paved roads, which jumped from 0.65 km/100 km² to 2.88 km/100 km² territory. As for the reference of kilometers of roads about the number of inhabitants, in the same period, the total km/1,000 inhabitants indicator doubled (from 8.1 to 16.7). Particularly noteworthy is the progress of the indicator of paved roads, from 0.68 to 2.71 km/1,000 inhabitants.

Table 3

Bolivia (Plur. State of): evolution of road density, 2014-2020 (In km/100 km²)

Descripción	2014	2016	2018	2020
Total km road	86,855	89,397	184,726	194,949
Total km paved road	7,134	7,950	27,688	31,653
Km ² territory	1,098,581	1,098,581	1,098,581	1,098,581
Total inhabitants	10,685,994	11,016,438	11,347,241	11,677,406
Km total/100 km ²	7.9	8.1	16.8	17.7
Km paved/100 km ²	0.65	0.72	2.52	2.88
Km total/1,000 inhab	8.1	8.1	16.3	16.7
Km paved/1,000 inhab	0.67	0.72	2.44	2.71

Source: the author based on INE.

Among the measures aimed at improving road transportation are:

- Strengthening of the Central Laboratory of the Bolivian Highway Administration (ABC), which monitors and provides technical support in the construction and maintenance stages of the roads, improving the quality of the information.
- The implementation of Intelligent Transportation Systems (ITS) in the Fundamental Road Network (FRN) and more and better weighing stations, for the conservation of the road patrimony avoiding damages due to overloading.
- The execution of the National Road Maintenance Plan with resources from the National Highway Account through the Vias Bolivia toll collection and the hydrocarbon tax and the contracting of maintenance by standards with service level agreements.

DRAFT

The strategic vision of the Plurinational State of Bolivia is to transform the country into a regional transport hub (Gobierno del Estado Plurinacional de Bolivia, 2021; 2023). In this sense, the continuity of efforts to guarantee an effective national integration is a priority, to conclude the construction of road sections. The plan foreseen for 2025 reaches the execution of 1,622.95 additional km of road sections and establishes that at least 70% of the Fundamental Road Network will be paved, providing the country with a greater length of double roads, integration corridors, bridges and accesses and challenges of inland water transport.

b. Progress and challenges of inland water transport

The Plurinational State of Bolivia has three navigable river systems: Lake Titicaca (210 km), the Amazon River Basin (5,728 km) to the northwest, and the La Plata River Basin (65 km) to the southeast. The Plata River Basin is connected to the Paraguay-Paraná Waterway (PPW), establishing it as the most crucial river access point in Bolivia (Plurinational State of). This significance is further emphasized by the extensive surface area of docks and infrastructure constructed in comparison to the other two river systems. The Ministry of Public Works, Services and Housing (MOPSV) plans to carry out actions in the Hydrographic Basins (Gobierno del Estado Plurinacional de Bolivia, 2023). At a general level, these works seek to:

- Execute complementary construction projects for the habilitation of the Amazon Basin and the Plata Basin.
- Build ports in the Plata Basin and the Amazon Basin to improve and optimize loading and unloading systems to make river transport services competitive with other forms of transport.
- Strengthen international ports as port zones and cargo terminals and articulation of river transport with other modes of transport.

Based on a study on International Transboundary Water Management, carried out by ECLAC in conjunction with the Ministry of Foreign Affairs (2022), there are three regional projects aimed at strengthening management and cooperation in transboundary water resources:

- Integrated Water Resources Management in the System: The Integrated Water Resources Management in the Titicaca-Desaguadero-Poopó-Slar de Coipasa System (TDPS) project is being implemented by the governments of Peru and Bolivia to help promote the conservation of water heritage in this shared transboundary basin.
- The Plata Basin Medium Size Project - PPM (CIC - Plata)⁷: during 2019, the governments of Argentina, Bolivia, Brazil, Paraguay and Uruguay agreed to prepare the Medium Portage Project (MPM), which aims to establish the basis for the implementation of the actions defined in the Strategic Action Plan agreed by the five-member countries.
- The Amazon Basin Project⁸: Bolivia is part of the Project for the Implementation of the Strategic Action Program to ensure the Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin, considering Climate Variability and Change.

⁷ Proyecto De Medio Porte (PPM) Available at : <https://www.mmaya.gob.bo/2020/07/proyecto-de-porte-medio-ppm-preparando-las-bases-para-la-implementacion-del-programa-de-acciones-estrategicas-pae-de-la-cuenca-del-plata-plan-de-ejecucion-del-proyecto-pep/>

⁸ The Amazon Basin is the largest river basin in the world and crosses the national borders of eight countries: Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela, and constitutes the most important element of the global water circulation. Available at: https://www.cancilleria.gov.co/sites/default/files/Desarrollo-Fronterizo/resumen_del_proyecto.pdf

DRAFT

c. Progress and challenges in rail transport

Bolivia's (Plurinational State of) railway system is composed of the Eastern Network and the Western Network, separated by some 500 km and not connected. They are managed by two companies under 40-year concession contracts, Ferrovial Oriental S.A. (FOSA) for the Eastern Network and Empresa Ferrovial Andina S.A. (FCA) for the Western Network. Ferrocarril Oriental S.A. serves the Eastern Network in the shape of an inverted "L" from Puerto Suárez at the east end of the country, bordering Brazil, to Yacuiba in the south end, bordering Argentina. Its total length is 1,244 kilometers. The eastern network is responsible for most of the export and import cargo and is crucial for the transport of soybean derivatives and other products transiting the PPW and uses the Bolivian ports of the Tamengo Canal to load and unload goods.

Empresa Ferrovial Andina S.A. connects some of the main cities in the southwest of the Andean Network, crossing the departments of La Paz, Oruro, Potosí, Chuquisaca and Cochabamba, reaching just over 1,882 kilometers in 2021. Although it connects with the railway networks of neighboring Argentina, Chile and Peru, only the railway network to Antofagasta - Chile - is currently operational and its use is limited to the transport of mineral cargo.

The data provided by INE has information on the kilometers corresponding to the route of both networks until 2022 (Table 4), showing that no significant modifications were made, except for the incorporation of 49 km in 2019.

Table 4

Bolivia (Plur. State of): evolution of rail transport, 2014-2022. (In kilometers)

Description	2014	2015	2016	2017	2018	2019	2020	2021	2022
Western Network	1,834	1,834	1,834	1,834	1,834	1,882	1,882	1,882	1,882
Eastern Network	1,244	1,244	1,244	1,244	1,244	1,244	1,243	1,244	1,244
Total	3,078	3,078	3,078	3,078	3,078	3,126	3,125	3,126	3,126

Source: the author based on INE

In the area of rail transport, the Central Bioceanic Rail Corridor (CFBC) project stands out, which will connect Brazil, Chile, Peru and Bolivia in the central part of South America, enabling trade between these countries and exports to overseas markets. With a length of almost 4,000 km, the CFBC will articulate rail networks from the port of Santos (Brazil) to the port of Arica (Chile), where it will cross into the Plurinational State of Bolivia at Puerto Suarez, pass through Santa Cruz de la Sierra and continue westward to the border with Peru.

The Bolivian section is crucial, as it requires interconnection between the country's two rail networks. The lack of a link in the Bolivian territory prevents continuous traffic throughout the corridor and the road sections cannot efficiently sustain the available load projections. In 2022 technical work meetings resumed and on January 2, 2023, the governments of the Plurinational State of Bolivia and Brazil agreed to reactivate the works to advance and finally consolidate the CFBC⁹.

The construction of the railway in the Plurinational State of Bolivia is planned in 5 stages. According to

⁹ Available at: (<https://abi.bo/index.php/gobierno2/32322-arce-y-lula-acuerdan-reactivar-el-corredor-ferroviario-bioceanico>).

DRAFT

official information, the country has already built more than half of the 1,894 km of CFBC track that will pass through its territory. This data corresponds to information updated in 2023 by the Bolivian Information Agency¹⁰, so it is not yet available in INE's databases. In the case of Brazil (which is responsible for the total construction of 1,521 km), it informed that it has the entire railway network consolidated and that it only needs a section up to the Paraguay-Parana Waterway to make the interconnection. In mid-2021, dialogues between the government of Bolivia (Plurinational State) and Peru were also resumed to reactivate technical and diplomatic activities regarding the railroad works, after a two-year pause in talks¹¹. Unlike Brazil and Bolivia, Peru has to start all the work, which is equivalent to a total of 456 kilometers.

On the other hand, work is also underway on the Cochabamba Metropolitan train, which will help develop a mass passenger transport system connecting several municipalities within the city, such as Sacaba, Cochabamba, Quillacollo, Colcapirhua, Vinto and Sipe Sipe, and will provide the population with an inter-municipal urban transport service (Gobierno del Estado Plurinacional de Bolivia, 2021b).

d. Progress and challenges in air transport

The country has 3 international airports in the cities of: Cochabamba "Jorge Wilstermann", Santa Cruz "Viru Viru" and La Paz "El Alto" and 11 domestic¹². In terms of aviation services, the flag carrier is Boliviana de Aviación (BoA), which offers domestic and international services. There are also nine (9) other airlines operating¹³ in the territory, such as Amazonas, EcoJet, TAM, Air Europa, Aerolíneas Argentinas among others (NAABOL,2023).

In 2013, by Supreme Decree¹⁴, the Plurinational State of Bolivia nationalized the shareholding package of the company TBI Overseas Bolivia (ABERTIS S.A). In this way, the Bolivian State was constituted as majority shareholder, under the ownership of the MOPSV, assuming the control, administration, management and operation of the nationalized company SABSA for three international airports. During the five (5) years of nationalization, an investment of more than 350 million Bolivianos was made.

In November 2021, the Bolivian National Government issued Supreme Decree 4630 creating the entity Navegación Aérea y Aeropuertos Bolivianos (NAABOL). The new company assumed the functions that were previously the responsibility of Administración de Aeropuertos y Servicios Auxiliares a la Navegación Aérea (AASANA), such as directing and administering airports, planning and creating infrastructure. In February 2022, Bolivian Airport Services (Sabsa) ceased to operate, passing all its functions to the state-owned NAABOL.

Thus, NAABOL is currently in charge of planning the aeronautical infrastructure, administration, management, construction, supervision, improvement, maintenance and implementation of all terminals open to public service in the national territory; in other words, it is in charge of the organization of airspace, air traffic control, the provision of auxiliary services to aircraft and the updated registration of all scheduled airfields in the country.

¹⁰ Available at: (<https://www.la-razon.com/economia/2022/06/28/bolivia-ya-cuenta-con-929-de-los-1-894-kilometros-del-corredor-ferroviario-bioceanico/>)

¹¹ Available at: <https://www.rieles.com/front/bolivia-y-peru-reanudan-proyecto-para-construir-un-corredor-ferroviario-bioceanico/>

¹² Available at: <https://boliviamia.net/bolivia-aeropuertos#:~:text=Bolivia%20tiene%203%20Aeropuertos%20Internacionales,Paz%2C%20Cochabamba%20y%20Santa%20Cruz>

¹³ Available at: <https://www.naabol.gob.bo/itinerario>

¹⁴ Supreme Decree No. 1494 dated February 18, 2013

DRAFT

The PDES 2021/25 defines the continuity of efforts for the integration and strengthening of regional economies through this mode of transportation. To this end, some of the actions defined are:

- Build, expand, improve, maintain and/or equip international, national and tourist airports in the country, aimed at integrating departments and municipalities with productive and tourist areas.
- Strengthen Empresa Boliviana de Aviación (BoA) to expand the service of domestic and international routes and destinations.
- Acquire 20 new aircraft for BoA by aviation standards.
- To modernize the necessary equipment for air navigation, communication and airport services (Airport Equipment Projects, Acquisition and Installation of ILS System, Implementation of the Hub at Viru Viru International Airport).
- To achieve high levels of safety and efficiency in Air Navigation, Airport and related specialized services, minimizing operational risks.

2. Review of transport connectivity in Paraguay

As a framework of specific State policies, and in the particular field of transportation infrastructure, Paraguay has two plans that were mentioned earlier. These are the "National Logistics Plan Paraguay 2030" (PNL) and the Transportation Master Plan 2012-2032 (PMT), both of which confer important institutional, budgetary and planning tools. As well as the PND 2030, the transportation sector is considered a priority for the achievement of the proposed development objectives.

The Ministry of Public Works and Communications (MOPC), under which the Directorate of Roads –in charge of national and departmental roads– and the Directorate of Neighborhood Roads depend, is responsible for proposing and executing policies and provisions for infrastructure and basic services for the integration and economic development of the country.

Paraguay's connection with transit countries is key to their trade relations and access to overseas markets. Paraguay has been investing in its transportation and logistics infrastructure, improving its internal and external connectivity and promoting investments in various modes of transportation.

a. Progress and challenges in road transport

Paraguay's road system is classified into three groups of roads: National Roads, Departmental Roads and Neighborhood Roads. According to the World Bank¹⁵, of the total length of the network, 30% is classified and administered by the Ministry of Public Works and Communications (MOPC), and the rest is under the administration of local authorities.

According to updated official data¹⁶ to 2021, the road network consists of 78,621 km, of which 8,368 km are categorized as paved and 1,190 km as paved. As of December 2022, maintenance contracts for 3,775

¹⁵ Available at: <https://documents1.worldbank.org/curated/en/751071525763871071/pdf/126021-WP-PUBLIC-SPANISH-PYNotasdePoliticafinal.pdf>

¹⁶ Official statistical sources of the governments of both countries were consulted for the preparation of the tables included in section B (Priority 2 a.). It was not possible to obtain more updated and evolving information on Paraguay's transportation infrastructure either from the National Institute of Statistics nor from the official website of the MOPC.

DRAFT

km of the Priority Paved Road Network are being executed and a further 1,300 km are under contract management (Gobierno Nacional del Paraguay, 2023). Although the development of paved networks has improved connectivity, their quality continues to be insufficient for current needs. In turn, there is a marked difference in accessibility, coverage and road development between the Eastern region (which occupies 40% of the territory) and the Western region (with 60%), due to the levels of activity and development of each region.

The paved road density indicator, expressed in kilometers of roads per km² of territory, showed an improvement, going from 1.38 to 2.50 km/100 km² of total territory in the period from 2014 to 2022. The same behavior was observed in the indicator of kilometers of roads with respect to the number of inhabitants, which went from 0.84 to 1.36 km/1,000 inhabitants.

Although river transport has a high share in foreign trade, imports, in particular, are mostly transported by land. The high level of traffic, combined with a poorly paved road network and a fleet that is on average 15 to 20 years old, have a direct impact on logistics performance (Gobierno de la República del Paraguay, 2021b). Another drawback is that most of the unpaved roads are used to transport mainly agricultural production from the fields to the storage silos, which become impassable during the rainy season, causing increased freight costs and delays in the logistics chain.

A last aspect to be included in the analysis of road transportation has to do with the seasonal nature of the work associated with the soybean harvest, which according to the Master Transportation Plan represents 28% of all cargo transported in the country. To measure the weight of this item, it should be taken into account that it is followed in order of importance by fuel, with only 8% of the total. This concentration generates the demanders of the service pay high prices for moving the cargo at the beginning of the harvest.

Strengthening transportation, including border interconnections, is one of the priorities defined in the PND 2030. In addition, the PNL includes a series of initiatives aimed at modernizing the sector and improving infrastructure to boost the country's competitiveness, to reduce costs and add greater value to logistics processes.

Within the framework of the project "Sustainable transport connectivity and implementation of transport-related SDGs¹⁷ in selected landlocked and transit countries" (SITCIN), an assessment of the performance of transport modes in the economic, social and environmental sustainability pillars was carried out in five countries that were chosen for the pilot. Paraguay was one of them and based on this analysis, the National Connectivity Report was published in 2020.

This report was prepared on the basis of indicators developed exclusively for landlocked countries, designed to provide an evidence-based transport policy framework that can promote sustainable transport connectivity at national, regional and international levels, under the achievement of the transport-related SDGs (Rodríguez L. M. and Lupano, j, 2021). From this report emerge several proposals for improvement to be implemented in that matter, among which are described:

¹⁷ The National Connectivity Report (NCR) is managed by the Economic Commission for Europe (UNECE), the Economic Commission for Latin America (ECLAC) and the United Nations Economic and Social Commission for Western Asia (ESCWA), developed with funding from the United Nations Development Account (UNDA).

DRAFT

- Adopt measures to incorporate lanes or fast lanes for trucks transporting live animals and perishable foods.
- Publish border clearance time data available through SOFIA (Fiscal Organization of Customs Levies).
- Consider implementing pre-trip traffic information systems to make international drivers aware of the traffic situation and travel conditions. This system could also notify approaching drivers of traffic conditions, occupancy, processing and waiting times, and provide early alternative recommendations.
- Establish a cooperation mechanism to further develop the use and integration of the Radio Frequency Identification System (RFID).

b. Progress and challenges of inland water transport

As an LLDC, river transport is of vital importance for Paraguay's international trade. According to information updated to 2020 in the PNL, the system of river ports and waterways is the backbone of the country's foreign trade, transporting 75% of the volume. This percentage is even higher (85%) if only soybean and beef exports are analyzed (Gobierno Nacional del Paraguay, 2021b). Given this high dependence, the climatic events that have occurred more frequently in the last decade, and in particular the droughts deepened since the end of 2021, which have had adverse effects on Paraguay's foreign trade, are a relevant risk.

The Paraguay-Paraná Waterway is formed by the conjunction of the Paraguay and Paraná rivers, and connects with the main ports of Buenos Aires and Montevideo. The largest volume is transported by the Paraguay River. Currently, more than 3,000 vessels are flying the Paraguayan flag, a fleet internationally recognized as the third largest in the world and the first in Latin America. (Gobierno Nacional del Paraguay, 2021b).

At present, projects are being carried out to enable navigability. Among them, the project called Propuesta de Vía Navegable por el Río Paraguay Tramo Norte Asunción - Apa, as well as its Master Plan for Navigability, are under study. Paraguay is part of the Bioceanic Corridor, an infrastructure project promoted since 2015 by the governments of Paraguay, Argentina, Brazil and Chile to integrate, through the implementation of physical infrastructure and improvement in the paving of existing roads, the Atlantic ports with the Pacific.

It is planned as a trade integration route that connects road, rail, river and air transport in the territories involved. The east-west corridor on the Axis of Capricorn begins in the ports of Brazil, passing through Paraguay and northwestern Argentina, to reach the ports of northern Chile through the Antofagasta Region, to connect with the markets of the Asia Pacific and the west coast of the United States.

The corridor links six regions with four Pacific ports (Port of Antofagasta, Ports in Mejillones, Tocopilla Terminals and Port of Iquique) through seven border crossings (Puerto Murinho, Carmelo Peralta, Pozo Hondo, Misión la Paz, Paso de Jama, Paso de Sico and Estación Socompa). Among the multiple benefits of such a corridor is the diversification of the productive matrix, the facilitation of trade exchanges, the reduction of logistics costs, the exploitation of value chains and the contribution to integration and development.

c. Progress and challenges in rail transport

Paraguay was one of the first countries to put into operation a railway service in Latin America. However, this service is not currently provided in its territory, except for some sporadic operations in the

DRAFT

surroundings of Encarnación, in a stretch of only 4 km in length. The development of a rail network, by current needs, is essential to allow the country to be more competitive with its export products (CAF, 2020).

The railway is not used for freight transportation. However, there is a two-stop passenger rail line (8 km) between the city of Posadas in Argentina and the city of Encarnación in Paraguay. This international rail service, with a 30-minute frequency, resumed operation in mid-2022, after being inactive due to the Covid-19 health crisis.

There is a project under evaluation on the development of rail infrastructure for freight transportation. This plan is based on the construction of a freight train in the southern city of Encarnación and another connecting the northeastern cities of Concepción and Pedro Juan Caballero. If realized, it will contribute to multimodal links between the Paraguay-Paraná waterways and the Brazilian Ponta Porá - Campo Grande railroads, increasing the volume of private investment in the north of the country (Rodríguez L. M and Lupano, j, 2021).

At the beginning of 2020, Ferrocarriles del Paraguay S.A. (FEPASA) officially received the proposal for the construction of a freight train between Concepción and Pedro Juan Caballero. The presentation was made by representatives of the consortiums TMH International and RSRS Railway Infrastructure Projects, of Russian, Swiss and Austrian origin. FEPASA is responsible for verifying the documentation submitted, and if the reports are in order, it is also responsible for initiating the design of the project.

d. Progress and challenges in air transport

Paraguay has three major terminals: Silvio Pettrossi International Airport, the main entry and exit point for international passengers, located 12 km from downtown Asunción; Guaraní International Airport, in Ciudad del Este (border with Brazil), 320 km from Asunción, mainly used for cargo; and Teniente Amín Ayub Airport, in Encarnación, which also has international status. According to information from the National Transport Directorate (DINATRA), 92% of the total passengers registered in 2022 were concentrated in the first of these airports.

According to data from the National Directorate of Civil Aeronautics (DINAC), air cargo movement in 2022 reached 22,707 tons, an increase of 8.41% over 2021. Since most of Paraguay's foreign trade is based on commodities, the movement of cargo by this mode is reduced. In this regard, PNL 2030 highlights the need to improve aeronautical conditions to contribute to those productive sectors whose logistics are more specialized, with products of higher value density with short lapses (between production, transportation and consumption), which do require air transportation. To optimize these conditions, it is necessary to work on improving airport logistics services (transportation, specialized warehousing and better handling conditions for cargo requiring special storage conditions or sensitivity to temperature changes), in addition to achieving more competitive costs, achieving higher frequencies and increasing airfreight options and.

