



BULLETIN 385 /

FACILITATION OF TRANSPORT  
AND TRADE IN LATIN AMERICA  
AND THE CARIBBEAN

# Digitization of trade logistics in landlocked countries in South America

## Background

During the coronavirus disease (COVID-19) pandemic, landlocked developing countries have been hampered in their access to global markets by restrictions on mobility imposed both at the national level and in transit countries.

The digitization of logistics processes, along with other facilitation mechanisms such as authorized economic operators (AEOs) and foreign trade single windows, can support smoother and safer transit of goods and foster greater traceability of flows and transparency in customs and foreign trade →

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This *FAL Bulletin* continues the reflections on disruptive technologies in transport that the Economic Commission for Latin America and the Caribbean (ECLAC) has been publishing through this medium. The present edition analyses the progress made by landlocked countries in South America in trade logistics facilitation and digitization in the period covered by the Vienna Programme of Action for Landlocked Developing Countries for the Decade 2014–2024.

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processes. The COVID-19 pandemic, which emerged at the end of the first quarter of 2020, demonstrated that these types of mechanisms and technologies are essential to ensure the continuity of international trade, eliminate inefficiencies that affect transport costs and times, and significantly reduce the lack of predictability in border crossing times that affect landlocked countries in particular. COVID-19 accelerated several of the technological processes that were already underway (Valdés and Pérez, 2020), which may help to achieve the priorities established in the Vienna Programme of Action for Landlocked Developing Countries for the Decade 2014–2024.

This bulletin analyses the recent progress made by the Plurinational State of Bolivia and Paraguay in the facilitation and digitization of their logistics processes, and the measures taken to improve connectivity domestically and with their transit countries (Argentina, Brazil, Chile, Peru and Uruguay).

It is divided into six sections, the first of which presents the main economic impacts of COVID-19 on the landlocked countries of South America. The second section analyses the importance of digital transformation in trade logistics and facilitation, and the subsequent sections examine progress relating to foreign trade single windows, AEOs and customs systems, both in Paraguay and in the Plurinational State of Bolivia, and the links with their transit countries. The document concludes with a set of recommendations to move towards logistics digitization and details specific actions for landlocked countries in South America in line with the priorities set out in the Vienna Programme of Action for Landlocked Developing Countries for the Decade 2014–2024.

## I. Economic impacts of COVID-19 on landlocked countries in South America

In 2020, the global economy was hit hard by the COVID-19 pandemic, which led to a contraction of nearly 18.5% in the volume of world trade in goods in the second quarter of 2020 compared to the same period in 2019. In this context, ECLAC estimates that the value of Latin American and Caribbean goods exports contracted by 13% in 2020, with decreases in both prices (-7%) and volumes (-6%). This is the region's worst export performance since the 2008–2009 global financial crisis, when the value of its exports fell by 21% (ECLAC, 2021).

Landlocked developing countries generally face a number of barriers to trade, such as longer export times, higher export costs and uncertainty about total transit times compared to similar countries with access to the sea. COVID-19 weighed heavily on these countries, making it more difficult for them to connect to global markets because of the measures taken by their transit countries to curb the spread of the virus, along with the measures they

took themselves to protect their population. This had major repercussions on connectivity and logistics facilitation for the landlocked developing countries. Therefore, the United Nations—through the Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS), the five regional commissions and the United Nations Conference on Trade and Development (UNCTAD)—called for the free movement of essential medical supplies and all goods to be maintained, with special attention to landlocked developing countries as they are more vulnerable to cross-border restrictions and closures (United Nations, 2020).

Towards the end of March 2020, Latin American countries took prompt action to restrict the movement of people (cruises and commercial flights), intensified epidemiological surveillance at border crossing points and introduced customs measures to encourage the free movement of essential goods. In the Plurinational State of Bolivia, the first case of COVID-19 was recorded on 11 March, and border closures, among other measures, were ordered under Supreme Decree 4196 of 17 March 2020. In Paraguay, the first case of COVID-19 was reported on 7 March, and on 16 March, through decrees 3458 and 3465, immigration checkpoints at the border were closed partially, while services linked to international and cross-border trade were allowed to continue. In both countries, problems were reported at border crossing points with transit countries, such as additional border restrictions relating to opening hours, an increase in the cost of services, uncertainty regarding operating times, and a deterioration in health and labour conditions in the first weeks of implementation of the new measures (Rivera, 2020).

According to official national figures, the pandemic caused a 37.7% contraction in imports and a 23.8% drop in exports in the Plurinational State of Bolivia. Meanwhile, in Paraguay, imports fell by 19.9% and exports declined by 8.2%. In both cases, the greater logistical complications stemmed from road access to transit seaports rather than a decrease in maritime connectivity. Road connectivity was also complicated by additional customs and phytosanitary measures imposed initially to contain the spread of the virus, and by further limitations on interoperability with the road and rail networks of neighbouring countries.

In the long term, there will also be additional needs requiring special attention, such as diversifying financing sources and attracting investment in physical and digital infrastructure. This is especially important to secure investments that improve digital connectivity as well as road and river transport connectivity for landlocked developing countries. Coordination with transit countries is essential to ensure effective facilitation of the movement of goods, which would also help resolve logistical bottlenecks within the transit countries themselves, along with other operational and regulatory inefficiencies that increase costs and transit times even in their own hinterland (Pérez and Sánchez, 2019).

