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Diagnosis Of the Reality of Algerian Ports According to the Logistics Performance Index

Rahma Belhadef [1]

[1] *Industrial Policy and Development of External Exchange Laboratory (POIDEX), Abdelhamid Ibn Badis University, Mostaganem (Algeria).*

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Abstract:

Through this study, we aim to diagnose the reality of Algerian ports based on logistics performance indicators, given that port performance depends largely on the efficiency of the logistics system as a whole, including transportation infrastructure, tracking, customs procedures, and others.

The study reached a set of results, the most important of which is that port efficiency is an integral part of the efficiency of the logistics system. Despite improvements in logistics performance in some years, it remains weak and below the required level, which has negatively impacted port efficiency. algerian Ports still face numerous challenges related to weak infrastructure, complex procedures, low operational efficiency, and the unequal distribution of tasks , among others, which has constituted an obstacle to their development despite the efforts made.

Keywords: *Maritime transport, Algerian ports, logistics performance indicators, foreign trade.*

Jel Classification Codes : *F10, R41.*

Corresponding Author : *Rahma Belhadef , Email: rahma.belhadef@univ-mosta.dz*

1. Introduction:

Algerian ports are among the most important pillars of the country's economic infrastructure, given their vital role in supporting foreign trade and facilitating access to global markets. As a coastal nation with more than 1,200 km of Mediterranean coastline, Algeria's ports serve as strategic hubs for the transport and distribution of goods, both for export and import. There are more than 10 ten major commercial ports that play pivotal roles in the movement of goods, particularly hydrocarbons, which constitute the majority of Algerian exports.

However, this sector faces significant challenges related to operational efficiency, weak integration with domestic transport networks, delayed adoption of digital systems, and limited availability of supporting logistics services.

Ports are a fundamental component of the logistics system. Conversely, port performance largely depends on the overall efficiency of the logistics system, including transport infrastructure, tracking capabilities, and customs procedures. Therefore, improving port efficiency requires strengthening various aspects of the logistics chain, such as infrastructure development, operational coordination, and the implementation of modern technologies. This interdependence between ports and logistics underscores the importance of evaluating port efficiency using logistics performance indicators.

- **Study problem:**

The research problem is represented in the following question: What is the reality of the performance of Algerian ports in light of global logistics performance indicators?

- **Hypotheses**:

Despite the efforts made by Algeria to develop the maritime transport sector, it has not been able to enhance the efficiency of its ports to a level that enables them to compete with international ports, due to the limited effectiveness of the supporting logistics system.

- **Importance of the study:**

This research derives its importance from the vital role that ports play in facilitating trade exchanges. Therefore, diagnosing their performance according to an approved global indicator such as the "Logistics Performance Index" contributes to providing a clear picture of the current challenges and opportunities available to improve the efficiency of Algerian ports and develop them in accordance with standards of international ports .

- **study Objectives:**

- Reviewing the components of the maritime transport sector in Algeria;
- Clarifying the key role of the maritime transport sector in Algeria’s foreign trade;
- Evaluating the performance of Algerian ports in light of global logistics performance indicators;
- Highlighting the most significant efforts made by Algeria to enhance port efficiency;
- Identifying the major challenges that hinder the development of Algerian ports in accordance with international standards;
- Contributing to the development of proposals aimed at improving the efficiency of Algerian ports in particular and improve logistics performance in general.

- **Research Methodology:**

The analytical method was adopted in this research by analyzing various indicators that diagnose the reality of Algerian ports.

2. The Infrastructure of the Maritime Transport Sector in Algeria:

2.1. Major Algerian ports:

Ports constitute a cornerstone of Algeria's transport and foreign trade infrastructure, owing to its coastal geography and strategic location along the Mediterranean Sea. The country boasts a 1,200 kilometer coastline, with numerous ports distributed along its shores. These include three major multi-functional ports (Algiers, Oran, and Annaba) alongside three oil ports (Arzew, Skikda, and Bejaia) as well as several other commercial ports, such as Djen Djen, Mostaganem, Ghazaouet, and Ténès. The following table presents a detailed identification card for each port.