The progress described above in the transport infrastructure of the landlocked countries of the region is reflected in the positive evolution of the score in one of the six components of the Logistics Performance Index (LPI) namely the quality of the transport infrastructure. The results of all the components that make up to the overall LPI score presented in the previous section (Priority 1) are presented and analyzed below. For this purpose, Figure 4 (a to e) and the rankings reported in the biannual LPI reports published from 2014 to 2023 have been used as input.

DRAFT

The components Customs efficiency¹⁸ (Figure 4.a), *Quality of transport infrastructure*¹⁹ (Figure 4.b), *easy Tracking and Tracing*²⁰ (Figure 4.c) and *competence and quality of logistics service*²¹ (Figure 4.e) are four components of the LPI that are considered structural. This means that they depend directly on the policies and management carried out in the area of transport. In the case of the first component, Customs efficiency (Figure 4.a), the Plurinational State of Bolivia obtained a lower score in relation to 2014, which is reflected in a drop in the ranking from 108th to 120th place by 2023. Paraguay, with a smaller drop, managed to remain in 90th place.

Regarding the evolution in *Quality of transport infrastructure* (Figure 4.b), significant improvements can be observed in the scores obtained between 2014 and 2023 for both countries. The Plurinational State of Bolivia registered a growth of more than 0.2 points in the score, and in relation to the ranking, this meant its move from position 133 to 89. The improvement in Paraguay's score allowed it to rise from position 97 to 80.

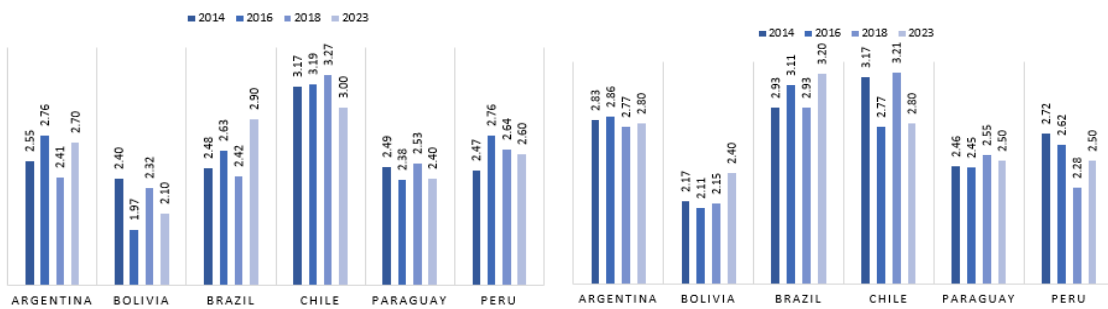
Regarding the remaining four (4) components, the only one that showed an increase, for all the countries analyzed, is in the *easy Tracking and Tracing* (Figure 4.c). Finally, Paraguay fell in the results of the three (3) remaining components, both in relation to 2014 and 2018. These components measure: *timeliness of deliveries*²² (Figure 4.d), *competence and quality of logistics service* (Figure 4.e) and *ease of international shipments*²³ (Figure 4.f). Bolivia (Plurinational State of), although it also declined in the comparison with previous years in the result of the first two components, in 2023 it achieved an improvement in the score of *ease of international shipments*.

Figure 4

LLCDs and transit countries: evolution by LPI component score, 2014 – 2023

a) Customs efficiency

b) Quality of transport infrastructure



c) Ease of Tracking and Tracing

d) Timeliness of Deliveries

¹⁸ *Customs Efficiency*: Measures the efficiency of customs processes in terms of time and cost, including customs clearance, inspections, and required documentation for international trade.

¹⁹ *Quality of transport Infrastructure*: Evaluates the quality and availability of transportation infrastructure, including roads, railways, ports, airports, and cargo terminals

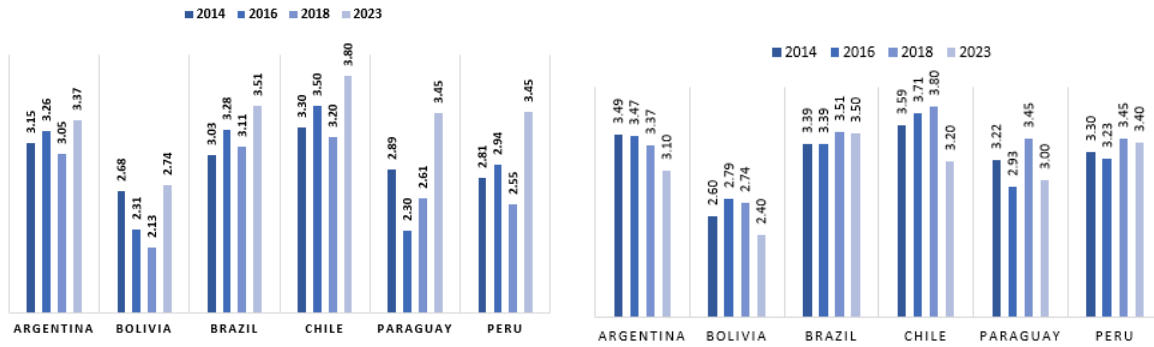
²⁰ *Ease of Tracking and Tracing Shipments*: Assesses the ability to track and trace shipments through tracking and monitoring technologies, as well as the availability of real-time information on shipment status.

²¹ *Competence and Quality of Logistics Services*: Measures the competitiveness and quality of logistics services, such as transportation and storage, provided by private providers in the country.

²² *Timeliness of Deliveries*: Evaluates the timeliness of goods deliveries, considering factors such as compliance with delivery deadlines and predictability of transit times.

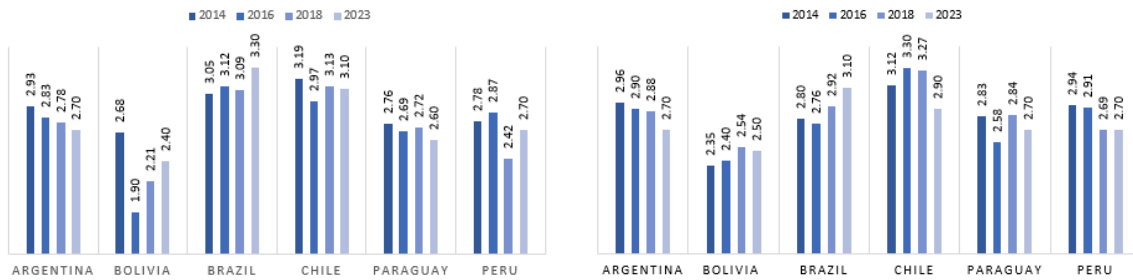
²³ *Ease of International Shipments*: Examines administrative and bureaucratic barriers affecting international trade, such as documentation requirements, complex customs procedures, and import/export formalities.

DRAFT



e) Competence and Quality of Logistics service

f) Ease of International shipments



Source: the author based on LPI, 2014 – 2023, World Bank

In summary, despite the efforts and progress made, the indicators show that for landlocked countries, problems related to transit and trade facilitation persist to a large extent. Compared to the better performing States, LDCCs, in addition to dealing with the disadvantages generated by dependence on transit countries, must face a more challenging political agenda. In this sense, the resources available for the implementation of policies and reforms aimed at improving logistics performance must be reconciled with a set of other broader priorities in achieving sustainable development.

3. Primary funds for infrastructure development

LLDCs face enormous challenges in achieving their SDGs. Considering the major development challenge of the region's lagging infrastructure investment gap, the lack of appropriate infrastructure and efficient service provision is an obstacle to achieving sustained economic growth rates and regional integration goals.

The topographical divisions of the Plurinational State of Bolivia play a major role in the higher costs borne by truck fleets, since they must cover routes ranging from 200 to 400 meters above sea level. In turn, this condition implies greater investment and road maintenance, as reflected in Table 5, this being the infrastructure subsector to which greater public funds are allocated. In the average for the period 2014 to 2021 the latter accounted for more than 90% of the items allocated to transportation, followed by railway infrastructure with 7% and then airport infrastructure with 3%. River infrastructure reached barely 0.1% in the allocation of sector funds.

DRAFT

Table 5

LLDCs: public investment in transport infrastructure, 2014-2021. (in USD millions)

Subsector	USD (millions)							
Bolivia (Plur. State of):	2014	2015	2016	2017	2018	2019	2020	2021
Air	43.83	29.77	24.74	26.90	30.82	50.63	21.88	21.90
Road	1,117.95	1,340.57	1,574.51	1,410.18	1,186.72	992.41	395.96	721.75
Railways	51.51	49.12	57.52	57.83	175.49	124.22	41.82	63.74
Fluvial and maritime	1.53	2.48	0.32	0.00	0.32	0.27	0.16	0.33
Total subsectors	1,214.82	1,421.93	1,657.09	1,494.91	1,393.35	1,167.53	459.83	807.72
Paraguay	2014	2015	2016	2017	2018	2019	2020	2021
Air	0.45	0.85	3.40	0.49	0.00	0.00	0.00	0.00
Road	465.90	456.21	454.46	510.12	432.51	495.72	906.795	1080.39
Railways o Rail	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluvial and maritime	3.19	3.08	8.23	7.29	4.24	11.14	1.31	0.00
Total subsectors	470.35	460.14	466.09	517.91	436.75	506.86	908.11	1,080.39

Source: the author based on Infralatom

Paraguay increased its level of public investment in transportation infrastructure, allocating more than 90% of the sector's allocated funds to the expansion of the road network (Table 5). Between 2014 and 2021, the use of these funds grew by more than 130%. The rest of the subsectors did not have allocated items since 2017. As an exception, the case of the investment allocated to river and maritime development is mentioned, which in 2019 quadrupled compared to 2014.

In 2020 CAF prepared a series of documents that comprehensively analyze interurban land transport infrastructure in Latin America. These documents describe the state of the sector in eleven countries in the region and estimate investment needs for the short and medium term. The main results for the Plurinational State of Bolivia and Paraguay in relation to the investment gap with respect to the world average and the average investment of developed countries in 2040 are presented below (AC&A and Cenit, 2020a).

The state of the roads in the Plurinational State of Bolivia has awakened the need for investments that, although they have been important, the estimates made in the above-mentioned report for the year 2020 indicate that –in order to close the gap with respect to the world average in 2040–, require that disbursements increase to 6.5% of the annual GDP, dedicating an additional 1.1% to maintenance. Likewise, to catch up with developed countries, the effort would be very high: 13% of their GDP would have to be allocated to investment, with an additional 2.8% for maintenance (AC&A and Cenit, 2020a).

In Paraguay, public investment levels have been significant (over 2 % of GDP, compared to an average of 1.1 % in the region in 2020), although with low private participation (generally restricted to management contracts based on service level agreements). Continuing with these percentages could lead the country to reduce its performance deficit in relation to the region in the coming years. The quantification of the investment gap shows that Paraguay has a transportation infrastructure of USD 1,593 per capita en 2020, a value that represents less than a quarter of the world average. In comparison with developed countries, investments up to the year 2040 should constitute 4.8% of annual GDP, in addition to 1% for maintenance (AC&A and Cenit, 2020a).

Section G develops in depth the advances in the main sources of financing in both countries, used as a means for the implementation of infrastructure development and maintenance.

DRAFT

4. Bottlenecks and recommendations to improve transport in LLDCs

Throughout this section, different bottlenecks have been identified, some of which are common to both countries and others that result from the particularities of each one. In the first point, both countries have made significant improvements in the development of their roads, but the percentage of paved roads continues to be low at the global level and in proportion to the increasing levels of traffic.

Another shared aspect is the importance of advancing in air transport. While these countries do not heavily rely on this mode of transportation due to the nature of their export products, it is crucial to acknowledge that making progress in this area will have numerous benefits for their overall development. Some of them are the growth in tourism and consequently, directly, in trade and other vital business activities, which in turn brings with it an indirect growth in employment. Finally, by increasing the supply, it contributes to the reduction of logistics costs in the warehouses for cargo transportation, thus promoting the possibilities of development of products that use it.

The section described the participation of the Plurinational State of Bolivia in terms of navigability and implementation of strategic plans at the regional level in the river basins; however, little progress has been identified in the development of the country's port infrastructure. Limited infrastructure, with docks, warehouses and loading and unloading areas that are insufficient or in poor condition, as well as the lack of modern cargo handling and transport equipment, restrict the efficiency of loading and unloading of goods. It is essential to give greater incentive to the actions defined by the Ministry of Public Works, Services and Housing (MOPSV).

There are multiple factors that inevitably push Paraguay towards the development of the railroad system. One of them is the need to generate an alternative to the complexity of river navigability. On the other hand, the importance of being an active part in facilitating and increasing regional connectivity, is based on the contribution of this mode. Finally, the need to meet the increase in the volume of cargo is expected in the coming years.

Each of the countries reported progress in relation to the bioceanic corridors, which is a key factor in their connectivity. In a recent analysis of road corridors presented by ECLAC, it was suggested that, when creating an interoceanic network, the different corridors should be seen as complementary, since the implementation of one corridor increases the chances of success of the others. It also proposed to resume regional governance in infrastructure based on the interoceanic network. (Silva Barros, P.; et al., 2022).

Addressing bottlenecks in LLDCs proposes going beyond unilateral policy interventions, so it is essential to design a transit system at the corridor level that involves the presence of global logistics operators that contribute best practices such as those of high-performing countries.

On this last point, the World Bank proposes to look at transit systems in Europe, as they promote regionally integrated markets of operators that meet quality and environmental requirements, while providing interoperability of financial guarantees across borders and digitization of transit manifests. It is mentioned the Transports Internationaux Routiers model (Transporte International Routiers, TIR), a system that has been superseded in Western Europe, but remains important for countries in Central Asia, Middle East and North Africa (World Bank, 2023).

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C. Priority 2b: Infrastructure development and maintenance - energy and ICT

1. Electric energy in Bolivia (Plurinational State of) and Paraguay

According to the Latin American Energy Organisation (OLADE, 2022), the regional electricity coverage rate was 97.6% in 2021. The population without access to electricity in that year was 16.1 million inhabitants, a significant improvement compared to 2020, when the population without access was 58.6 million inhabitants. In relation to energy production, the total supply for 2021 increased by 1.8% compared to 2020, from 786 to 800 Mtoe (million tons of oil equivalent). These markers indicate a still gradual post-COVID economic recovery, considering that 2020 saw an energy supply decline of 9.3%. The share of renewable energy sources in total primary energy supply decreased, from 33.65% in 2020 (241 Mtoe) to 33.18% in 2021 (239 Mtoe). Notwithstanding these results, OLADE highlights the fact that Latin America and the Caribbean remains the greenest region on the planet.

The electricity generation capacity in the Plurinational State of Bolivia in 2021 was 4,136 MW, with an increase of around 420 MW compared to 2020 and more than 1,900 MW compared to 2014 (Table 6). The generation capacity comes mainly from the non-renewable thermal source, followed by hydro. It is noteworthy the growth of these years in the installed capacity of wind energy, which went from 3 MW in 2014 to 129 MW in 2021, and solar energy, which registered installed capacity of 5.3 MW from 2015 and 171 MW in 2021.

Paraguay is a major producer of electricity, mostly from hydroelectric sources. These capacity levels remained largely unchanged in the period analyzed, ranging between 8,760 and 8,775 MW. Moderate levels of wind and solar electric capacity began to be recorded from 2020 onwards. As shown in Table 6, non-renewable thermal power capacity started to decrease significantly from 2016 onwards. While data for 2022 is not yet available from OLADE, the country's energy supplier (Administración Nacional de Electricidad - ANDE), the country's energy supplier, confirmed that as of 2022 Paraguay became the only country in the world with 100% clean and renewable electricity generation.

Table 6
LLDCs: installed energy capacity by source, 2014-2021 (MW)

	2014	2015	2016	2017	2018	2019	2020	2021
Bolivia (Estado Plurinacional de)								
Hydro	493.8	494.9	494.5	619.4	690.2	759.2	759.2	759.2
Thermal (non-renewable)	1,694.4	1,804.3	1,795.8	1,842.0	1,855.7	2,669.6	2,677.1	2,923.7
Wind	3.0	3.0	27.0	27.0	27.0	27.0	27.0	129.2
Solar		5.3	5.3	10.9	71.0	121.0	121.7	171.7
Thermal (renewable)	60.0	98.5	98.5	86.0	127.5	127.5	127.5	152.5
Total	2,256	2,406	2,421	2,585	2,771	3,704	3,713	4,136
Paraguay								
Hydro	8,760.0	8,760.0	8,760.0	8,760.0	8,760.0	8,772.0	8,772.0	8,760.0
Thermal (non-renewable)	14.7	14.7	0.5	0.5	0.5	0.5	0.5	0.5
Total	8,775	8,775	8,761	8,761	8,761	8,773	8,773	8,761

Source: the author based on OLADE

In 2021, the Plurinational State of Bolivia generated close to 10,000 GWh of electricity per year, 27% more than the generation in 2014. Paraguay, which reached over 60,000 GWh in 2016, reduced its generation in 2021 to just over 40,500 GWh (Table 7).

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Table 7
LLDCs: electric power generation by source, 2014-2021 (GWh)

	2014	2015	2016	2017	2018	2019	2020	2021
Bolivia (Estado Plurinacional de)								
Hydro	2,251.4	2,463.1	1,719.8	2,233.5	2,612.4	3,250.5	2,942.2	3,236.8
Thermal (non-renewable)	6,174.7	6,470.7	7,495.9	7,266.1	7,021.4	6,507.5	6,520.7	6,717.7
Wind	8.2	11.5	34.9	60.4	58.8	70.2	64.2	119.6
Solar	0.4	4.8	5.7	6.9	127.4	189.0	250.0	350.5
Thermal (renewable)	125.8	170.5	147.0	130.1	129.2	217.0	260.2	454.8
Total	8,561	9,120	9,403	9,697	9,949	10,234	10,037	10,879
Paraguay								
Hydro	55,276.4	55,742.8	63,770.2	59,683.8	59,210.9	49,445.5	46,371.0	40,574.2
Thermal (non-renewable)	5.9	1.4	1.3	1.5	1.6	2.0	1.9	2.0
Total	55,282	55,744	63,771	59,685	59,212	49,448	46,373	40,576

Source: the author based on OLADE

The population's access to electricity services evolved favorably during the period analyzed in both countries. In the Plurinational State of Bolivia, total population coverage increased from 89.3% in 2015 to 94.1% in 2021, with a marked difference between urban and rural areas. Paraguay is close to all its citizens being able to access electricity, although there is still a minor gap in rural areas, since it registered an electricity coverage of 99.7% in 2021— and of 99.4% in 2015.

The Plurinational State of Bolivia has implemented the "Electricity Programme to Live with Dignity", which has the objective of granting universal access to electric power by 2025, within the framework of its PDES 2021-2025. The initiative seeks to increase the coverage index and contemplates the implementation of projects with a variety of supply technologies to improve quality of life and the income of rural populations (Gobierno del Estado Plurinacional de Bolivia, 2023).

In relation to hydrocarbons, the Plurinational State of Bolivia introduced new conditions for the application of incentives for investments in exploration and operation of hydrocarbons when Yacimientos Petrolíferos Fiscales Bolivianos (YPFB) acts as operator, prioritizing areas with an oil production potential. The established incentives focus, fundamentally, on the exploration and operation of new reservoirs found in areas reserved in favor of YPFB (OLADE,2022).

As regards renewable sources, as displayed on the energy matrix chart, the country was noted as a point of opportunity in wind and solar sources. The projects involve the start of operations of a photovoltaic solar park in the latter half of 2020, and the opening of two wind farms during the first half of 2021 – the Warnes Wind Farm of 14.4 MW and the San Julián Wind Farm of 39.6 MW (Strategic Energy, 2021). In November 2021, the Plurinational State of Bolivia also inaugurated the El Dorado wind farm, the largest in the country, with an installed capacity of 54 MW (MHE, 2021a).

On the other hand, the country approved in 2021 a Supreme Decree²⁴ aimed at regulating and encouraging the incorporation of distributed generation in the national territory, which means a person may utilize a domestic generation system combined with the local distribution network (for instance, a solar panel installation), which brings the possibility of injecting the surplus into the local distribution network and receiving income from the transmission of electricity. This measure provides both an environmental and economic impact, estimating that in the first year of implementation it can achieve the economic

²⁴ Supreme Decree Nº 4477 published the 24th of March, 2021.

DRAFT

reactivation of 400 Small and medium enterprises (SMEs) dedicated to the installation of photovoltaic systems (OLADE, 2022).

Lastly, with regard to international agreements, cooperation and energy integration by the Plurinational State of Bolivia, in 2021 the Ministry of Hydrocarbons and Energy of Bolivia (MHE) signed with its Peruvian counterparts four energy integration agreements projecting the exportation of LPG and LNG to Peru, the installation of gas networks and the promotion and commercialization of Bolivian urea in the Peruvian market. In the same year, several activities were carried out for the laying out and building of electrical interconnection projects for the export of these services with Argentina, Brazil, Chile, Paraguay and Peru, with the aim of consolidating the regional energy integration (Bnamericas, 2021a; 2021b).