## II. Digital transformation and trade facilitation

Since before the COVID-19 pandemic, Latin American and Caribbean countries had been implementing a series of international trade facilitation measures related to the digitization of logistics processes aimed at reducing logistics costs and the time spent on customs procedures. These actions included efforts to implement mechanisms such as authorized economic operators (AEOs), foreign trade single windows and other digital logistics systems contained in the Agreement on Trade Facilitation of the World Trade Organization (WTO) (Volpe Martincus, 2016).

These initiatives seek to create efficient procedures and ensure effective coordination between the different institutions involved in trade logistics, in order to reduce times and errors in paperwork that can create significant trade costs. The costs of complying with trade-related regulatory requirements are estimated to represent between 3.5% and 7% of the value of goods, or as much as 10%–15% when factoring in typographical or other errors that require documents to be resubmitted or create a trade discrepancy between the parties (Volpe Martincus, 2016).



In the framework of both WTO and the World Customs Organization (WCO), agreements have been made to facilitate trade, with harmonization through the streamlining of customs procedures and practices. Thus, the provisions of the Trade Facilitation Agreement (TFA) and the Protocol of Amendment to the International Convention on the Simplification and Harmonization of Customs Procedures (RKC) are aimed at expediting the movement, release and clearance of goods, and at encouraging cooperation between customs administrations and other related authorities on trade facilitation and compliance with customs procedures. These agreements also include the use of information technologies and electronic media for customs operations, ensuring international best practices, technical assistance and capacity-building in this field, based on the assumption that digital transformation can significantly reduce trade costs and transit times (Estevadeordal, Rodríguez Chatruc and Volpe Martincus, 2020).

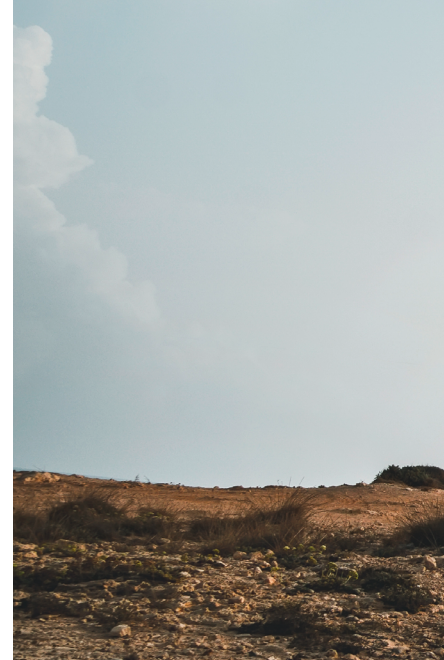
Despite this, the significant structural heterogeneity that characterizes the region is also reflected in this type of technological development. Currently, there is a mixed technological ecosystem linked to international facilitation and logistics that shows different levels of technological maturity, even with some systems that are almost obsolete. The lack of homogenization and standardization of processes also affects the interoperability of regional digital systems, making logistical operations difficult for landlocked countries in South America, since they need to operate in close coordination with the different systems in their main transit countries.

### III. Foreign trade single windows

Foreign trade single windows are digital technology platforms that seek to facilitate the exchange of information between private sector agents involved in foreign trade and the public services that control trade flows. The concept of the single window emerged in 2005, when recommendation no. 33 of the United Nations Economic Commission for Europe (UNECE) defined it as “a facility providing trade facilitation that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfil all import, export, and transit-related regulatory requirements”. The same year, WCO also adopted the Framework of Standards to Secure and Facilitate Global Trade (SAFE Framework) promoting the use of information technology in customs-to-customs shipments to facilitate the foreign trade single window. More recently, in 2013, WTO highlighted foreign trade single windows as a fundamental instrument to achieve the goals of the Agreement on Trade Facilitation at its ninth Ministerial Conference in Bali (D’Elia, 2017).

Single windows vary in scope and development, ranging from simple structures that only facilitate some procedures—with or without the automatic transfer of data or approved documentation—to fully integrated windows that also include automated logistics processes with the logistics environment, i.e. with the operations, records and procedures in different exchange points and in customs processes, in addition to electronic payment operations. Thus, instead of physically completing and carrying documents from one office to another, companies can use a single virtual platform to carry out all the procedures required by the various agencies involved in foreign trade, reducing the time and operating costs of the required processes.

In Latin America and the Caribbean, there are several examples of work already under way on foreign trade single window 2.0 aimed at better interconnection, services and security, both internally, with all the entities linked to foreign trade processes, and with windows in







other countries and trade blocs of interest. Also noteworthy are the multilateral efforts to promote greater interoperability of the foreign trade single windows for the countries of the Pacific Alliance (Chile, Colombia, Mexico and Peru) and of the Southern Common Market (MERCOSUR), made up of Argentina, Brazil, Paraguay and Uruguay, along with the Bolivarian Republic of Venezuela<sup>1</sup> and the Plurinational State of Bolivia (in the process of joining).

It is also important to highlight the creation of the Inter-American Network of International Trade Single Windows (RedVUCE), a regional forum for dialogue and collaboration promoted by the Inter-American Development Bank (IDB) that includes the governmental, public and private agencies in charge of the design, development and administration of electronic trade windows in the countries of Latin America and the Caribbean.

