



# Digital Ports in Latin America and the Caribbean: Situation and Prospects

**Economic and Technical Cooperation**

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**F O R E W O R D**

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*The Permanent Secretariat of the Latin American and Caribbean Economic System (SELA) submits herewith the document "Digital Ports in Latin America and the Caribbean: Situation and Prospects", in accordance with its Work Programme for the year 2015, approved at the XL Regular Meeting of the Latin American Council of SELA. This document will be presented at the XXVI Meeting of International Cooperation Directors for Latin America and the Caribbean (Dominican Republic, 23 and 24 April 2015), as a basis for the debates during the event.*

*The study highlights the progress and results of the "Programme for the creation of the Latin American and Caribbean Network of Digital and Collaborative Ports: Strengthening logistic port communities, service standards and technological innovation for a globalized, logistically competitive and sustainable trade", conducted by the Permanent Secretariat of SELA in 2014, through a technical cooperation agreement with CAF-development bank of Latin America.*

*This Programme recognizes port logistics communities in Latin America and the Caribbean (LAC) as one of the main factors to improve competitiveness in foreign trade, and aims at identifying and promoting best practices in collaborative governance, use of Information and Communications Technologies (ICTs) for electronic data exchange, application of new and better standards of cargo and transport services, and higher levels of efficiency in the logistic processes involved in the various links of the logistic port chains in Latin American and Caribbean countries.*

*After the introduction, the study analyzes the evolution of foreign trade in LAC, as well as port activities and container traffic in the region. Then, it deals with the main elements of the Programme on the Network of Digital and Collaborative Ports, and concludes with recommendations and guidelines as regards national and regional public policies in this area.*

*This document was drafted by Engineer Luis Ascencio Carreño, to whom the Permanent Secretariat of SELA wishes to express its gratitude and recognition.*

## EXECUTIVE SUMMARY

The current port development model prevailing in Latin America and the Caribbean (LAC) is the result of the major reforms carried out in the 1990s and the 2000s, which allowed for making great strides in the implementation of high productivity standards in port services in the region, in a substantial reduction of logistics costs, the inclusion of the region in international maritime transport networks and trade facilitation, and in the opening-up to markets for a large number of small and medium-sized enterprises.

Despite such significant achievements, this development model shows signs of exhaustion in various quantitative and qualitative aspects, for instance: the high level of congestion in the infrastructure of transport services (including road access and cargo inspection areas); the lack of progress in the implementation of informatics coordination systems in the logistic port chain, with projects such as Port Community Systems (PCS) or Port Single Windows (PSW); the weak public-private coordination to create true port communities; the low productivity of land links in the logistic port chain, particularly those operating in the land interface of the chains (e.g. customs agents, freight brokers and land carriers); conflicts in the port-city relationship; and, in general, deficient access to ports and inter-port service areas (road and railways), which produces a funnel effect for land interface operations.

Indicators for logistic performance and foreign trade, such as Doing Business and the Logistic Performance Index of the World Bank, show the structural problems affecting Latin America and the Caribbean, whose performance is below the world average, with its main exporting countries being far from the standards of the OECD and the world's largest economies.

In line with the regional interests and international trends, the Latin American and Caribbean Economic System (SELA) has conducted a systematic work aimed at delving into issues pertaining international trade and Information and Communication Technologies (ICTs), fostering intra-regional dialogues, undertaking joint actions, and participating as a third party in international cooperation proposals to boost regional initiatives concerning such issues. Thus, in 2014, the Permanent Secretariat of SELA, through a technical cooperation agreement with CAF-development bank of Latin America, started the first phase of the "Program for the creation of the Network of Digital and Collaborative Ports<sup>1</sup> in Latin America and the Caribbean", with the participation of the ports of Manzanillo and Veracruz, in Mexico; Buenaventura and Cartagena, in Colombia; Callao, in Peru; San Antonio and Valparaíso, in Chile; and Balboa and Colón, in Panama. In 2015, this initiative will include five additional countries.

The programme included activities such as the dissemination of best practices for port governance, efficiency standards, operational improvement based on modern management of logistic port chains, and delivery of technical guidelines for the gradual implementation of information technology Port Single Window in interoperability with foreign trade single windows.

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<sup>1</sup> The concept of digital port refers to the application of Information and Communication Technologies (ICT) to the community-type port processes within the context of logistic port chains, which involve both the land and maritime interfaces, so as to increase the efficiency of the various links of the chain through digital connection of services and interoperability with the national foreign trade single windows systems. In turn, the concept of collaborative ports refers to the new governance required to implement the digital modernization of ports, with emphasis on public-private partnerships.

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The paper concludes with a series of recommendations and guidelines for national and regional public policies which are expected to contribute to the debates to be held at the XXVI Meeting of International Cooperation Directors. They are summarized below:

- a) The recent experience of the Programme Network of Digital and Collaborative Ports in Latin America and the Caribbean reflects the need to move forward simultaneously in each country, following *TOP-DOWN* and *BOTTOM-UP* approaches. A recent document by ECLAC confirms this trend, which has been called "Governance 2.0", which requires "a change from a unimodal to an integrated and systemic vision, including integration with the hinterland, logistics, production and other transport modalities" (Sánchez and Pinto, 2014). In this connection, emphasis is made on the need for new institutions, new and deeper public-private partnerships, a comprehensive and sustainable port policy seeking to streamline both land and maritime interfaces, while strengthening collaboration among all stakeholders in the port logistic chain.
- b) At the structural level of every country, at least three actors or public areas are expected to be implemented and have a clear role to play in improving logistics competitiveness: a Leading Ministry; an area called Logistic Program or Logistic Cabinet, with power to address the national logistics policy and contribute to foreign trade facilitation; and an Innovation System of the country, which should have public funds for promoting institutional and technological initiatives on the national logistics system.
- c) Five aspects are identified where the efforts for facilitation, harmonization and standardization of the region's port systems should focus: specialization of transport infrastructure, technologized public services, standardization of regional logistic observatories, port Governance 2.0. and digital ports.
- d) Port Single Windows (PSWs), as informatics platforms for the electronic exchange of data among the main groups of stakeholders in the port logistic chain, have achieved significant levels of maturity in the major world regions. PSWs can adapt themselves to the realities of each country and each port system, and for this reason analyses should be promoted of their design, funding and implementation in the next 10 years.
- e) Based on the schemes promoted in Europe and Asia, the following guidelines for regional public policies on ports established under key programmes are suggested: Institutional programme for harmonization of policies; coordination among public entities and their modernization; water infrastructure programme; land infrastructure programme; port community and quality programme; community information systems programme; training and human resources programme; environment programme; security programme; and logistic areas programme.



## INTRODUCTION

The port model prevailing in Latin America and the Caribbean is the result from the major reforms of the decades of the 1990s and 2000s. It has allowed for substantial achievements as regards the reduction of foreign trade port costs, but with limitations in terms of adding value to trade facilitation and transport in the supply chains of importers and exporters. As a matter of fact, a study carried out in 2014 by the Economic Commission for Latin America and the Caribbean (ECLAC) indicates that such port model is becoming exhausted if a series of quantitative and qualitative aspects are considered:

- Between 2000 and 2013 there has been a low physical expansion of ports (nearly 76%) compared to a much stronger increase in production (460%).
- Old public ports have narrow margins to grow physically, because they are surrounded by populous cities with growing pressures as regards cohabitation and the use of the waterfront. This is the phenomenon of port cities in conflict with maritime container and cargo terminals.
- In many cases, the productivity of transport infrastructure services has become exhausted, since the combination of technology and organization is not enough.
- The governments and their entities for foreign trade, industry and economy are witnessing major advances in the area of Foreign Trade Single Windows (FTSW), which urgently need to include the port component in their paperless operations. But the reality faced by ports is problems with land transport coordination, congestion and excessive use of papers in their transactions.
- Zero progress in terms of informatics coordination systems in port logistic chains such as Port Community Systems (PCS) or Port Single Windows. In Europe and Asia, those technologies have been in use for 20 years now.
- Lack of a systemic organization of stakeholders into permanent technical groups or logistic port communities with public-private participation.
- Low productivity of critical links in the port logistic chain, particularly those operating in the land interface of the chain, such as customs agents, freight forwarders and carriers, who must still face long waits for their transactions to withdraw and deliver containers at port terminals and inter-port areas.
- Poor planning for port access (roads and railways) and inter-port service areas, which produces a funnel effect for land interface operations.

Both ECLAC and SELA promote overcoming these faults in port development in Latin America and the Caribbean through a new *TOP DOWN* and *BOTTOM UP* public policy approach. A recent document by ECLAC proposes to move ahead towards a new evolution in port governance which has been called "Governance 2.0", which requires "a change from a unimodal to an integrated and systemic vision, including integration with the hinterland, logistics, production and other transport modalities" (Sánchez and Pinto, 2014). In this connection, ECLAC makes emphasis on the need for new institutions, new and deeper public-private partnerships, a comprehensive and sustainable port policy seeking to streamline both land and maritime interfaces, while strengthening collaboration among all stakeholders in the port logistic chain.