In Paraguay, certain energy projects stand out as well, among which the technological update for supervision, control and data acquisition (SCADA) is highlighted in enhancing and optimizing the management of the National Interconnected System (SIN). Likewise, the Wide Area Monitoring, Protection and Control (WAMPAC) scheme dubbed ECCANDE (Contingency Control Scheme in the National Electricity Administration) was implemented, with the purpose of guaranteeing the interconnected and synchronized operation of the Itaipú, Acaray and Yacretá hydroelectric plants (OLADE, 2022).

The new Buey Rodeo Substation was recently inaugurated, built in compliance with the country's proposed clean and renewable energy objectives. Once all the works are completed, more than thirty thousand users will benefit from higher quality electricity. The investment is financed by the Development Bank of Latin America (CAF), the Organization of the Petroleum Exporting Countries Fund for International Development (OFID) and the National Electricity Administration (ANDE, 2022).

Progress may also be noted in the greater participation of liquid biofuels in the consumption matrix of the transport sector, reaching 26.42% of the total volume of fuels used in this sector in 2021. In 2021, 99.7% of all motor gasoline traded in the country contained a mixture with absolute alcohol (OLADE, 2022). This indicates significant progress in the incorporation of biofuels into Paraguay's consumption matrix and demonstrates a commitment by the country to employ renewable and sustainable energy sources in the transport sector.

By means of the Vice Ministry of Mines and Energy (VMME) and the Ministry of Public Works and Communications of Paraguay (MOPC), the government of Paraguay officially introduced its green hydrogen route (H2V). These measures are mainly aimed at the use of hydrogen in the land transport sector and are aimed at passenger vehicles, buses and trucks.

Lastly, with regard to the progress in international agreements, cooperation and energy integration, in November 2021 the country officially launched the Energy Information System of Paraguay (siePARAGUAY) with the goal of strengthening the capacities for management, storage and processing of statistical data in the energy sector. These datasets, which will contribute to the overseeing of compliance with the SDGs, constitute a project coordinated by VMME, with the support of IDB and OLADE (Planas Marti, M et al., 2023).

2. Information and Communication Technology (ICT)

Given the level of ICT expansion, there are significant digital divides between countries and regions. However, these technologies have also growing in the developed countries, in terms of connectivity and

DRAFT

internet usage. This section highlights the progress and challenges faced by LLDCs in the region with regard to ICTs.

Regarding telephone services, the Plurinational State of Bolivia saw them reach 81.5% of the districts with a population greater than 50 inhabitants in 2019, evidencing an advance of 35.4 percentage points compared to 2015. The goal set for 2025 is to improve the coverage of mobile telephone services so that the regions and districts of the country receive a quality service and affordable rates (Gobierno del Estado Plurinacional de Bolivia, 2021a). In this sector, Paraguay also managed to improve connectivity. According to data from the Permanent Household Survey, the possession of mobile telephony services went from 75% in 2007 to 97.7% in 2020 (Gobierno del Paraguay, 2021a).

Between 2015 and 2020, the use of ICTs in the country increased. Mobile phone use grew by 3.5 percentage points and internet use by 23.7 percentage points. The number of registered mobile phone lines increased from 10.1 million to 11.8 million and the number of Internet connections from 6.7 million to 10.9 million. This increase is related to an increase in demand from the population that requires increasing levels of digital communication. In relation to internet use, according to data from the INE of Paraguay, 68.5% of the population aged ten or over used the internet in 2019 (about 3.9 million people), marking an increase of 3.5 percentage points compared to 2018 (65.0%).

In 2020, 74% of the population aged ten years or older used the internet, which is equivalent to around 4.2 million people and represents an increase of approximately 9 percentage points compared to 2018 (Gobierno Nacional del Paraguay, 2021a). To deepen these achievements, in May 2022 the National Telecommunications Commission (CONATEL) presented its National Telecommunications Plan for the period 2021-2025, with public policy guidelines to increase coverage and improve ICT services in the country. Since data obtained from the International Telecommunication Union (ITU) for 2021, it can be seen that the overall percentage of Internet use in both countries has been growing throughout the analysis period, while the percentage of internet connection for 2021 is close to double that registered in 2014 (Table 8). Thus, the Plurinational State of Bolivia reaches 66% of the total population, while in Paraguay it does so in 77%.

Table 8

LLDCs: individuals using the Internet by gender, 2014-2021 (As a percentage of the total population)

Year	Bolivia (Plurinational State of)			Paraguay		
	Internet users as a % of total female population	Male Internet users as a % of total male population	All individual	Internet users as a % of total female population	Male Internet users as a % of total male population	All individual
2014	32.2	37.1	34.6	42.9	43.1	43.0
2015	S/D	S/D	S/D	50.1	49.3	49.7
2016	S/D	S/D	S/D	53.8	53.0	53.4
2017	S/D	S/D	S/D	61.3	60.8	61.1
2018	41.7	47.0	44.3	65.7	64.3	65.0
2019	44.4	50.7	47.5	69.0	68.0	68.5
2020	58.0	61.9	60.0	75.0	72.9	74.0
2021	63.7	68.3	66.0	77.9	76.1	77.0

Source: the author based on ITU. No data available for Bolivia for the years 2015 to 2017.

In relation to the digital gender divide, inequality in access to high-speed broadband and useful devices is part of the regional reality. Moreover, the gap is accentuated among women with a lower educational level and with residence in rural areas (ECLAC, 2022j). In this regard it can be observed that the behaviors of the

DRAFT

Plurinational State of Bolivia and Paraguay seem to go in opposite directions. In the former, the percentage of the male population online is higher than that of women (by 4.5%), while in Paraguay there are 1.8% more women connected. This scenario applies to only 32 of the 121 countries for which ITU data are available. Among these 32, there are only 4 other LLDCs besides Paraguay (Armenia, Bhutan, Niger and Zimbabwe).

Although the percentages of connectivity in these countries have been growing since the implementation of the VPoA, the data presented (table 9) allow the comparison of results in landlocked countries in the region with their transit countries. This exercise leads to the conclusion that both Paraguay and the Plurinational State of Bolivia still have low percentages of connection than majority of the countries in the subregion.

Table 9
LLDCs and transit countries: individuals using the Internet, by gender and location
As a percentage of the total population.

Economy name	Latest year data	All Individuals	Gender		Urban			Rural		
			Male	Female	Total	Male	Female	Total	Male	Female
Argentina	2021	87.2	87.8	86.5	...	...	...	...	...	...
Bolivia (Plur. State of)	2021	66.0	68.3	63.7	77.6	79.6	75.8	37.9	41.8	34.1
Brazil	2021	80.7	81.6	79.8	81.8	83.3	80.4	73.5	70.1	76.2
Chile	2017	82.3	84.0	80.7	...	...	...	...	...	...
Paraguay	2021	77.0	76.1	77.9	...	...	...	...	...	...
Peru	2021	71.1	73.2	69.1	77.1	78.9	75.3	45.2	50.3	39.2
Uruguay	2019	83.4	82.8	83.8	...	...	...	...	...	...

Source: the author based on ITU

Most connected people are located in urban areas. According to ITU (2023), between 2019 and 2022, the urban-rural ratio globally declined, as rural areas experienced an annual growth rate during that period of more than double the growth rate in urban areas.

In recent years, tasks were carried out at the regional level to reduce gender gaps in women's and girls' access to information and communication technologies. Thus, after approving in 2021 the Regional Alliance for the Digitalization of Women in Latin America and the Caribbean, Various mechanisms were agreed to promote women's full participation in the digital economy. Recently, the document "Gender equality and the autonomy of women and girls in the digital age" was published, as a contribution to education and digital transformation in Latin America and the Caribbean with a gender perspective (ECLAC, 2023c).

3. Bottlenecks and recommendations to improve Energy and IT in LLDCs

Although with particular differences in terms of generation capacity and installed power, both the Plurinational State of Bolivia and Paraguay have made progress in strengthening their energy matrix. The access to electricity by the population advanced significantly since the adoption of the VPoA to date. Electricity coverage is very close to reaching the entirety of urban population in Paraguay. In the Plurinational State of Bolivia, whilst access levels are lower, the effort requires being located in the most marked difference between urban and rural areas, which is why the country is working intensively to achieve the challenge of materializing its goal of universalizing the electricity service by 2025.

Paraguay became one of the first countries to have completely clean and renewable electricity generation, after inaugurating the electrification works in Bahía Negra with energy generated by hydroelectric plants.

DRAFT

The potential for expansion in hydroelectric technology is remarkable and, although it already amounts to a significant share of the energy matrix in the Plurinational State of Bolivia, the government advances towards the construction of three plants to begin operations in the next five years (Miguillas, Ivirizu and El Cónдор).

The challenge is to adjust regulatory frameworks and sustain investments to accompany the process of diversification of the energy matrix and consolidate renewable and sustainable energy sources. In the Plurinational State of Bolivia, the objective has been set not only to aim at this diversification but also to increase the installed capacity to 4,129 MW, guaranteeing the production of sufficient electricity to supply the domestic market, and allocate at least 20% of the energy surplus to export (Gobierno del Estado Plurinacional de Bolivia, 2023).

In the development and implementation of ICTs, the Plurinational State of Bolivia and Paraguay remain at lower levels when compared to other countries in the region, despite the progress shown in recent years at investments in technologies such as fiber optics, the expansion of broad band and the utilization of the Internet and smart communication equipment. Inequity in access, mainly considering rural areas, remains a major gap to close.

The level of ICT development in LLDCs is also reflected in the use of ICT in e-government, streamlining of procedures and controls in administrative processes. However, these advances present challenges linked, on the one hand, to the digital divide and, on the other, to the significant resources needed to advance in the digital transformation.

Both landlocked countries should continue to focus their efforts towards expanding the telecommunications system in order to achieve a rapid and secure market access; to continue the development of broadband infrastructure throughout their territories; to facilitate access to the Internet; to reduce fees through increased competition in the sector. In the same vein, efforts should be increased in reducing the digital divide, both in terms of gender and between regional and urban locations.

D. Priority 3: International trade and trade facilitation

1. International trade of Bolivia (Plurinational State of) and Paraguay

a. Trade balance performance

In order to provide a quick overview of the export performance in recent years for landlocked and transit countries, the evolution of the trade balance (Table 10) is presented below. Almost all countries in the region experienced an expansion in the value of goods exports for the two years following the pandemic. The same occurred with imports, which can be largely attributed to the higher cost of fuels, food, and fertilizers due to the conflict in Ukraine (ECLAC, 2023b). Tables 11 and 12 below show values for the period 2014 to 2022, specifically for LLDCs. This allows an assessment of the evolution of the trade balance of these countries before the pandemic, its impact and recovery.

DRAFT

Table 10
LLDCs and transit countries: trade balance, 2020-2022. (USD millions)

Countries/regions/groupings	2020			2021			2022		
	Exports	Imports	Trade Balance	Exports	Imports	Trade Balance	Exports	Imports	Trade Balance
South America	469,361	398,499	70,862	639,992	562,839	77,153	774,816	703,583	71,233
Southern Common Market (MERCOSUR)	292,517	243,892	48,625	401,227	340,941	60,286	485,111	430,884	54,227
Andean Community	102,759	99,497	3,262	144,088	137,749	6,339	189,821	174,419	15,402
Argentina	Transit 54,946	40,315	14,631	77,987	59,291	18,696	90,075	80,049	10,026
Brazil	Transit 210,707	178,337	32,370	284,012	247,648	36,364	343,796	311,461	32,335
Bolivia (Plur. State of)	LLDC 6,953	6,517	436	10,966	8,740	2,226	14,311	11,047	3,264
Chile	Transit 74,086	55,110	18,976	94,677	84,148	10,529	99,884	98,280	1,604
Paraguay	LLDC 11,494	10,035	1,459	14,025	13,086	939	14,835	14,912	-77
Peru	Transit 42,905	34,709	8,196	63,151	48,317	14,834	76,097	57,202	18,895
Uruguay	Transit 9,924	7,848	2,076	15,086	11,137	3,949	19,914	13,511	6,403

Source: the author based on ECLAC, 2023b.

With the exception of Paraguay, the countries and groupings presented show a surplus in the trade balance during the analyzed period. It should be noted that according to the statistical database of the Central Bank of Paraguay, the country has been experiencing a trade deficit since 2005. One contributing factor to this is the high percentage (20%) of Paraguay's imports being re-exported to neighboring countries (Pérez, G. and Sánchez, R., 2019; Gobierno Nacional del Paraguay, 2022). Another significant factor that influenced the results in the last two years was adverse weather conditions, leading to a decrease in soybean exports, as further explained later.

When analyzing the evolution of the trade balance for landlocked countries since the adoption of the Vienna Programme of Action (VPoA), it can be observed that the Plurinational State of Bolivia experienced five periods of trade deficit from 2015 to 2019, which it managed to reverse and maintain since 2020. In 2021, the country recorded the highest surplus in the past three years, amounting to USD 1.46 billion, although this value remained well below the surplus achieved in 2014 (USD 2.36 billion) (Table 11). In these results, the extractive sectors of mining and hydrocarbons had contrasting contributions in 2021: while the former contributed with a positive balance of USD 2.62 billion, the latter subtracted momentum with a negative balance of USD 2.23 billion (ECLAC, 2022c).

Regarding Bolivia's (Plurinational State of) economic activity in that year, over half (54.1%) of the recovery can be attributed to two industrial supplies: metallic gold and tin, with the volume effect being the main factor for the latter, as well as soybean derivatives. The extraction of minerals, specifically zinc, lead, and silver, ranks second, fueled by both the rising global demand for electronic device manufacturing and shifts in vein composition in large-scale mining (ECLAC, 2022c).

Table 11
Bolivia (Plur. State of): international trade indicators, 2014-2022

	2014	2015	2016	2017	2018	2019	2020	2021	2022
Exports (USD millions)	13,034	8,923	7,259	8,367	9,110	8,933	7,093	11,080	13,671
Exports (percentages of GDP)	39.5	27.0	21.4	22.3	22.6	21.8	19.4	27.4	32.2
Imports (USD millions)	10,674	9,843	8,564	9,374	10,002	9,824	6,955	9,618	13,044
Imports (percentages of GDP)	32.3	29.8	25.2	25.0	24.8	24.0	19.0	23.8	30.7
Trade Balance (USD millions)	2,360	-920	-1,305	-1,007	-892	-891	137	1,462	626
GDP (USD millions, current Price)	32,996	33,000	33,941	37,509	40,288	40,895	36,630	40,408	42,445

Source: the author based on INE²⁵ and CEPALSTAT.

²⁵ The trade balance data for the Plurinational State of Bolivia obtained from INE exclude re-export values.

DRAFT

In 2022, exports reached a historic high in foreign trade, totaling USD 13.67 billion (4.9% higher than in 2014). This remarkable achievement marks the beginning of a recovery path after overcoming the impacts of institutional conflicts and the Covid-19 pandemic.

As mentioned earlier, Paraguay has been running a trade deficit for seventeen consecutive years, so there were no changes in this regard during the period under analysis. However, in 2021, exports of goods witnessed a significant recovery, recording the highest increase in several years, with a growth of over 10% compared to 2014 (Table 12).

Table 12
Paraguay: international trade indicators, 2014-2022

	2014	2015	2016	2017	2018	2019	2020	2021	2022
Exports (USD millions)	9,636	8,327	8,502	8,680	9,042	7,968	8,518	10,571	9,957
Exports (percentages of GDP)	23.9	22.9	23.6	22.3	22.5	21.0	24.0	26.5	24
Imports (USD millions)	11,299	9,529	9,042	11,875	13,334	12,544	10,217	13,613	15,853
Imports (percentages of GDP)	28.0	26.3	25.0	28.3	30.9	33.1	28.8	34.1	38.4
Trade Balance (USD millions)	-1,663	-1,202	-540	-3,195	-4,292	-4,576	-1,699	-3,042	-5,896
GDP (USD millions, current Price)	40,366	36,297	36,098	38,992	40,239	37,923	35,424	39,948	41,266

Source: the author based on Central Bank of Paraguay and CEPALSTAT. Re-exports included

This was driven by the upward trend in international soybean prices and increased volumes of beef exports. In 2022, despite the expected increase in the value of goods exports as a result of higher international food prices, the severe drought that began at the end of 2021 caused a significant decrease in soybean exports. Compared to 2021, exports of that product experienced a notable drop of 58.76%. Electric power, meanwhile, experienced year-on-year growth, albeit at a rate of 2.57%. Finally, beef production grew by 11% (Gobierno Nacional del Paraguay, 2022).

b. Product export matrix changes

The global crisis caused by the COVID-19 pandemic has once again brought attention to the critical role of the manufacturing sector and the uneven adoption of advanced digital production technologies, leading to a substantial digital divide between developing industrial economies and emerging ones. According to a study conducted by the United Nations Industrial Development Organization (UNIDO, 2021), countries that had a higher manufacturing capacity before the pandemic, as measured by the share of the manufacturing sector in GDP, experienced smaller declines in output compared to countries with limited manufacturing capacity.

The manufacturing sector is currently undergoing a period of significant transformation associated with the so-called fourth industrial revolution. This transformation involves the digitization of processes, increased automation, and the introduction of disruptive technologies like artificial intelligence, the Internet of Things, and additive manufacturing or 3D printing²⁶. These changes emphasize the growing importance of intangible elements such as software and associated services (such as research and development, design, installation, and maintenance) for value generation in the manufacturing industry.

The impact of disruptive technologies extends to global trade as well. The intensity of these transformations, coupled with the disruptions caused by the pandemic and shifts in global geopolitics, are

²⁶ Definitions and Potential Business Benefits available on Dini, Gliogo, and Patiño (2021).

DRAFT

likely to lead to a reconfiguration of industrial production in terms of geographical distribution in the coming years. This reconfiguration will have significant implications for manufacturing employment.

Analysing the export matrix of the Plurinational State of Bolivia (Table 13), it can be seen that fuel and energy exports accounted for 51% of the total value exported in 2014, largely made up of natural gas exports. This is followed by the manufacturing sector with 28% and agriculture with 21%. Within this 21%, 16% corresponds to the Mining sector (INE, 2023).

An analysis of the export matrix of the Plurinational State of Bolivia (Table 13) shows that fuel and energy exports accounted for 51% of the total value of exports in 2014, largely made up of natural gas exports. This is followed by manufacturing with 28% and agriculture with 21%. Within this 21%, mineral exports account for 16% (INE, 2023). However, by 2022, there was a significant change in this distribution, with the manufacturing sector taking the lead, representing 51% of the total export value (US Dollar) and over 90% of the value recorded in 2014. The fuel and energy exports experienced a 29-point reduction during the analyzed period. This transformation highlights the importance of value-added generation and export diversification as key components of the country's new export cycle.

Table 13
Bolivia (Plur. State of): exports value and share, 2014 and 2022. (USD millions, percentage)

Clasificación	2014		2022	
	Value	Participation %	Value	Participation %
Primary products	2,666	21%	3,691	27%
Manufactures (agricultural and industrial origin)	3,638	28%	6,922	51%
Fuels and energy	6,595	51%	2,973	22%
Total	12,899	100%	13,586	100%

Source: the author based on INE.

When analyzing the ten (10) most exported products between 2014 and 2022 (Table 14), it is clear that the main differences in the export matrix are due to the exported values of each product rather than the "type" of goods. In other words, the composition of the main exported products has not changed significantly, but the share of each of them in the total exported has changed. One example is natural gas, which decreased from 47% to 22%, while the export of metallic gold - a manufactured product - increased from 11% to 22%. Soybean derivatives also experienced a 5% rise compared to 2014, achieved through soybean cake and soybean oil.

Table 14
Bolivia (Plur. State of): exports by product, 2014 and 2022. (USD millions, percentage)

2014			2022		
Product description	Value	%	Product description	Value	%
Natural gas	6,011	47%	Other unwrought forms of gold	3,003	22%
Other unwrought forms of gold	1,359	11%	Natural gas	2,973	22%
Zinc ore and concentrates	967	8%	Zinc ore and concentrates	1,818	13%
Silver ores and concentrates	704	5%	Soybean cake	981	7%
Soybean cake	664	5%	Silver ores and concentrates	750	6%
Crude petroleum oils	584	5%	Crude soybean oil	704	5%
Unalloyed tin	345	3%	Unalloyed tin	508	4%
Crude soybean oil	276	2%	Soybean	334	2%
Quinusa	197	2%	Lead ores and concentrates	193	1%
Shelled brazil nuts	173	1%	Urea	193	1%
Total main products	11,299	88%	Total main products	11,458	84%
Other products	1,600	12%	Other products	2,128	16%
Grand Total	12,899	100%	Grand Total	13,586	100%

Source: the author based on INE.

DRAFT

Within the remaining 16% of products in 2022 (Table 14), the INE data showed a very diversified basket. Within that group, some notable manufactured products were granulated urea, sunflower derivatives, beef, metallic silver and wood product.

Paraguay's economic model and global integration has historically been characterized by three key aspects: the traditional export of agricultural, forestry, and livestock products; the export of hydroelectric energy to neighboring countries, and commercial intermediation or triangulation (Gobierno Nacional del Paraguay, 2021a). The country's export matrix has not changed significantly, with the largest share concentrated in the primary and manufactured sectors, mainly of agricultural origin (Table 15).