## A. The single window in the Plurinational State of Bolivia

The single window project has existed in the Plurinational State of Bolivia for a while. In 1991, Supreme Decree 23009<sup>2</sup> was enacted, creating the single window for exports, which has not been implemented to date. In 2011, the first plurinational meeting to advance change was organized, in which representatives of the public and private sectors participated with the goal of creating a single window and streamlining procedures. In 2013 and 2014, other meetings were held to consolidate the project, which led to the first steps of implementation in 2016, and a preliminary progress report on the country's work on the foreign trade single window (VUCEB) was presented at the National Forum on Trade Logistics held that same year.

In January 2020, the project was given a new impetus when the Ministry of Productive Development and Plural Economy was tasked with inter-agency coordination activities and the creation of forums for dialogue for the reactivation, prioritization and development of the VUCEB. These aspects were formalized in Supreme Decree 4339<sup>3</sup> of 16 September 2020, which established the VUCEB and provided the guidelines for its implementation. The internal rules of procedure for its operation were expected to be approved within 60 days of that date.

<sup>1</sup> The Bolivarian Republic of Venezuela is suspended from the exercise of all of its rights and duties arising from its condition of member State of MERCOSUR, in accordance with the provisions of paragraph 2 of article 5 of the Ushuaia Protocol on Commitment to Democracy in MERCOSUR, the Republic of Bolivia and the Republic of Chile.

<sup>2</sup> See [online] <https://www.lexivox.org/norms/BO-DS-23009.html>.

<sup>3</sup> See [online] <http://www.gacetaoficialdebolivia.gob.bo/edicions/view/1311NEC>.

The progress on the project was presented by representatives of the national government and by the consulting firms involved<sup>4</sup> at the National Forum on Trade Logistics in 2016 and the inter-agency meeting in January 2020. The report on the first phase consisted of a presentation of the analysis and mapping of the entities involved, their procedures and processes, analysis of the technology gap and the proposed architecture of the foreign trade single window. Table 1 details the activities implemented in 2015–2017 and those to be implemented in 2020.

**Table 1**  
Progress on the VUCEB project

Implemented from 2015–2017:
✓ Identification of the 22 entities involved in foreign trade, mapping and validation of processes of 11 priority public entities.
✓ Detailed mapping of the main foreign trade processes and procedures.
✓ Analysis of the technological maturity of the entities.
✓ Proposal for the streamlining and optimization of foreign trade processes.
✓ Proposal of technological infrastructure improvements in mapped entities.
✓ Preliminary design of the VUCEB based on international best practices.
✓ Proposal for the regulatory framework and organizational structure for the VUCEB.
✓ Workshops for the sharing of best practices with countries in the region.
✓ Training.
To be implemented in 2020:
✓ Workshops for the dissemination of the VUCEB and interaction with the public and private sectors.
✓ Workshops for the dissemination of the National Logistics Plan.

**Source:** Ministry of Production Development and Plural Economy, “VUCEB: Ventanilla Unica de Comercio Exterior de Bolivia” [online] <http://vci.produccion.gob.bo/siexco/web/app.php/portal/vuceb> [accessed in October 2020].

The VUCEB will be implemented gradually, considering the streamlining and optimization of processes and procedures and the development and implementation of the computer system. The incorporation of public entities will be based on a timeline to be established by the Technical Council, which will coordinate design, implementation and operation, and will be made up of nine representatives of the public sector with the possibility of incorporating representatives of other institutions related to foreign trade. The representative of the Ministry of Productive Development and Plural Economy is the chair of the Council, and this Ministry is also responsible for its administration, which will be carried out through the Vice-Ministry of Domestic Trade.

Based on planning in 2016, within the 11 priority public entities reflecting the greatest participation in foreign trade for the Plurinational State of Bolivia, 38 processes were mapped and validated, and these processes and entities are expected to be the first to operate in the single window, as shown in table 2.

<sup>4</sup> CrimsonLogic was in charge of mapping processes relating to the procedures of the entities with the greatest impact on foreign trade and their respective costs and times. Business Solution Consultores was responsible for evaluating the technology gap.

**Table 2**

Mapped and validated processes with the greatest impact on foreign trade for the Plurinational State of Bolivia