Table (1) : Major Algerian ports

Major Ports	
Algiers Port	With a total area of 126 hectares, the port includes three docks covering 184 hectares, quays extending 8,609 meters, and a grain silo with a capacity of 30,000 tons. It also features a marine terminal capable of handling 350,000 passengers annually, and a container terminal with a capacity of 6,200 containers equipped with a container scanner.
Annaba Port	Covering a total area of 89 hectares, this port comprises three docks totaling 104 hectares, quays measuring 3,455 meters, and a grain silo with a storage capacity of 16,000 tons. It is also equipped with specialized facilities, including a marine terminal accommodating 30,000 passengers annually and a container terminal occupying an area of 10 hectares.
Oran Port	With a covered area of 16 hectares, the port includes seven docks spanning 164 hectares, quays stretching 4,200 meters, and a grain silo with a capacity of 40,000 tons. It also contains a marine terminal capable of handling up to 4,500 operations per day and a container terminal with a capacity of 4,200 containers.
Oil Ports	
Arzew Port	With a total area of 24 hectares, including 1 hectare of covered space, the port comprises three basins totaling 153 hectares and quays measuring 1,730 meters in length. It also includes a cement silo with a capacity of 1,800 tons and a waste unloading station extending 6,000 meters.
Skikda Port	Covering a total area of 51 hectares, of which 17 hectares are covered, the port features two basins totaling 43 hectares and quays extending 1,860 meters. It also includes a grain silo with a capacity of 20,000 tons and a marine terminal with an annual capacity of 12,000 passengers.
Bejaia Port	Spanning a total area of 44 hectares, including 2 hectares of covered space, the port contains three docks totaling 156 hectares and quays with a total length of 2,200 meters. It is equipped with specialized facilities, including a marine terminal with an annual capacity of 45,000 passengers and two grain silos with capacities of 30,000 tons and 120,000 tons, respectively.
Other Commercial Ports	
Djen Djen Port	With a total area of 104 hectares, including 1 hectare of covered space, the port features one basin covering 180 hectares and three quays with a combined length of 1,995 meters. It also has a 23 km railway network. The container terminal has a storage capacity of 6,200 containers arranged over three levels and is equipped with a container scanner.
Mostag-anem Port	Spanning a total area of 68 hectares, including 2 hectares covered, the port consists of two basins measuring 14 and 16 hectares, respectively, and quays with a total length of 1,995 meters. It also includes a bitumen plant with a capacity of 4,700 tons and a grain silo with a capacity of 30,000 tons.
Ghazaouet Port	With a total area of 28 hectares, including 1 hectare of covered space, the port includes three basins totaling 153 hectares and quays extending 1,800 meters. It houses a grain silo with a capacity of 1,800 tons and a waste unloading station covering 6,000 meters.
Ténès Port	Covering a total area of 75 hectares, the port consists of a single basin of 17 hectares and quays with a total length of 4,200 meters. It also includes a grain silo with a capacity of 5,500 tons and a weighbridge with a capacity of 50 tons.

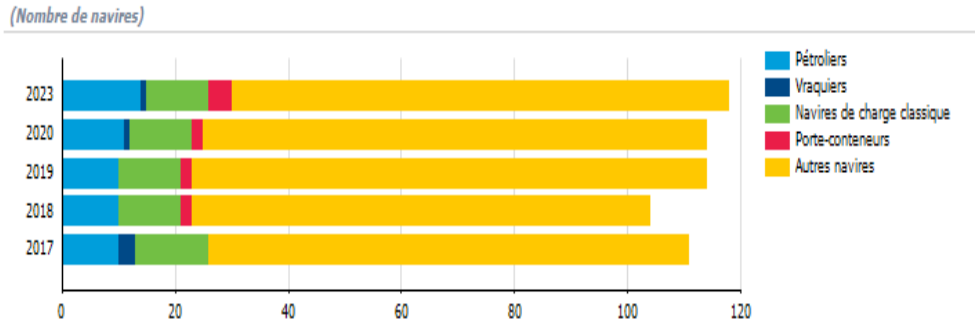
The source : (hanachi, bali, & bali, 2020, pp. 808-809)

2.2. The Algerian Maritime Fleet:

Figure n°1 shows the evolution of the number of vessels in the Algerian naval fleet during the period 2017–2023, based on UNCTAD data.

The number of vessels increased during the period, reaching a peak of approximately 120 vessels in 2023. This is due to a significant increase in oil tankers, which reflects Algeria's interest in strengthening its naval fleet with oil tankers, as they represent Algeria's most important export. In addition, the number of container ships increased in 2023. Meanwhile, there is a decline in the number of bulk carriers and classic ships.

Figure (1): Fleet by vessel type



The source : (UNCTAD)

There is significant change in maritime transport capacity by vessel type during the period 2005–2023, with the total capacity declining from 913.0 thousand DWT to 651.7 thousand DWT, representing a decrease of 28.6%. This decline is mainly due to the reduction in certain vessel types, such as bulk carriers, which dropped from 288.0 thousand DWT to 53.5 thousand DWT. In contrast, oil tankers have witnessed a substantial increase in transport capacity in recent years, rising from 17.2 thousand DWT in 2015 to 72.2 thousand DWT in 2023. Meanwhile, container ship capacity reached 82.6 thousand DWT in 2023. The capacities of classic ships and other vessel types have fluctuated between improvement and decline.

Table (2): Transport capacity by vessel type (thousands of DWT)

	2005	2010	2015	2023
Total fleet	913	764.6	802	651.7
Oil Tankers	47	25.1	17.2	72.2
Bulk Carriers	288	204.3	149.6	53.5
Classic Ships	135	64.5	112.7	105.7
Container Ships	-	-	00	82.6
Other Ships	443	470.7	522.6	337.8

The source : (UNCTAD)

2.3. Institutional framework:

Maritie transport subject to public law was assigned to the Algerian Maritime Transport Group (GATMA), established on February 14, 2016, pursuant to State Shareholding Company (CPE) Decision No. 01-145 dated May 17, 2015. The group was created with the aim of managing maritime transport activities for both passengers and cargo, as well as related services, including ship and cargo agency, brokerage, transit, shipbuilding, and repair, as illustrated in the following table. (kennouche & Dehimi, 2023, p. 40).