Table 15
Paraguay: exports value and share, 2014 and 2022 (USD millions, percentage)

Classification	2014		2022	
	Value	Participation %	Value	Participation %
Primary products	3,142	33%	2,991	30%
Manufactures (agricultural and industrial origin)	4,308	45%	5,287	53%
Fuels and energy	2,186	23%	1,679	17%
Total	9,636	100%	9,957	100%

Source: the author based on Central Bank of Paraguay²⁷

In 2014, the ten main products exported by Paraguay accounted for 86% of the total value. Among them, soybeans, electricity, beef, flour, soybean meal and other residues, soybean oil and corn stood out. It is worth noting that only 1% of total exports that year consisted of manufactured products of industrial origin, with a single good (wires, cables and other insulated conductors for electricity with connectors). In 2022, the top ten exported products accounted for 78% of the total value, indicating greater diversification compared to 2014. While the share of some manufactured products increased, the composition of the top ten exported products did not change significantly (Table 16).

Table 16
Paraguay: exports by product, 2014 and 2022. (USD millions, percentage)

2014			2022		
Product description	Value	%	Product description	Value	%
Soybeans	2,305	24%	Beef	1,816	18%
Electric power	2,144	22%	Electric power	1,671	17%
Beef	1,360	14%	Soybeans	1,227	12%
Soybean meal, cakes and other soybean residues	1,107	11%	Corn	1,089	11%
Soybean oil	481	5%	Soybean meal, cakes and other soybean residues	586	6%
Corn	357	4%	Soybean oil	534	5%
Prepared hides and skins	196	2%	Rice	293	3%
Rice	178	2%	Cables and other electrical conductors	277	3%
Cables and other electrical conductors	93	1%	Aluminum	154	2%
Wheat	79	1%	Beverages, alcoholic liquids and vinegar	147	1%
Total main products	8,300	86%	Total main products	7,795	78%
Other products	1,336	14%	Other products	2,162	22%
Grand Total	9,636	100%	Grand Total	9,957	100%

Source: the author based on Central Bank of Paraguay.

²⁷ The fuels and energy category consists almost entirely of energy exports. The export matrix obtained from the Central Bank of Paraguay identifies the fuels and energy category as a separate category from primary products.

DRAFT

In the comparison presented in the previous table, it can be observed that the exports of manufactured goods, both of agricultural and industrial origin, showed an increase in their share. However, the overall decline of 5.8% in total exports in 2022 was primarily driven by the decrease in soybeans, soybean meal, and soybean oil exports (Gobierno Nacional del Paraguay, 2022). The country faced significant challenges due to severe droughts during the 2021/2022 season, resulting in a decline in Paraguay's global ranking as an exporter and producer of soybeans. Nevertheless, projections from the United States Department of Agriculture (USDA) for the 2022/2023 season indicate a recovery to the third position in the export ranking and the sixth position as a major global producer (CAPECO, 2023; Productiva Comunicación y Marketing, 2023).

c. Markets expansion

An analysis of the main export markets for landlocked countries in the past eight years indicates that, in 2014, the Plurinational State of Bolivia had its majority share distributed between Brazil (30%) and Argentina (20%). However, in 2022, the first place was occupied by India with 17%, followed by Brazil and Argentina (with 14% and 13%, respectively). On the other hand, the market share of the U.S. significantly declined during the period under analysis, causing the country to be excluded from the top ten destinations in 2022, while in 2014 it ranked third with 16% (Table 17).

Table 17
Bolivia (Plur. State of): exports by destination country, 2014 and 2022
(USD millions, percentage)

2014			2022		
Countries	Value	%	Countries	Value	%
Brazil	3850	30%	India	2259	17%
Argentina	2564	20%	Brazil	1892	14%
United States of America	2044	16%	Argentina	1744	13%
Colombia	647	5%	Colombia	1039	8%
Peru	564	4%	Japan	967	7%
South Korea	496	4%	Peru	849	6%
China	443	3%	China	782	6%
Japan	433	3%	South Korea	537	4%
Belgium	231	2%	Arab Emirates	507	4%
Canada	200	2%	Ecuador	419	3%
Other countries	1562	12%	Other countries	2591	19%
Total	13034	100%	Total	13586	100%

Source: the author based on INE.

In addition to India (17%), the United Arab Emirates (4%) and Ecuador (3%) are two new markets that achieved significant percentages in 2022. Meanwhile, Japan (7%) and China (6%) doubled their share compared to 2014, while Colombia (8%) and Peru (6%) also increased, albeit to a lesser extent. In summary, the data presented indicates that during these years, there was a strengthening of extra-regional trade and trade with the Andean Community (CAN).

When examining the relative market share of Paraguay's export destinations, it is evident that Brazil continues to hold the dominant position. Its share increased from 31% in 2014 to 37% in 2022 (Table 18). Similarly, Argentina and Chile experienced an increase in their shares, with both countries rising from 7% to 19% and 12%, respectively, during the same period.

DRAFT

Table 18

Paraguay: exports by destination country, 2014 and 2022 (USD millions, percentage)

2014			2022		
Country	Value	%	Country	Value	%
Argentina	654	7%	Argentina	1,914	19%
Brazil	2,956	31%	Brazil	3,667	37%
Chile	673	7%	Chile	1,154	12%
United States	203	2%	United States	255	3%
India	218	2%	India	156	2%
Italy	383	4%	Israel	144	1%
Netherlands	430	4%	Poland	135	1%
Russia	1,038	11%	Russia	356	4%
Turkey	292	3%	Taiwan	222	2%
Uruguay	182	2%	Uruguay	203	2%
Other countries	2,608	27%	Other countries	1,752	18%
Total	9,636	100%	Total	9,957	100%

Source: the author based on Central Bank of Paraguay.

In terms of countries outside of South America, the Russian market saw the largest decline in its market share. Although Taiwan (2%), Israel (1%), and Poland (1%) were incorporated as export destinations in 2022, the total exports to these countries were lower than the exports recorded in 2014 for Italy (4%), the Netherlands (4%), and Turkey (3%), which were no longer among the main destinations in 2022, as shown in Table 18. Only the United States experienced an increase (1%) in its share compared to the years under analysis, among the extra-regional markets.

In conclusion, during the analyzed period, there was a contrasting pattern in the relative market share of export destinations between the two landlocked countries. The Plurinational State of Bolivia saw an increase in extra-regional trade (from 30% in 2014 to 38% in 2022), while Paraguay strengthened its participation in intra-regional trade, particularly within MERCOSUR (from 39% to 58% in the same period).

2. Value added of exports and regional or global value chains

For the purpose of conducting a comparative analysis of the value added by each country in its exports, the study provided by the Economic Complexity Index (ECI), determined by the Observatory of Economic Complexity (OEC), proves useful. In this analysis, we will focus on the *ECI Trade* indicator provided by the Observatory. This index measures a country's ability to produce and export complex products that demand advanced knowledge and skills. Therefore, a low economic complexity in trade is associated with a less diverse productive and export structure.

The ECI 2021 ranking included 131 countries, with Japan (2.06), Switzerland (1.94), China (1.93), South Korea (1.82), and Germany (1.81) occupying the top five positions. Among Latin American countries, Mexico stood out (ranked 23rd with an index of 1.09), while Brazil ranked 49th (with an index of 0.32) in South America. Both landlocked countries in the region obtained negative values for their indices, indicating that their exports have low economic complexity. This implies that their export baskets are less diversified and consist of products that are also exported by many other countries.

The evolution of the ECI index from 2014 to its latest estimation in 2021 is presented for the landlocked and transit countries in the region. Paraguay is the only country that demonstrates a relative improvement, from 91st to 80th place during the period under analysis. Conversely, the Plurinational State of Bolivia has experienced a decline, dropping from 97th place in 2014 to 106th place in 2021.

DRAFT

Table 19
LLDCs and transit countries: ECI Trade, 2014-2021

Country	Score								Ranking		2021 vs 2014
	2014	2015	2016	2017	2018	2019	2020	2021	2014	2021	
Argentina	0.37	0.38	0.31	0.20	0.12	0.11	0.09	0.06	45	60	↓
Bolivia	-0.66	-0.78	-0.89	-0.80	-0.75	-0.90	-0.98	-0.91	97	106	↓
Brazil	0.66	0.61	0.56	0.51	0.46	0.42	0.45	0.32	37	49	↓
Chile	0.03	-0.04	-0.08	-0.18	-0.20	-0.18	-0.18	-0.19	65	74	↓
Paraguay	-0.53	-0.56	-0.67	-0.59	-0.61	-0.51	-0.48	-0.41	91	80	↑
Peru	-0.53	-0.54	-0.60	-0.61	-0.60	-0.58	-0.69	-0.62	90	91	↓
Uruguay	0.12	0.21	0.16	0.20	0.07	0.03	-0.03	0.11	56	57	↓

Source: the author based on OEC, 2023

In turn, the Observatory makes a distinction between highly specialized products, the most complex exports, and the main export opportunities based on the affinity of each country. Based on the aforementioned, the main export opportunities identified for the Plurinational State of Bolivia —according to the affinity index— are Manganese Ore, Maté, Crude Petroleum, Cocoa Beans, and Raw Cotton. In the case of Paraguay, Gold, wool, Sorghum, Dried Legumes and Raw Cotton were identified for this category (OEC, 2023).

In this context, a study published by the International Labour Organization (ILO, 2022) in 2022 examines the export potential of sectors in the Plurinational State of Bolivia in the post-pandemic period. The study indicates that there is significant room for growth in the country's exports in the medium term, not only in neighboring regions but also through the development of markets such as Turkey and China. In terms of products, the study identifies that 70% of the potential growth is concentrated in eight main products: soybean residues, crude and refined soybean oils, raw tin, Amazonian chestnuts, ethyl alcohol, bananas, and jewelry. The remaining 30% is distributed across various sectors, with notable mentions including peanuts, sesame, and chia, which have the potential for growth through market diversification into China and Turkey. Additionally, cereals and legumes, particularly Andean grains like quinoa, as well as the llama and alpaca garment sector, show promising prospects for development (ILO, 2022).

As mentioned in the previous point (b) of this section, there is evidence of a change in the export matrix, which was previously characterized by a marked primary-extractivist profile (hydrocarbons and minerals). The current Government links this progress to the fact that it considers that the generation of added value and diversification are fundamental factors in the Economic, Social, Community and Productive Model (Gobierno del Estado Plurinacional de Bolivia, 2023).

Although the Plurinational State of Bolivia reached an all-time high in export value in 2022 (above 32% of GDP), its landlocked status poses challenges for further performance, growth and diversification of the export sector. Dependence on foreign ports in neighboring countries like Chile and Peru limits the country's potential. Additionally, logistical constraints hinder opportunities to expand exports to major markets such as the European Union, China, Japan, and India, among others (Gobierno del Estado Plurinacional de Bolivia, 2023).

The diversification of exports in Paraguay represents a priority objective according to its National Development Plan. In this regard, although progress has been observed over the past decade, it has been gradual. As mentioned earlier, Paraguay's export basket continues to heavily rely on soybeans and their derivatives, beef, and electricity. Regarding the evolution of the composition of exports recorded for the

DRAFT

period under analysis, a slight decrease in the share of primary products and growth in manufacturing of industrial origin can be observed.

A study published by the World Bank, focusing on Paraguay's international integration (World Bank, 2022), highlights the country's current participation in global value chains is stagnant and lags behind other countries in the region²⁸, consistent with a pattern of limited foreign direct investment (FDI) flows. The study shows that the country's indirect value added²⁹ grew steadily until 2011, when it peaked. From that year onwards, exports remained broadly stable in nominal terms and started to decline as a share of GDP in 2018.

Global value chains provide opportunities for countries to diversify trade and boost productivity and growth by specializing in specific stages of the production process. Factors such as the COVID-19 pandemic, economic uncertainty, geopolitical events and concerns about protectionism, and frequent natural disasters have incentivized countries and companies to reassess their positions in global value and supply chains. However, for the most part, Latin America and the Caribbean's participation in global value chains remains low (18%) compared to Asia (28%) and Europe (34%) (Alvarez, 2022).

According to a recent study conducted by Amar and Torchinsky (2019) on regional value chains in South America, the region as a whole has had limited involvement in global value chains, with a focus on traditional commercial integration through the export of primary products and their derivatives. In the context of regional value chains, Paraguay primarily participates as a supplier of agricultural raw materials and food products to its partners in MERCOSUR (Argentina, Brazil, and Uruguay), while Bolivia (Plurinational State of) acts as a supplier of mining and energy raw materials to its partners in the Andean Community (Peru, Colombia, and Ecuador).

The study also shows that although the countries of the region represent an important destination market for LLDCs, both countries have a low level of participation in regional value chains compared to other South American countries. This reflects the low weight of the value of their exports in the region as a whole. In other words, the value of LLDC exports is less significant compared to countries such as Brazil, which conducts most of its trade with partners outside the region. Consequently, it is difficult to imagine a significant expansion of regional value chains for Paraguay and Bolivia (Plurinational State of) without Brazil playing a prominent role in promoting their development (Amar and Torchinsky, 2019).

3. Enabling environment for trade facilitation

The TFA entered into force on February 22, 2017, following the decision made by the General Council of the World Trade Organization. It serves as a tool to make customs procedures more efficient, primarily through cooperation between customs authorities and other entities involved in foreign trade operations. The primary objective is to reduce the costs associated with international trade by simplifying the movement of goods across borders.

Both, the Plurinational State of Bolivia and Paraguay, ratified their accession to the TFA and have established the creation of their National Trade Facilitation Committees (NTFCs). These committees aim to

²⁸ In the aforementioned report, the countries used for the comparison of the described point are: Brazil, Chile, Colombia and Costa Rica (World Bank, 2022).

²⁹ Indirect value added; the value of exports from Paraguay that are used as inputs elsewhere and then exported as final goods (World Bank, 2022).

DRAFT

promote internal coordination and the implementation of the provisions outlined in the Agreement. Likewise, transit countries have also ratified the TFA, with Brazil ratifying it in March 2016, Uruguay in August 2016, Chile in November 2016, and Argentina in January 2018.

The NTFC of the Plurinational State of Bolivia convened its inaugural meeting in 2021 and is organized into seven working committees that address various aspects, including customs and border issues, sanitary and phytosanitary measures, technical barriers to trade, transit, trade defense, trade notifications, and infrastructure and ports. Their goal is to coordinate the facilitation of export procedures, identify trade barriers, and propose suitable solutions.

In addition to this initial meeting, the NTFC held two more meetings, the last one on January 20, 2023. During these sessions, the regulations for each technical committee were finalized, the inclusion of the private sector in committee meetings was decided, and the process of creating a Single Window for Foreign Trade (VUCE) was initiated. A proposal for a Supreme Decree is currently being prepared and analyzed. It is worth mentioning that one of the technical committees is dedicated to fighting smuggling, given its sensitivity to foreign trade operations and its negative impact on trade facilitation (Gobierno del Estado Plurinacional de Bolivia, 2023).

The NTFC of Paraguay is composed of 27 public sector institutions and 19 private sector institutions. It is structured into three working groups, which are jointly coordinated by representatives from both sectors. In 2022, the NTFC held three meetings to report on the progress made in implementing TFA measures about three key areas: i) transparency and trade information, ii) simplification of clearance procedures, and iii) release and facilitation of agricultural and livestock trade.

Among the most significant advancements are the expansion of the Committee's website services, providing trade facilitation information to traders, public sector actors, and the general public. Progress has been made in the group's roadmap for establishing cross-cutting procedures for urgent goods shipments. Collaborating with Kansas State University, the Committee has conducted training sessions on microbial analysis and laboratory testing as part of the T-FAST project. Additionally, the Committee has approved the Work Plan of the Technical Group for the Platform for the digitalization, integration, and simplification of foreign trade processes (DIGI-VUCE).

In the case of the Plurinational State of Bolivia, the customs administration has been using SUMA (Unique Customs Modernization System), which was developed by the National Customs Office to replace ASYCUDA++. The Bolivian National Customs Office (BCO) recently received certification for its Quality Management System by ISO 9001:2015 standards from the Colombian Institute of Technical Standards and Certification Bolivia SRL - ICONTEC. This certification signifies that the customs institution meets technical requirements in all its processes.

In Paraguay, the SOFIA system (Fiscal Classification System for Customs Taxes) developed by the National Directorate of Customs (DNA, in Spanish) is used. Although the system has been operational for 30 years, the DNA achieved technological independence in 2020 through the Directorate of Information and Communication Technologies (DTIC), after 26 years of outsourcing the development of customs systems. According to the DNA, notable progress and significant accomplishments were observed in the SOFIA system from August 2020 to November 2021.

It was also mentioned in its report that during the pandemic, the management of the so-called DTIC-SOFIA remained unaffected. The document outlined several advancements, including the documentation

DRAFT

of over 70 systems, the integration of a third data center, and the introduction of a new DNA website adhering to technological standards and e-government commitments. Among the upcoming challenges, the development and implementation of the new Open Data Portal for real-time queries were mentioned, as well as the migration of the customs broker application and VUCE management.

E. Priority 4: Regional integration and cooperation

Regional integration is an important component of Latin American and Caribbean development strategies. Within such a diverse region, it is essential to have integration policies that promote the region's potential and overcome the obstacles to economic growth and reduce inequality.

As mentioned in section A, there are four important integration bodies: the Central American Common Market (CACM), the Southern Common Market (MERCOSUR), the Andean Community (CAN) and the Caribbean Community (CARICOM). The Plurinational State of Bolivia participates in CAN and is a member in the process of joining MERCOSUR, while Paraguay is a member of MERCOSUR. Both countries are also members of the ALADI. In this group, the two landlocked countries of the region benefit from a preferential trade system that includes special cooperation programs (pre-investment, business rounds, financing, technological support) and compensatory measures in favor of less developed countries.

World trade and its governance are going through a period of great turbulence. In this context, the powerful signal represented by the recent entry into force of the RCEP³⁰ should not go unnoticed by the countries of the region, especially when the region has been going through a process of trade disintegration since the mid-2010s (Hiromi, 2021).

An example of bi-regional South-South cooperation is the Forum for Cooperation between L. A. and East Asia (FOCALAE), made up of sixteen East Asian countries and twenty Latin American countries, including the Plurinational State of Bolivia and Paraguay. The objective of this association is to increase dialogue, cooperation, and mutual understanding between the two regions.

Trade agreements have fostered the development of exports in these countries in the period under analysis. MERCOSUR is the main destination for Paraguayan exports, accounting for nearly 60% of the total in 2022. In the case of Bolivia, exports to MERCOSUR accounted for 27% of the total in 2022. The CAN member countries ranked third after India in terms of export destinations, with a 17% share of the total³¹. In the 2019-2022 period, the Plurinational State of Bolivia and Paraguay have made progress in the approval of integration agreements in different fields aimed at supporting the development of the VPoA priorities. Below, in chronological order, are some of the most important agreements in this period, in addition to those already explained in the previous sections.

³⁰ The RCEP emerged as a free trade agreement between the ten-member states of the Association of Southeast Asian Nations (ASEAN) (Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam) and five states in Asia and Oceania with which ASEAN has existing free trade agreements (Australia, China, South Korea, Japan, and New Zealand).

³¹ Section III.D presents a detailed analysis of the foreign trade performance of the Plurinational State of Bolivia and Paraguay for the period 2014-2022.

DRAFT

1. Plurinational State of Bolivia: recent agreements

In January 2019, the Administration of Port Services Bolivia (ASP-B) and the National Port Administration (ANP) of Uruguay signed an operating agreement for Bolivian cargo to access the Atlantic Ocean through the Nueva Palmira and Montevideo ports. This allows the country to have a presence in both docks, which are connected through the Paraguay-Paraná Waterway. The document grants preferential treatment to operations and tariffs to cargo in transit to and from Bolivia, in addition to facilitating the commercial connectivity of Bolivia (Plurinational State of) across the Atlantic.

Within the framework of the Agreement with Argentina for the establishment of a free zone for the Plurinational State of Bolivia in the Port of Rosario (1969), in February 2019 both countries agreed that the Plurinational State of Bolivia proceed to the return of the Free Zone property and the redefinition of the relocation in a space with the same or better characteristics than those of the previous property.

In August 2021, the governments of Bolivia (Plurinational State of), Colombia, Ecuador and Peru signed an agreement on free movement, residence and work for the citizens of these countries, in accordance with CAN Decision No. 878, which establishes the Andean Migratory Statute.

In April 2022, the country signed a memorandum of understanding with the Republic of Argentina to advance scientific and technological research in the area of evaporite and lithium resources and to exchange knowledge regarding this natural resource of strategic importance for the scientific and technological development of both countries.

Based on the 1948 Transit Agreement signed with Peru, the Plurinational State of Bolivia may use the port of Ilo free of charge; likewise, in 2022 an agreement was signed between ASP- B and Empresa Nacional Puertos (ENAPU) that extends the storage time of goods in transit from 90 to 120 days. In 2022, an agreement was signed between ASP-B and Empresa Nacional de Puertos (ENAPU) that extends the storage time of goods in transit from 90 to 120 days. In addition, an addendum was agreed to extend the discount for container handling by -35%, which will increase the volume of cargo through the port.

In February 2023, Bolivia's ASP and Uruguay's ANP - previously mentioned - reached an agreement to facilitate the storage of Bolivian products and use the port of Fray Bentos under a "free port" regime, boosting foreign trade across the Atlantic.

In March 2023, the customs agencies of the Plurinational State of Bolivia and Brazil signed an agreement to establish a new joint regulation of the Integrated Cargo Control Area (ACI) corresponding to Corumbá and Puerto Suárez in order to generate greater fluidity in the transit of export and import trucks.