Entity	Imports	Exports	Mapped and validated processes	
			No.	Details
<b>Main entities</b>				
National customs authority	Yes	Yes	3	1) Definitive exports: Exports by road, rail and river – Exports by air – Exports by courier – Exports by pipeline. 2) Imports for consumption, general clearance: Preparation of the single import declaration – Payment of customs duties and channel assignment – Submission of the document folder in person – Inspection and release – Withdrawal of goods. 3) Management of manifests and customs transit.
National Agricultural Health and Food Safety Service (SENASAG)	Yes	Yes	8	1) Food safety permits or prior authorization for imports. 2) Issuance of health certificates for border clearance. 3) Application for phytosanitary permits to import plant products and by products. 4) Issuance of permits to import agrochemicals, fertilizers and related substances. 5) Issuance of permits to import veterinary products for animal/pharmaceutical/surgical/industrial use. 6) Issuance of permits to import live animals of bovine, ovine, caprine, camelid and porcine species. 7) Issuance of permits to import hides, skins, feathers, hooves and other similar products. 8) Business processes for exports: Food safety: food safety certificates for exports. – Plant health: issuance of phytosanitary certificates for exports. – Animal health: issuance of animal health certificates for exports.
National Export Verification Service (SENAVEX)	x	Yes	4	1) Single Register of Exporters (RUEX). 2) Declaration of origin (DDJJ). 3) Issuance of certificates of origin. 4) Issuance of certificates of the International Coffee Organization.
National service for the registration and control of the trade in minerals and metals (SENARECOM)	x	Yes	1	1) Single form for export of minerals and metals (Form M-03).
Port Services Administration (ASP-B)	Yes	Yes	6	1) Single port document of receipt. 2) Request for priority clearance. 3) Cargo movement planning. 4) Single port clearance document. 5) Issuance of port expense forms. 6) Collection of port expense forms.
Authority for the inspection and control of forests and land (ABT)	Yes	Yes	1	1) Issuance of digital certificates of origin for exports of forest products for companies.
Vice-Ministry of Domestic Trade	x	Yes	2	1) Issuance of domestic supply and fair price certificates. 2) Issuance of export licences.
<b>Complementary entities</b>				
National Hydrocarbons Agency (ANH)	Yes	Yes	2	1) Liquid hydrocarbon export permit. 2) Import authorization for hydrocarbons and their regulated and non-regulated refined products.
Special Force against Drug Trafficking (FELCN)	x	Yes	2	1) Analysis of suspicious cargo. 2) Physical inspection of suspicious cargo.
Department of Biodiversity and Protected Areas of the Ministry of the Environment and Water	Yes	Yes	5	1) Issuance of CITES export certificates for flora (wood). 2) Issuance of CITES export certificates for fauna (reptiles). 3) Issuance of CITES export certificates for fauna (vicuña). 4) Issuance of CITES re-export certificates (fauna - reptiles). 5) Issuance of CITES import certificate.



Entity	Imports	Exports	Mapped and validated processes	
			No.	Details
Medicines and Health Technologies Unit of the Ministry of Health and Sports	Yes	Yes	2	1) Customs clearance certificate (Imports). 2) Prior authorization (Imports).
<b>Total</b>			<b>38</b>	

**Source:** Prepared by the authors, on the basis of Ministry of Production Development and Plural Economy “Programa VUCE-Bolivia: fase piloto - Ventanilla Única de Comercio Exterior en Bolivia”, 2016 [online] <https://docplayer.es/53410797-Programa-fase-piloto-ventanilla-unica-de-comercio-exterior-en-bolivia-noviembre-de-2016.html> [accessed in October 2020].

Similarly, the processes of other entities involved in the foreign trade procedures of the Plurinational State of Bolivia were identified according to their characteristics, and are expected to be developed and incorporated into the VUCEB in subsequent phases of implementation, as shown in table 3.

**Table 3**  
Plurinational State of Bolivia: processes related to foreign trade pending mapping and validation

Entity	Processes/procedures	Transaction type
Telecommunications and transport regulation and oversight authority (ATT)	Prior authorization for importation and/or certification for customs clearance of telecommunications equipment.	Importation
Bolivian Institute of Metrology (IBMETRO)	Authorization of workshops on gas emissions. Authorization of workshops on reconditioning. Inspection of gas cylinders. Inspection of compressed natural gas (CNG) conversion kits. Inspection of ozone-depleting substances. Inspection of vehicles from free-trade zones.	Importation
Bolivian Institute of Standardization and Quality (IBNORCA)	Certification of oil imports. Certification of cigarette imports.	Importation
Municipal governments	Certificate of deregistration of light and heavy vehicles for exportation.	Exportation
National Department of Controlled Substances	Prior authorizations.	Importation/Exportation
Ministry of Cultures, Decolonization and Depatriarchalization	Export permit for contemporary works. Export request for traditional attire. Export request for musical instruments.	Exportation
Bolivian Institute of Science and Nuclear Technology (IBTEN)	Import authorization for radioactive material.	Importation
	Import authorization for X-ray equipment.	Importation
	Export authorization for X-ray equipment.	Exportation
	Export authorization for radioactive material.	Exportation
Governmental Commission on Ozone	Prior authorizations.	Importation
Ministry of Defence	Prior authorizations.	Importation/Exportation
National taxes	Tax refund (CEDEIM) Commercial invoice verification.	Exportation
Bolivian Customs Warehouses (DAB)	Receipt slips.	Importation/Exportation
	Exit passes.	Importation/Exportation
	Transit control assistance.	Transit

**Source:** Prepared by the authors, on the basis of Ministry of Production Development and Plural Economy “Programa VUCE-Bolivia: fase piloto - Ventanilla Única de Comercio Exterior en Bolivia”, 2016 [online] <https://docplayer.es/53410797-Programa-fase-piloto-ventanilla-unica-de-comercio-exterior-en-bolivia-noviembre-de-2016.html> [accessed in October 2020].

## B. The single window in Paraguay

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In Paraguay specifically, the export and import processes are divided between the Ministry of Industry and Trade, which manages the single window for exports, and the National Customs Service, which manages imports through the single window for imports.

The single window for exports was created in 2001, through Decree 13652/2001, replacing the Centro Único de Trámites de las Exportaciones which managed all export procedures, although it was not implemented as it should have been. Thus, in 2003, through Decree 20546/2003, the Centro de Simplificación de Trámites de Exportación for the streamlining of export procedures was created as a temporary and provisional instance until the system began operating. In 2006, Decree 7290/2006 authorized the implementation of the simplified export system called the single window for exports.