In line with the regional interests and international trends, SELA has conducted a systematic work aimed at delving into issues pertaining international trade and Information and Communication Technologies (ICTs), fostering intra-regional dialogues, undertaking joint actions, and participating as a third party in international cooperation proposals to boost regional initiatives concerning such issues. Thus, in 2014, SELA started the first phase of the Programme for the creation of the

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Network of Digital and Collaborative Ports in Latin America and the Caribbean (LAC), with the participation of the ports of Manzanillo and Veracruz, in Mexico; Buenaventura and Cartagena, in Colombia; Callao, in Peru; San Antonio and Valparaiso, in Chile; and Balboa and Colón, in Panama. Within this context, a Reference Model for competitiveness of participating port logistic chains was created.

In this way, a systemic view of the port and the stakeholders involved is being promoted, to optimize the overall operation and not as individual companies, and to ensure that the role of the port authority includes the vision and prospect of expanding investments, improvements in productivity and connectivity, while promoting the logistic integration of processes and, above all, strengthening the port community or Industrial Cluster of enterprises through permanent dialogue among stakeholders and a common vision. Special emphasis should be made on the optimization of the land interface and the productivity of road transport operators, and it should be incorporated by the port authority in a harmonious way, with the highest standards of services and the corresponding regulations.

Another relevant stakeholder has been CAF-development bank of Latin America, which attaches great importance to supporting the competitive development of national logistic systems including infrastructure, services, processes, information systems, management capacity, institutional framework and regulations. For this purpose, CAF has promoted since 2014 the General Programme for Regional Logistic Development for Latin America (CAF-LOGRA), aimed at identifying, analysing, promoting and carrying out projects and programmes in specialized logistics that contribute to promote the National Logistic Systems of its member countries.

This seeks to build capacity and knowledge with differential value, which is capitalized by the agents of the public and private sectors, to improve the comprehensive management of domestic and international logistic chains, as well as the comparative logistic performance of Latin America. The institution has been working closely with its member countries and establishing contacts with key players in the area of logistics both in the public and private sectors so as to identify opportunities for support and at the same time socialize the guidelines of CAF's Regional Logistic Development Programme.

As a result of the introductory phase of the CAF-LOGRA Programme, the multilateral organization is developing a logistic profile of the region, which would be the first logistic map of Latin America and the portfolio of priority logistic development projects and programmes. In addition, as part of the agenda to generate knowledge within the Logistic Programme, CAF is conducting a series of analyses in sustainable logistics, urban logistics and global trade logistics issues.

Within this context, CAF-LOGRA, in conjunction with the Latin American and Caribbean Economic System (SELA), launched in 2014 the Program "Creation of the Latin American and Caribbean Network of Digital and Collaborative Ports: Strengthening logistic port communities, standards of service and technological innovation for a globalized, logistically competitive and sustainable foreign trade". Its objective is to disseminate the best practices of port governance, efficiency standards, operational improvement based on the management of modern logistic port chains, and deliver technical guidelines for the gradual implementation of information technologies with Port Single Windows in interoperability with the Foreign Trade Single Windows.

The objectives of this technical document, prepared for the XXVI Meeting of International Cooperation Directors for Latin America and the Caribbean – whose central topic is "Port

Cooperation in Latin America and the Caribbean: Digital Ports: Situation and Prospects" – are as follows:

- Describe the importance of foreign trade in Latin America and the Caribbean and consider the challenges of intra-regional trade.
- Characterize the regional model of port development, its achievements and challenges.
- Describe the results of the first year of the SELA-CAF Programme "Network of digital and collaborative ports in Latin America and the Caribbean".
- Make recommendations on guidelines for national and regional public policy and multilateral cooperation with respect to the challenges of digital ports in Latin America and the Caribbean.

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**I. HISTORY OF FOREIGN TRADE IN LATIN AMERICA AND THE CARIBBEAN**

In the early 1990s, the ports of Latin America and the Caribbean were among the least efficient in the world, which made it extremely difficult for them to fulfil their mission of facilitating trade or to become centres for the provision of logistic services and pivots of the international transportation system. The reasons for such backwardness were varied, but in general it should be noted that there was a deficit of port infrastructure and shortcomings in the use of their capacity.

At that time, the main countries of Latin America and the Caribbean made strides with deep reforms that forever changed the model of organization and port management in the region, following mainly the so-called *landlord* model (landlord or owner), which as a tool or service model differs from others for the following characteristics: the ownership of infrastructure, superstructure and equipment; the form of exploitation of the assets; the public, private or joint provision of services, especially those related to handling cargoes; the administration of the port and the situation of the workers; and the local, regional or global orientation of the port.

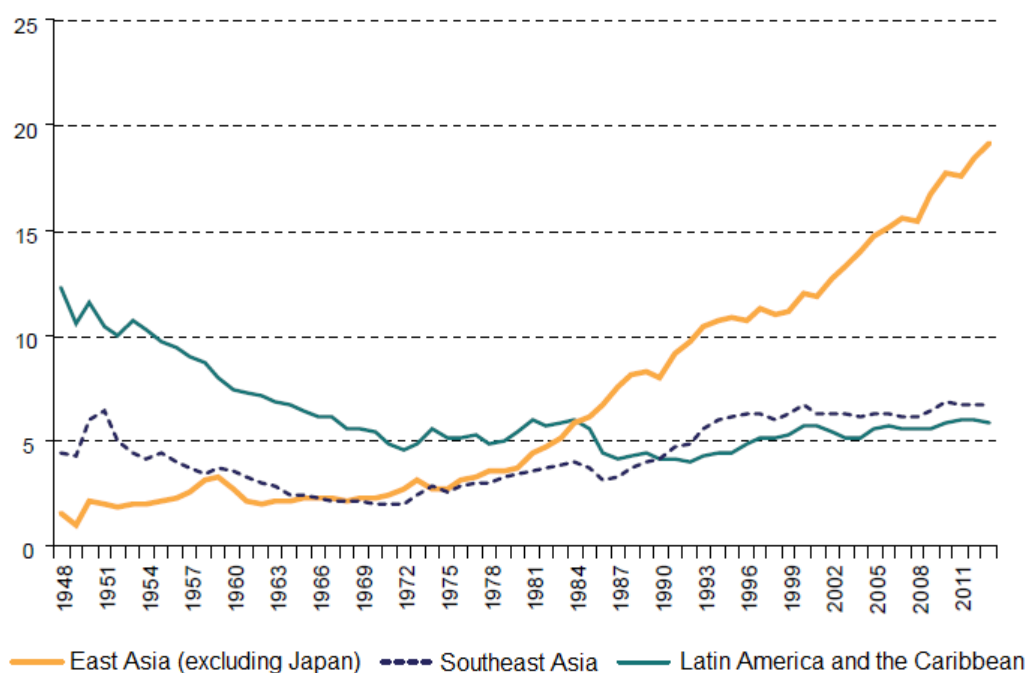
In the *landlord* model, the ownership of infrastructure (including land and accesses to the port) and his administration are under a State port authority or enterprise, or a Superintendency of ports linked to a Ministry or another body of the Executive Branch, which performed a regulatory function. Quite frequently, this public entity (port authority or Superintendency) would hand over the infrastructure in a long-term concession to private companies (with or without State participation in their property), which is responsible for the development and maintenance of new infrastructure (always on account of the State ownership), superstructure and equipment (which are of its property) and the recruitment of staff at the port.

In this model, the series of port services for ships and the handling of cargo are provided by port operators in competition. The ideal situation would be that such competition leads to significant investments in superstructure and equipment. However, there is a risk that the conduction of too many investments can generate excess installed capacity. This model of port organization was successfully implemented in countries such as Chile, Colombia, Mexico, Panama, Brazil and Argentina. In general, it can be noted that in those countries the investments made by concessionaires evidence a strategic planning in relation to the demand, the orientation of the port and the country's economic growth; therefore those ports have not reached a situation of excess installed capacity.

**1 Evolution of foreign trade in Latin America and the Caribbean**

Since the 1980s, global exports of goods have grown steadily, driven mainly by Asian regions such as East Asia (excluding Japan) and since the 1990s, Southeast Asia. It is interesting to note that Latin America and the Caribbean show a stagnation situation, because their participation since the late 1990s has fluctuated between 5% and the current 6%, despite the fact that in the last few years the region has enjoyed high prices in a number of exported commodities.

**CHART 1**  
**SHARE IN WORLD EXPORTS OF GOODS, 1948-2013**  
**(PERCENTAGES). SELECTED REGIONS**



Source: ECLAC 2014.

At present, a great amount of foreign trade and global production corresponds to so-called value chains, either regional or global. According to the United Nations Conference on Trade and Development (UNCTAD), about 80% of the world exports of goods and services would correspond to this type of chains, with a high participation of multinational companies. The phenomenon of the geographical fragmentation of production has consolidated since the 1980s, mixing various facilitating factors that have evolved, such as the reduction of barriers to trade, foreign investment, reduction of transport costs and technological breakthroughs. Clear examples of these value chains can be seen in the automotive, electronics, aeronautics and apparel industries.