2. Paraguay: recent agreements

In September 2019, a draft agreement was submitted to Argentina for the construction of a new International Bridge over the Pilcomayo River between the cities of Puerto Falcón (Paraguay) and Clorinda (Argentina), to be fully financed by Paraguay. On March 13, 2023, the second progress meeting of the Puerto Falcón-Clorinda Bridge Technical Committee was held in Buenos Aires. The financing is fully provided by Paraguay.

Within MERCOSUR, in 2021, the "Agreement on Electronic Commerce" was signed, which establishes a common legal framework to facilitate the development of electronic commerce within the bloc, in

DRAFT

accordance with the new trends in global commerce³².

In January 2022, work began on the construction of the Bioceanic Corridor bridge that will link the cities of Carmelo Peralta and Puerto Murtinho in Brazil. The work, which will have an extension of 1,300 meters, is a fundamental link in the corridor that will join the Atlantic and Pacific Oceans. With a value of USD 85 million, the construction of the Paraguayan margin is financed by the Itaipu Binational Entity. As of April 2023, the project is 19% complete.

The new route will enhance commercial and social relations between the countries it crosses: Brazil, Paraguay, Argentina and Chile, and will also improve the connection with Bolivia. In December 2022, the construction of the Integration Bridge over the Paraná River, the second bridge between Paraguay and Brazil, between the cities of Puerto Presidente Franco and Foz de Iguazú (Brazil), was completed. The complementary works in Paraguayan territory are expected to be completed by the first half of 2023 (Gobierno Nacional del Paraguay, 2023).

The draft agreement with Argentina for the construction of another international bridge over the Paraguay River between the border towns of Pilar and Puerto Cano was presented at the XVIII Meeting of the Argentina-Paraguay Joint Technical Group on March 13, 2023 in Buenos Aires. This project is expected to be financed by the Development Bank of Latin America (CAF).

F Priority 5: Structural economic transformation

1. Productive capacity changes and export diversification

Economic structural transformation is the process by which an economy changes its sectoral composition and improves its productivity and competitiveness. The World Economic Forum's (WEF) Global Competitiveness Index is a measure that evaluates the conditions for sustained economic growth in 141 countries, based on 12 pillars divided into four categories: business climate, human capital, markets, and innovation ecosystem. Therefore, a higher score in the global competitiveness index, or a higher ranking, implies a greater capacity to diversify and transform the economy, and vice versa. Additionally, the forum defines competitiveness as the set of institutions, policies, and factors that determine the level of productivity of a country. Table 21 displays the variations experienced by the Plurinational State of Bolivia and Paraguay in the global competitiveness ranking between 2014 and 2019. It also focuses on two components that, according to the WEF, determine a country's productivity: product market and market size. Paraguay achieved a notable improvement in its global positioning, climbing 15 positions from 112th in 2014 to 97th in 2019. In contrast, the Plurinational State of Bolivia dropped 2 positions during the analysis period, going from 105th to 107th.

³² Available at: <https://www.mercosur.int/documento/acuerdo-sobre-comercio-electronico-del-mercosur/>

DRAFT

Table 20
LLDCs: global competitiveness ranking, 2014 and 2019

Pillar	Bolivia (Plur. State of)			Paraguay		
	2014	2019		2014	2019	
Overall	105	107	↓	112	97	↑
Product Market	132	128	↑	92	72	↑
Market Size	84	91	↓	92	87	↑
Innovation capacity	83	124	↓	134	137	↓

Source: the author based on World Economic Forum, 2014; 2019

It is important to clarify that, according to the WEF, a good positioning in the product market component reflects an efficient allocation of resources in the goods market and competitiveness at the domestic and international levels. Regarding the market size component, which includes both the domestic and external market, it explains the levels of productivity as it relates to the exploitation of economies of scale. Table 20 shows that Paraguay also managed to climb several positions in the ranking for these components since 2014, rising 20 positions from the 92nd spot in 2014 in the product market component and 5 positions in relation to market size.

In the case of the Plurinational State of Bolivia, it can be observed that it has achieved a slight improvement in the product market component during the analyzed period, climbing 4 positions from the 132nd spot obtained in 2014. However, in terms of market size, it dropped 7 positions to the 91st spot. It is worth noting that, despite the mentioned progress, both countries are still among the lowest positions globally and regionally (Table 20).

As mentioned in section III, on priority 3, both Bolivia (Plurinational State of) and Paraguay continue to be highly dependent on exports of raw materials and resource-based manufacturing (mining, hydrocarbons, hydroelectric power, soybeans and its derivatives, and livestock). This high productive concentration results in a high dependence on external prices and climatic factors. This has been evident with the contraction of demand during the COVID-19 pandemic and the pressure that the subsequent recovery of international prices exerted on the productivity of the extractive sector over the past two years.

While both countries have been working diligently to diversify their export baskets and increase their degree of openness to international trade by targeting non-traditional markets, economic structural transformation, innovation, and growth in modern business services remain significant challenges in the face of the rapid global expansion. The following are the main progress achieved by each country in these aspects.

a. Progress of the Plurinational State of Bolivia

The agricultural sector has proven to be resilient in the face of the recessionary landscape that characterized the year 2020, achieving a year-on-year growth of 3.1% that year and 1.8% in 2021 (Gobierno del Estado Plurinacional de Bolivia, 2023). The dynamics of this sector have been strengthened in response to supportive policies and measures. Among them are the creation of ten agricultural programs, the purchase of ethanol by YPFB from the national sugarcane sector, the creation of the oilseed program, and the establishment of the Bolivian Agroproduction Company (B-Agro) (Supreme Decree No. 4701) with the aim of strengthening national food sovereignty (Gobierno del Estado Plurinacional de Bolivia, 2023).

DRAFT

The strength of this sector was also largely based on the consolidation of the meat industry. The export of beef showed growth as a result of the consolidation of agreements with Asian markets, particularly with China since 2018. In 2022, the country reached a record of USD 120 million from the sale of beef products in the international market, of which China accounted for USD 99 million (around 80%) (Bolivian Information Agency, 2022). Tourism in Bolivia (Plurinational State of) is the country's fourth-largest industry in terms of generating foreign exchange, contributing 4.2% to the national GDP and generating over 400,000 direct and indirect jobs (ILO, 2021). According to official communications, inbound tourism received over 400,000 foreign visitors between January and August 2022, which is a 450% increase compared to the same period of the previous year when it reached a total of 89,000 foreigners. To strengthen this sector, the country has implemented the National Program for Community Tourism (PNTC, in Spanish) "Revitalization of Tourist Areas" to increase the contribution of tourism to socio-economic development.

Following the significant decline experienced by the manufacturing sector in Bolivia due to the impact of the pandemic, the national government took measures to boost industry recovery. The main policies facilitated access to resources through the SIBOLIVIA credit program for import substitution, the reinstatement of productive portfolio quotas in the financial system, and the creation of the Guarantee Fund for the Development of the National Industry (FOGADIN, in Spanish). Initiatives providing direct support to the industry were also implemented, such as granting tax incentives for the importation of capital goods and industrial plants with zero value-added tax, the Trust Fund for Supporting Public Investment Reactivation (FARIP, in Spanish), and the Contestable Fund for Productive Public Investment (FOCIPP, in Spanish) (Gobierno del Estado Plurinacional de Bolivia, 2023).

Among the industrialization projects supported by the Bolivian government, the development of the lithium industry stands out. This includes the construction of the Lithium Carbonate Industrial Plant in Potosí with an estimated value of USD 115 million, which is expected to be completed by mid-2023 (Terrel, 2023). Additionally, a contract was signed for the construction of the Granulated Fertilizer Production Plant in Cochabamba. This plant will determine the percentage component of each chemical element based on the specific requirements of each terrain and soil to improve productivity (La voz de Tarija, 2022). The construction of the Mutún steel complex, comprising at least seven plants and with an investment of over USD 500 million, is also noteworthy. This new plant will produce 200,000 tons of steel per year, reducing steel imports by 50%, which is a significant step in boosting the mining sector (Hinostraza, 2023).

b. Progress of Paraguay

Paraguay's export basket continues to be heavily concentrated in soybeans and its derivatives, beef, and electricity. The country remains among the top five soybean producers and among the top ten beef exporters worldwide (World Bank, 2022b). The beef market has been strengthening due to improvements in quality, health standards, and reproductive technology. While the primary sector contributes around 11% to the national GDP, exports of electric power to Brazil and Argentina also have a significant impact on economic activity (IDB, 2021).

DRAFT

According to data from the Investment and Export Network (Rediex, 2021), Paraguay added new³³ products to its export list in 2021, both in the Americas and in Asia, despite the contraction of global trade caused by the Coronavirus pandemic. These include butter (to the United Arab Emirates), french fries (to Argentina and Brazil), vetiver extract (used as an input for perfumery, to India), and propylene polymer (primary plastics, to Argentina). Although the volumes and amounts achieved do not yet position Paraguay as a major trading partner for the countries and products mentioned, it is seeking to help gain market share in historically less traditional markets such as Russia, Israel, India and the United States.

Among the goals defined in its 2030 National Development Plan (NDP), Paraguay has established the need to improve its positioning among competitive global food exporters. To achieve this, the country has implemented a series of measures, such as incentivizing organic food production, developing negotiation strategies related to the new exportable supply applicable to new free trade agreements made by the country, promoting companies with export potential, advocating for the elimination of tax, customs, commercial, or health barriers to the export or transportation of Paraguayan products, organizing economic and trade missions, as well as providing incentives for private sector investment, among others.

In relation to services exports, although they accounted for only about 9% of total exports in 2019, they have shown more dynamism than goods exports. Between 2008 and 2019, Paraguay's services exports grew by 8.3%, compared to 2.1% annual growth in goods exports. Paraguay focuses its services exports on transportation and travel. In 2019, these sectors accounted for more than 75% of total services exports, ahead of financial services, telecommunications, and information and communication technologies (ICT). Tertiary activities accounted for 68% of people employed in 2018, confirming that services are a key dimension of economic development through employment generation and should be the focus of public policies (UNCTAD, 2021).

Over the past five years, tourism in Paraguay has emerged as one of the country's economic drivers, generating a significant influx of foreign exchange. It ranks behind traditional export sectors such as electricity, beef, soybeans, and its derivatives. The tourism sector's contribution to the GDP has shown steady growth, increasing from 0.79% in 2012 to 1.26% in 2019. According to official sources, this upward trend can be attributed to a sustained international promotion campaign that includes participation in major global trade fairs. Additionally, the implementation of the Tourism Master Development Plan, initiated in August 2008, has played a crucial role by identifying strategic areas for tourism development (Gobierno Nacional del Paraguay, 2021a). The creation of new thematic tourist circuits and the implementation of programs such as Youth Tourism, Women's Empowerment, and Touristic Neighborhoods have empowered local communities and provided them with the necessary tools to promote domestic tourism.

Regarding investment projects in Paraguay, the Ministry of Industry and Commerce reported the approval of 122 projects in 2022, with a total value reaching USD 276 million. The majority of these investments, around 84%, were allocated to the industrial sector, with significant activities in food product manufacturing, followed by metal product manufacturing and pharmaceutical product manufacturing (Gómez Rojas, 2023).

³³ The term "new" is applied to exports that surpass a value of USD 50,000 during the reference month and have no previous record of being sent to that particular destination in the past seven years. Additionally, these accounted products must possess a certification of national origin, serving as evidence of their genuinely Paraguayan origin (Rediex, 2021).

DRAFT

2. Science, technology, and innovation

The advancement of science, technology, and innovation (STI) is crucial for achieving export diversification, productivity, efficiency, and competitiveness in various economic sectors. In comparison to other regions, Latin America and the Caribbean have lagged behind in terms of efforts and outcomes in STI. According to data from the World Bank, the region's research and development (R&D) expenditure as a percentage of GDP stood at around 0.67% in 2019, significantly lower than the average of 2.67% among OECD member countries (UNESCO Institute for Statistics, 2023a; 2023b).

Against this backdrop, during the period under review, the progress made in improving STI in the Plurinational State of Bolivia and Paraguay has been insufficient. In this regard, the latest report published by the WEF, *The Global Competitiveness Report (2019)*, shows that Paraguay is ranked 137th and the Plurinational State of Bolivia 124th out of the 141 countries considered in terms of the "innovation ecosystem" component. Even in sectors where these countries have comparative advantages, such as natural resource exploitation, they have not advanced towards more knowledge-intensive stages. One limiting factor to the competitiveness of these economies lies in the limited technological development and the lack of innovation applied to both production processes and public management (Gobierno de Paraguay, 2021).

The above highlights the need to strengthen the capacity of public and private actors responsible for designing and implementing innovation strategies, considering it a prerequisite for successful transformation.

It is worth noting that both countries have the regulatory frameworks and general guidelines to develop institutions and critical mass that can achieve greater progress in STI. These institutional frameworks were developed in line with the Economic and Social Development Plans of each country, which align with the 2030 Agenda for Sustainable Development.

In terms of progress in this regard, the Plurinational State of Bolivia has a "National Plan for Science, Technology, and Innovation" (2013) that recognizes science and scientific research as essential factors for modifying the production matrix and industrializing natural resources (Ministerio de Educación del Estado Plurinacional de Bolivia, 2013). Two of the main issues identified in this plan are the limited connection between universities and social and productive demands, and the gap between social sectors and the realms of knowledge and technological development, as well as the lack of updated indicators for STI.

Notably, Bolivia established the Center for Research in Science and Technology of Materials and Evaporitic Resources in 2021. This specialized center aims to generate scientific knowledge that can facilitate significant advancements in applying STI to the industrial sector. By prioritizing collaboration with national universities, the center seeks to foster projects that strengthen the strategy for lithium industrialization, thereby enhancing scientific and technological sovereignty (MHE, 2021).

In collaboration with authorities and experts, ECLAC conducted workshops to explore opportunities for value addition in the lithium chain in Argentina, Bolivia, and Chile. The objective was to formulate recommendations oriented to the countries of the "Lithium Triangle" in order to promote national and regional coordination mechanisms that foster innovation, technological development, linkages, and value addition in lithium exploitation, particularly in the context of electromobility and the global energy

DRAFT

transition. The preliminary results of the countries' efforts in attracting specialized manufacturers and research and technological development centers were also presented (ECLAC, 2022e; 2021c).

In recent years, Paraguay has also taken steps to strengthen its regulatory and institutional framework to support STI. The National Council for Science and Technology (CONACYT) plays a crucial role in stimulating and promoting scientific research, technological development, human resource training, and innovation processes through knowledge generation, dissemination, and transfer (Gobierno Nacional del Paraguay, 2021).

CONACYT aims to develop support programs for human capital formation in science and innovation and promote the linkage between actors within the country's scientific and technological system. Additionally, it engages in research and innovation projects that address social challenges in areas such as family farming, agricultural production, educational and healthcare technologies, and sustainable housing.

In this context, Paraguay approved its National Policy for Science, Technology, and Innovation 2017-2030 (Decree No. 8420/2018). The policy recognizes that despite the country's recent efforts in promoting STIs, several factors continue to hinder scientific and technological production (CONACYT, 2017). The aim is to improve the capacity of local universities and institutes to generate and transfer knowledge and technology to the productive sector, as Among the key objectives set out in the National Policy is to increase investment in STI activities as a percentage of GDP, which remains low compared to other countries in the region. Paraguay's investment in R&D rose from 0.14% of GDP in 2019 to 0.16% in 2020 (CONACYT, 2021), and it stood at around 0.15% in 2021 (CONACYT, 2022).

Most investment efforts in 2021 were directed towards applied research (79%). Public funds constituted the main source of financing for research (76%), showing an upward trend in recent years. Additionally, half of the investment in R&D activities was carried out by public organizations, 29% by public universities, 14% by non-profit private organizations, and 7% by private universities. In terms of investment distribution across scientific areas, the field of engineering and technology received the largest share (22%), a decrease of 4% compared to 2020, while natural sciences increased from 6% in 2020 to 20% in 2021. Agricultural and veterinary sciences, on the other hand, experienced a consecutive decline in their percentage of participation for the fifth year in a row, dropping from 37% in 2015 to 13% in 2019 (CONACYT, 2022).

3. Progress in private sector development

The 2030 Agenda for Sustainable Development recognizes the role of the private sector as a key actor in achieving the SDGs and promotes its participation in public-private partnerships. In this regard, and within the framework of the Forum of Latin American and Caribbean Countries on Sustainable Development, since 2017, ECLAC (Economic Commission for Latin America and the Caribbean) and the United Nations Global Compact have collaborated extensively to this end, establishing Regional SDGs Business Forums in the framework of the Forum of the Countries of Latin America and the Caribbean on Sustainable Development, in order to facilitate the analysis and exchange of good practices regarding the role of the private sector in the implementation, monitoring, and review of the 2030 Agenda, as well as the development of public-private dialogue (United Nations, 2021).

Although there have been improvements in the productivity of small and medium enterprises (SMEs) in both landlocked countries in the region, there are still several factors that require ongoing efforts and specific actions. One of these factors is related to the export profile of both countries, which heavily relies

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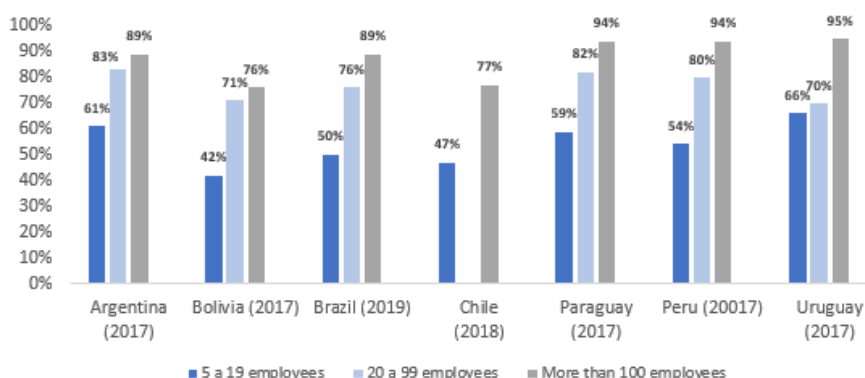
on natural resources. This concentration on resource-based exports creates disincentives for the participation of small enterprises, as they may face limitations in making investments and a low level of linkages that many of these export activities generate. Furthermore, challenges include difficulties in accessing skilled human resources, availability of managerial and technological capabilities, and navigating complex regulatory frameworks encompassing taxation, labor policies, trade policies, and market entry and exit requirements.

An important aspect in analyzing the progress of the private sector relates to the level of digital transformation experienced by companies in recent years. According to a study on the digital transformation of MSMEs (Dini, Gliogo, and Patiño, 2021), this aspect can be studied based on three factors. Firstly, the level of adoption of mature technologies, such as broadband internet access, availability of a website, electronic banking, and social media presence. Secondly, the implementation of e-commerce. And finally, the adoption of modern technologies, including Artificial Intelligence (AI), Additive Manufacturing or 3D printing, Advanced Robotics, Internet of Things (IoT), or Blockchain³⁴.

The study reveals that, in terms of mature technologies, the level of connectivity among companies in the region is high, with minimal differences between SMEs and large enterprises. This level of connectivity is comparable to that of more advanced countries like Spain and Germany. However, when it comes to the quality of the connection, as measured by download speed indicators, there are noticeable disparities among local companies based on their size. A significant obstacle to the development of many SMEs in the region is the low speed of their internet connection, which hampers the use of certain applications and technologies such as cloud computing or 3D printing, which require higher speed levels.

Regarding to the availability of websites, which is another aspect of mature technologies, there is a notable trend linking their use to the size of the company. According to the available data (Figure 5), smaller companies are less likely to have their own website, which limits their ability to provide information and expand their offerings. This pattern is consistent in most countries, with the exception of Uruguay (between small and medium-sized enterprises) and Bolivia (between medium-sized and large companies), where the differences are less pronounced.

Figure 5
LLDCs and transit countries: website availability according to company size (In % of availability)



Source: the author based on Dini, Gliogo and Patiño, 2021

³⁴ Definitions and Potential Business Benefits available on Dini, Gliogo, and Patiño (2021).

DRAFT

Despite the overall increase in global e-commerce in recent decades due to the widespread adoption of digital technologies, the COVID-19 pandemic has compelled many businesses, particularly MSMEs in sectors such as restaurants and retail, to adapt their business models to mobility restrictions. This has resulted in the adoption of digital sales channels to sustain their operations. The aforementioned study highlights that Paraguay exhibits a relatively low percentage of e-commerce among its companies compared to other countries included in the analysis. However, there is not a significant disparity between the percentages of SMEs (32%) and large enterprises (37%). Unfortunately, no data was available for the Plurinational State of Bolivia, over the periods analysed in Figure 5. Furthermore, concerning advanced technologies, none of the landlocked countries in the region showed notable advancements (Dini, Gliogo, and Patiño, 2021).

G. Priority 6: Means of implementation

Financial resources and cooperation are requirements in order to achieve the goals and objectives of the VPoA, as well as the 2030 Agenda for Sustainable Development. The mobilization of these resources is a central challenge for LLDCs, especially in an extremely uncertain and challenging global macroeconomic context. The impacts of the war in Ukraine, sharp increases in food, fertiliser and energy prices and tightening financial conditions further affected the prospects for development financing (United Nations, 2023). Progress and challenges in the various resources available to these countries as means of implementing VPoA will be discussed below.