The single window for imports began operating in 2015, through Decree 3002/2015, which authorized the operation of the simplified electronic system for the issuance of import permits and licenses, or the single window for imports of the National Customs Service, for which procedures are regulated through resolution No. 722/2015. The single window for imports is based on the electronic management system of the single window for exports, and first incorporated into the system the institutions operating in the single window for exports. See table 4.

Both windows streamline and automate the export and import procedures of goods that require authorizations outside the customs territory, integrating them into the existing Customs Service Tax Management System (SOFIA) in the country. Therefore, the single windows include all the institutions that, by the nature of their functions, need to issue permits, certifications and authorizations for customs processes, as established by the Customs Code and its regulations.

According to Volpe Martincus (2016), Paraguay's single window for foreign trade supports 44 of the 46 foreign trade procedures. The procedures not yet incorporated into the single window for exports are those relating to the permits for products processed with protected animals or plants, under the responsibility of the Ministry of the Environment and Sustainable Development, and to the permits for processed foods certified fit for human consumption, under the responsibility of the National Institute of Food and Nutrition (INAN).

The Consortium for the Single Window for Exports (CONVUE) was established in 2012, and comprised the Paraguayan Chamber of Exporters (CAPEX), the Paraguayan Chamber of Exporters of Cereals and Oilseeds (CAPECO) and the Paraguayan Customs Brokers Institute (CDAP). This consortium was formed with the aim of implementing the public-private cooperation and participation agreement for the sustainability of the single window for exports signed with the Ministry of Industry and Trade to maintain and develop the services of the single window for exports based on the contributions of the system's users, to support the computerization and facilitation of the internal and external processes of the Ministry, and also to meet urgent needs relating to the continuity of the service that are not covered by the general budget, such as acquisitions of equipment, software, professional services and others, which could not be carried out appropriately and in a timely manner owing to rigidity and budgetary deadlines (CONVUE, 2020).

Between 2018 and 2019, the mapping and systematization of foreign trade processes (Lanfranconi Bobbio, Medina Barrantes and García Vázquez, 2019a and 2019b) was carried out by the National Confederation of Industries of Brazil (CNI) and the Paraguayan Industrial Union (UIP). This work, which included the participation of different public and private sector representatives of the foreign trade logistics chain in Paraguay, establishes a series of proposals that seek to modernize export and import processes and to create a working group within UIP for the implementation of the proposals to improve the foreign trade mechanisms in Paraguay.

**Table 4**  
Paraguay: public institutions participating in the single window

Public institution	Single window for exports	Single window for imports
National Service for Animal Quality and Health (SENACSA)	Yes	Yes
National Service for Plant and Seed Quality and Health (SENAVE)	Yes	Yes
National Customs Service	Yes	Yes
National Forest Institute (INFONA)	Yes	Yes
Paraguayan Timber Federation (FEPAMA)	Yes	
Ministry of Industry and Trade	Yes	Yes
Ministry of Agriculture and Livestock	Yes	
Department of Merchant Shipping	Yes	Yes
Department of Health Monitoring (DGVS)	Yes	Yes
National Anti-drug Secretariat (SENAD)	Yes	Yes
Office of the Undersecretary of State for Taxation	Yes	
Central Bank of Paraguay	Yes	
National Directorate for Climate Change	Yes	Yes
National Institute of Technology, Standardization and Metrology (INTN)	Yes	Yes
National Institute of Food and Nutrition (INAN)	Yes	Yes
Ministry of Finance		Yes
Municipality of Asunción		Yes
Directorate for War Materials (DIMABEL)		Yes
Ministry of Foreign Affairs		Yes
Ministry of Public Health and Social Welfare		Yes
National Directorate for Intellectual Property (DINAPI)		Yes
<b>Total public institutions</b>	<b>15</b>	<b>17</b>

**Source:** Prepared by the authors, on the basis of Government of Paraguay, “VUE: Ventanilla Única de Exportación” [online] <http://www.vue.org.py/> and “Ventanilla Única del Importador (VUI)” [online] <https://www.aduana.gov.py/125-6-ventanilla-unica-del-importador-vui-.html>.

The proposals include the pilot plan of the national integrated electronic invoicing system and improvements aimed at promoting electronic payment of fees within the single window for exports itself, incorporating procedures for document traceability and greater security, managing historical documents and uploading digitized information into the same system. All these elements would allow progress towards much more efficient, less costly and more secure paperless trade logistics.



## C. Interoperability of foreign trade single windows within South America

One of the priority projects and actions of the Andean Community is to help implement national foreign trade single windows and promote interoperability among its four member countries: Colombia, Ecuador, Peru and Plurinational State of Bolivia. Something similar occurs within the framework of MERCOSUR, where member countries, including Paraguay and the Plurinational State of Bolivia, agreed on a road map for convergence with the Pacific Alliance, in order to coordinate trade facilitation actions and achieve interoperability between both integration schemes (Valdés Figueroa and Pérez, 2020). This process is also supported by IDB, which is conducting a study on the characteristics of the foreign trade single windows in each country, which will identify the governance, technological and regulatory gaps that should be addressed for future integration, as well as the existing degrees of convergence (Barreiros, 2019).