Table (3): GATMA group

Activities	Subsidiaries
Passenger transport	– ENTMV: National Maritime Passenger Transport Company
Freight transport	– CNAN Nord: National Navigation Company North AND: with stakes (45%) in RTC (Rouiba Dry Port) with Rail Logistique (SNTF) – CNAN Med: National Navigation Company Mediterranean in partnership with the Italian company Dario Perioli (49%).
Maritime auxiliaries	– GEMA (Société Générale Maritime) is involved in the SIH ALC Group (Algeria Ligabue Corporation), a catering company specialized in life bases in the South, as well as in the SAIDAL Group. – FILTRANS (International Transit Transport) – NASHCO (National Shipping Company) – ISA ANVERS (International Shipping Agencies Anvers/ Belgian law company) – CNAN ITALIA (National Navigation Company CNAN ITALIA/ Italian law Company)
Shipbuilding and repair	– ERENAV (Ship Repair Company)

The source : (Ministry of Transport, 2020, p. 10)

2.3.1. Freight fleet: The Algerian freight fleet comprises ten vessels, seven of which are operated by CNAN Nord, while the remaining three are managed by CNAN Med. These vessels were acquired between 2014 and 2017 under the investment plan approved by the CPE. The following table presents the vessels that constitute the GATMA Group's freight fleet. (kennouche & Dehimi, 2023, p. 41)

Table (4):Cargo ships of the GATMA group

Company	Ship	Type	Acquisition Date	Deadweight tonnage	Number of Containers	Acquisition Price (Million USD)
CNAN Nord	STIDIA	Multi-purpose for transporting heavy, reinforced parcels and equipped for container transport.	2011/2014	9095	681	15.4
	SEDRATA		2011/2014	9095	681	15.4
	SAOURA		2012/2014	9095	681	16.4
	KHERATA		2012/2014	12767	665	19.8
	CONSTANTINE		2012/2015	12767	665	19.5
	TINZIREN		2016	12460	864	25.5
	TIMGAD		2016/2017	12500	864	25.5
CNAN Med	GORAYA		2010/2014	9822	631	14.5
	TITIERI		2016	11816	813	25.1
	TAMANRASSET	Cellular Container Ship	2017	19319	1700	27.5
Total investments of both companies						**204.3**

The source : (Ministry of Transport, 2020, p. 08)

Although the Algerian maritime fleet consists of ten vessels capable of transporting goods, these vessels are not being utilized by CNAN Nord and CNAN Med. This is primarily due to the unsuitability of the seven vessels owned by CNAN Nord for the needs of the national market. Similarly, the three vessels owned by CNAN Med are not in use due to their non-compliance with international maritime transport standards.

The underutilization of these ten vessels has negatively affected the financial position of both companies, given the high operating and maintenance costs. Furthermore, both companies face a

shortage of qualified personnel required to properly operate and maintain the technologically advanced vessels. This situation has hindered Algeria's ability to keep pace with the growth in global maritime freight traffic.

In addition to the two Algerian freight shipping companies, CNAN Nord and CNAN Med, there are: (kennouche & Dehimi, 2023, pp. 42-43)

- Nolis, a subsidiary of the Cevital Group operating under private law, manages the AZAO and TAMGOUT vessels for the transportation of bulk cargo .
- Global Motors has been accredited to operate in container transport.

2.3.2. assenger transport fleet : The Algerian Maritime Transport Company for Passengers owns three ships, acquired in 1995, 2004, and 2005. A fourth vessel was added to the fleet at the end of 2021. The company also operates two single-hull ships dedicated to urban maritime transport. Table (08) presents the composition of the fleet of the Algerian Maritime Transport Company for Passengers. (kennouche & Dehimi, 2023, p. 44)

Table (5) :fleet of the maritime passenger transport company

Company	Ship	Type	Acquisition Date	Number of passengers	Number of Tourist vehicles
The National Company for Maritime Passenger Transport	Tarik Ibn Ziyad	International Maritime Passeger Transport Car-ferries	1995	1300	500
	El Djazairia 2		2005	1300	300
	Tassili 2		2014	1300	300
	Badji Mokhtar 3		2018/2021	1800	600
	Seraidi	Urban Passeger Transport	2011/2015	206	00
	Badji Mokhtar		2011/2015	206	00

The source : (Ministry of Transport, 2020, p. 06)

3. The role of maritime transport in Algeria's foreign trade :

3.1. Maritime Trade in Algeria :

Maritime transport contributes to 95% of foreign trade. According to UNCTAD data, Algeria's maritime trade volume amounted to approximately 765,000 tons in 2010, rising to 802,000 tons in 2012. However, it declined in 2013 and 2014 due to fluctuating oil prices, before rebounding in 2015 to 796,000 tons. It then declined again during the period 2016–2018, reaching only 640,000 tons in 2018 as a result of Algeria's austerity policy.

Table (6): Evolution of Maritime Trade Volume in Algeria (2010-2018)

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018
Thousand Tons	765	787	802	748	749	796	763	743	640

The source : (UNCTAD)

3.2. Algerian Exports:

Algerian exports between 2006 and 2023 experienced significant fluctuations, reflecting their reliance on energy prices. The early years of the period were marked by strong growth, with exports increasing from $54.7 billion in 2006 to $78.1 billion in 2008, fueled by rising oil prices on international markets. However, this upward trend was short-lived, as exports dropped to $45 billion in 2009 due to the impact of the global financial crisis. Between 2010 and 2014, exports saw a relative rebound, fluctuating between $57.2 billion and $71.6 billion, before declining again to $55.4 billion in 2014. The years 2015 to 2020 witnessed a sharp downturn, with exports plunging to $21.9 billion in 2020 ,the lowest level during the entire period due to falling energy prices and the effects of the

Covid-19 pandemic. In the following period, from 2021 to 2023, exports recovered notably, reaching $65.1 billion in 2022, before declining once more to $55 billion in 2023.

Table (7): Total Algerian exports (2006-2023)

Years	2006	2007	2008	2009	2010	2011	2012	2013	2014
M.$	54733.7	60183.1	78113.6	45078.2	57219	72874	71622	65020	55443
Years	2015	2016	2017	2018	2019	2020	2021	2022	2023
M.$	37787	29087	34925	41115	35312	21925	38447	65105	55061

The source : (Arab Monetary Fund, 2011, p. 396), (Arab Monetary Fund, 2015, p. 477) , (Arab Monetary Fund, 2018, p. 370) (Arab Monetary Fund, 2024, p. 422)

3.3. Algerian Imports:

Algerian imports witnessed a remarkable development during the period from 2006 to 2023, recording an upward trend between 2006 and 2014, rising from $20.6 billion to $60.2 billion, driven by rising oil revenues that strengthened the country's ability to finance its imports. However, this trend reversed starting in 2015 due to the decline in global oil prices, which led to a gradual decrease in the volume of imports, reaching $46.1 billion in 2017. This decline continued until 2022, when imports reached their lowest level of $38.8 billion. Algerian imports then rose to $41.6 billion in 2023.

Table (8): Total Algerian imports (2006-2023)

Years	2006	2007	2008	2009	2010	2011	2012	2013	2014
M.$	20680.1	25992.3	37444.2	36754.7	37806	46459	44694	52040	60246
Years	2015	2016	2017	2018	2019	2020	2021	2022	2023
M.$	51501	47133	46129	48292	44323	35421	37405	38860	41616

The source : (Arab Monetary Fund, 2011, p. 396), (Arab Monetary Fund, 2015, p. 477) , (Arab Monetary Fund, 2018, p. 370) (Arab Monetary Fund, 2024, p. 422)

4. Evaluation of the efficiency of Algerian ports :

4.1. Logistics Performance :

Trade, supply chains, production processes, and economic integration between countries depend heavily on efficient port systems and the logistics that support them. Therefore, the Logistics Performance Index (LPI) was developed, which provides a comprehensive ranking of countries by examining six components of the index: the efficiency of customs clearance processes, the presence of trade and transport infrastructure, the ease of arranging shipments at competitive prices, the availability of logistics services, the ability to track and trace shipment routes, and the rate of shipments arriving at their destinations on time. (Madani, 2021, p. 556)

Algeria's Logistics Performance Index (LPI) experienced uneven development between 2007 and 2023. In 2007, Algeria ranked 140th globally with a low score of 2.06, reflecting the limited efficiency of its logistics system at the time. However, the subsequent period witnessed gradual improvement, with Algeria rising to 75th place in 2016, achieving its best performance with a score of 2.77. This improvement reflects efforts to upgrade infrastructure, develop customs systems, and enhance logistics services. Nevertheless, this progress was not sustained, as Algeria’s ranking dropped significantly to 117th place in 2018, with a score of 2.45. In 2023, Algeria recorded a slight improvement, ranking 97th with a score of 2.5. Despite this relative progress, Algeria's logistics services performance remains weak compared to some Arab countries: Qatar and Bahrain ranked 34th with a score of 3.5, followed by Saudi Arabia in 38th place with a score of 3.4, Kuwait in 51st place with a score of 3.2, and Egypt in 57th place with a score of 3.1.

- **Customs :** Customs performance in Algeria has experienced fluctuating developments over the period from 2007 to 2023. In 2007, Algeria ranked very low (148th globally) with a score of 1.60,

reflecting significant difficulties in customs procedures and weak border transaction efficiency. However, the subsequent years witnessed notable improvements, particularly in 2014, when Algeria achieved its best-ever ranking (66th globally), despite a score of only 2.17. Although Algeria attained its highest score 2.37 in 2016, its ranking declined to 108th, indicating that the improvement in domestic performance was not matched by a relative improvement at the global level. Subsequently, Algerian Customs experienced a significant decline in 2018, before recording a relative improvement in 2023, reaching 101st place with a score of 2.3. These results highlight the need to continue reforming customs systems and enhancing their effectiveness to ensure greater competitiveness in logistics performance.

- **Infrastructure :** Algeria experienced significant fluctuations between 2007 and 2023. In 2007, it recorded its lowest performance, with a score of 1.83 and a global ranking of 139th, reflecting a weak logistics infrastructure.

In 2010, a relative improvement was observed, with the score rising to 2.06 and the ranking improving to 122nd. However, this progress was not sustained, as Algeria returned to its 2007 ranking of 139th globally in 2012, accompanied by a slight decline in the score to 2.02.

A notable improvement occurred in 2014, with the score increasing to 2.54 and the ranking improving significantly to 87th. This positive trend continued until 2016, when the score reached 2.58 and the ranking rose to 80th globally, the best performance during the period.