1. Internal resources and institutional capacity building

The 2019-2022 period began with a generalized reduction in commodity prices, which was significantly accentuated during the first months of 2020 with the contraction of international trade triggered by the pandemic. Although commodity price declines began to reverse as of May 2020, except energy products, the period was marked by significant price fluctuations. In addition, volatility in the financial markets set a context that had a considerable impact on the public finances of The Plurinational States of Bolivia and Paraguay.

Regarding fiscal performance in the Plurinational State of Bolivia, the overall result in 2022 maintained its deficit trend for the ninth consecutive year. The Non-Financial Public Sector (NFPS) posted an overall fiscal deficit of 7.2% of GDP, below the 9.3% of GDP recorded for 2021 and the 12.7% of GDP recorded in 2020 (ECLAC, 2022c; Gobierno del Estado Plurinacional de Bolivia, 2023).

The fiscal result was financed mainly with internal resources. In the year 2022, the National Treasury required liquidity credits to meet its obligations and for debt service payments. As mentioned above, in aggregate terms, Bolivia's national public debt exceeds 80% of GDP. During the last few years, actions have been taken to improve. Although measures have been taken in recent years to improve tax revenues, the decline in economic activity and lower incomes as a result of the pandemic have led to a decline in tax revenues. Thus, while Bolivian government revenues accounted for 36.1% of GDP in 2015, they will fall to 22.1% by 2020.

As a redistributive policy, Law No. 1355 established a value added tax (VAT) refund was also implemented, for up to 5% of purchases by people with incomes of up to 9,000 bolivianos (equivalent to about USD 1,300). On the other hand, to increase tax collection, at the end of 2020 the government created a tax applicable to natural persons whose assets exceed 30 million bolivianos. However, due to regulatory and

DRAFT

operational limitations, the amount collected during the first year of implementation represented approximately 0.2% of total revenues (ECLAC, 2022c).

In terms of external financing, fiscal performance hurt risk perception and sustainability during the first post-pandemic year. It was only in February 2022 that the government was able to access the swap of bonds previously issued in 2012, 2013 and 2017 (ECLAC, 2022c). In 2022, the Bolivian government managed to place USD 850 million in sovereign bonds at an interest rate of 7.5% and a maturity of eight years (Gobierno del Estado Plurinacional de Bolivia, 2023). Regarding public investment, the PDES 2021- 2025 estimates a public investment of USD 33.2 billion for the productive sector (53%), infrastructure (34%), social projects (11%), and environment and water (2%).

Paraguay showed a decline in public finances in 2021 as a result of the adoption of an expansionary fiscal policy in a context characterized by a sharp reduction in revenues. As a result of falling revenues and additional spending to cope with the pandemic, the central government fiscal deficit rose from 2.9% of GDP in 2019 to 6.1% in 2020, bringing it, for the second consecutive year, above the 1.5% of GDP limit set by the Fiscal Responsibility Law. At the end of 2021, the deficit reached 5.1% of GDP.

In 2020, total revenues fell by 5.3% in real terms, to recover by 8.3% in 2022, thanks to the dynamism of economic activity on tax collection. If by 2020, the drops recorded in the collection were marked (-9.9% in the selective tax on goods, -18.8% in the foreign trade tax and -1.8% in the value added tax), by 2021 tax collection stood at 10% of GDP (ECLAC, 2022g). At the end of 2021, the balance of the public debt was USD 13.63 billion, equivalent to 35.1% of GDP, registering an increase of 1.3% of GDP compared to 2020. Most of it is foreign debt contracted with multilateral organizations. In summary, this increase is explained by official loans for approximately USD 670 million, the net placement of international bonds for almost USD 500 million and new debt linked to the execution of infrastructure projects in association with the private sector, for close to USD 150 million (ECLAC, 2022g).

Investment in Paraguay is mainly supported by three sources of financing, the largest share of total financing in 2022 corresponds to public credit³⁵ (59.8%). That year, these resources reached a total amount of USD 1.26 billion. This is followed by institutional resources³⁶, which amounted to USD 787 million in 2022, representing 37.3% of total financing. Finally, treasury resources³⁷, which in 2022 amounted to USD 61.46 million, represented 2.9% of total funding.

2. International support to the VPoA priorities development

The international community supports developing countries through various mechanisms: with financial resources in the form of concessional loans or grants and with technical assistance. This subsection analyzes the progress made in the contribution aimed at advancing the priorities established in the VPoA in landlocked countries in the region. Three channels are considered: Official Development Assistance

³⁵ Public credit corresponds to funds derived from internal and external public indebtedness, from the placement of securities or from the disbursement of loans.

³⁶ Institutional resources are those belonging to the agencies of the Central Administration and Decentralized Entities, originated by legal disposition, tax co-participation, transfers, donations or other concepts.

³⁷ Treasury resources correspond to those ordinary revenues of the General Treasury, administered by the General Directorate of the Public Treasury of the Ministry of Finance, collected and obtained during the fiscal year.

DRAFT

(ODA)³⁸, the agencies of the United Nations system and other development support institutions, and South-South and triangular cooperation.

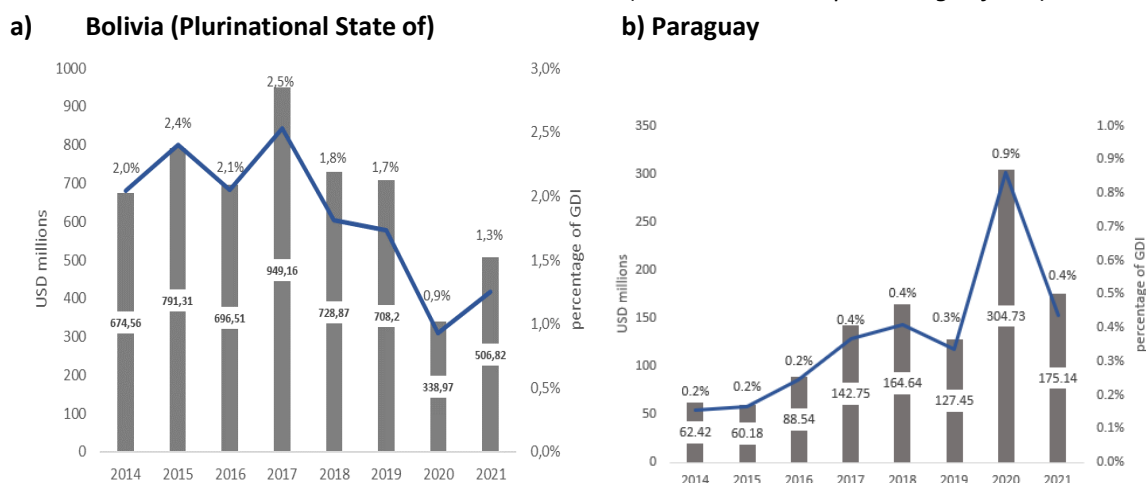
a. Official Development Assistance (ODA)

ODA disbursements received by the Plurinational State of Bolivia and Paraguay increased throughout the period 2014-2018, although with fluctuations in the Plurinational State of Bolivia. While in 2019 disbursements had already shown a decline, in 2020 the drop was pronounced for the Plurinational State of Bolivia (-54%). In Paraguay, although in 2019 there was also a drop in the amount of funds compared to the previous year, in the year of the pandemic they received the highest amount recorded for the period of analysis, representing an increase of 136% over 2019 (Figure 6 a and b).

It is worth mentioning that, in global terms, ODA reached its highest level in 2021, with significant support in response to the COVID-19 pandemic, including support for vaccination (OECD, 2022). Disaggregated data by country are not available yet, but global ODA in 2022 remained responsive to crises, with a growth of 13.6%, one of the highest increases on record and only surpassed in 2005 when net ODA increased by 32% due to exceptional debt relief operations (OECD, 2023).

Figure 6

LLDCs: ODA disbursements 2014-2021. (USD millions and percentage of GDI)



Source: the author based on OECDStat and CEPALStat.

In relative terms, these disbursements have had a significant impact in these countries in recent years, particularly in the Plurinational State of Bolivia, where in 2017 they peaked at 2.5% of GDP. In 2021, disbursements accounted for 1.3% of GDP, evidencing an improvement over 2020, but still falling well short of the 2017 peak. In Paraguay, this proportion has been lower throughout the 2014-2018 period, where it kept fluctuating between 0.2% and 0.4, then made a peak in 2020 (0.9%) and decreased again in 2021, in line with the trend previously observed.

³⁸ ODA is defined as government aid designed to promote the economic development and welfare of developing countries, according to the criteria of the Organization for Economic Cooperation and Development (OECD). Aid may be provided bilaterally, from donor to recipient, or channeled through a multilateral development agency such as the United Nations or the World Bank, including grants, "soft" loans and the provision of technical assistance.

DRAFT

Table 21 represents the sectoral targeting of ODA resources. While all sectors converge with the 2030 Agenda for Sustainable Development, particularly those related to production and economic infrastructure and services are more specific for supporting progress on the priorities established in the VPoA. In the Plurinational State of Bolivia, disbursements directed toward the economic infrastructure and services sector represented only 3% in 2021 (in 2017 it had reached its highest proportion of 64%) and toward the productive sectors 15% (practically half that of 2014). The social infrastructure and services sector accounted for the largest share about the destination of disbursements in 2021.

In Paraguay, ODA disbursements for economic infrastructure and services represented the highest proportion (62%), showing an increase of 44 points compared to 2020. They represent 43% and 6%, respectively.

Table 21
LLDCs: ODA disbursements by sector 2014-2021 (Percentage of total ODA disbursements)

Sector	2014	2015	2016	2017	2018	2019	2020	2021
Plurinational State of Bolivia								
Social Infrastructure & Services	45%	57%	40%	29%	50%	64%	77%	53%
Economic Infrastructure & Services	10%	4%	38%	64%	36%	26%	3%	3%
Production Sectors	29%	19%	9%	2%	7%	4%	8%	15%
Multisector	12%	18%	9%	3%	7%	4%	8%	26%
Programme Assistance	0%	0%	0%	0%	0%	0%	0%	0%
Other	3%	2%	3%	2%	1%	2%	3%	3%
Paraguay								
Social Infrastructure & Services	23%	58%	70%	33%	78%	28%	77%	28%
Economic Infrastructure & Services	70%	4%	5%	36%	4%	54%	18%	62%
Production Sectors	4%	26%	9%	11%	8%	4%	2%	5%
Multisector	3%	11%	13%	14%	6%	3%	1%	3%
Programme Assistance	0%	0%	0%	0%	0%	7%	0%	0%
Other	0%	2%	2%	6%	4%	4%	2%	2%

Source: the author based on OECDStat

Within the economic infrastructure and services sector, the energy subsector is especially relevant for economic activity in the two countries analyzed. Table 22 shows that disbursements directed to this component in the Plurinational State of Bolivia reached their highest percentage in 2017 (99% of the total disbursements of the economic infrastructure sector of that year). In the last two years for which data is recorded, that percentage dropped considerably to 30% in 2020 and 15% in 2021, with a more diversified investment towards other sectors. In particular, growth in the percentage of funds directed to the transport and storage subsector in 2021 (68%) is observed, starting from 2% in 2014.

The last years with data for Paraguay show significant growth in the funds allocated to the energy subsector, going from 0% in 2014 to 96% in 2021, and even 2020 had a high allocation of disbursements oriented to this subsector (73% of the total economic infrastructure sector). In the transportation and storage subsector, a reverse trend was observed, going from 99% of the sector's total in 2014 to 2% in 2021 (Table 22).

DRAFT

Table 22
LLDCs: ODA disbursements economic Infrastructure and services by subsector, 2014-2021
 (Percentage of total Economic Infrastructure and Services)

Subsector	2014	2015	2016	2017	2018	2019	2020	2021
Plurinational State of Bolivia								
Transport & Storage	2%	17%	2%	0%	94%	0%	0%	68%
Communications	1%	4%	1%	0%	1%	1%	3%	4%
Energy	72%	22%	96%	99%	4%	97%	30%	16%
Banking & Financial Services	23%	1%	1%	0%	0%	1%	13%	5%
Business & Other Services	1%	56%	1%	0%	2%	2%	55%	6%
Paraguay								
Transport & Storage	99%	35%	2%	94%	7%	61%	25%	2%
Communications	1%	33%	12%	3%	19%	1%	1%	0%
Energy	0%	16%	1%	0%	14%	0%	73%	96%
Banking & Financial Services	0%	7%	0%	0%	12%	38%	0%	0%
Business & Other Services	0%	9%	85%	3%	48%	0%	1%	1%

Source: the author based on OECDStat

ODA continues to be an important source of external financing for LLDCs in the region. It is therefore important that these countries can maintain and even increase current disbursement levels in order to reverse the impacts of the COVID-19 pandemic. Considering the still uncertain context, governments should work to reshape the regulatory frameworks for financing in line with the new demands of sustainable development.

b. Development support institutions

Like other countries in the region, the Plurinational State of Bolivia and Paraguay receive technical assistance and financial support from various institutions whose purpose is to contribute to economic and social development. This framework includes the United Nations system, development banks and other international and regional organizations. The diversity of programs and projects are useful instruments for advancing the implementation of VPoA priorities, and also offer the possibility of improving the coordination of actions with these organizations.

Development banks have the potential to play a greater role in financing long-term development. In the new IDB Group Strategy with the Plurinational State of Bolivia 2022-2025, three priority pillars were proposed: (i) economic reconstruction and boosting productivity; (ii) productive diversification; and (iii) inclusive and sustainable social development. In addition, actions in the areas of institutional capacity, gender, diversity, indigenous peoples and climate change are foreseen as cross-cutting areas of support. The IDB estimates approvals for at least USD 1.648 billion in the 2022-2025 period, which would maintain its position as the main multilateral financier, accounting for around 40% and 30% of multilateral financing and the country's external debt, respectively (IDB, 2022).

In Paraguay, by 2019, the IDB held a share of 48.8% of multilateral financing and slightly over 23.3% in external financing. The IDB Group's Strategy with Paraguay for the period 2019-2023 aims to support the country's institutional and productive transformation under the criteria of sustainability, equity, and economic and social inclusion. The new strategy prioritizes four areas of collaboration and support: (i) public management and institutions; (ii) integration and diversification; (iii) productive and resilient infrastructure; (iv) human capital and living conditions. The actions planned are aligned with the 2030 National Development Plan of Paraguay. The total amount of loans approved for Paraguay is slightly more than USD 3.107 billion (IDB, 2019).

DRAFT

The World Bank currently has a portfolio of five projects in Paraguay that focuses on supporting health programs, transportation connectivity, agricultural markets, economic management support, and green and resilient growth, with a total committed amount of USD 755 million³⁹. Of this total, 13% is earmarked for the "Transportation Connectivity" project, which aims to reduce costs and improve road safety and the planning and management capacity of national road assets.

The World Bank's project investment portfolio⁴⁰ in the Plurinational State of Bolivia comprises seven projects totaling nearly US\$1.4 billion. These projects focus on the areas of transportation, health, rural development and agriculture, and urban development. Three of these initiatives are related to transport infrastructure development: i) the National Roads and Airport Infrastructure Project, ii) the Transport Sector Capacity Building Project, and iii) the Santa Cruz Corridor Road Project.

About the support provided by international organizations, it is worth mentioning that ECLAC, which, in its Resolution 765 adopted in Buenos Aires in October 2022, reiterated its invitation to regional and sub regional organizations to incorporate the Vienna Programme of Action into their work programs and to provide technical and financial assistance for its implementation. In this regard, the agency encouraged regional financial institutions and banks, in collaboration with other stakeholders, including the private sector, to make investments to address gaps in renewable energy, information and communications technology, e-commerce, trade, and regional infrastructure related to transport and transit (ECLAC, 2022i).

c. South-South and triangular cooperation

The 2030 Agenda and the SDGs recognize global challenges that must be addressed through a cooperative approach, requiring regional partnerships and the exchange of technical expertise and specific knowledge. South-South Cooperation (SSC) and Triangular Cooperation (TC) are international cooperation modalities to promote sustainable development through mechanisms such as the exchange of trade and successful experiences, technology transfer, infrastructure improvements and inclusion, among others.

Developing countries share characteristics, skills and knowledge to achieve their development goals through concerted efforts. Recent developments in SSC and TC have benefited trade and promoted increased Foreign Direct Investment (FDI) flows between countries in the South, technology transfer and regional integration.

In 2019, the Second United Nations High-Level Conference on SSC (PABA+40) was held in Buenos Aires, which set the path for promoting greater technical, financial, social and political cooperation. The BAPA+40⁴¹ outcome document encouraged developing countries to elaborate their systems to assess the quality and impact of SSC programs and to improve data collection and statistics. In the same vein, Resolution 765 of 2022 on the implementation of the VPoA adopted at the thirty-ninth session of ECLAC emphasizes that SSC and TC are vital for LLDCs, especially in the areas of productive capacity building, infrastructure, energy, science and technology, trade, investment and transit transport cooperation.

Recently, the First Meeting of the Regional Conference on SSC in Latin America and the Caribbean was held within the framework of ECLAC (2023a), in which the participating countries committed to reaching a

³⁹ see: <https://www.worldbank.org/es/country/paraguay> accessed June 21 2023.

⁴⁰ See: <https://www.worldbank.org/es/country/bolivia/overview#2> accessed June 21 2023.

⁴¹ See: https://cooperaciontriangular.org/wp-content/uploads/2021/02/documentofinalPABA_es.pdf

DRAFT

renewed agreement on international cooperation for development to achieve the SDGs of the 2030 Agenda.

The Ibero-American Program to Strengthen SSC (PIFCSS) was approved in 2007 and aims to fortify the institutional capacities of the agencies responsible for cooperation and improve the quality of SSC. Both the Plurinational State of Bolivia and Paraguay participate in this program. The latest PIFCSS report on the evolution of SSC and TC Ibero-America shows that during the 2020-2021 biennium, and amid the crisis caused by the pandemic, Ibero-American countries managed to carry out a total of 1,168 SSC and TC initiatives, thus accentuating the decline they had already been suffering (SEGIB, 2023). Three stages can be distinguished: a stage of growth between 2007 and 2013, in which initiatives increased at an average annual rate of 8.5%; a stage of moderate decline before the crisis (2014-2019), in which the annual drop was -7.6%; and the stage marked by the crisis (2020-2021) in which the decline stood at -16.4%.

Of the overall total for this biennium, Paraguay accounted for 11.8% of total actions and projects (138 initiatives) and Bolivia (Plurinational State of) 10.6%. Of the total 121 TC initiatives carried out during this period, both landlocked countries in the region stood out as recipients (13% and 11%, respectively) compared to their regional counterparts.

Regarding the sectors related to VPoA priorities, some studies corroborate that the social sector is the one that stands out the most in SSC and TC, followed by the economic and productive sectors. In the specifically TC projects in which Bolivia participated as a recipient, in 2019, 44.4% of the projects were oriented to the environment and 11% equally to the social and productive sectors. In turn, two thirds of the projects received by Paraguay under the TC framework focused, in equivalent proportions (33%), on supporting the social and productive sectors. This strengthens the productive sectors and enhances the infrastructure and services that support the functioning of economies (SEGIB, 2021).

Since SSC and TC are some of the mechanisms that can contribute to reducing existing development asymmetries between countries, the region's landlocked countries should continue to work to strengthen their role as both recipients and providers of initiatives. Some strategies to increase the efficiency of development cooperation could be summarized as follows:

- Orient cooperation initiatives to the human development approach and capacity building, overcoming the predominant economic approach (Hernández Rosario, A., 2023).
- Prioritize projects aimed at achieving the SDGs and the issues included in the VPoA, facing the challenges of an increasingly complex agenda that includes issues of gender, governance, human rights, sustainability, etc.
- Strengthen effectiveness and quality by working on coordination among actors, institutional management, transparency and accountability.
- Improve the management of information involved in SSC and TC.

3. Contribution of foreign and private sector investments to VPoA implementation.

The analysis of FDI in the Plurinational State of Bolivia and Paraguay and its contribution to the implementation of the VPoA is largely based on the reports prepared by ECLAC for the years 2020 and 2021 on FDI in Latin America and the Caribbean, from which it was possible to obtain data for the entire period of analysis.

DRAFT

a. Foreign Direct Investment

Starting in 2014, FDI inflows to Latin America and the Caribbean showed a downward trend, except a brief rebound in 2018. As expected, the COVID-19 pandemic had a strong negative impact on investments by transnational corporations worldwide, reaching their lowest level during the last decade. Although in 2021 FDI inflows to the region showed signs of recovery after the sharp drop recorded the previous year (USD 142,794 million were received, 40.7% more than 2020), this growth was not enough to reach pre-pandemic investment levels. Likewise, the weight of FDI inflows in GDP reached 2.9%, which is still below the figure observed during the 2010s (3.5% on average).

The Plurinational State of Bolivia recorded negative figures for 2020 and disinvestments totaled more than USD 1 million (2019 had not been positive for FDI inflows into the country either). 2021 brought a recovery of foreign inflows, which reached USD 599 million. These inflows represent 1.5% of GDP, thus showing values closer to those reported at the beginning of the analysis period (2% of GDP for 2014) (Table 23).

FDI inflows to Paraguay for 2020, on the other hand, were positive and reached USD 120 million. However, this was 47% less than the amount verified in 2019 (Table 23). In 2021, the country received USD 122 million in FDI, just 2% more than in 2020, which in relative terms represents 0.3% of GDP, a percentage that fell about the 1.5% recorded for 2014.

Table 23
LLDCs: evolution of FDI income, 2014-2021

	2014	2015	2016	2017	2018	2019	2020	2021
Plurinational State of Bolivia								
USD Millions	657	555	335	712	302	-216.6	-1129.5	599
Porcentaje de GDP	2.0%	1.7%	1.0%	1.9%	0.7%	-0.5%	-3.1%	1.5%
Paraguay								
USD Millions	604	379	505	336	156	225	120	122
Porcentaje de GDP	1.5%	1.0%	1.4%	0.9%	0.4%	0.6%	0.3%	0.3%

Source: the author based on Cepalstat and ECLAC (2022d).

Investments directed to the natural resources sector in 2020 were the most affected by the crisis at the regional level (-47.9% concerning 2019) (ECLAC, 2021a). In this sense, table 23 shows that that year, both countries recorded year-on-year drops in foreign capital inflows in that sector. In the particular case of Paraguay, a very pronounced negative capital inflow stands out, as it approached -USD 52.5 million.

In the Plurinational State of Bolivia, the sector that received the highest proportion of income in 2021 was the manufacturing industry, with 36% of total FDI, reaching a level nine times higher than in 2020. Mining and quarrying accounted for 29% of total FDI. About mergers and acquisitions, the largest transaction, although for a smaller amount, also occurred in the mining sector and was the acquisition of lead mining rights⁴². Regarding the origin of the flows, the largest contributor to the Plurinational State of Bolivia in 2021 was Sweden, with 27% of the total and an amount almost three times higher than that recorded in 2020, followed by investments from Peru (24%) and Spain (15%).

⁴² Sunawayo Silver Elephant Mining Corp. project.

DRAFT

There are no official FDI statistics by sector for Paraguay, but, according to recent data and about the fuel sales and distribution sector, the purchase by the Brazilian company Raízen S.A. of 50% of the ownership rights of the fuel retailer Barcos & Rodados, one of the leaders in the Paraguayan market, for USD 122 million was reported.

Over the last few years, Paraguay has received FDI from a growing number of countries. Investment flows come mainly from investors residing in Brazil, the United States, the Netherlands, Spain and Chile. Other countries that have expanded their position in Paraguay's FDI are Uruguay, Argentina and Mexico. The increase in the number of direct investors countries in the country is notable, which was 20 in 2008 and has increased to 42 in 2021, remaining relatively stable since 2018 (Central Bank of Paraguay, 2021).

Paraguay's structural particularities, which have already been mentioned above, and its LLDC status require additional efforts to transform its growth into development. In this sense, the country is recognized for its favorable business climate with differentiating proposals for attracting investment. This strategy often represents tax reductions, which in turn limit the maneuverability of public policies, which are necessary for their development. The search for solutions to this bottleneck requires a joint effort that integrates, among others, all landlocked countries with similar particularities, transit countries and financing organizations (Gobierno Nacional del Paraguay, 2023).

Generally speaking, there were few greenfield FDI projects during the last few years, revealing the absence of an upward trend in manufacturing or services FDI (World Bank, 2022b). New project announcements in Bolivia (Plurinational State of) did not become more dynamic throughout 2021. The Chilean company Entel made the largest announcement, with an estimated investment of USD 157 million, as part of its fiber optic infrastructure expansion plan for homes (ECLAC, 2022d).

Two major projects were announced in Paraguay: a renewable diesel biomass complex (USD 800 million) and a sustainable forestry and cellulose project (USD 3.2 billion), which led to a significant increase in FDI totals in those years. These projects are based on the use of agricultural and forestry resources while promoting sustainability and economic development in the country. In addition, Empresa Nacional de Energía Enx S.A. (Chile) announced new investments in the service station sector, confirming its interest in expanding into the Paraguayan market (La Nación, 2021b). Also noteworthy are the announcements in manufacturing projects aimed at exporting to regional markets, especially to MERCOSUR countries, such as the installation of a factory of the U.S. company Samsonite, a project estimated at USD 23.4 million (La Nación, 2021b).

In summary, investment prospects in developing countries in general, and the region's landlocked countries in particular, follow the trend of a generalized slowdown in foreign capital flows over the last decade. This behavior, aggravated by the pandemic, highlights the difficulties that these countries will face in repositioning themselves as an attractive destination for transnational corporate operations in the short and medium term.

b. Domestic private sector

Private entrepreneurship, investment and innovation are drivers of productivity and inclusive economic growth. The national private sector makes an important contribution to the economy in both the Plurinational State of Bolivia and Paraguay. Its participation in the production and export of non-traditional products and the provision of transportation and logistics services is noteworthy. In the face

DRAFT

of fiscal restrictions and the challenges of the post-pandemic period, the private sector could play an active role in the growth of economic activity, particularly in the promotion of new industries and a more diversified economy.

The articulation of the private sector with the objectives of sustainable development requires a regulatory and policy framework that encourages this contribution. Indeed, private participation in the economy is influenced not only by the perception of the business climate but also by legal security. In both the Plurinational State of Bolivia and Paraguay, legal frameworks have been approved to encourage national investments in support of economic and social development.

The Plurinational State of Bolivia has Law No. 516/14 on Investment Promotion, which establishes the legal and institutional framework for the promotion of investments in the country, and Paraguay has Investment Law No. 60/90, which establishes the regime of tax incentives for investment of domestic and foreign capital. Another important law is Law No. 5542/15 on guarantees for investments and promotion of employment generation and economic and social development.

Also, in Paraguay, Law No. 5102/13 promotes investment in public infrastructure and the expansion and improvement of goods and services provided by the State under what is known as Public-Private Partnership. Finally, Law No. 4427/12, for the assembly of high-tech products, establishes tax exemptions and exemptions for investments in capital goods, raw materials, components and parts, whose objective is the production, development and/or assembly of high-tech goods in the electronics sectors.

In Paraguay, the Investment and Export Network (REDIEX), under the Ministry of Industry and Commerce, is the entity in charge of promoting investments and exports in privately financed projects under the "Public-Private Partnership (PPP)" and "Turnkey" modalities –fundamental tools for providing new infrastructure and enabling the private sector to manage the life cycle of the projects. In 2021, REDIEX and the Paraguay SDGs Commission signed a Memorandum of Understanding to undertake a work plan. Among other objectives, it was proposed to encourage the participation of the business sector that makes up the Network in the Multisectoral Dialogue Spaces of the SDGs Paraguay Commission to carry out specific projects to advance sustainable development in its social, economic and environmental dimensions.

In the Plurinational State of Bolivia, the State plays an important role in the creation and participation of state-owned companies and public investment. Public investment in productive infrastructure also contributes to making private investment profitable. Total private investment in terms of GDP reached 7% in 2021, which represents a lower level compared to other countries in the region. Likewise, private investment occupied only 0.2% of the 6% of GDP that public investment and private investment in infrastructure add together⁴³.

As of May 2023, investments under the regime of Law No. 60/90 on Investment Promotion in Paraguay reached USD 192 million, a 500% increase over the USD 32 million obtained during the first five months of 2022 (Agencia de Información Paraguaya, 2023). There were 54 projects approved by the Investment Council, 86% more than in the same period of 2022, when a total of 29 investment projects were approved.

⁴³ <https://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=EZSHARE-433119796-124>

DRAFT

IV. Emerging challenges

Climate change, environmental degradation, gender equality and strengthened national statistical systems.

Both the Plurinational State of Bolivia and Paraguay are highly vulnerable to the effects of climate change due to their geographic location, territorial distribution of their population, and their productive systems based on natural resources. Alterations in climate patterns also affect the region's infrastructure and transportation system, leading to increasing damages and subsequent economic losses.

The main environmental challenge for the Plurinational State of Bolivia is to halt deforestation. In 2021, forest loss reached 268,000 hectares, placing the country in the third position globally in terms of absolute deforestation and first in terms of deforestation rate per capita. The main causes are the expansion of the agricultural frontier and livestock farming, two activities that promote large-scale logging (Paredes Tamayo, 2023). At this point, the country has made progress in the policy of integrated and sustainable forest management, based on comprehensive and coordinated planning of forests, forest soils, and stakeholders. Between 2015 and 2020, the proportion of illegal deforestation has been reduced by 10.7 percentage points, from 64.6% in 2015 to 53.9% in 2020 (Gobierno del Estado Plurinacional de Bolivia, 2021a).

Bolivia (Plurinational State of) has been implementing various measures aimed at improving air quality. A non-exhaustive list of such measures includes controlling the import of vehicles that comply with EURO emission standards, improving the quality of fuels (Special Plus Gasoline and Super Ethanol), and implementing specific actions in municipalities regarding industrial activities and other emitting sources. Among them, the implementation of environmentally friendly mass transit modes, such as the cable car system "Mi Teleférico" in the municipality of La Paz, is mentioned. These efforts led to 30% of the municipalities belonging to the Air Quality Monitoring Network not exceeding the Air Pollution Index (API) in 2017. The target set for 2030 is to extend this percentage to 45% of municipalities.

The Bolivian government has also implemented a series of projects aimed at transforming the country's energy matrix by increasing the use of renewable energy and reducing the consumption of fossil fuels. Regarding the energy matrix, in 2015, the installed capacity from alternative energy sources represented 2% of the total, increasing to 6.20% in 2020. With the incorporation of hydroelectric and alternative energy projects until 2020, 33.65% of the installed capacity of the energy matrix comes from thermal power plants (natural gas and diesel), 36.57% from combined cycle thermal power plants, 23.57% from hydroelectric generation, and 6.20% from alternative energy generation (solar, biomass, and wind) (Gobierno del Estado Plurinacional de Bolivia, 2021a).

The environmental challenge for Paraguay in the coming years is related to the lack of availability of drinking water in rural areas. While there are abundant water sources in the eastern region with the potential to supply a large portion of the population, many of these sources - including shallow aquifers - are contaminated or access to them has been privatized (Salas Dueñas, 2015). As progress, the development of 227 drinking water systems in rural communities with fewer than two thousand inhabitants and 39 drinking water systems in indigenous communities is mentioned, reaching over twenty-four thousand households with new access. This progress is the result of the Rural and Indigenous Communities Drinking Water and Sanitation Program executed between 2009 and 2019, with financing

DRAFT

from the IDB and non-reimbursable contributions from the Spanish Fund for Water and Sanitation in Latin America and the Caribbean (FECASALC) (IDB, 2023).

Regarding the care of air quality, Paraguay regulated the Law through Decree No. 1269 of 2019, which helps improve the applicability and coordination among different institutions collaborating with the Ministry of Environment and Sustainable Development (MADES) to significantly reduce the release of waste into the atmosphere (Gobierno Nacional del Paraguay, 2021c).

Paraguay has set the goal in its National Development Plan (PND, in Spanish) to "Add value to environmental capital." The specific objectives include revitalizing the market for environmental services and promoting a more sustainable energy matrix through the use and generation of unconventional renewable energies, among others (Gobierno Nacional del Paraguay, 2021a). In May 2023, the Master Plan for Electric Mobility in Urban and Logistics Public Transportation was presented, which entails replacing 100% of the public transportation bus fleet with electric buses. The same applies to 50% of cabs. Additionally, the inclusion of electric bicycles is planned for the five major cities in the country (Diario ABC, 2023).

On the other hand, concerning advances in gender equity, it was reported that in 2022, the Plurinational State of Bolivia managed to reduce differences compared to the previous year, rising 10 positions and ranking 51st globally and 13th regionally in the WEF ranking that analyzes the gender gap in resources and opportunities between men and women among 146 countries. The analysis considers aspects such as Economic Opportunity and Participation, Educational Attainment, Health and Survival, and Political Empowerment (WEF, 2022).

In addition, in the field of women's political participation, the elections of 2020 increased the percentage of seats held by women in the Plurinational Legislative Assembly, rising from 47% in 2014 to 48.8% in 2020. Normative advances and institutional strengthening are also highlighted, with the creation of the Interinstitutional Commission responsible for the implementation of the "Comprehensive Public Policy for a Dignified Life for Women."

In recent years, the gender gap in the tourism sector has decreased, according to the Observatory for Sustainable Tourism Industry, which highlighted the sector as having the highest female participation in Bolivia, with 72% of the positions being occupied by women (El Diario del Viaje, 2022).

Regarding progress towards the goals established in the SDGs to undertake reforms that grant women equal rights to economic resources and access to the property, among others, the government reported advancements as a result of implementing policies that prioritize women's participation in land sanitation and distribution processes. According to estimates, between 2010 and 2019, the proportion of women landowners grew by 45.2%. Although there was a significant increase in land titling for both men and women during this period, this progress was hindered starting in 2020.

The gender inequality gaps between women and men in Paraguay, particularly among the poorest segments of society, with limited access to economic resources, property, financial services, technology, healthcare, and other services, hurt their development (Gobierno Nacional del Paraguay, 2021c). Although the gender gap index reported a slight improvement in 2022, climbing 6 positions compared to 2021,

DRAFT

Paraguay still ranks lower in the global ranking at 80th position and at the regional level, where it ranks 17th out of 22 countries in the region.

Regarding the indicator of progress towards the goals set in the SDGs concerning women's participation spaces, there is low representation both in parliaments and in local governments. As of 2018, only 19.9% of positions were held by women overall. When comparing these values to 2015, there is only minimal improvement, around 0.5%.

It should be mentioned that the Ministry of Women in Paraguay is part of the structure of the SDGs Commission, represented by its minister. The main planning instrument of the Ministry of Women is the IV National Equality Plan 2018-2024, which was approved by presidential decree. The plan commits efforts to advance toward gender equality and establishes goals and necessary actions for its fulfillment. In 2020, budgetary resources invested in achieving SDGs 5.5 (gender equality) reached 2.8% of the National General Budget.

One aspect highlighted in the political declaration of the High-level Midterm Review of the Vienna Programme of Action (VPoA) was the need to collect data to monitor the specific objectives of VPoA. A commitment was made to provide the necessary support to LLDCs in terms of training to strengthen their national statistical systems (United Nations, 2019).

In this regard, the Chamber of Deputies of the Plurinational State of Bolivia approved a \$100 million loan from the Inter-American Development Bank (IDB) in June 2022 for the Strengthening of the Statistical System Program of the Plurinational State of Bolivia. A portion of the funds (26.4%) was allocated to the Population and Housing Census, while the remaining portion (73.6%) was designated for censuses, surveys, and technical and institutional strengthening programs of the National Institute of Statistics of the Plurinational State of Bolivia (INE, 2022).

On the other hand, until 2020, Paraguay had the oldest Statistical Law in the region, along with El Salvador, which did not comply with the internationally approved Fundamental Principles of Official Statistics. With the enactment of a law promoting the modernization of the National Statistical System (SiSEN) and the creation of the National Institute of Statistics (INE), the country has positioned itself in the international statistical arena (DGEEC, 2020). The INE conducted the 2022 census, achieving a national coverage of 97.5% of sectors in 263 districts throughout the country, and is planning the National Economic Census for 2024 (Instituto Nacional de Estadística de Paraguay, 2022).

DRAFT

V. Conclusions and recommendations

The Vienna Programme of Action (VPoA) and its predecessor, the Almaty Programme of Action (APoA), have highlighted the specific and priority development needs of landlocked countries, contributed to support within the United Nations system and fostered the engagement of the international community.

In the period analyzed (2014-2022), Bolivia (Plurinational State of) and Paraguay continued to focus their efforts on achieving the goals defined around the specific priorities of the VPoA, even showing signs of recovery after overcoming the impact of the COVID-19 pandemic. Particularly noteworthy are those aimed at improving connectivity—with a focus on transport infrastructure—and access to electricity. Furthermore, notable progress has been made in trade facilitation, along with systematic efforts towards regional integration and cooperation.

Although progress has been made, there is still ample room for improvement in reducing travel time and mitigating the costs associated with logistics services, which remain among the key challenges. The following is an overview of the progress made and the challenges identified in the priorities defined in the VPoA, as well as some recommendations. Reflections on emerging challenges are also included.

A. On the priorities of the Vienna Programme of Action and emerging challenges

Priority 1: Fundamental transit policy issues: progress has been observed as a result of the implementation of measures to strengthen the application of the TFA within the framework of the WTO, as well as other treaties that favor the transit of goods and services. In accordance with this instrument, landlocked countries have been working at the regional level to promote the efficiency of transit systems. Within the framework of integration processes such as the ALADI, the CAN and MERCOSUR, work has been carried out on the applicability of approved community standards to facilitate transport services in their different modalities and harmonize technical regulations.

Among the most important advances is the recent signing of the "Regional Mutual Recognition Arrangement" and the exchange of information that streamlines and facilitates trade between the customs offices of Argentina, Bolivia, Brazil, Colombia, Costa Rica, Chile, Guatemala, Paraguay, Peru, the Dominican Republic and Uruguay. Its implementation will result in time improvements, which will have a direct impact on the reduction of foreign trade costs.

The PPW River Transport Agreement (1992) has a key impact on national trade, as it creates the common regulatory framework for agile trade and efficient river operations among the five countries participating in the Plata Basin: Argentina, Bolivia (Plurinational State of), Brazil, Paraguay and Uruguay. In 2018, the commitments made in the Additional Protocol to the PPW Agreement were extended indefinitely. During this last period, commercial shipping in the waterway has been affected by the prolonged drought. This will result in losses that have not yet been calculated, due to additional docking time and lower volumes transported, which will increase shipping costs.

In terms of customs control, the Plurinational State of Bolivia has defined strategic actions to favor border management, which have been included in the Integrated Strategic Plan 2021-2025. These include the modernization of foreign trade operations, more effective and efficient control of the freight transportation, and the strengthening of administrative management, human resources, technology and infrastructure. Also, noteworthy is a recent "Customs Clearance Time Study", the first of its kind in the

DRAFT

country, designed to measure and improve border operations in real time, using WTO-approved methodology and software.

With regard to progress in the formulation of national transit policies, Paraguay has made efforts to harmonize several technical regulations within the MERCOSUR framework, including those aimed at finding solutions to unnecessary technical obstacles. In terms of time reduction, the country currently has seven control centers coordinated with its three border countries and is negotiating the incorporation of three more - two with Brazil and one with Argentina. These centers allow officials from both countries to carry out their activities jointly, unifying working hours and continuity of service, and harmonizing and simplifying administrative procedures and operational practices.

The government of Paraguay presented in 2021 the NLP 2030, and in 2018 the Update of the MPT 2018 - 2028, to guide, in the short and medium term, the development of multimodal transport infrastructure. The government's priority is placed, according to the Plan, on road-river modes, to contribute to the competitiveness of the national economy, harmonizing the sustainable development of the country's national and international trade, within the framework of the process of integration into international markets.

In the same sense, the Plurinational State of Bolivia, through a Supreme Decree in early 2023, established the creation of the Preventive Logistics Observatory, the preparation of the PNL and the implementation of the National Logistics Council, within the functions of the Vice Ministry of Commerce and Internal Logistics.

In general, the LPI scores of LLDCs are historically low. Based on the overall score obtained by the Plurinational State of Bolivia, the country is classified in the lowest of the four existing categories, called "Poor Logistics Performance". This grouping includes 43 of the 139 countries evaluated in LPI 2023 edition, which have been identified as having serious logistical constraints. Paraguay was placed in the second category, "Partial Performers", which corresponds to 46 countries with a level of logistics constraints typically found in developing economies.

Although both countries have showed a slight decrease in the overall score achieved in 2023 compared to 2014, mainly due to the LPI component of *Customs Efficiency* and *Timeliness of Deliveries*, however, improvements were evidenced in the Transport Infrastructure Quality component. This shows the efforts made to achieve the objectives established in the VPoA priority related to the development and maintenance of transport infrastructure, which is summarized in the following section.

It is imperative that LLDCs and transit countries continue to examine their internal processes to promote movement in a streamlined and coordinated manner. Addressing bottlenecks is beyond the scope of unilateral interventions, it requires coordinated management across integrated borders, as well as the introduction of robust transit regimes, the implementation of technology and the input from best practices that are now being developed by global logistics operators. This report sets out the World Bank's recommendations on the logistics systems to focus on, based on experiences in Europe and Asia.

Priority 2: Development and maintenance of transport, energy and ICT infrastructure: connectivity is associated with logistics performance. The improvement of logistics services, the development of commercial infrastructure and the execution of investments in this sector are fundamental to this

DRAFT

performance. The pandemic had a strong impact on the development of transport infrastructure both globally and regionally, which highlighted the need to include this sector as a priority in recovery plans.

In the 2014-2022 period, the Plurinational State of Bolivia and Paraguay have directed significant efforts to improve their transport infrastructure and connectivity, mainly towards road development. Bolivia (Plurinational State of) has incorporated infrastructure investment in its PDES 2021-2025. Paraguay defines the transport sector as a priority for achieving the proposed development objectives in its NDP 2030. The aforementioned PNL and PMT, among others, provide an institutional framework, budgetary predictability and planning tools. Both the length and density of roads have been growing steadily since the adoption of the VPoA in the Plurinational State of Bolivia and Paraguay. Although the development of paved networks has improved connectivity in recent years, the quality of these networks remains low. In turn, there is a marked difference in accessibility, coverage and road development between different areas or regions.

The countries must continue to expand their territorial extension coverage, as well as the level of roads to favor their internal integration with transit countries. In this regard, the Bolivian plan for 2025 calls for the construction of 1,622.95 additional kilometers of road sections, with the paving of close to 70% of the Fundamental Road Network. In Paraguay, maintenance contracts for 3,775 kilometers of the Priority Paved Road Network are being executed, and contracts for an additional 1,300 kilometers are in the pipeline. The growth of public investment in the period covered by the VPoA, so far, was more than 130%.

River transport is essential for the countries of the region. Paraguay's system of river ports and waterways is the backbone of the country's foreign trade (more than 80% of exports are carried out by this means). The Paraguay-Paraná Waterway (PPW) is the most important river access in Bolivia (Plurinational State of). Several regional projects are being developed to strengthen management and cooperation in transboundary water resources. Projects are also being carried out to make the Paraguay River navigable through the Asunción-Apa Northern Section of the Paraguay River. River transport through the PPW continues to present difficulties, ranging from weather conditions, particularly the droughts recorded since 2021, to logistical and coordination issues between countries.

The Bioceanic Corridor, an infrastructure project promoted since 2015 by the governments of Paraguay, Argentina, Brazil and Chile, seeks to integrate, through the implementation of physical infrastructure and improvements in the paving of existing roads, the ports of the Atlantic with the Pacific. It is projected as a trade integration route that connects road, rail, river and air transport in their territories. The east-west corridor on the Axis of Capricorn begins in the ports of Brazil, passing through Paraguay and northwestern Argentina, to reach the ports of northern Chile through the Antofagasta Region, to connect with the markets of the Asia-Pacific and the west coast of the US.

The Railway Network of the Plurinational State of Bolivia is composed of the Eastern Network and the Western Network. The Eastern Network is responsible for most of the export and import cargo and is crucial for the transport of soybean derivatives and other products transiting the PPW and uses the Bolivian ports of the Tamengo Canal to load and unload goods. One of the main obstacles to optimizing this means of transport is the lack of a link between the Eastern Network and the Western Network. Official sources informed that half of the 1800 km that correspond to the Plurinational State of Bolivia, out of the total of almost 4000 km of the Network, have already been built.

DRAFT

Paraguay was one of the first countries to implement rail services in Latin America. However, at present, passenger and cargo transportation is almost non-existent. The development of a rail network, in line with current needs, will allow the country to be more competitive with its export products. The development of Paraguay's railway system is an important part of improving the competitiveness of the country's logistics sector. Many factors indicate this, among them, the need to generate an alternative to the problems presented by the navigability of the rivers. Others are the importance of having an active participation in the facilitation and improvement of regional connectivity, through a multimodal offer, as well as being able to respond to the expected increase in cargo volumes in the coming years.

With regard to air transport, although the nature of the products that these countries mainly export does not generate a demand for this mode, it has been shown that promoting its development is very important because it brings with it, among other things, the growth of tourism, trade and other business activities, while contributing to the indirect growth of employment and foreign exchange earnings.

The development plans of the Plurinational State of Bolivia and Paraguay define as necessary the continuity of efforts to integrate and strengthen regional economies through air transportation. To this end, several actions have been defined, such as the construction, improvement and expansion of international and domestic airports; the strengthening of the flag airlines; the acquisition of new aircraft; and the development of a new airline network. The development of this means of transport would contribute to the growth of tourism, commerce and other business activities, which would bring about indirect growth in employment and foreign exchange earnings.

Despite the efforts and progress, indicators show that for landlocked countries, problems related to transit and trade facilitation persist to a large extent. The resources available for the implementation of reform policies aimed at improving logistics performance must be reconciled with a set of other broader priorities in achieving sustainable development. While infrastructure projects are part of both countries' recovery plans, their implementation continues to present challenges in the face of increased resource scarcity due to global economic difficulties. It is essential to direct investments towards quality infrastructure in all modes of transportation to achieve integrated logistics systems that improve connectivity with transit countries and facilitate international trade.

Access to electricity service has evolved favorably in both countries during the 2014-2022 period. Paraguay is close to having access to electricity for the entire urban population, although there is still a small gap in rural areas, with 99.7% electricity coverage. In the Plurinational State of Bolivia, total population coverage reached 94.1% in 2021, growing about four points from 2018 levels. However, the gap between urban and rural areas is much more marked in this country.

In the case of Paraguay, it is worth noting a significant reduction in capacity from non-renewable thermal energy, which reached a total reduction in 2022. As of that year, Paraguay became the only country in the world with 100% clean and renewable electricity generation.

In terms of renewable sources, the Plurinational State of Bolivia has found a point of opportunity in wind and solar energy. At the beginning of 2021 was inaugurated the largest photovoltaic solar plant in the country, also considered the highest in the world, which contributes to the change in the energy matrix that the Plurinational State of Bolivia is pursuing with the generation of sustainable electricity from a social and environmental perspective. Supreme Decree No. 4477 of 2021 also supports this change of matrix, by

DRAFT

encouraging the incorporation of an own generation system at personal homes, combined with the local distribution network (for example, a solar installation), providing the possibility of injecting the surplus into the local distribution network and receiving income for the transmission of electricity.

In the development and use of ICTs, the Plurinational State of Bolivia and Paraguay have recorded increases in the portion of the population using the Internet and in the coverage of mobile telephony services. However, although the connectivity percentages in these countries have been growing since the implementation of the VPoA, a comparison with their transit countries leads to the conclusion that both Paraguay and the Plurinational State of Bolivia still have low connection percentages for the subregion.

The level of ICT development in LLDCs is also reflected in the use that is being made of ICTs in the areas of e-government, simplification of procedures and controls in administrative processes. However, these advances present challenges related, on the one hand, to the digital divide and, on the other, to the significant resources needed to advance in the digital transformation.

Both landlocked countries should increase efforts to expand the telecommunications system in order to achieve rapid and secure access to markets; to continue developing broadband infrastructure throughout the country; to facilitate Internet access; and to reduce tariffs through greater competition in the sector. They should also increase efforts to reduce the digital divide, both in terms of gender and between regional and urban locations.

Priority 3: International trade and trade facilitation: the economies of the Plurinational State of Bolivia and Paraguay are highly open to international trade. The main market for their exports is MERCOSUR, followed by Asia, Europe and North America. Their exports are concentrated in a small number of items and are mainly related to the primary sector. These are products that, due to their characteristics, have a low value added. The share of manufactured products is lower.

The LLDCs of the region have negative values in the economic complexity indexes determined by the Observatory of Economic Complexity (OEC). This indicates that their exports have low economic complexity, i.e. their export baskets are not very diversified and are made up of products that, at the same time, are exported by many others. However, the Plurinational State of Bolivia and Paraguay have been making efforts to add greater value to their exports.

During the review period, there was an increase in the production of manufactured goods (agricultural and industrial), indicating a transformation towards higher value-added products, although primary goods continue to account for most exports. Investment promotion instruments play a key role in generating value added in the manufacturing sector and diversifying the economy.

Almost all countries in the region recorded an expansion in the value of goods exports for the two years following the pandemic. The same was true for imports, which can be attributed, to a greater extent, to the higher cost of fuel, food and fertilizers in the wake of the conflict in Ukraine. Exports in 2022 reached the highest level in the history of foreign trade in Bolivia (Plurinational State of), an achievement that stands out for having begun a path of recovery after overcoming the effects caused by the conflicts in the institutional order and the Covid-19 pandemic. Paraguay has been running a trade deficit for seventeen years in a row. However, in 2021, exports of goods showed the greatest recovery recorded in those years. This was due to the momentum of the international evolution of soybean prices and higher volumes of

DRAFT

beef exports.

In terms of export markets, the relative share of export destinations between the two LLDCs during the period under analysis showed a different behavior. While the Plurinational State of Bolivia recorded an increase in extra-regional trade, Paraguay increased its intra-regional participation, particularly within MERCOSUR.

To achieve greater value added in exports, a change in product diversification strategy is required. diversification strategy to stop depending on a few low-value-added products and start exporting products that are more competitive in the world market. A key factor in achieving this goal is for both countries to work on their technological development and innovation plans. This point is discussed in more detail in the summary of Priority 5, on structural economic transformation.

Regarding trade facilitation, both the Plurinational State of Bolivia and Paraguay ratified the WTO TFA. Both countries have set up their National Trade Facilitation Committees (NTFC), whose purpose is to promote internal coordination and the application of the Agreement's provisions.

The Plurinational State of Bolivia convened its first meeting in 2021, followed by two more in 2023, whose objective is to coordinate the facilitation of export procedures, identify trade barriers and propose appropriate solutions. During these sessions, the regulations of each technical committee were finalized, the inclusion of the private sector in the meetings was decided and the process of creating the " Single Window for Foreign Trade" (VUCE) was initiated.

Paraguay's NTFC was established in 2019 and is composed of institutions from the public and private sectors. Among the most significant advances is the expansion of the services of the Committee's website, which provides information on trade facilitation to traders, public sector agents and the general public. In 2022, a mapping process was carried out to systematize foreign trade processes, the improvement opportunities of which were addressed by the various working groups of the Committee.

The latest publication of the cross-border trade indicators of the World Bank's Doing Business 2020 Report –which is in process of being replaced by the B-Ready indicator– shows that Paraguay is better positioned in the global ranking of trade facilitation than Bolivia (Plurinational State), which ranks last among the landlocked and transit countries of the region. To strengthen its position in this type of indicators, it is necessary to harmonize and ensure the full implementation of regulatory frameworks to promote smooth cargo transport and of procedures that favor transparency and mutual respect for transit regulations and treaties in force between transit and landlocked countries.

The standardization of operating procedures and information systems, as well as the elimination of impediments and administrative barriers, are necessary elements for the promotion of interoperable and multimodal regional transport networks. At this point, the implementation of regional indicators is proposed, which will make it possible to evaluate the joint efficiency of these processes and thus direct investments and work in a coordinated manner in order to implement the necessary improvement actions based on a shared vision.

Priority 4: Regional integration and cooperation: Regional integration is an important component of the development strategies of Latin American countries. It has been demonstrated for several decades now,

DRAFT

their willingness to participate in integration mechanisms to coordinate efforts and resources in order to enhance regional advantages and overcome regional obstacles. The regional integration process must continue to be strengthened, in this environment transit countries can and should play a more active role in cooperation with landlocked countries.

During the period analyzed, trade agreements have promoted the development of exports from LLDCs in the region. MERCOSUR is the main destination for Paraguayan exports, accounting for more than half of the total market in 2022. In the case of Bolivia (Plurinational State of), exports to MERCOSUR accounted for 27% of the total in the same year, while CAN member countries ranked third with 17%.

The crisis caused by the pandemic has called for an even greater commitment to integration initiatives. The complex regional situation is an opportunity to accelerate actions to facilitate trade and improve transit conditions in the Plurinational State of Bolivia and Paraguay. To this end, it is proposed to harmonize and ensure the full implementation of regulatory frameworks to promote smooth cargo transport through procedures that promote transparency and mutual respect for transit rules and treaties in force between transit and landlocked countries.

Transport corridors are a key factor in improving LLDCs' connectivity to markets, achieving efficient transit, reducing costs, and providing benefits for all stakeholders. To expedite their implementation, transit and partner countries should work together with LLDCs to identify and address development bottlenecks. It is also important to coordinate the identification of costs and benefits when evaluating infrastructure projects with supranational outcomes, which will impact funding decisions for such projects.

Priority 5: Structural economic transformation: the economies of Bolivia (Plurinational State of) and Paraguay continue to be highly dependent on exports of raw materials and manufactures based on natural resources (mining, hydrocarbons, hydroelectric power, soybeans and their derivatives, and livestock). The high concentration in this type of manufacturing production results in a high dependence on external prices and climatic factors. This has been evidenced by the contraction in demand during the COVID-19 pandemic and the pressure that the subsequent recovery of international prices exerted on the productivity of the extractive sector during the last two years.

Developing countries must redirect their resources to higher productivity sectors. The agricultural sector in Bolivia (Plurinational State of) proved to be resilient in the face of the recession that characterized the year 2020. The dynamics of this sector have been strengthening in response to government policies and support measures, and its strength was largely related to the consolidation of the beef sector. In 2022, the country reached a record in the export of this product, mainly to China.

Paraguay's export basket continues to be heavily concentrated in soybeans and their derivatives, beef and electricity. The beef market has been strengthening due to improvements in quality, health issues and reproductive technology. In recent years, Paraguay has added new products to its list of exports, both to the Americas and Asia, despite the contraction in world trade caused by the Coronavirus pandemic. Paraguay has also sought to gain export market shares in historically less traditional markets, such as Russia, Israel, India and the United States.

By contributing greater value and diversification to the economy, the industrial manufacturing sector plays

DRAFT

an important role as a driver of development. Following the sharp decline in the manufacturing sector due to the impact of the pandemic, the governments of both countries promoted some support measures for the recovery of the industries, based mainly on the granting of credits and tax reductions or exemptions. However, these countries must work to overcome economic incentives and define an industrial policy that takes into account the accumulation of knowledge, information and skills.

Tourism is an important source of foreign exchange for both LLDCs. For Bolivia (Plurinational State of), it contributes 4.2% to the national GDP and generates more than 400 thousand direct and indirect jobs, while in Paraguay the sector's share of GDP increased from 0.79% in 2012 to 1.26% in 2019. In order to continue strengthening this sector, countries should continue working on strategies to implement National Tourism Programs, promoting a series of proposals such as the creation of new thematic tourism circuits, domestic tourism, youth tourism, among others.

Structural economic transformation depends largely on the improvement of science, innovation and technology. The advancement of science, technology and innovation (STI) is a key aspect of achieving export diversification, productivity, efficiency and competitiveness in economic sectors. These aspects continue to represent a major challenge for both countries, even more so in a context of marked contrast due to rapid global expansion.

The low level of technological development and the lack of innovation, both in production processes and in public management, are important factors limiting the competitiveness of these economies. This highlights the need to strengthen the capacity of public and private actors responsible for designing and implementing innovation strategies, considering it a prerequisite for productive transformation.

During the period under review, progress in improving science, technology and innovation in the Plurinational State of Bolivia and Paraguay is still insufficient. In this regard, the latest WEF report, published in 2019, shows that Paraguay ranks 137th and the Plurinational State of Bolivia 124th out of the 141 countries considered. Even in the sectors in which these countries have comparative advantages, such as the exploitation of natural resources, there has been no progress towards more knowledge-intensive stages.

It is necessary to develop a strategic alliance that includes various sectors and actors of society to effectively promote research and technological development in response to the population's needs. This must be supported by an increase in the economic and training resources allocated to this end.

Finally, with regard to progress in the private sector, although progress has been made in terms of SME productivity in both landlocked countries of the region, there are several factors that require continued work on concrete actions. One of these factors is related to the export profile of both countries, which is concentrated on natural resources, which discourages the participation of small enterprises, both because of their limited ability to make investments and because of the low level of linkages that many of these export activities generate. This is compounded by the complexity of access to qualified human resources, the availability of managerial and technological skills, and the difficulties associated with the regulatory framework (in terms of taxation, labor, trade policy, and market entry and exit).

Priority 6: means of implementation: the period 2014-2022 began with a generalized reduction in the price of raw materials, which was significantly accentuated during the first months of 2020 with the

DRAFT

contraction of international trade triggered by the pandemic. The following period was marked by notorious price fluctuations, which, added to the volatility in the financial markets, ended up shaping a context that had a significant impact on the public finances of Paraguay and the Plurinational State of Bolivia.

To be able to provide continuity to these levels of investment and achieve the goals set out in the development plans, the priorities of the VPoA and the commitments made in the 2030 Agenda for Sustainable Development, the support of the international community is needed. This support, consisting of financial resources in the form of concessional loans or grants and technical assistance for the preparation of bankable projects and in the negotiation FDI contracts. It should also give special priority to those actions related to making the necessary investments in economic infrastructure and services and to the establishment of institutional capacities related to logistics and institutional development, favoring interventions that are part of a comprehensive development program.

It also calls for the mobilization of resources from various alternative sources of financing, including public-private partnerships, infrastructure investment funds and innovative sources of financing, such as infrastructure investment funds and other cooperation modalities such as South-South and triangular cooperation. These modalities are bold, innovative and growing means of strengthening cooperation and supporting the achievement of the SDGs.

FDI and intra-regional investment play a key role in the proper integration of transport infrastructure networks and communications between LLDCs and neighboring countries. In this regard, it is recommended to continue to promote measures to attract and channel investment to these key development sectors, with a greater impact on connectivity and digital innovation. Finally, the commitment of donor countries in terms of ODA, based on their contribution of 0.7% of their Gross National Income by 2030, with special attention to LLDCs, is of significant importance.

Emerging challenges: Changes in weather patterns are already affecting the infrastructure and transportation systems of the region and the landlocked countries of the region. Both countries are highly vulnerable to the effects of climate change due to their geographical location, the territorial distribution of their populations, and their natural resource-based production patterns.

The main environmental challenge currently facing the Plurinational State of Bolivia is to halt deforestation. The main causes are the advance of the agricultural frontier and cattle ranching, two of the activities that promote large-scale deforestation. Paraguay's challenge is related to the lack of availability of drinking water in rural areas. Although there are abundant water sources with potential in the eastern region, restrictions are due to the contamination of these sources or the privatization of access to them. The severity of the environmental damage faced by countries will depend on their vulnerability and resilience, and on the measures taken in the short term to address this challenge. Building infrastructure or implementing projects that take these factors into account may require greater economic resources to be mobilized in the short term, but in the medium term it will generate greater economic returns and allow for more sustainable development.

It is also necessary to include gender equality as an emerging challenge, as there may still be significant gaps between men and women in terms of opportunities, access to resources, decision-making and rights. These inequalities manifest themselves in various areas, such as education, employment, political

DRAFT

participation, gender-based violence and media representation.

In 2022, the Plurinational State of Bolivia managed to reduce the differences compared to the previous year, moving up 10 positions to 51st globally and 13th regionally in the WEF ranking, an indicator that analyzes the gap in resources and opportunities between men and women among 146 countries in different areas. In Paraguay, inequality gaps are deepening in the poorest sectors of society - with less access to economic resources, property, financial services, technology, health services, among others. Although the WEF index showed a slight improvement in 2022, up 6 positions compared to 2021, it occupies lower positions in the global ranking - 80th - and at the regional level, where it ranks 17th out of 22 countries at the regional level.

Gender equality is not only a fundamental human right, but also a key driver of sustainable development and progress for nations. Addressing gender disparities and inequalities leads to greater empowerment of women and promotes their participation in all spheres of society, which benefits the entire community.

The political declaration of the High-level Midterm Review of the Vienna Programme of Action emphasized the importance of data collection for monitoring the specific objectives of the Programme. It emphasized the commitment to provide the necessary capacity-building support to LLDCs to strengthen their national statistical systems. National statistical systems play a fundamental role in the planning, implementation and monitoring of policies and programmes related to sustainable development. This is because it is necessary to have accurate, reliable and up-to-date information on various aspects such as poverty, education, health, employment, the environment and others. This data enables governments and decision-makers to understand the challenges and needs of society, identify gaps and formulate effective strategies to address them.

Strengthening national statistical systems involves improving the capacity to collect, analyze and manage data and ensuring the quality of the information produced. This includes developing statistical frameworks and methodologies, training staff responsible for data collection and analysis, investing in information and communication technology, and promoting international cooperation and collaboration in the exchange of data and good practices.

Developing countries can strengthen their national statistical systems in a number of ways. These include improving the technical skills of statistical personnel through education and training, establishing a sound legal and regulatory framework, improving interagency coordination, expanding the coverage and quality of surveys and censuses, promoting the use of information and communication technologies, and fostering transparency and accountability. These actions require political commitment, adequate resources and cooperation among the various actors involved.

B. Final conclusions and recommendations

During the period under review, the Plurinational State of Bolivia and Paraguay have continued to make significant efforts to improve their transport infrastructure and connectivity, which has allowed them to reduce, in part, the negative impact of their lack of a maritime coastline. Both countries have made infrastructure improvements and the physical connection of their territory central elements of their respective National Development Plans, which has allowed them to direct investment towards these sectors. This has been accompanied by the implementation of improvements in customs processes and systems. All these efforts have been aimed at reducing transport times and associated costs, one of the

DRAFT

main problems still in place.

In other words, despite the progress made, there are still obstacles to accessibility for landlocked countries, which are evident in the transport of products through transit countries. These difficulties are reflected in the high costs of exporting and importing, as well as in the longer time required to manage operations. Such difficulties are observed in global benchmark indicators such as the Logistics Performance Index (LPI) as well as the Economic Complexity Index determined by the Observatory of Economic Complexity (OEC).

Other aspects to be strengthened are related to the attraction of investments that allow for greater productive transformation, even more so in an economic context of recovery of most of the macroeconomic variables. This point highlights the need to strengthen the capacity of public and private actors responsible for designing and implementing strategies for the development of science, technology and innovation, as a prerequisite for a successful transformation.

Based on the findings of the report, six key areas have been identified for further action on the path to sustainable development in the region. These are: i) Continue to assess the extraordinary logistics costs faced by LLDCs and their impact on development in order to identify their causes and more quickly prioritize and optimize resources for improvement. ii) Address the investment deficit to reduce the physical infrastructure gap. iii) Improve the operational efficiency of transport services and modernize their fleet. iv) Promote research, technology and human capital formation as key factors for economic diversification and the creation of regional value chains. v) Coordinate air traffic rights and promote tourism development. vi) Regional and international cooperation.

In summary, despite the progress achieved so far, priority problems persist for landlocked countries related to transit and trade facilitation. Strengthening and improving regional integration mechanisms is a key to overcoming them and building collaborative tools that will lead to a more just, egalitarian and equitable society.

DRAFT

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