## IV. Authorized economic operator (AEO)

Another important instrument for the facilitation of foreign trade processes is the authorized economic operator (AEO). This is a voluntary certification programme that seeks to ensure supply chain security and a smooth flow for “firms certified by the national customs administration as complying with relevant supply-chain security standards based on a comprehensive scrutiny of their plants and their tax and customs behaviour” (Volpe Martincus, 2016).

This instrument falls under the SAFE Framework of standards, which in annex I, defines an AEO as “a party involved in the international movement of goods in whatever function that has been approved by or on behalf of a national customs administration as complying with WCO or equivalent supply chain security standards”. Under this definition, AEOs may include manufacturers, importers, exporters, brokers, carriers, consolidators, intermediaries, ports, airports, terminal operators, integrated operators, warehouses, distributors and freight forwarders (WCO, 2018).

Businesses that meet these criteria can benefit from additional trade facilitation measures, including: less frequent customs inspections of physical goods and documents, fast-track processing and release of cargo, and priority during periods of high threat alert or post-incident resumption of operations, and streamlined procedures for meeting administrative requirements through the use of simplified customs declarations. Additionally, AEO certification can serve as a mark of quality, which allows the operator to build an image of security and reliability in relation to customs and financial activities. Also, by complying with safety and security standards, it can be considered a safe company, that is, a reliable business partner with global reach (LAIA, 2020).

Globally, there are 84 AEO programmes in operation and 19 in development. In Latin America and the Caribbean, 18 countries already have programmes that are operating and one programme in development. Considering that this type of programme provides important advantages for improving logistics in landlocked countries, it is not surprising that both Paraguay and the Plurinational State of Bolivia already have them in place, as do four of their transit countries, namely Argentina, Brazil, Peru and Uruguay, while Chile is in the process of implementing the regulations (WCO, 2020), as shown in table 5.

**Table 5**  
South America: Implementation of authorized economic operator (AEO) programmes, 2019

	Country	Start	Eligible operators	No. of operators (2019)	Certifying authorities	Mutual Recognition Agreements (MRAs)
Landlocked countries	Plurinational State of Bolivia	2015	Exporters, importers, brokers, carriers and consolidators	31	Customs	In progress: Andean Community, Brazil, Uruguay.
	Paraguay	2018	Exporters and importers	1	National Customs Service	In progress: MERCOSUR, MERCOSUR/Pacific Alliance, Regional.
Transit countries	Argentina	2006	Exporters and importers	4	Federal Public Revenue Administration (AFIP) – Department of Customs (DGA)	In progress: MERCOSUR, MERCOSUR/Pacific Alliance, Regional.
	Brazil	2014	All actors in the supply chain	84	Federal Revenue Service (Receita Federal)/ Health Regulatory Agency (ANVISA), Service for International Agricultural Surveillance (VIGIAGRO) and the army	Signed: China, MERCOSUR, Uruguay. In progress: MERCOSUR/Pacific Alliance, Mexico, Peru, Plurinational State of Bolivia, Regional, United States.
	Chile	2017	Exporters and customs agents	In development	National Customs Service	
	Peru	2012	Exporters, importers, customs agencies, warehouses	101	National Tax and Customs Administration (SUNAT)	Signed: Pacific Alliance, Republic of Korea, United States and Uruguay. In progress: Andean Community.
	Uruguay	2014	All actors in the supply chain	60	National Customs Service	Signed: Argentina, Brazil, China, MERCOSUR, Peru, Plurinational State of Bolivia, Republic of Korea. In progress: MERCOSUR/Pacific Alliance and United States.

**Source:** Prepared by the authors, on the basis of World Customs Organization (WCO), *Compendium of Authorized Economic Operator Programmes: 2020 edition*, 2020 [online] <http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/facilitation/instruments-and-tools/tools/safe-package/aeo-compendium.pdf?db=web>; and Latin American Integration Association (LAIA), *Estudio sobre los programas Operador Económico Autorizado en los países miembros de la ALADI con especial énfasis en los requisitos para obtener la certificación* (ALADI/SEC/Estudio 229/Rev. 2), Montevideo, 2020.

As of November 2020, there are 45 companies in the Plurinational State of Bolivia with AEO certification<sup>5</sup> and another 26 in the process of certification.<sup>6</sup> In Paraguay, since the AEO programme is more recent, the number of certified companies is lower (4) with another three in the process of certification.<sup>7</sup> The next steps in this regard would be to advance in the facilitation and convergence of actions through coordination with their transit countries through Mutual Recognition Agreements (MRAs), which are a mechanism through which the validations and authorizations granted to an AEO in the country are recognized by other countries that are part of the programme, thus eliminating the duplication of security checks and significantly reducing the transit times and costs of border crossing. The last column of table 5 lists the MRAs in force and in the process of negotiation.

## V. Customs computer systems

Customs management systems have been developed on the basis of internationally standardized regulations and procedures, and also by customs administrations themselves, as in the case of Paraguay and the Plurinational State of Bolivia. The National Customs Service of the Plurinational State of Bolivia has developed software called the Single Customs Modernization System (SUMA), which replaces the Automated System for Customs Data (ASYCUDA++), and the Customs Service Tax Management System (SOFIA) is used in Paraguay.