Interestingly, the regions that have best developed value chains within their geographical scope show the highest percentages of intra-regional trade. In a recent publication of ECLAC, in 2014, it found that for selected groups, the participation of intra-group exports in total exports between 2008 and 2013 yielded the following results:

- European Union: 63.4%
- North America Free Trade Agreement (NAFTA): 48.5%
- Association of Southeast Asian Nations (ASEAN)+5: 49.1%

Latin America and the Caribbean as a whole is still far from reaching the figures of other consolidated global blocs, yielding a regional average of 19.7% in 2013 (see Table below). This figure is strongly influenced by the low participation of exports from Mexico to the rest of the region, as the Mexican productive structure is much more connected to the North American Free Trade Agreement, and shows figures between 7% and 8%. A closer look at the regional sub-blocs reveals that Central America and South America have very similar numbers, around 35% and 36% out of the total of exports, which shows that there is an important basis for strengthening value

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chains that operate in such geographical territories. The Caribbean as a region keeps an even lower trade exchange, due in part to the fragmentation of the territory into islands and their poor maritime connectivity, which otherwise would allow for reducing transport costs.

**TABLE 1**  
**INTER-REGIONAL TRADE AS PERCENTAGE OF TOTAL EXPORTS**  
**2011-2013**

Inter-regional trade as percentage of total exports and imports						
Country	2011		2012		2013	
	% Exports	% Imports	% Exports	% Imports	% Exports	% Imports
<b>Mexico</b>						
Mexico	7.7%	4.1%	7.8%	3.8%	7.3%	3.9%
<b>Caribbean</b>						
Jamaica	5.1%	44.6%	7.0%	41.1%	4.7%	42.1%
Bahamas	3.5%	6.2%	3.5%	5.7%	3.3%	4.5%
Dominican Republic	24.6%	31.0%	25.3%	30.7%		
<b>Average - Caribbean</b>	<b>11.1%</b>	<b>27.3%</b>	<b>11.9%</b>	<b>25.8%</b>	<b>4.0%</b>	<b>23.3%</b>
<b>Central America</b>						
Panama	66.9%	15.1%	23.5%	50.9%	22.7%	46.0%
Guatemala	41.7%	34.2%	42.2%	34.7%	41.0%	36.4%
Costa Rica	29.9%	24.3%	28.6%	22.7%	27.5%	22.0%
Honduras	29.0%	33.8%	21.2%	34.5%		
El Salvador	44.3%	39.8%	45.2%	39.6%	45.3%	35.6%
Nicaragua	47.1%	51.4%	38.8%	46.3%	39.9%	39.3%
<b>Average - Central America</b>	<b>43.2%</b>	<b>33.1%</b>	<b>33.3%</b>	<b>38.1%</b>	<b>35.3%</b>	<b>35.9%</b>
<b>South America</b>						
Brazil	20.8%	17.0%	19.9%	17.0%	22.0%	16.7%
Chile	18.3%	28.2%	17.9%	27.7%	18.2%	25.2%
Colombia	30.0%	32.2%	29.6%	31.5%	28.7%	27.0%
Argentina	41.8%	39.9%	43.7%	38.6%	42.4%	38.0%
Peru	22.2%	31.0%	23.7%	29.4%	24.5%	27.3%
Ecuador	33.2%	37.5%	33.5%	34.0%	29.8%	30.1%
Bolivarian Republic of Venezuela	1.6%	35.8%				
Bolivia	61.7%	53.1%	71.6%	53.1%	72.0%	48.7%
Paraguay	56.9%	48.6%	58.9%	46.2%	53.4%	45.5%
Uruguay	42.2%	47.5%	39.6%	45.6%	37.3%	40.2%
<b>Average - South America</b>	<b>32.9%</b>	<b>37.1%</b>	<b>37.6%</b>	<b>35.9%</b>	<b>36.5%</b>	<b>33.2%</b>
<b>Latin America and the Caribbean</b>	<b>18.9%</b>	<b>19.9%</b>	<b>19.8%</b>	<b>19.2%</b>	<b>19.7%</b>	<b>17.8%</b>

Source: ECLAC 2014.

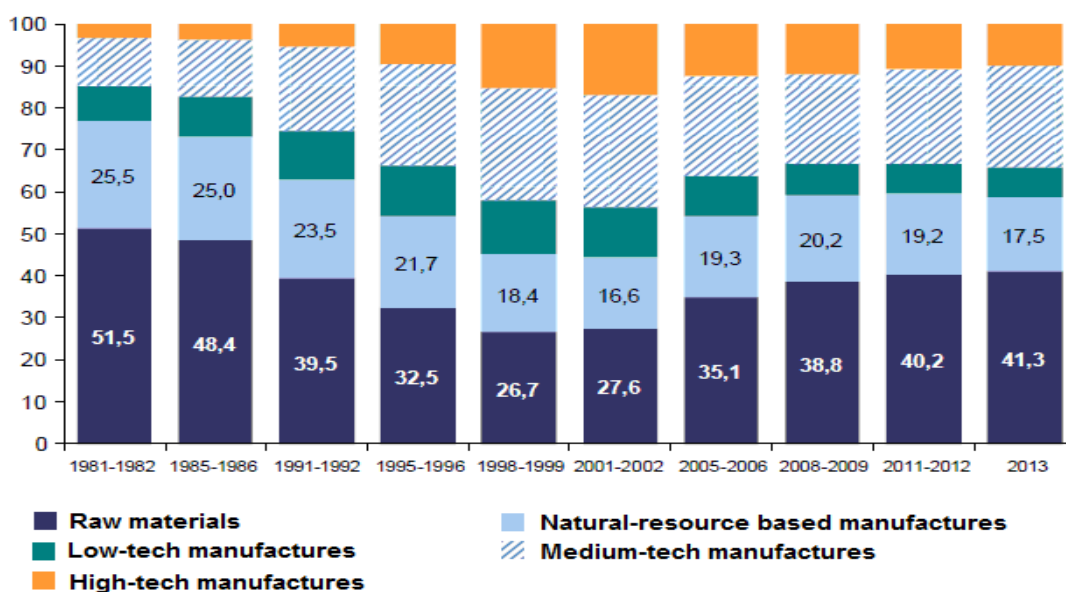
The strengths of Latin America and the Caribbean within the context of world trade can be summarized as follows:

- Existence of a generous endowment of mining natural resources with respect to the world total in countries such as Chile, Peru, Bolivia, Brazil and Mexico, highlighting products with a high global share: bauxite (20%), mine and refined copper (33%), gold (20%), iron (21.1%), mine zinc (19.4%), among others.
- In the area of energy, it is the second region of the world with major proven oil reserves after the Middle East, with 20% of the world total.
- The region intends to become an agri-food power, with 52% of the world production of soy, 16% of meat and corn, and 11% of milk. The accelerated process of urbanization and expansion of the middle classes in Asia and the rest of the developing world will significantly increase the demand for vegetables, fruit and fish (FAO, 2009), and, in general, for food with higher quality, sophistication and safety. The region has, therefore, a great potential to develop linkages among the extractive activities, the processing activities and the various modern services associated with the agri-food value chains.

In contrast, the region still faces a series of barriers and weaknesses that do not allow it to increase its participation in the global trade in goods. The main barriers can be summarized as follows:

- Low dynamism of exports in the last three years, both in volume (1% of the average growth) and value (-0.15%). This result contrasts with the values seen between 2004 and 2008, when exports grew at an average annual rate of 17%.
- Strong dependence on raw materials and commodities, particularly in South American countries, where they account for more than 40% of their export portfolios. These countries are highly dependent on the production cycles of Asia and Europe, with the latter being badly hit by the crisis of 2008-2009.

**CHART 2**  
**VALUES OF EXPORTS FROM LATIN AMERICA AND THE CARIBBEAN TO THE WORLD**



Source: ECLAC 2014.

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- Low number of exporting companies over the total number of enterprises in the countries of the region. Whereas in countries such as Belgium, France, United States or Spain the number of exporting companies is between 3.9% and 5.8%, in Latin America and the Caribbean it does not reach an average of 1%. The only countries standing out in this regard are Costa Rica, Uruguay and El Salvador, with 3.2%, 1.7% and 1.3%, respectively.
- Exports show a high concentration at the level of companies. On average, the first percentile of exporting companies concentrates a proportion higher than 70%.
- There is a high turnover of small businesses entering and exiting the export market in every country, considering that because of their scale they are highly dependent on the fluctuations of the destination market.

Logistics costs are an unresolved issue regarding foreign trade in Latin America and the Caribbean, as they are still very significant and reduce competitiveness of the region's export sector. According to the "Doing Business 2015" report of the World Bank, while the direct cost of exporting a 20-foot container can be classified as competitive with respect to the rest of the world's economies, there is a series of aspects such as the number of documents, time frames for transactions and the additional costs arising from inefficiencies in land interfaces at ports that make this indicator to be higher than those registered for other developing regions, and to affect the total logistic cost of foreign trade.

The *Logistic Performance Index*, also of the World Bank, has been published since 2007, with four issues: 2007, 2010, 2012 and 2014. The following table shows the average results obtained for each year by the various economies of Latin America and the Caribbean, broken down into the main four subregions.

**TABLE 2**  
**LPI INDICATOR 2007-2014, BY SUBREGION IN LATIN AMERICA AND THE CARIBBEAN**  
**AND COMPARISON WITH WORLD**

LAC subregions	Global LPI indicator				Comparative percentage according to global indicator 2014		
	2014	2012	2010	2007	% LAC	% World	% OECD
Mexico	3.13	3.06	3.05	2.87	113%	108%	85.0%
Average – Caribbean	2.61	2.42	2.55	2.28	94%	90%	70.9%
Average - Central America	2.82	2.72	2.76	2.56	101%	98%	76.6%
Average – South America	2.81	2.80	2.84	2.69	101%	97%	76.4%
Average – LAC	2.78	2.71	2.76	2.60		96%	<b>75.5%</b>
Average – World	2.89	2.87	2.87	2.74			78.5%
OECD	3.68	3.64	3.64	3.61			100.0%

*Source: Prepared by the author, based on LPI 2014, World Bank.*

Table 2 shows that in the global LPI ranking, Mexico, as a representative subregion in LAC, has the best logistic performance index, with sustained improvements since 2007. This assessment exceeds the world average, and stands at 85% of the average recorded for the economies of the Organization for Economic Cooperation and Development (OECD).



The subregion with the worst overall performance is the Caribbean, standing below the world average and the average for Latin America and the Caribbean. It is also well below the OECD average.

In general, Latin America and the Caribbean is, on average, **below the world average** (96%) **and well below the average of the OECD economies** (75.5%), which should lead us to conclude that many aspects taken into account in the LPI should be analysed very carefully and proceed to develop national and regional public policies that allow for reaching a better standard. The current situation is the result of a sum of factors, such as deficiencies in transportation infrastructure, poor efficiency of logistics services and major shortcomings in the simplification and rationalization of the procedures associated with foreign trade.

## 2. Port activity and container traffic in Latin America and the Caribbean

As in the rest of the world, South American ports are the main doors for entry and exit of trade flows. The differences in the dependence on maritime transport and the port activity itself hinge on the physical, geographic and economic conditions and on the transport infrastructure. The geographic location and the distances between countries, together with the existence of transport services covering those distances, have an influence on trade flows. Closest countries have more bilateral trade than more distant countries. This is explained partly by historical, political, cultural and linguistic reasons, and also by transportation costs and the time of delivery of the goods.

The port system for container traffic in the region is made up by a total of 57 major facilities. According to the number of ports and the specialization of each one, four large blocs can be clearly distinguished in this structure: Mexico, Central America, Caribbean and South America; on two coasts – Atlantic and Pacific – with different functionalities and very uneven relevance in terms of maritime flows.

The *throughput*<sup>2</sup> of containers in Latin American and Caribbean ports in 2013 accounted for 7.1% of the total movement of containers in ports around the world, reaching 46 million TEUs<sup>3</sup> (ECLAC 2014) and experiencing a 253% growth from 1997 to 2013. See Table 3, which details the total movement of TEUs and the relative weight of the various coasts in each subregion.

### ***Situation in Mexico***

Mexico, as a country of relative importance, has grown 430% during the period 1997-2013, reaching a share in total movements of 10.8%. Its West Coast is the most active with 3.31 million TEUs, three ports of importance and 1,000% growth during the period under analysis, reaffirming the importance of the Pacific basin for the country's foreign trade. In turn, on the East Coast, 1.46 million TEUs were mobilized in 2013 in two large ports.

The Mexican port system is beginning to play a major role, not only in its main function as a gateway for foreign trade of the second economy and populous country in Latin America, after Brazil, but it is also becoming a permanent alternative for shipping companies serving in the ports of the West coast of North America, which have been hit by high congestion and considerable

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<sup>2</sup> Throughput is the net volume of loads or information flowing through a system, as in a computer network.

<sup>3</sup> The abbreviation TEU (an acronym for the English term Twenty-foot Equivalent Unit) represents an inaccurate unit of measurement of capacity of maritime transport in containers.

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labour stoppages, and whose cargoes have the centre of the United States as destination. The ports on the Mexican West already are transshipment centres for an important flow of imports coming from Asia and have Central America and the South American Pacific coast as destination. Those cargoes are redistributed through *feeder* services to the ports of the South. Two major Mexican ports have competitive offers for shipping companies with post-panamax vessels: Manzanillo and Lázaro Cárdenas.

The Mexican Atlantic coast has not yet developed a competitive port bid vis-à-vis the progress of the ports of the Caribbean and the South of the United States, concentrating their market on Mexican imports from Europe and the Americas. Veracruz, the main port on the East Coast, has envisaged an ambitious expansion plan that will allow it to take advantage of the benefits that will mean an increased capacity traffic as of the start-up of the new Panama Canal.

**TABLE 3**  
**SHARE IN CONTAINER TRAFFIC BY SUBREGION, 1997-2013**  
**MILLIONS OF TEUs**

Subregion/Coast	Background	1997	2005	2013	% Growth 97-13	% Share Subregion
<b>Caribbean</b>	<b>TEUs</b>	<b>3.5</b>	<b>6.5</b>	<b>6.91</b>	<b>97%</b>	<b>15.6%</b>
	<b>N° Ports &gt; 100K</b>	<b>5</b>	<b>9</b>	<b>9</b>		
Mexico - East Coast	TEUs	0.6	1.03	1.46	143%	
	N° Ports > 100K	2	2	2		
Mexico - West Coast	TEUs	0.3	1.09	3.31	1003%	
	N° Ports > 100K	1	2	3		
<b>Mexico</b>	<b>TEUs</b>	<b>0.9</b>	<b>2.12</b>	<b>4.77</b>	<b>430%</b>	<b>10.8%</b>
	<b>N° Ports &gt; 100K</b>	<b>3</b>	<b>4</b>	<b>5</b>		
Central America - East Coast	TEUs	1.8	3.8	5.87	226%	
	N° Ports > 100K	5	5	5		
Central America - West Coast	TEUs	0.13	1.1	3.88	2885%	
	N° Ports > 100K	0	3	4		
<b>Central America</b>	<b>TEUs</b>	<b>1.93</b>	<b>4.9</b>	<b>9.75</b>	<b>405%</b>	<b>22.0%</b>
	<b>N° Ports &gt; 100K</b>	<b>5</b>	<b>8</b>	<b>9</b>		
South America - North Coast	TEUs	1.01	1.98	3.54	250%	
	N° Ports > 100K	3	3	5		
South America - East Coast	TEUs	3.2	7.4	11.18	249%	
	N° Ports > 100K	7	12	16		
South America - West Coast	TEUs	2	3.95	8.17	309%	
	N° Ports > 100K	5	8	13		
<b>South America</b>	<b>TEUs</b>	<b>6.21</b>	<b>13.33</b>	<b>22.89</b>	<b>269%</b>	<b>51.6%</b>
	<b>N° Ports &gt; 100K</b>	<b>15</b>	<b>23</b>	<b>34</b>		
<b>Total Latin America and the Caribbean</b>	<b>TEUs</b>	<b>12.54</b>	<b>26.85</b>	<b>44.32</b>	<b>253%</b>	
	<b>N° Ports &gt; 100K</b>	<b>28</b>	<b>44</b>	<b>57</b>		

Source: ECLAC 2014.

### ***Situation in the Caribbean***

The Caribbean subregion had a strong growth between 1997 and 2005, nearly doubling its capacity of movements of containers, basically due to the transshipment traffic which was positioned at its ports – a situation that has tended to stagnate over the past eight years, mainly because of the efforts made by countries such as Panama and Colombia to become transshipment centres for the shipping companies serving in Latin America. During the period 1997-2013, the Caribbean experienced the lowest growth rate in the region with only 97%, reaching 7 million TEUs in nine large ports and a regional participation of 15.6% of the total volume.

Inter-port competition in the Caribbean is high. Firstly, in the countries and islands of the Caribbean there are many ports and the distances between them are relatively short. The most important ones are Freeport in Bahamas; Kingston in Jamaica; San Juan in Puerto Rico; Rio Haina in the Dominican Republic; Port of Spain in Trinidad and Tobago; and Mariel in Cuba. Several of them have terminals specializing in containers and global operators working on their coastlines.

In addition to the port offer on the main islands of the Caribbean, some other mainland ports have entered the market of transshipment of containers: in Central America, the port of Colón in Panama; in South America, Cartagena de Indias in Colombia, and to a lesser extent, Puerto Cabello in Venezuela; and finally in North America, with the port of Miami emerging as a great competitor in coming years.

Secondly, the Caribbean region is crossed by the Pacific-Atlantic Axis that goes through the Panama Canal, which deals with an important portion of global trade and traffic. This turns Caribbean ports into a natural hub of one of the major axes of the international maritime network. Thirdly, in several of the aforementioned ports there have been successful privatizations which, in a few years, have modernized obsolete and inefficient ports. Fourthly, there are cases, such as that of Cartagena de Indias, in which inter-port competition is compounded by intra-port competition, thus creating a highly competitive environment.

### ***Situation in Central America***

Influenced by the significant growth of Panama's ports on both coasts, Central America grew 405% during the period 1997-2013, with nearly 10 million TEUs mobilized in 2013 and a share of 22% in regional trade. Central America has nine important ports. The East Coast has a greater participation with 5.87 million TEUs in five ports. The West Coast mobilized a total 3.88 million TEUs in four ports in 2013.

The ports of Central America face disparate situations in terms of competitiveness and quality of service to shipping routes. On the one hand, Panama has a strong leadership on both coasts, which has made the country the main transshipment centre of the Americas, serving both North-South routes and Pacific-Atlantic traffic. The ports of Balboa and Colon have a marked leadership in the transfer of containers and attention to post-panamax ships. The inter-port competition has also contributed to achieving this objective.

The rest of the subregion faces very different situations in terms of modernization and quality of port services. Although Guatemala has a significant amount of cargoes in its ports on both coasts, it has not developed specialized container terminals yet, unlike Honduras, Costa Rica, and more recently El Salvador, which have already done so.

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### ***Situation in South America***

Finally, South America is the most important subregion in terms of container traffic through its 34 ports. The subregion grew by 253% in total during the period 1997-2013, being the West coast the most dynamic one with a 309% growth in that period. This coast has 13 ports that mobilized a total of 8.17 million TEUs in 2013. However, the East coast continues to be main one of South America for container traffic, with Brazil leading the total number of movements. On this coast, 11.18 million TEUs were mobilized in 16 ports. Finally, the North coast of South America, the third one in terms of dynamism in the subregion, reached in 2013 a total of 3.54 million TEUs, with the ports of Colombia and their orientation to the transshipment market being the driving force.

### ***Situation on the South American Pacific coast***

Inter-port competition on the West coast of South America is low. Firstly, the maritime facade of the South Pacific is very long (3,000 nautical miles), it has approximately 16 ports able to serve container ships, but only five of them are really important: from North to South, Buenaventura, Guayaquil, Callao, Valparaíso and San Antonio, and the distances and sailing times between them are very long, with the exception of the last two ports.

Secondly, the freight land transport between ports is expensive, the frequency of services is low and the duration of the trip is high. There are no railway connections and borer crossings are hampered by transfer problems, insufficient infrastructure or lack of adequate services.

Thirdly, cabotage traffic is underdeveloped and transshipment facilities are low. Such operations are costly due to the loading and unloading of containers, the stay at the terminal and bureaucratic procedures.

One of the consequences of this situation of weak competition is the need for the public authorities to be especially vigilant in order to prevent situations of monopoly or abuse of dominant position. One alternative is to create intra-port competition, even though this option has the disadvantage that if the market is small, as it is the case, the existence of several companies can limit the exploitation of economies of scale in the provision of services for loading and unloading containers. Another option is tendering one single terminal for port and carefully regulating the rates and characteristics of the services.

The exception to this situation is Chile and its ports of San Antonio and Valparaiso, which are quite near, well connected and highly dependent on the loads coming from the capital, Santiago, and its metropolitan area. This natural geographic rivalry between the two ports, which should be monitored, adds up to a whole set of preventive measures to ensure effective competition adopted by the government on the occasion of the tenders of 1999.

In the case of some bulk transits, the situation is gradually changing due to the emergence of private ports, some of which even operate in the vicinity of major public ports. They have been created with investments made by large business groups that are also interested in the sector of cargoes.

### ***Situation on the South American Atlantic coast***

In comparison with the situation described above, in the Atlantic port competition is intermediate, lower than in the Caribbean because the Atlantic coast is located far from the main inter-oceanic East-West axis, but higher than in the Pacific, since the distances between ports are shorter, mainly in the Buenos Aires-Santos section area, and sailing times are also shorter.

Adding to this is the port liberalization in Argentina, the international projects to improve land and river connections – from the Buenos Aires-Colonia bridge to the waterway – and the improvements of the ports in the South of Brazil, such as Rio Grande. One factor that weakens this competition is the proximity of the large cargo centres to the ports, a fact especially noticeable in Buenos Aires and Montevideo and to a lesser extent in the case of Santos.

Competition is particularly intense in Río de la Plata. There, the ports competing in the same geographic market or area of influence include: Puerto Nuevo in Buenos Aires, Dock Sud in the province of Buenos Aires, TecPlata in the city of La Plata and, recently, the terminal of Zárate in container traffic, followed at greater distance by Montevideo, in Uruguay.

In Puerto Nuevo, Buenos Aires, there is also intense intra-port competition, which practically does not exist in the rest of South America. Such competition is the result of the initial purpose of the port reform to prioritise competition over the exploitation of economies of scale that could be gained from this activity.

## **II. PROGRAMME LATIN AMERICAN AND CARIBBEAN NETWORK OF DIGITAL AND COLLABORATIVE PORTS**

The ports of Latin America and the Caribbean (LAC) are entering a new phase of modernization that allows maritime and land transport to move towards new standards of service, leading to the reduction of costs in the global supply chain and thus improving competitiveness in foreign trade. The experiences in Europe and Asia point to a path beyond the port reforms and the increase of maritime transport, which aims at transforming ports and port areas into true critical links in global supply chains, where elements such as the Port Single Window (PSW) in interoperability with the Foreign Trade Single Window (VUCE) – within the context of generation of sustainability, productivity, low costs, and quality customer service – are the new inductors of competitiveness for a globalized trade.

A recent analysis conducted by the Programme CAF-LOGRA 2014 evidences the structural problem of Latin American economies in its logistic competitiveness component. Also, the historical evolution of the LPI (*Logistic Performance Index* of the Bank World) from 2007 to 2014, the average for Latin America remains below the world average (180 countries), and shows a stagnation which has not allowed countries such as Chile or Mexico to make substantial increases in their logistic competitiveness.

The Programme for the creation of the Network of Digital and Collaborative Ports, conducted by SELA through a technical cooperation agreement with CAF-development bank of Latin America, recognizes port logistic communities of Latin America and the Caribbean as one of the main drivers to improve competitiveness in foreign trade. The main objective of the program is: “to identify and promote best collaborative and institutional practices, characterized by the use of new forms of inter-organizational working, ICTs for electronic data exchange, efficient logistic processes and implementation of new and improved standards of cargo and transport services”.

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The first stage of the Programme started in 2014, with four (4) series of actions that included: exploratory activities, design of methodological instruments, pilot workshops and outreach activities.

The international experiences documented in the "exploratory activities" phase allowed for identifying the key areas for improving competitiveness of the port systems under analysis:

- **Infrastructure.** Transport service infrastructure – such as harbour lines, intermodal yards, truck centres and customs facilities for non-intrusive inspection of cargo out of container terminals – are some of the initiatives that allow for better cargo traffic in the various stages of the port logistic chain. Terminals are increasingly becoming fast-track zones for cargoes, both for foreland services (transshipment) and for hinterland services (import and export markets). Such precision and availability of infrastructure has led several ports to rethink their internal facilities and inter-port areas, as well as their impact in terms of service level for the users of maritime and land transport. It is increasingly more necessary to think of integral and intermodal infrastructure projects.
- **Level of service.** The main users of port transportation (land, sea or rail transport) are increasingly more dependent on the efficiency of the port logistic chain, and the role of ports, their facilities and the services provided. Since transportation is a narrow-margin sector, it is very sensitive to any type of inefficiency that may arise in port facilities, such as excessive service times due to poor planning of operations, or high levels of congestion in the maritime (bay) and land areas (rail and road accessibility). A joint effort to better manage the factors determining the level of service has been undertaken in many complex port systems, to better administrate available capacity and coordinate its use by sea and land users.
- **Legislation.** The port industry is an economic sector regulated by national and regional legislations. Many of these laws date back to the 1990s when the State participation in ports was deregulated worldwide, and they started to be run by the private sector through concessions of all types. While such measures allowed for greater investments in infrastructure and remarkable improvements in ship performance and maintenance, international experiences show that it is very important to make periodic reviews to regulations in order to reach new standards of service and efficiency. For example, maritime terminal concessions now include contracts that envisage the responsibility for companies take care of land congestions, i.e., to be in charge of the use of ports and access to them.
- **Public-Private Partnerships.** The last aspect to be highlighted as regards the best practices being used by the vast majority of the cases analyzed is the ability to generate "win-win" strategic alliances between traditional logistic and port organizations and other local and international actors, which allow for gaining access to new technologies, services and knowledge. Experiences of industrial private-public partnerships – such as port logistic communities, "clustering" of ports with local productive chains, inter-regional logistic corridors – are the new ways of positioning port hubs into the local, national and regional economy.

At the level of the port communities in Latin America and the Caribbean, under the first phase of the programme, and after a first round of technical visits that allowed for interviewing the great majority of relevant stakeholders for development logistics, port activity and foreign trade, the following aspects and general gaps were identified:

- While there are national plans (at the logistic or port level) and/or inter-institutional coordination, they have not incorporated all the national and local private actors and their

innovations. In addition, such plans do not envisage a thorough analysis of the needs for new logistic processes and enabling information technologies for a competitive scenario of foreign trade through ports.

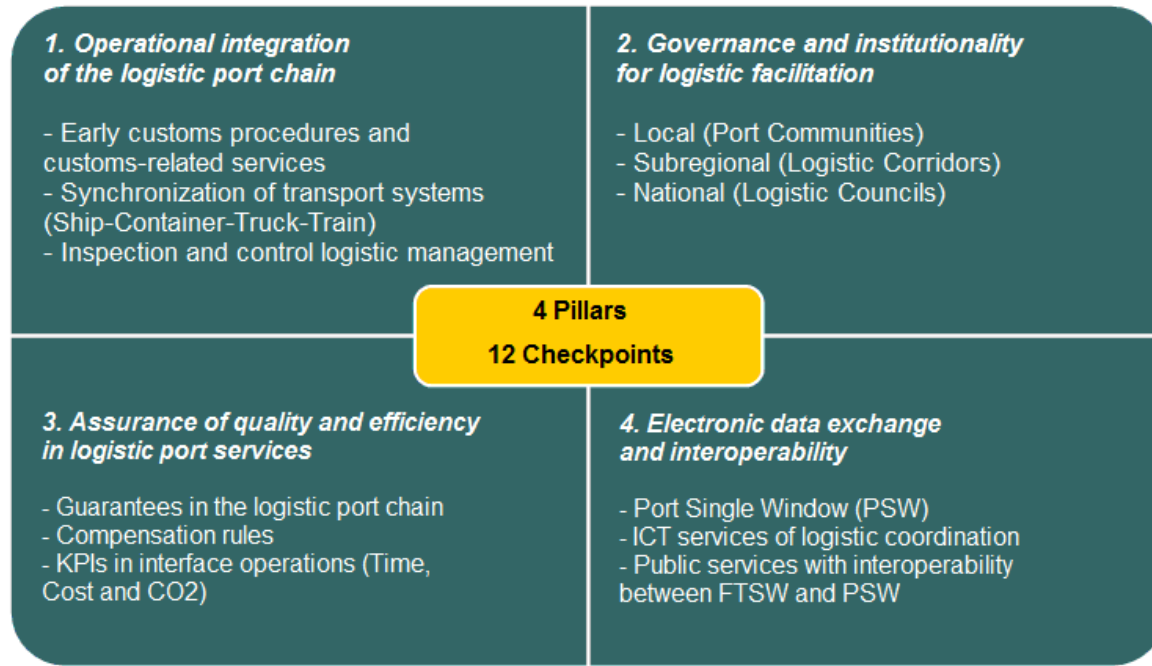
- The container terminals have high degrees of independence in Colombia, Peru and Panama. In Mexico and Chile the existence of port authorities limits the degree of flexibility (which is a strength and a weakness at the same time, since they do not implement projects for community facilitation).
- In their logistic components, FTSWs have made strides in Colombia and Peru. In Colombia there seems to be a better understanding of the role of the Single Window in logistic instances. In other countries it is still an emerging issue that deserves a greater communication effort with stakeholders.
- In general, there is a public-private understanding about where emphasis should be made in the model of logistic operation, fiscalization, control and technological support in ports. A reference model was welcomed by all respondents, who noted that such a model should always conform to the national and/or local reality, as the case may be.
- There is a belief that the leadership that government agencies directly involved in trade and transport facilitation can exercise under this programme is crucial to promote greater competitiveness.
- It is necessary to make progress with mechanisms for management change to review the current plans for logistic development (operation models, quality assurance, governance and technology), so as to help local port systems to carry out the necessary transformations to better serve its hinterland and foreland markets.
- Particularly FTSW projects are the entrance to introduce improvements in port logistic processes. Shipping coordination, integrated inspection and import cargo profiling are part of the challenges for the majority of the countries.
- The interaction of universities and innovation centres with the maritime port industry in the region is still low.

The Programme for the creation of the Network of Digital and Collaborative Ports promotes the improvement of competitiveness and productivity of integrated logistic chains among its members, by means of a self-assessment, diagnosis and treatment of gaps, on the basis of a reference model that includes four pillars and 12 checkpoints, designed as part of the second set of activities of the programme in 2014.

*The following chart illustrates the reference model of the Four Pillars of Competitiveness:*

### CHART 3

#### REFERENCE MODEL FOR COMPETITIVENESS OF THE PORT LOGISTIC CHAIN<sup>4</sup>



The proposed reference model is based on the best practices for Supply Chain Management (SCM). A definition of this approach to business is summarized below:

*"SCM for Port Logistic Chains can be defined as an administration that promotes an efficient integration and coordination of public-private actors involved in the planning, implementation and control of the of sea and land transport, and the flows of cargo and information (international trade documentation and service orders) from their source to their destination (hinterland and foreland), in an efficient and effective manner, in order to minimize the overall costs of the system, while meeting the service levels of importers and exporters (agility and predictability)" (Ascencio et al., 2014).*

Following is a description of each pillar of the reference model proposed, with their main triggers of competitiveness and productivity.

#### **Pillar N° 1: Operational Integration: Aligned processes in the port logistic chain**

This pillar focuses on planning and implementing operations and comprehensive processes in port logistic chains, with an emphasis on early management of information upstream the chain (before the cargo and/or transportation means arrives at port), and also on differentiating logistic lines within the chain.

<sup>4</sup> KPI, *Key Performance Indicator*, is a measure of the level of performance of a process; the value of the indicator is directly related to an objective set in advance. It is normally expressed as a percentage.



This is in line with a key principle of the SCM in the port logistic chain: "To balance the Capacity (Offer) with Orders of attention (Demand), as far as possible without incurring in inventories and extra-costs". In the case of ports, this definition can be interpreted as follows: "To balance the capacity of operations means sizing the scarce resources of a port with adequate care, by developing a detailed programme on what to do at every moment during the unloading, shipping and care of transport means."<sup>5</sup> For this purpose, it is essential to know very well the kind of attention that should be given at every stage of the chain of services.

In addition, the synchronization between transport means and the port specifically means not to incur unnecessary inventories in both subsystems in the logistic chain port; i.e., to minimize waiting times and times of attention to such transport means in the port stage. Particularly, on the ship it is necessary to handle all the information prior to its arrival to anchorage, the administrative approval from both the legal and the operational standpoints, its stay on pier and its departure from the port. For the land transport means, it is necessary to have all the customs and customs-related approvals for removal or dispatch of cargo, the programming of operations in the service area within the port, and the use of support infrastructure vis-à-vis operational exceptions.

Once these concepts are determined, actions should be taken such as concrete measures to allow the port logistic chain to gain a comprehensive vision of operations and processes. The first pillar intends to focus on three aspects promoting productivity:

- i. Early customs procedures and customs-related services
- ii. Synchronization of transport means
- iii. Differentiated management of the logistic line of inspections and control

### **Pillar N° 2: Governance and institutional framework: mobilizing trade facilitation and transport**

The definition of SCM focused on ports clearly points to the need for implementing operational excellence in an environment of consensus of the public and private sectors. Lately, the number of operations and stakeholders in the port logistic chain has contributed to the exponential growth of port complexity. Port environments are substantially growing in terms of organizational structures of influence, taking into account the business challenges in a port city environment with high social pressures, the lack of adequate infrastructure to connect ports with main roads or railways, and the constant pressures from importers, exporters and the government to open up more and better markets for foreign trade.

The best practice that has been implemented to gradually solve problems and take advantage of opportunities is to organize a comprehensive task force in each port area with the name of each port logistic community. Such structures correspond to the concept of "industrial clustering", which are very much in vogue in horizontal value chain environments (directly from supplier to supplier and from customer to customer, involving a few main products) and in vertical value chains (a series of commercial organizations which operate in a defined territory). We could say that a port is kind of a hybrid cluster, because it involves a horizontal value chain – the port logistic chain including importers and exporters, their representatives, the port and its service providers, and the maritime transport – and a vertical value chain, which is concentrated in a particular

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<sup>5</sup> A Collaborative Supply Chain Management for a Maritime Port Logistic Chain. Ascencio, Gonzalez-Ramirez. Journal of Applied Research and Technology. Volume 12. June 2014.

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territory and therefore requires a series of goods and services that are provided by local and/or regional organizations that take advantage from this integration space.

Such cluster feature must be understood and implemented at three levels:

- i. Port logistic community or local level
- ii. Logistic corridor or regional level
- iii. Programme for transport and trade facilitation or national level

### **Pillar N° 3: Orientation to client: Quality and efficiency of integral services**

Once again, the principles of the SCM clarify the key elements that must be present in the design of an efficient and competitive port logistic chain. The chain should be aimed at meeting the needs of customers or their representatives, so as to allow for a harmonious growth of demand and facilitate the continuous improvement of the services provided.

Quality and efficiency are central elements for a transport system, and particularly for a port with multiple stages managed by different actors. First, it must be understood that a lack of orientation towards quality and efficiency generates a non-sustainable environment, because quality problems – such as long waiting times, poor performance in terms of physical resources, administrative obstacles, failure to use new technologies or outdated regulations and operations – increase production costs in the long run, which are therefore transferred to customers.

Such inefficiencies, which are evidenced in low operational productivity, and in the worst cases in high fees, result in high transaction costs for clients and, ultimately, additional costs in foreign trade. The customers have two options: either they take up the costs of those inefficiencies and reduce the competitiveness of their products in domestic or foreign markets, or they simply resort to other ports, and even other countries.

When a port logistic chain seriously works on this pillar, its efforts should be aimed, at least, at these three measures:

- i. Define standards and guarantees for its integral services
- ii. Adequate compensation rules
- iii. Key Performance Indicators

### **Pillar N° 4: Technological Innovation: Electronic Exchange of data and interoperability**

Many of the elements analyzed thus far refer to new principles, paradigms and procedures that should be designed, implemented and controlled within a complex environment, such as a modern port logistics chain.

Even if there is a belief that a port may be unique, the international reality shows that there are various patterns and technological standards that have proved through time to be useful to a large number of ports and transport systems. The trend towards standardization emerges almost in unison with the creation and massive use of containers in the 1970s and 1980s. Already at that time, the main maritime routes and ports decided to establish standards for the administrative management of manifests and customs electronically. At present, many of these efforts have resulted in technology-based enterprises whose clients include the main ports of the world.

Technological innovations have been and will be fundamental for the administration of port logistic chains. The reference model includes three aspects that must be addressed by ports in order to enable stakeholders to reach higher productivity levels:

- i. Port Single Window (PSW) or *Port Community System*
- ii. Technological services for logistic coordination
- iii. Interoperability between PSWs and FTSW

The International Port Community System Association (IPCSA) defines these tools as “open and neutral electronic platforms that facilitate a smart and secure exchange of information among public and private stakeholders in order to improve the competitive position of a port logistic chain”. For this purpose, these tools “optimize, manage and automate the logistic operations of a port into a single delivery of data and connect it with the transport and logistic chains”.

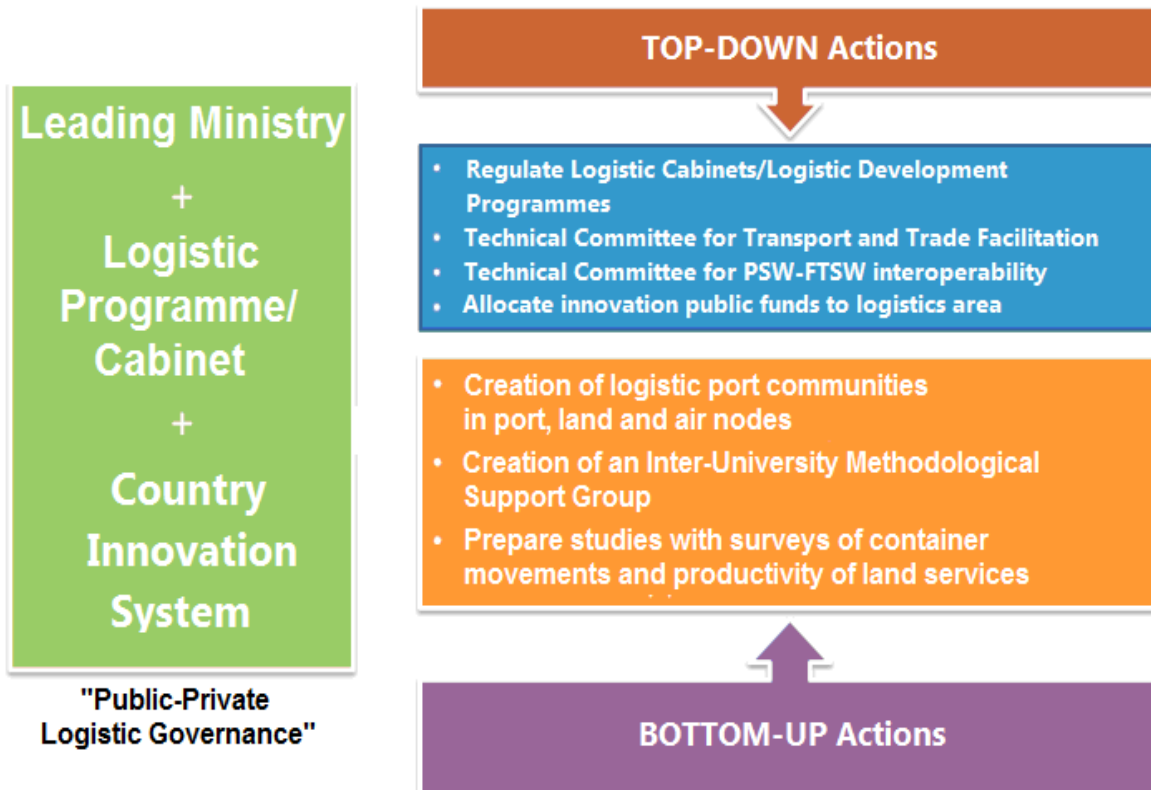
The PSWs combine a comprehensive project management and transformation management in port communities, regulatory standards for national and international documents and technologies and communications based on security and high-level operational continuity. All PSWs have a clearly defined technology provider in strategic alliance with the State, an organized port or port community, in addition to a “business and operation model” that allows for sustainability of these initiatives from the commercial standpoint.

In addition to transactional services, which are the main targets within the functions of a PSW, port communities should promote their integration and logistic coordination processes, along with high technological standards. Such services have gained great relevance, even in port environments that do not count on a PSW. Therefore, it can be concluded that large developments are not necessarily required to implement this type of innovation. The services that are provided through these ICT platforms are coordination of vehicle booking systems – for both maritime terminals and container storage – management systems of return of freight containers and traceability systems of containers in the port chain and transport stages.

Finally, this pillar addresses the challenge of interoperating national technologic projects, such as the Foreign Trade Single Window, with future PSW projects. For this purpose, bridges of understanding should be laid from both operating sides to allow for anticipating the needs for logistic coordination between a world based on inter-governmental integration and another one based on the private integration of logistic operations. Elements such as the exchange of information on customs-profiling and customs-related services for containers, an integrated system for cargo inspection in ports, an integrated system for inspection of ships, and a national database of truck drivers authorized to enter the port, emerge as key functionalities for interoperating in this type of environment.

### **III. RECOMMENDATIONS AND NATIONAL AND REGIONAL PUBLIC POLICY GUIDELINES**

In the working sessions of the Programme for the creation of the Network of Digital and Collaborative Ports in Latin America and the Caribbean thorough debates were held about the role that national and local actors should play to improve logistic competitiveness. The region’s conclusion was that it is necessary to make simultaneous strides on both fronts: TOP-DOWN, and BOTTOM-UP, as illustrated on the following chart.

**CHART 4****TOP-BOTTOM AND BOTTOM-UP ACTIONS TO IMPROVE LOGISTIC COMPETITIVENESS**

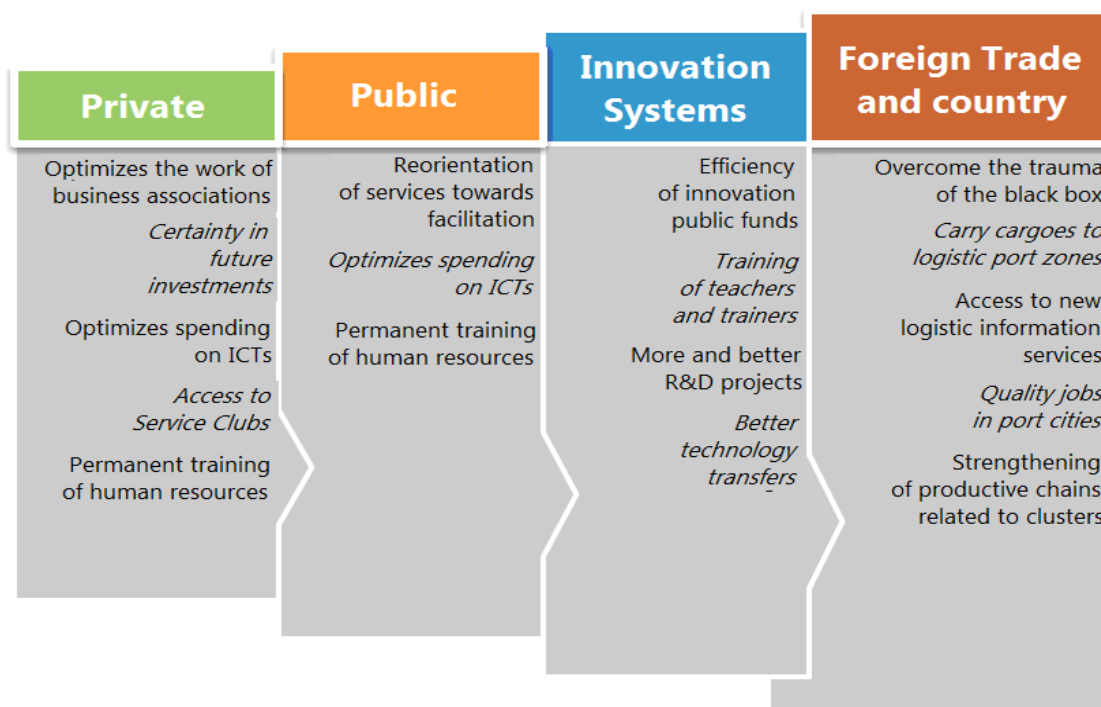
Source: SELA-CAF Programme "Network of Digital and Collaborative Ports".

At the structural country level, at least three actors or public areas are expected to be implemented and have a clear role to play in improving logistic competitiveness:

- A Leading Ministry.
- An area called Logistic Programme or Logistic Cabinet, with a Presidential mandate to deal with national policies on logistics and foreign trade facilitation.
- A Country Innovation System, which should have available public funds to promote institutional and technological initiatives within the national logistic system.

The impacts expected from the Programme on the various participating stakeholders include the private and public sectors, the innovation system, foreign trade, and the country as a whole. The following chart summarizes the main aspects.

**CHART 5**  
**IMPACTS OF THE PROGRAMME ON MAJOR AREAS**



Source: SELA-CAF Programme "Network of Digital and Collaborative Ports".

In addition, there are **five aspects** where efforts should be focused for facilitation, harmonization and standardization of port systems in the region:

- **Specialization of transport infrastructure.** The full incorporation of specialized terminals for containers with high operational and technological standards, which allow for providing a predictable service according to the current and future requirements of high capacity maritime transport. The 67 terminals existing in the region allow for anticipating a permanent improvement in service for the next 20 years. This network of companies ensures the inclusion of Latin America and the Caribbean into the global foreign trade networks.
- **Technologized Public Services.** Foreign Trade Single Windows are strategic projects for any country in the region, as they provide importing and exporting small and medium-sized enterprises with access at a low transactional cost when marketing their products in world markets. The FTSWs, with nearly 10 years of development in some cases, have made steady progress based on the best practices disseminated at the annual meetings that SELA has organized in this area, and also because of the interoperability of documents and transactions between national FTSWs of different countries.
- **Standardization of regional logistic observatories.** Measures for effectiveness of maritime, port and land interfaces are fundamental for measuring and improving the region's port logistic systems. There is still a long way to go to standardize time indicators, as well as cost and productivity indicators, so it is necessary to adopt a common and centralized approach to facilitate data collection, processing and dissemination at the regional level.
- **Governance 2.0.** Port logistic communities, as platforms for work and coordination of public-private partnerships in each port complex environment, can ensure improvements in the quality of services, standards, transparency and logistic fiscalization. The examples of

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Mexico, Chile and Argentina – the three LAC countries with better global Logistic Performance Indexes (LPI) – allow for predicting good results to the rest of the region.

- **Digital ports.** Port Single Windows (PSWs), as telematic platforms where telecommunication and informatics technologies converge, for the electronic exchange of data among the main stakeholders of port logistics chains, have reached significant levels of maturity in the major regions of the world. PSWs can perfectly adapt themselves to the realities of any port system in any country. Therefore, the analysis, design, funding and implementation of PSWs should be fostered in the next 10 years.
- **Regional policy as future goals.** Based on similar schemes to those promoted in Europe and Asia, the following guidelines for regional public policies related to ports are proposed:

### 1. Institutional Programmes

Sub-programme for harmonization of policies, with the main purpose of promoting the harmonization of regulations governing the functioning of the port system and services.

Sub-programme for coordination among government agencies. Its main purpose is to promote the development of mechanisms for collaboration among the various public entities operating on each port and their peers in other ports.

Sub-programme for modernization of public entities. Its main purpose is to support the modernization of procedures, to improve technical resources, rationalize the organization, train workers, increase transparency and fight against corruption.

### 2. Water Infrastructure Programme

Main purpose: To contribute to carrying out shelter or protection works, dredging and construction of docks that ensure sufficient draught and an adequate capacity to meet demand for services.

### 3. Land Infrastructure Programme

Main purpose: To contribute to eliminate bottlenecks at entry and exit ports, by making direct, seamless connections from ports to the main land roads and developing intermodal transport means.

### 4. Programme for Quality at Port Communities

Main purpose: To promote the implementation of comprehensive systems to ensure the quality of port services and public-private governance.

### 5. Programme on Information Systems

Main purpose: To promote the development of information systems to electronically integrate port chains and minimize the use of physical documents.

### 6. Programme on Training of Human Resources

Main purpose: To promote the offer of training activities to enhance the capacity of human resources, dignify their working conditions – especially dockers – and reduce occupational hazards.

**7. Environment Programme**

Main purpose: To promote the implementation of comprehensive systems for environmental protection at ports.

**8. Security Programme**

Main purpose: To support the improvement of security and safety conditions for persons and goods at ports, and conform to the new requirements of the European Union and the United States.

**9. Programme on Logistic Zones**

Main purpose: To promote the necessary measures in order to facilitate the construction of areas specialized in providing logistic services linked to maritime transport.





**BIBLIOGRAPHY**

- CAF. IDEAL 2013. La infraestructura en el desarrollo integral de América Latina. José A. Barbero. 2013. [http://www.caf.com/\\_custom/static/ideal\\_2013/index.html](http://www.caf.com/_custom/static/ideal_2013/index.html).
- CAF. Perspectivas económicas para América Latina 2014. Logística y Competitividad para el Desarrollo. 2014. CAF. OECD. ECLAC. [http://www.keepeek.com/Digital-Asset-Management/oecd/development/perspectivas-economicas-de-america-latina-2014\\_leo-2014-es#page1](http://www.keepeek.com/Digital-Asset-Management/oecd/development/perspectivas-economicas-de-america-latina-2014_leo-2014-es#page1).
- ECLAC. Anuario Estadístico de América Latina y el Caribe. 2014.
- ECLAC. Logística y facilitación del comercio entre la Comunidad del Caribe y Centroamérica. Martha Cordero. July 2014. <http://www.cepal.org/es/publicaciones/logistica-y-facilitacion-del-comercio-entre-la-comunidad-del-caribe-y-centroamerica>.
- ECLAC. Políticas portuarias. Octavio Doerr. December 2011. <http://www.cepal.org/es/publicaciones/politicas-portuarias>.
- ECLAC. Principios de políticas de infraestructura, logística y movilidad basadas en la integralidad y la sostenibilidad. Giorgina Cipoletta. November 2011. <http://www.cepal.org/es/publicaciones/principios-de-politicas-de-infraestructura-logistica-y-movilidad-basadas-en-la>.
- ECLAC. Boletín FAL. Issue 330. Number 2. 2014. América Latina y el Caribe: Evolución del sistema portuario, 1997-2013. <http://www.cepal.org/cgi-bin/getProd.asp?xml=/Transporte/noticias/bolfall/2/53732/P53732.xml&xsl=/Transporte/tpl/p11f.xsl&base=/transporte/tpl/top-bottom.xsl>.
- ECLAC. Boletín Marítimo y Logístico. Nuevos escenarios del transporte marítimo. Los puertos requieren un cambio de gobernanza para consolidar su futuro. December 2014.
- SELA. Programa para la Creación de la Red de Puertos Digitales y Colaborativos de América Latina y el Caribe. Phase 1, December 2014.
- SELA. VI Encuentro Regional Latinoamericano y del Caribe sobre Ventanillas Únicas de Comercio Exterior: las VUCE y su integración con diferentes eslabones de la cadena internacional de suministro. <http://www.sela.org/view/index.asp?ms=258&pageMs=124539>.
- UNCTAD. Review of Maritime Transport. 2014.
- A Collaborative Supply Chain Management for a Maritime Port Logistic Chain. Ascencio, Gonzalez-Ramirez. Journal of Applied Research and Technology. Volume 12. June 2014. [http://www.jart.ccadet.unam.mx/jart/vol12\\_3/10\\_aCollaborative.pdf](http://www.jart.ccadet.unam.mx/jart/vol12_3/10_aCollaborative.pdf).