However, performance declined again in 2018, with the score falling to 2.42 and the ranking dropping to 96th. By 2023, the score had declined further to 2.10, placing Algeria 125th globally.

- **International shipments :** Algeria witnessed a significant improvement in this index between 2007 and 2023. In 2007, it recorded its lowest score, at 2.00, with a global ranking of 139th. However, performance improved notably in 2010 and 2012, with scores rising to 2.70 and 2.68, respectively, and rankings improving to 98th and 89th globally. This reflects a clear enhancement in Algeria's ability to facilitate cross-border logistics operations .In 2014, the score declined again to 2.54, accompanied by a drop in ranking to 117th. Nevertheless, in 2016, the score increased to 2.80, and Algeria ranked 77th globally , one of the highest rankings during the period. In 2023, Algeria achieved a qualitative leap in this indicator, with the score reaching 3.00 , the highest throughout the period studied ,and a global ranking of 57th, indicating a tangible improvement in the efficiency of executing international shipments.
- **Logistics competence :** Algeria's performance during the period from 2007 to 2023 fluctuated significantly, reflecting instability in the quality of logistics services provided. In 2007, Algeria recorded its lowest score with a score of 1.92 and a global ranking of 139th, indicating weak logistics services. Despite a slight improvement in 2010,when the score rose to 2.24 and the ranking improved to 129th, this progress was not sustained. Performance declined again in 2012, with the score dropping to 2.13 and the ranking deteriorating to 145th. This indicates that Algeria’s development in this area has been slower than that of other countries.

In 2014, Algeria began to witness significant improvement, as the score increased to 2.54 and the ranking improved to 102nd. This positive trend continued, culminating in 2016, when Algeria achieved its highest score during the period under review (2.91) and its best global ranking (59th). However, performance declined once again in 2018, with the score dropping to 2.39 and the ranking falling to 113th. This downward trend continued in 2023, with the score declining to 2.20 and the ranking dropping further to 126th globally.

- **Tracking & tracing :** The Track and Trace Index (T&T) is one of the most important Logistics Performance Indicators (LPIs), measuring a country's ability to accurately and efficiently track and monitor shipments across the supply chain. Algeria's performance fluctuated between 2007 and 2023.

In 2007, Algeria recorded its lowest score of 2.27 and ranked 109th, reflecting weak digital tracking and tracing capabilities. In subsequent years, performance declined further, with the ranking

deteriorating significantly in 2010, reaching 138th, while the score remained at 2.26, indicating a relative lag in keeping pace with international developments in this area. However, Algeria recorded a gradual improvement from 2012 (2.46) to 2016, when the index peaked at 2.86. Algeria then achieved its best ranking during the period under review (72nd globally).

Beginning in 2018, performance declined again to 2.60, bringing the ranking down to 103rd. This trend continued in 2023, with a further drop in ranking to 116th, indicating weak utilization of advanced and modern tracking systems.

- **Timeliness :** The Timeliness Index measures a country's commitment to delivering shipments on time. Analyzing Algeria's performance between 2007 and 2023 reveals that the evolution of this index has been marked by instability, reflecting fluctuations in the effectiveness of its logistics system.

In 2007, Algeria scored 2.82, ranking 103rd globally. In 2010, Algeria dropped to 136th place, although the score remained nearly unchanged at 2.81, indicating a relative improvement in the performance of competing countries.

In 2012, Algeria showed a slight improvement with a score of 2.85 and a ranking of 116. The most notable positive shift occurred between 2012 and 2016, with the score rising to 3.04 and then 3.08, accompanied by a gradual improvement in ranking to 94th and then 91st.

However, this positive trend did not continue. In 2018, Algeria experienced a decline in both ranking (124th) and score (2.76), followed by a sharper drop in 2023, when the score fell to 2.50, the lowest during the entire period,despite an improvement in ranking to 98th. This relative improvement in ranking is attributed to a decline in the performance of several other countries.

Table (9): Logistics Performance Index and its indicators

Years	2007	2010	2012	2014	2016	2018	2023
Logistics Performance Index							
rank	140	130	125	96	75	117	97
Score	2.06	2.36	2.41	2.65	2.77	2.45	2.5
Customs							
rank	148	141	117	66	108	138	101
Score	1.60	1.97	2.26	2.17	2.37	2.13	2.3
Infrastructure							
rank	139	122	139	87	80	96	125
Score	1.83	2.06	2.02	2.54	2.58	2.42	2.1
International shipments							
rank	139	98	89	117	77	122	57
Score	2	2.70	2.68	2.54	2.80	2.39	3
Logistics competence							
rank	139	129	145	102	59	113	126
Score	1.92	2.24	2.13	2.54	2.91	2.39	2.2
Tracking & tracing							
rank	109	138	114	109	72	103	116
Score	2.27	2.26	2.46	2.54	2.86	2.60	2.6
Timeliness							
rank	103	136	116	94	91	124	98
Score	2.82	2.81	2.85	3.04	3.08	2.76	2.5

The source : (World Bank, 2007, pp. 32-33) (World Bank, 2010, p. 30) (World Bank, 2012, p. 38) (World Bank, 2014, p. 49) (World Bank, 2016, p. 53) (World Bank, 2018, p. 47) (World Bank, 2023, p. 34)

4.2. Algerian ports' connection to international ports :

Connectivity to global shipping networks is a critical factor in reducing transportation costs and securing competitive shipments. Countries with better connectivity are more capable of competing in international markets and integrating into global value chains. (Madani, 2021, p. 555)

Based on Table (10), which includes World Bank data on the Algerian Port Connectivity Index (LSCI) , which is calculated based on five components of the maritime transport sector: number of ships, container capacity, maximum vessel capacity, number of services, and number of companies operating container ships in the country's ports, the LSCI index (2006-2021) witnessed fluctuations in the performance of Algerian ports in terms of integration into the global maritime transport network.

Despite Algeria's strategic geographic location, Algerian ports have not recorded stable performance. The index recorded a significant decline in 2007, reaching 9.3, compared to 2006, when it was estimated at 11ndicating a decline in Algeria's ability to attract shipping services. However, it witnessed a gradual improvement in the period after 2014, peaking in 2016 at 13.5. This rise reflects an increased capacity of Algerian ports to attract shipping companies and accommodate more vessels.However, the index declined again, settling at 12.2 in 2021.

This disparity indicates that Algeria still need to adopt many reforms in the maritime transport sector in order to enhance their integration into global supply chains and attract more regular shipping lines.

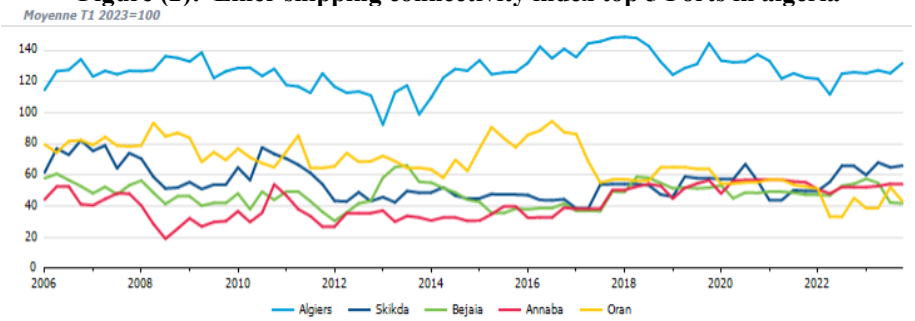
Table (10): Liner shipping connectivity index (maximum value in 2004 = 100)

Years	**2006**	**2007**	**2008**	**2009**
LSCI	11	9.30	10.20	9.60
Years	**2010**	**2011**	**2012**	**2013**
LSCI	11	10.60	9.90	10
Years	**2014**	**2015**	**2016**	**2017**
LSCI	11.40	13.10	13.50	12.30
Years	**2018**	**2019**	**2020**	**2021**
LSCI	12.10	12.60	12.80	12.20

The source :(WorldBank)

It is noted from the figure n° 2 that shows the development of LSCI of five Algerian ports (Algiers, Skikda, Bejaia, Annaba, and Oran) during the period 2006–2023 that there is a clear variation in the levels of performance between these ports. The Port of Algiers maintained the lead throughout the period compared to the rest of the ports, with some minor fluctuations during 2012 and 2017, which reflects its pivotal role in the Algerian maritime transport sector, and most of the international marine services are stationed in it. As for the Port of Oran, it recorded a relatively good performance in some years before it declined after the year 2017, indicating a decline in the volume of services in it or the transformation of part of the activity into other ports. The Ports of Skikda and Bejaia have witnessed an average performance with some limited improvement in recent years, While the performance of Annaba port was the weakest, which demonstrates the limited role of it in maritime connectivity with ports in the world.

Figure (2): Liner shipping connectivity index top 5 Ports in algeria



The source : (UNCTAD)

4.3. Container port traffic :

Container throughput (TEU) grew significantly during the period 2007–2016, rising from 200,050 units in 2007 to 1,831,056 units in 2016, reflecting expanding trade activity . However, this growth was unstable, with a slight decline in 2017 to 1,725,198 units, followed by a recovery in 2018 to 1,844,422 units before declining again in 2019 to 1,793,990 units, indicating fluctuations in port performance . In 2020, a sharper decline to 1,541,273 units was observed, which can be linked to the negative impacts of the COVID-19 pandemic on global trade and supply chains.

Table (11) :Container port traffic (TEU: 20 foot equivalent units)

Years	**2006**	**2007**	**2008**	**2009**
TEU	-	200050	225140	250095
Years	**2010**	**2011**	**2012**	**2013**
TEU	1198828	1309432	1400495	1508774
Years	**2014**	**2015**	**2016**	**2017**
TEU	1660660	1694426	1831056	1725198
Years	**2018**	**2019**	**2020**	**2021**
TEU	1844422	1793990	1541273	-

The source : (WorldBank)

5. Algeria's Efforts to Develop Its Ports

5.1. Algerian Port Agreements with International Ports:

5.1.1. Béjaïa Port Partnership Agreement with the Singaporean company Portak:

In 2007, the Port of Béjaïa signed a partnership agreement with the Singaporean company Portak. This partnership aims to modernize the port by equipping the quay with optical scanners, introducing information systems into the cargo control system, and installing gantry cranes, all of which are expected to improve traffic volume. Currently, the Béjaïa Port quay handles 20 to 25 containers per hour, compared to 8 to 10 containers per hour at the Port of Algiers. The new equipment is projected to increase container traffic to 250,000 TEUs. (Messedaa, Bennaceur, & Chennouf, 2020, p. 875)

5.1.2. Port of Algiers Partnership Agreement with Dubai Ports World (2009) :

This partnership has also enabled the Port of Béjaïa to integrate into the multimodal transport chain by using rail services to transport containers between the port and inland dry ports, such as the dry port in Bordj Bou Arréridj. As a result, the Port of Béjaïa has emerged as a strong competitor to the Port of Algiers, moving from fourth to second place nationally. (Morseli & Benhamida, 2024, p. 307)

This partnership aims to develop profitable infrastructure at the Port of Algiers by modernizing container docks and increasing handling capacity. In 2008, annual traffic at the port did not exceed 400,000 containers, with an average unloading rate of 10 containers per hour. However,

following the partnership with Dubai Ports World, annual container traffic surpassed approximately 700,000 containers.

To alleviate pressure on the port, a dry port dedicated to receiving containers was established on the outskirts of the capital. The partnership also sought to modernize the inspection process for containerized cargo, allowing port users to save time and accelerate investment operations. Moreover, the implementation of an electronic single window system enhanced cargo storage procedures and strengthened overall port management.

These developments provided a significant boost to container handling operations at the Port of Algiers, positioning it as the leading container port in the country. Container throughput increased to over one million in 2010, reaching nearly 1.5 million containers by 2018.

5.1.3. Djen Djen Port Agreement with Dubai Ports World

Dubai Ports World obtained the concession for the deep-water port of Djen Djen with the objective of increasing container traffic to 1.5 million twenty-foot equivalent units (TEUs) annually, up from an estimated volume of fewer than 100,000 TEUs in 2009. (Messedaa, Bennaceur, & Chennouf, 2020, pp. 875-876)

5.2. Port Digitization:

5.2.1.The Algerian Port Community Platform :

This platform was launched on June 7, 2021. The Algerian Port Community System is interconnected with the Customs Administration's information system, serving as the electronic gateway for institutions, administrations, public bodies, economic operators, and other stakeholders in the logistics chain.

The SERPORT Group is responsible for the development, monitoring, management, and maintenance of the Algerian Port Community System. Access is secured through user accounts; therefore, obtaining a username and password is required to log in, as access is restricted to sector stakeholders to ensure information security.

Electronic platforms have been created to stimulate export operations, record cargo processing at ports, and provide digital solutions to facilitate transit operations and enhance route tracking.

Additionally, the group has established two electronic hubs at the Port of Djen Djen in Jijel and the Port of Oran.(Helis & Brahimi, 2023, p. 319)

5.2.2. Annaba Port :

- The port relies on the DOS system, which manages files and indexes, including file naming rules.
- The use of email has been updated, enabling beneficiaries to send and receive messages efficiently.
- The port also utilizes its website to disseminate information about the company and to display various statistics related to its annual activities.
- The container complex is managed using information systems, with port workers employing information and communication technologies. The port has an internal internet network, and each employee is provided with a professional email address for exchanging documents, data, and information with colleagues.
- the company uses an electronic program that uploads all information related to ships and shipments. This program automatically calculates the cost of loading and unloading, prepares final invoices, and generates daily statistics.(Chili & Ammari, 2020, p. 68)

5.2.3. Skikda Port :

The administration employs a set of approved programs to implement e-management, including the following:

- **Internal Network:** An integrated wireless information system used as a comprehensive ship management platform to oversee all port operations for customers and port operators, primarily through a dynamic website. This system allows employees to communicate and exchange various

types of information related to import, export, and transit procedures. Additionally, all users have free access to the internet.

- **Software:** A range of internally developed and deployed programs, as shown in table n°12 :

Table (12): The programs used at Skikda Port

program	usefulness
Employment Management Program	An online operational program , used to monitor vacant positions and manage new employee recruitment.
Port Statistics Program	An online operational program used to monitor all statistics related to port activities.
Financial Invoice Management Program	An online operational program that facilitates the preparation and management of invoices.
Customer Complaint Tracking Program	An online operational program used to receive complaints, correct errors, and gather customer feedback.
Computer Field Monitoring Program	An online operational program used to monitor the performance of computers.
Customer Management Program	A program used to strengthen customer relationships and deliver distinguished, high-quality services.
Change Management Program	An online operational program used to track and digitally implement organizational changes.
Legal Business Program	An online operational program designed for managing legal affairs.

The source: (Chili & Ammari, 2020, pp. 69-70)

In addition, the port relies on other programs, including Logiciel du Pont Bascule, PCPaie, Gestion des Stocks, and BIG Finance. Email is widely used as a primary communication tool among employees, and the Skikda Port Authority maintains a website that provides a wide range of information about the organization and its activities.

The Skikda Port Authority has also launched a bank card payment service, becoming the first port authority to offer this service through its website. This service aims to facilitate transactions for economic partners, provide immediate access to data, and digitize administrative procedures within ports. Invoices are sent to customers via email, allowing them to make payments at any time without the need to travel. (Helis & Brahimi, 2023, pp. 319-320)

6. Challenges Facing Algerian Ports:

- **Obsolescence of Infrastructure**: Algerian ports are classified as first-generation ports, having been established during the colonial period without any modifications to develop their infrastructure. These ports consist of small, narrow basins, closely spaced warehouses, and docks separated by narrow barriers. These specifications no longer meet the requirements of the significant development witnessed in the field of maritime transport, which has become dependent on the use of large ships with international specifications. This requires parties dealing with Algerian ports to use small ships, which are considered uneconomical and have high shipping costs. Moreover, the functionality of these ports is further hindered by sediment accumulation, which reduces port depth and hampers the berthing process. This, in turn, leads to prolonged docking times, increased labor requirements, and additional operational expenses.
- **Container Handling Delays:** Algerian ports continue to lag behind, with the global container handling rate standing at 62%. In an effort to free up space for container terminals, the Port of Oran has been expanded by adding 12 hectares to its eastern side, allocated for containers. Another project is planned to add 30 more hectares. A dedicated dry port for containers has also been established on the outskirts of the capital to relieve pressure on the Port of Algiers.

- **Low Port Performance Rates**: A significant contributing factor is the suspension of activities during nighttime hours, particularly those related to cargo handling.
- **Excessive Administrative Procedures**: These include processes related to unloading cargo and subsequent agricultural quarantine, veterinary quarantine, and customs procedures.
- **High Labor Force:** There is a surplus of workers in Algerian ports, which necessitates taking the necessary measures to transfer some of them to other jobs.
- **Poor Distribution of Tasks Among Ports:** The Port of Algiers, the most important port at the national level, handles most foreign trade transactions, accounting for more than 60% of them. This is at the expense of other ports, whose role is limited to their respective regions, reflecting a centralized policy. Its dominance over commercial transactions also causes congestion, in addition to the high costs of loading, unloading, and docking long-haul vessels.
- **Port Congestion:** This is due to the simultaneous arrival of large quantities of imported goods, resulting from the lack of a coordinated import schedule by some importing agencies.
- **Underutilization of Coastal Navigation:** Effective use of coastal navigation can help alleviate pressure on the land transport network, which also suffers from several shortcomings. Notably, there is a lack of local agencies and offices across various regions and at the national level to raise awareness among stakeholders about the benefits of coastal navigation.
- **Failure of the Centralized State Management Model:** Since its independence, Algeria has adopted a centralized policy, which has hindered the continuity of the 1962 law that granted autonomy to some Algerian ports. These ports are managed by the state through two entities: the National Ports Office and the National Navigation Company. (habili, 2023, pp. 66-69)
- **Lack of Equipment and Machinery:** Most Algerian ports suffer from a shortage of heavy machinery and scanning equipment, not to mention the continued use of traditional methods for unloading and storage. An exception is the Port of Algiers, which possesses a self-propelled crane. This situation results in long waiting periods(sometimes lasting months)for loading and unloading operations due to lengthy administrative procedures and delays in cargo and container handling. This has a particularly negative impact on perishable goods.
- **Port Location Within the Urban Fabric:** The location of ports within densely populated urban areas contributes to poor road efficiency, making movement extremely difficult. This, in turn, hinders the exchange and integration between different modes of transport, ultimately reducing overall port efficiency. (Morseli & Benhamida, 2024, pp. 300-303)

7. Conclusion:

7.1. Results :

- The weak infrastructure of the maritime transport sector in Algeria is due to the lack of port modernization, insufficient equipment, and limited expansion of storage spaces;
- Port efficiency is an integral part of the overall efficiency of the logistics system. Despite improvements in logistics performance in certain years, it remains weak and below the desired level compared to other countries;
- There is a clear disparity in performance levels among the sub-indicators of the Logistics Performance Index. Algeria achieved its best relative performance in both "Timeliness" and "Track and Trace," reflecting a significant improvement in adherence to delivery deadlines and the gradual adoption of modern shipment tracking technologies. In contrast, the weakest performance was recorded in "Customs," "Infrastructure," and "International Shipments," indicating persistent obstacles related to customs procedures, underdeveloped logistics infrastructure, and a decline in the effectiveness of trade exchange operations;

- Despite Algeria's strategic location, the performance of its ports on the International Shipping Connectivity Index (LSCI) remains weak, reflecting the limited capacity of Algerian ports to integrate into global supply chains;
- Algeria's strategy of partnering with international ports has positively impacted port operational efficiency;
- algeria has made efforts to digitize its ports through the use of certain information and communication technology (ICT) tools, though this use remains limited to administrative operations;
- Algerian ports still face numerous challenges, including weak infrastructure, complex procedures, poor operational efficiency, and the unequal distribution of tasks among ports, all of which hinder their development.

7.2. Recommendations:

- Developing port infrastructure by modernizing docks, expanding storage spaces, and equipping ports with machinery and equipment that improve operational efficiency;
- Adopting multimodal transport to facilitate the movement of goods in and out of ports and reduce delivery times;
- Establishing more dry ports and linking them to coastal ports to reduce pressure and improve the flow of goods to inland areas;
- Adopting integrated electronic systems to digitize ports and manage various port operations, such as customs clearance, tracking, and container management,
- Investing in human capital development within the maritime transport and logistics sector ;
- Developing support logistics services in ports, such as collection, transfer, packaging, and warehousing centers,
- Improving the investment climate in the maritime transport sector and encouraging public-private partnerships to develop and modernize ports;
- Partnering with international ports to leverage their expertise in management and digitization.

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