The Plurinational State of Bolivia's SUMA is a web-based system that incorporates innovations such as the use of electronic or digital signatures, document digitization, electronic notification and automation of processes, among other digital processes that seek to improve the facilitation and control of foreign trade operations, minimize the use of paper and direct physical contact between customs officers and foreign trade operators. It was developed based on open software tools and standards. Products such as Java, Angular, PostgreSQL, MongoDB, Red Hat EAP and Red Hat BPM Suite are the basis of this system, which allows interoperability with other systems using the same base.<sup>8</sup>

In Paraguay, SOFIA was developed by the National Customs Service and is a computer system that connects the Service with the different users linked to its activity: brokers, importers, exporters, consolidators and carriers, insurance companies, transport companies, express shipping companies, warehouses, and State and private banks. It is also connected with governmental institutions, with the single window for exports and single window for imports and public prosecutors' offices, among others.<sup>9</sup>

Another interesting feature of SOFIA is that it links the National Customs Service with the customs authorities of the MERCOSUR bloc through the INDIRA System,<sup>10</sup> which allows the exchange of foreign trade information essential for cross-border control among the countries that make up MERCOSUR.

## VI. Recommendations for moving towards logistics digitization

The use of information technologies and electronic media in trade logistics and especially in customs operations plays a fundamental role in facilitating processes by streamlining procedures, increasing customs intelligence and risk profiling, and reducing operation times and costs. To meet these objectives, systems development must be conceived as a

<sup>5</sup> See [online] <https://www.aduana.gob.bo/oea/certificadas-pag>.

<sup>6</sup> See [online] <https://www.aduana.gob.bo/oea/solicitud-pag>.

<sup>7</sup> See [online] <https://www.aduana.gov.py/index000.php>.

<sup>8</sup> See [online] <https://suma.aduana.gob.bo/sso/indexOce.html>.

<sup>9</sup> See [online] [www.aduana.gov.py](http://www.aduana.gov.py).

<sup>10</sup> INDIRA is a platform for the exchange of information from customs records connecting the customs authorities of Argentina, Brazil, Chile, Ecuador, Paraguay, the Plurinational State of Bolivia, Uruguay and some other countries, representing a risk management tool.



value added service and focus on processes that affect the efficiency, resilience and security of the logistics chain. It is also important that they focus on a continuous-improvement approach, taking advantage of international standards and best practices in software design and development (Valdés Figueroa and Pérez, 2020).

Various trade facilitation and digitization initiatives have been deployed in the region, such as the single windows, authorized economic operator programmes and other logistics systems discussed in this document. Along with strengthening these developments, it is necessary to move towards interoperability of systems, both regionally and internationally, and to provide them with better cybersecurity to address new threats, as discussed in *FAL Bulletin*, No. 382.<sup>11</sup>

Among the priority aspects, it is important to highlight the importance of connectivity and access to high-speed Internet at a cost that allows its widespread use by logistics operators everywhere, particularly in rural areas and areas that are difficult to access, where transport and border crossing operations are usually carried out. The upcoming deployment of 5G technology could support the digital transformation of logistics by providing the necessary connectivity with much faster speeds than existing ones (between 2 and 20 Gbps) and with latency rates (network response speed) of between 1 and 2 milliseconds, which will make operations on the Internet or in the cloud almost instantaneous.

Another element to keep in mind is interoperability of systems and among logistics actors, since it has been observed that some technological developments have been implemented as independent and separate technological platforms, when from the functional point of view they should be highly complementary and compatible to work in an interconnected manner and according to defined standards that allow the incorporation of new technologies or actors into existing systems. This is especially important for landlocked countries, which need to coordinate closely with their transit countries to ensure a free, competitive and secure flow of trade, and thus require the identification of the governance, technological and regulatory gaps that should be addressed to achieve this interoperability.

A third aspect to highlight is the need to advance in the digitization of the logistics industry, which was analysed in Valdés Figueroa and Pérez (2020), which proposes a road map to advance in the digitization and automation of processes, as well as adequate management and security in the handling of information.

## A. Specific actions for landlocked and transit countries in South America

Taking these considerations into account, a series of specific actions are detailed below to encourage the digitization of logistics services and trade facilitation and to achieve the priorities set out in the Vienna Programme of Action for Landlocked Developing Countries for the Decade 2014–2024, which seeks to address the challenges faced by these countries in six priority areas: (1) fundamental transit policy issues, (2) development and maintenance of transport, energy and ICT infrastructure, (3) international trade and trade facilitation, (4) regional integration and cooperation, (5) structural economic transformation, and (6) means of implementation (Pérez and Sánchez, 2019).

### **1. Ensure broadband Internet connectivity, with services and values that allow stakeholders to benefit from the digital transformation.**

Both Paraguay and the Plurinational State of Bolivia have lower Internet penetration than the rest of South America, along with more expensive services and slower connection speeds than the Latin American and Caribbean average. To solve this problem, the Plurinational State of Bolivia launched its own fibre optic network connected directly to the international Internet network in September 2020. This network extends across 2,200 km: 1,180 km run along the seabed between the towns of Ilo and Lurín in Peru, where the network links to the connection point with international underwater cables, and 1,020 km run through overhead and underground cables connecting the towns of Desaguadero

<sup>11</sup> See Díaz (2020).

and Ilo. The telecommunications company Entel has a fibre backbone of 24,427 km in the Plurinational State of Bolivia, with plans to expand. It also has the satellite TKSAT-1 (Túpac Katari), launched into orbit on 20 December 2013, which consists of 30 channels in the C, Ku and Ka frequency bands and operates in the following three areas:

- (i) Internet services throughout the Plurinational State of Bolivia.
- (ii) Radio broadcasts and communication.
- (iii) Rental of different types of transmission to other countries.

Paraguay, for its part, completed the first stage of the National Fibre-optic Network, also in 2020, unifying overhead cables in the most populated area of the country, concentrated in the Asunción, Ciudad del Este and Encarnación triangle, where a total of 27 nodes were installed and also reached the strategic area known as Ruta 9 – Chaco. The second phase will involve extension to the south of the country and the third phase will include areas in the north. The country is also pushing for a fibre-optic link through Brazil, with a network extending from the Itaipú hydroelectric dam to the Atlantic coast at the port of Santos to connect to underwater cables. A memorandum of understanding was signed for the project in Brazil in 2016, but no real progress has been made since then.

For transit countries, it is essential to create the conditions for and facilitate access to underwater cables for landlocked countries to make Internet access cheaper and to ensure higher connection speeds.

## **2. Strengthen interoperability.**

Given the wide variety of actors and public and private entities that participate in foreign trade logistics, it is essential to promote the use of international standards and regulations, which allow the more flexible and affordable development of solutions, using best practices that ensure scalability and avoid technological obsolescence. See for example UN/CEFACT (2005).

In the Plurinational State of Bolivia, where the single window is still in the study stage, the use of international standards, including United Nations regulations and recommendations on these matters, would not only allow for greater efficiency in operation and the achievement of objectives with much shorter development times and lower costs, but would also favour rapid interoperability at the international level and with regional trade blocs such as CAN and MERCOSUR, which are in the process of connecting their platforms.

Paraguay is already working on improvements for this purpose and also to connect with the other MERCOSUR countries and with the countries of the Pacific Alliance.

## **3. Work with the public and private sectors.**

Public-private synergies have proven to be effective and very dynamic even in times of political uncertainty. Therefore, strengthening the creation of consortiums or public-private advisory bodies that promote the digitization of trade logistics in landlocked and transit countries is expected to produce more durable solutions and ensure they are not affected by the vagaries of political change, which is especially important when dealing with long-term developments or when the level of regulatory convergence required demands State commitments.

In the Plurinational State of Bolivia, this building of trust between public and private actors is more recent and very much linked to politics. A logistics policy with a long-term vision could serve as a road map to strengthen processes such as the VUCEB and other digital logistics developments, where coordination between actors is necessary.

In Paraguay, there are links between the public and private sectors in foreign trade and investment promotion, for example with CONVUE, the Investment and Export Network (REDIEX) and the public partnerships to implement the National Logistics Plan, along with other initiatives such as the mapping and systematization of the foreign trade processes mentioned previously.

#### 4. Work on the continuous improvement of processes seeking to generate value added services.

The review and continuous improvement of the operations carried out with these computer systems aim to optimize and enhance the efficiency of operations, and thus add value to services to support the competitiveness of foreign trade actors as a whole.

Several countries in the region have been working on foreign trade single window 2.0, which offers new functionalities, updated technology, faster response times for obtaining approval, lower costs, parameterized codes, support in other browsers, new queries and reports, and electronic payments and mechanisms for greater system cybersecurity.

The mapping and parameterization of foreign trade processes in Paraguay is a good example of working towards continuous improvement, since several actions have been identified that relate to improving and optimizing virtual platforms, which is expected to increase foreign trade in the country by reducing costs and deadlines and facilitating access to information in keeping with a paperless policy.

Finally, it should be noted that the digitization of logistics systems, especially those related to customs and other entities involved in foreign trade processes, is constantly evolving and is a fundamental element of the fourth industrial revolution, as analysed in *FAL Bulletin*, No. 375.<sup>12</sup>

Moreover, the COVID-19 pandemic is expected to further boost these changes, especially in customs systems that are expected to be altered through a remodelling of the engineering associated with the processes aiming for greater security and traceability of cargo, and also in terms of transparency, streamlining of processes, use of digital technology eliminating the use of paper, and the minimization of human participation in both processes and handling of goods.

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<sup>12</sup> See Barleta, Pérez and Sánchez (2020).

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## VIII. Publications of interest



*FAL Bulletin No. 381*

### Digital Transformation in Latin American and Caribbean logistics

Gabriel Pérez  
Luis Valdés Figueroa

This *FAL Bulletin* continues the Reflections on Disruptive Technologies in Transport that ECLAC has been publishing through this medium. The present edition analyses the importance of the digital transformation of logistics, especially in the current circumstances where the need for fluid, safe and resilient logistics calls for additional actions on traceability and process facilitation.

Available in:



*FAL Bulletin No. 382*

### Cybersecurity in the time of COVID-19 and the transition to cyberimmunity

Rodrigo Mariano Díaz

This *FAL Bulletin* forms part of the Reflections on Disruptive Technologies in Transport that often appear in Economic Commission for Latin America and the Caribbean (ECLAC) publications. On this occasion, it examines the importance of cybersecurity from a logistical standpoint, especially in the current context of a pandemic.

Available in: