

Port of Bar: Fragments from 120 Years of History, an Overview of the Present, a Glimpse into the Future

**Deda Đelović*, Milutin Lakićević, Vesna Mihaljević,
Dragan Ščekić, Dejan Novović**

Abstract: The history of the Port of Bar (Montenegro) is remarkably rich, with its origins reaching far into the past and making it nearly impossible to present it in a comprehensive manner. Motivated directly by the 120th anniversary of the period that started in 1906, this paper provides fragments from this era in the history of the Port of Bar. Considering its numerous aspects of fundamental importance – not only for the city of Bar and Montenegro, but also for the region – as well as its notable development potential, in addition to analyzing key historical points, this paper also addresses the current state of the Port of Bar and examines its important development perspectives. The applied approach combines a presentation of historical facts from available literature sources and elements of specific methods and findings of studies related to the development and evolution of ports throughout history, the main challenges ports face while fulfilling their multifaceted roles, as well as current development trends. Given the broad scope of possible thematic aspects, this paper does not aim to provide a fully comprehensive overview. Instead, only selected elements from certain phases of the history of Port of Bar are presented in detail, along with an analysis of cargo throughput as an indicator of operational performance of the port during different phases of its development and its market position. Additionally, elements related to development perspectives of the Port of Bar are considered.

Keywords: Port of Bar, History, Present, Development.

1. Introduction

The “illustrious town of Bar” and its origins date back into the distant past which, according to evidence confirmed by material remains, can be traced to the Early Iron Age [1, 2]. An inseparable bond and simultaneous formation, existence, and development of the city of Bar and its port have been evident from the early beginnings of civilization in this region, up to the

modern era [1, 2]. In the Middle Ages, following Dubrovnik and Kotor, Bar was the most important city on this part of the Adriatic coast. Historical sources show that, at the time, Bar had a developed port system, where significant trade took place, under favorable weather conditions [1, 2].

Following the Ottoman conquest of Bar in 1571, a small harbor protected by a small breakwater on the west side was built. A stone embankment served to protect the harbor and the small breakwater from tall waves and pirate attacks. During that period, a quarantine building, as well as a customs office, was located near the harbor in order to inspect the vessels, sailors, and cargo [2, 3].

In 1878, when Montenegro liberated Bar, it acquired its first harbor with a breakwater and a small wooden pier and regained access to the sea. The first foreign steam vessel to arrive was Alcino in 1879, which brought 1750 tons of grain from Odessa. Small steam vessels owned by the Split company Prini and Tartaglia also called at the port, which led to the construction of the first stone pier intended to replace the wooden one. A renowned builder Josip Slade from Trogir (Croatia), led the project [2, 3]. In the period between 1878 and 1906, maritime transport was conducted through the Bar wharf. The city was receiving all the goods necessary for its functioning and was able to export all the surplus goods, providing logistical support, among other activities, for the operation of a new water-powered olive mill and the first factory in Montenegro – a soap factory [2, 3].

As Montenegro lacked the resources necessary for the reconstruction of the port and the construction of a railway, it granted a concession to the Montenegrin-Italian joint-stock company (Bar Company – Compagnia di Antivari) for the construction of the port and the Bar-Virpazar railway (as well as for the establishment of radio-telegraph connections in Montenegro). The foundation stone for the new port was laid by Prince Nikola on March 10, 1905, from the stern of his new yacht Rumija, while construction works started on March 23, 1905, even though the concession agreement had not yet been signed due to complex geopolitical circumstances – namely the opposition of Russia and Austria-Hungary to Italian investments in Montenegro [2, 3]. Ultimately, on June 27, 1906, in Cetinje, the Contract on the Construction and Exploitation of the Port of Bar with an Additional Free Zone and the Railway from the Port to Lake Skadar, as well as the Navigation by Mechanical Means on Lake Skadar was signed between the Government of the Principality of Montenegro and the Bar Company - Compagnia di Antivari [2]. The signing of this Contract marked the beginning of the modern era of the Port of Bar and this year commemorates its 120th anniversary.

Following these introductory remarks regarding the existence of the Port of Bar prior to 1906, the second chapter sets out the theoretical foundations of the considerations presented in the paper, with the aim of identifying - based on the available literature - the key functions of ports, the elements determining their current significance, the challenges they face and the principal directions of their development. Particular emphasis is placed on the components of the WORKPORT model of the transition process in European ports, in order to define the elements that, from a methodological perspective, should be analyzed when examining the historical development of a given port. The third chapter provides a concise overview of the development and operational phases through which the Port of Bar passed during the period from 1906 to 2026, highlighting the fundamentally important “turning points” that determined the directions and intensity of its development. The fourth chapter focuses on an analysis of cargo throughput at the port during the observed 120-year period, while also attempting to relate the data series to the factors that directly conditioned the achieved throughput, and the role and significance the Port of Bar has had over time within the logistics system to which it belongs. Bearing in mind the EU Ports Strategy published in mid-March of 2026, the fifth chapter sets out the main development directions for the Port of Bar. The key conclusions arising from the considerations covered in the paper are systematized in the sixth chapter.

2. Theoretical Foundations of the Analysis

Ports are multimodal transport and logistics centers and hubs for sustainable industry and clean energy [4]. They are essential to the transport sector and have significant potential for job creation and investment [5], while also playing a critical role in the global supply chain [6, 7]. Various aspects of the significance of ports are considered in this paper [8], in which the port is treated as a major piece of infrastructure with crucial importance for the local (and wider) economy.

Based on a review of the available literature, the following principal challenges faced by ports have been identified: long-neglected port infrastructure and legal constraints on port development [9]; rising risks, administrative problems, and increasingly shorter investment life cycles [10]; numerous logistical, technological, and economic uncertainties [11]; multiple sustainability challenges (e.g. pollution arising from port activities) [12]; etc.

The risks faced by ports have evolved over time. According to the findings presented in [13], the priority risks in 2021 were those associated with the COVID-19 pandemic, supply chain instability, and trade barriers,

whereas in 2023 the three most important risks were political instability, financial instability, and cyberattacks.

The existing megatrends - drivers of port development, according to the report in [14], are geopolitical, technological, and environmental. In the report on maritime technologies issued by the American Bureau of Shipping (ABS) [15], future maritime technologies are organized into three main categories or trends: digitalization (artificial intelligence, digital twins, autonomous operations, etc.), applied research (new materials, green ecosystems, blue economies, etc.) and the transition to the clean energy.

Ports are vital for the security and strategic autonomy of Europe. They must expand capacity, implement decarbonization and digitalization processes, and strengthen security. They have the potential to become centers of new industries, clean energies and innovation clusters, and they are already taking on a key role in energy supply, defense, and the blue economy [16]. In parallel, ports are exposed to new vulnerabilities and responsibilities [16]. Figure 1 shows the key elements/pillars of the EU Ports Development Strategy.



Fig. 1 – Key pillars of the European Union's Port Development Strategy (source: [16])

Development directions are also influenced by the priorities in the field of environmental protection in ports, which have evolved over time, as shown in Figure 2 [17].

TABLE 4 Top 10 environmental priorities of the port sector over the years		1996	2004	2009	2013	2021	2022	2023	2024	2025
1	Port development (water-related)	Port development (water-related)	Garbage/Port waste	Noise	Air quality	Air quality	Climate change	Climate change	Climate change	Climate change
2	Water quality	Water quality	Dredging operations	Air quality	Garbage/Port waste	Climate change	Air quality	Air quality	Energy efficiency	Air quality
3	Dredging disposal	Dredging disposal	Dredging disposal	Garbage/Port waste	Energy consumption	Energy efficiency	Energy efficiency	Energy efficiency	Air quality	Energy efficiency

Fig. 2 – Evolution of the top three environmental priorities in ports (source: [17])

In the research presented in [8], the authors emphasize that port development does not guarantee that its competitiveness will remain unchanged over time. In [18], various aspects of port connectivity (e.g. maritime connectivity, hinterland connectivity) are highlighted as factors influencing port development. According to the results presented, paper [19] points out that the integration of advanced technologies associated with the Fourth Industrial Revolution has become a strategic direction toward sustainable development of modern ports. Paper [20] examines how port cities can steer their development paths and outcomes, taking into account interrelated economic, social, political, and technological factors. Paper [21] analyzes the correlations between port development and the economic development of its hinterland, exploring the ways in which a modern port influences the economic growth of its hinterland, while paper [22] addresses the evolution of the spatial development of ports.

Based on an analysis of relevant literature, the authors in [23] underline that ports evolve over time and that, when analyzing their transformation, a political context must also be taken into account. Paper [24] discusses key perspectives for port development, with respect to the need for ports to adapt to current development trends.

Port development directions and trends are also addressed in various documents of global significance. The Sustainable and Smart Mobility Strategy - putting European transport on track for the future [25] identifies ports as hubs of multimodal mobility and transport, clean energy hubs, and testing grounds for waste reuse and the circular economy. The European Green Deal [26] calls for a 90% reduction in greenhouse gas emissions from transport by 2050, aiming for zero pollution. The 2030 Agenda for Sustainable Development [27], with its 17 Sustainable Development Goals (SDGs), recognizes that development must balance social, economic, and environmental sustainability [28]. Several SDGs are directly related to reducing the environmental impact of ports, including SDG 7 – Affordable and Clean Energy, SDG 8 – Decent Work and Economic Growth, SDG 9 – Industry, Innovation and Infrastructure, SDG 11 – Sustainable Cities and Communities, SDG 12 – Responsible Consumption and Production, SDG 13 – Climate Action, etc.

The transition toward sustainable ports requires radical systemic changes based on new knowledge and innovation. Ports are increasingly becoming energy hubs, facilitating the transition from fossil fuels to renewable energy sources [29].

Digitalization can play a key role in reducing the environmental impact of ports, as well as in reducing negative impacts on passenger and freight transport in both urban and non-urban areas. Enabling the transition to

more sustainable modes of transport is one of the areas in which digitalization can act as a major driver [30].

By summarizing the results of the analysis of the available literature, it is possible to define the elements that must be considered when examining the significance of a port, its role within the logistics system to which it belongs, its transformation through history, and the main directions of its development in line with the dominant trends in the development of modern ports (Table 1).

The available literature provides various approaches to analyzing the stages of port development. Given its particular relevance to the subject of this paper, the WORKPORT model is examined in more detail [31], based on research findings showing that ports continuously evolve, adapting to new technologies, regulatory frameworks, revised operational practices, and other influencing factors. The main elements of the WORKPORT schematic representation of the transition process in European ports are presented in Table 2.

The structure of the WORKPORT model of the transition process in European ports, as presented in Table 2, indicates the complexity of a port as a system and the large number of elements (column (1) in Table 2) that should be included in a more comprehensive analysis of port development and operations over time. In addition to the elements listed in Tables 1 and 2, the relationships between the port and the city are also significant. Changes in the relationship between ports and cities from the late 19th century to 2020 are examined in [32]. The key findings show that the average distance between ports and cities doubled during this period, increasing from 4.9 km in 1880 to 10.1 km in 2020.

Based on the results of the theoretical considerations presented in this chapter, the subject of the paper has been defined, including the following main components: an analysis of the development phases of the Port of Bar in the period 1906–2026, an analysis of cargo throughput achieved at the Port of Bar during the same period (1906–2026), and the main directions of its future development.

Table 1 – *Considerations relating to a particular port - domains of analysis (source: authors)*

Domain of analysis	Elements to be covered by the analysis	References
PORT SIGNIFICANCE	Ports as centres of multimodal transport and logistics, sustainable industry and clean energy;	[4]
	The potential of ports to create new jobs and attract investment;	[5]
	The importance of ports for global supply chains;	[6, 7]
	The port as a major infrastructure asset of fundamental importance to both the local economy and to that of the wider area to which it gravitates;	[8]
CHALLENGES FACED BY PORTS	Postponement of investment in capital maintenance of port infrastructure; legal constraints on port development;	[9]
	Rising risks, administrative barriers, the need to implement investments within the shortest possible time frames;	[10]
	Logistical, technological and economic uncertainties;	[11]
	Challenges arising from the requirements of the sustainable-development concept (impact of port activities on the environment);	[12]
DRIVERS / DIRECTIONS OF PORT DEVELOPMENT	Development drivers: geopolitical, technological and environmental-protection trends;	[14]
	Development direction: centres of multimodal transport;	[25]
	Development direction: sustainable development (decarbonization, clean energy, circular economy, etc.);	[25, 26, 27]
	Development direction: digitalization;	[30]
FACTORS INFLUENCING PORT DEVELOPMENT	Port development is no guarantee that its competitiveness will remain at the same level over a longer period (regardless of development, the level of competitiveness may decline);	[8]
	Connectivity (maritime connectivity, hinterland connectivity) as a factor influencing port development;	[18]
	The use of advanced technologies related to the Fourth Industrial Revolution as a strategic direction for the sustainable development of modern ports;	[19]
	The influence of the city in which the port is located on the direction of its development, taking into account the interrelated economic, social, political and technological factors;	[20]
	Impact of hinterland economic development on port development (and vice versa);	[21]
	Characteristics of the spatial development of ports;	[22]
	Political factors influencing port development;	[23]
	The need for ports to adapt to current development trends;	[24]

Table 2 – WORKPORT schematic model of the transition process in European ports
(source: [31])

Period (development phase) Element	1960s		1970s	1980s		1990s	2000s
(1)	(2)		(3)	(4)		(5)	(6)
OWNERSHIP / MACRO- ORGANISATION	Infrastructure mostly state-owned (with exceptions in the United Kingdom-UK). Superstructure and port operations managed by the state or by private actors.	Increasing involvement of the private sector in the management of superstructure and port operations.		Privatisation of nationalized ports in the United Kingdom. Concentration of ownership in UK ports.	Increased "commercialization" of port authorities. Greater customer-orientation of ports. Further privatization of UK ports.	Greater concentration of ownership in container terminals through partial acquisition by multinational terminal operators.	
CARGO THROUGHPUT STRUCTURE	General cargo Dry bulk Liquid bulk	Consolidation of general cargo units; Division of general cargo into containerized, Ro-Ro, palletized, LASH, etc.; Minor changes in cargo forms.		Increased vessel deadweight.			Consolidation of general cargo almost fully completed.
CARGO HANDLING TECHNOLOGY			...	...		...	...
INFORMATION SYSTEMS			...	...		...	...
OCCUPATIONAL SAFETY			...	...		...	...
PORT FUNCTIONS / PORT DEVELOPMENT			...	...		...	...
LABOR FORCE, WORK ORGANIZATION, EMPLOYMENT CONDITIONS, LABOR RELATIONS			...	...		...	...
ENVIRONMENTAL PROTECTION			...	...		...	...

3. 1906-2026: Development Phases of the Port of Bar

At the very beginning of the 120-year history that began in 1906, the infrastructure of the Port of Bar consisted of a breakwater and a small wooden pier, approximately ten meters long and 3–4 meters wide [2, 33].

The documentary basis for the development of the port was a spatial/development plan drawn up by the renowned Italian architect Coen Caglia, which clearly confirms the intention for the Port of Bar to be developed in a planned manner, in line with all the scientific and

professional achievements of the time. The plan (Figure 3) provided for the construction of a breakwater to the west and to the north, while two wide piers, each 150 m long, were planned at the foot of the Volujica hill, along with a passenger pier at the site of the old port [3].

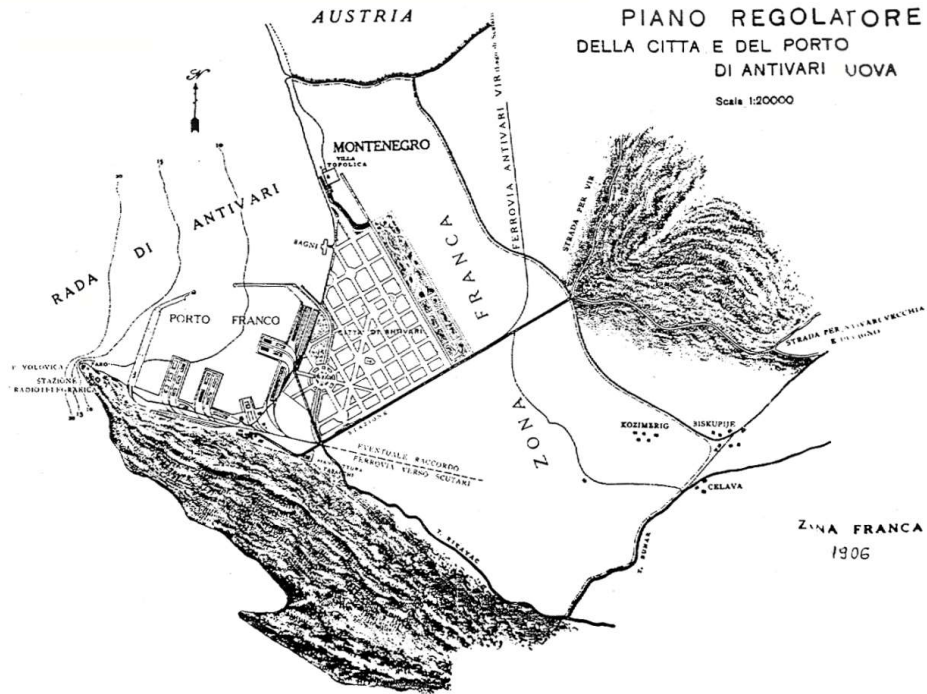


Fig. 3 – Spatial plan designed by the Italian architect Coen Caglia (source: [34])

A particularly valuable dimension of this plan lies in the fact that it also addressed the development of the urban area and the construction of the Bar–Virpazar railway line, while the entire port area was envisaged as a free zone. Upon the completion of the breakwater and the operational quay, with a total length of 250 meters, the narrow-gauge Bar–Virpazar railway line, 43.3 km long, was put into operation. The port was officially opened for traffic on October 23, 1909 [35]. It is especially important to recognize that the development of the Port of Bar, even 120 years ago, was based on concepts that remain highly relevant today: the development of combined transport (maritime and rail) and the development of a free zone, which clearly indicates that the port was not viewed merely as a link between maritime and land transport, but rather as a foundation for the development of other core port functions, including industrial and commercial activities.

Even at that time, a concession system for the use of port area and the development of activities within it was applied, while spatial planning documentation ensured a clear separation between the urban and port zones.

During the Balkan Wars and the First World War, the importance of the port was confirmed through its role in maintaining the continuity of supply chains for food and military material. The available literature notes that, by the end of 1914, attacks by Austro-Hungarian submarines and seaplanes on the Port of Bar had become frequent, which significantly hampered its operations [3].

The period between the First and the Second World War was rather unfavorable and no major port facilities were expanded at this period. During the Second World War, warships, submarines, and seaplanes occasionally entered the port. Before withdrawing in the face of the Yugoslav National Liberation Army (which liberated Bar on November 24, 1944), German forces mined the port and the powerful explosion almost completely destroyed operational quay built in 1909 [3]. This act set the “wheel of history” of the Port of Bar back as much as 35 years and, unfortunately, as will be shown later, it would not be the only setback in its history.

As early as 1947, the first Federal People’s Republic Yugoslav project for the reconstruction of the Port of Bar was initiated. A broader recognition of the port’s importance dates from 1950, with the Study on the Construction of Ports in Yugoslavia, while in 1951 the design bureau “Obala” – Split prepared the conceptual design for the new Port of Bar. Construction works began in mid-1952 with the extension of the reconstructed main breakwater, while at the same time alternative maritime solutions were being evaluated, alongside field investigations and model testing at the “Jaroslav Černi” Institute in Belgrade [35].

On December 30, 1950, the Government of the Federal People’s Republic (FPR) of Yugoslavia adopted a decision to establish a maritime construction company in Bar, which carried out the port construction works until 1956. The company lacked adequate machinery and a sufficient workforce. At the beginning of the same year, the works were taken away from this company and assigned to the company “Pomgrad” – Split. Finally, in 1954, the company “Port of Bar under Construction” was established, assuming the role of investor, after the investor had been changed several times: the Dubrovnik Port Directorate, the Maritime Authority of the South Adriatic – Kotor, then the People’s Council of Bar District [35].

According to the development plan of the FPR Yugoslavia, the first phase of the construction of the Port of Bar was to be completed in 1961. The

official inauguration of phase I of the Port of Bar, together with the standard-gauge Nikšić–Titograd railway and the Adriatic Highway from Debeli Brijeg to Bar, took place on November 27, 1965; thereafter, the company “Port of Bar under Construction” was constituted as the enterprise “Port of Bar” and began independent operations on January 1, 1966. Upon completion of phase I, the port’s capacity reached 1.2 million tons per year [35]. The completion of this phase provided 1,768 meters of operational quay, of which 1,318 meters were designated for cargo vessels and 450 meters for passenger vessels. A total of 57,717 m² of covered storage space and approximately 70,000 m² of open storage space were built, including a cold storage facility with a capacity of 2,500 tons [33].

In the period between phases I and II (essentially from 1966 to 1970), major Yugoslav economic enterprises invested significant resources in the development of their own facilities within the port area in order to mitigate the mismatch between port capacities and their actual needs. The following facilities were built: warehouses of the Federal directorates for industrial, food and other products; warehouses of “Centroprom” and “Centrotekstil” from Belgrade; the warehouse of “Trudbenik” from Belgrade; the petroleum installations of “Jugopetrol”; cement silos of “Servis-import” - Podgorica; alumina silos and caustic-soda tanks of the “Aluminium Combine” - Titograd; the workshop of the “Bijela Shipyard”; and so on [33–35]. Two aspects of these investments are particularly significant. Their realization contributed to an increase in cargo throughput at the port, which materialized certain forms of the port’s industrial (e.g. coffee roasting) and commercial (e.g. wholesale trade) functions. However, it later became evident that the outcomes of ownership transformations and the cessation of operations of the companies that had built these facilities became sources of uncertainty and problems in the relations among the entities operating within the area of the Port of Bar.

The realization of Phase II of the construction of the Port of Bar began in 1971. It was planned that the first stage of port development (Phases I and II) and the first stage of the Belgrade–Bar railway would be completed simultaneously, in early 1974. Projections indicated that, in the first year following the opening of the Belgrade–Bar railway, cargo throughput at the Port of Bar would reach 3 million tons [35].

The comprehensive planning of the port, the city, and industrial development was entrusted to the company “Obala” – Split, which completed the task in 1968. The new master plan was presented in two variants: the first envisaged the expansion of the port to the west, transforming the breakwater into a large container pier and creating a petroleum port at a depth of approximately 30 meters, while the secondary breakwater would

be converted into a large pier within a free customs and industrial zone. The second variant proposed expansion to the north, including excavation works on Volujica Hill and the deepening of the harbor basin [33–35]. Among other outcomes, these analyses led to ideas for complementary development and the use of space in areas such as Crmnica Field and Čemovsko Field. In relation to these elements, we again encounter specific forms of a concept that remains relevant today and is present, in certain variations, in current strategies and plans for the development of Montenegro's logistics system: the development of a "dry port" (intermodal terminals, etc.).

The General Urban Plan of Bar was adopted at the end of 1970, allocating 334 hectares to the port zone, 344 hectares to the industrial zone, and 111 hectares to the railway zone, making a total of 789 hectares designated for port functions (compared to 790 hectares for urban functions) [35].

Following the completion of Phase II of the construction (in 1978) [36], the capacity of the port was increased to 5 million tons per year. An operational quay of approximately 2.8 km in length was built, and spatial, technological, and organizational units, specialized for the handling of various types of cargo - terminals for general cargo, dry and liquid bulk, containers, Ro-Ro cargo, and passenger traffic - were established. The depth of the port's basin ranges from 6 m (at the Passenger Terminal) to 14 m (at the Dry Bulk Terminal), enabling the berthing of vessels of up to 80,000 DWT. The established capacity was based on adequately dimensioned components of the port infrastructure (primary and secondary breakwaters, operational quays, port electrical network, port railway infrastructure, port road network, water supply and sewage system and telecommunications network), facilities of the port superstructure (universal closed port warehouses with a total area of 120,000 m²; a grain silo with a capacity of 30,000 tons; a cold-storage facility; warehouses for dangerous goods; bulk-cement silos; etc.) and port handling equipment (a container crane; three gantry cranes; a grain loading tower; container forklifts; loaders; etc.). The space for further development of the port was defined through spatial-planning documentation [34].

The catastrophic earthquake of April 15, 1979 inflicted extensive material damage on the port, postponing the utilization of the constructed capacity and disrupting plans for increasing cargo throughput. Demolition and damage occurred at the operational quay, storage facilities, and port equipment [33]. Only about 20% of the constructed quay withstood the impact of the disaster. The most severe damage occurred at Terminal 2, where 800 meters of quay were destroyed. Handling and operational areas, including crane tracks and railway lines, were completely devastated, while the passenger quay suffered damage along 550 meters of its length [33]. This

natural disaster once again turned back the “wheel of history”: in terms of available operational quay length, the port was effectively returned to its pre-1960 condition.

The earthquake was followed by a period of reconstruction and rehabilitation. A recovery program was adopted in 1980, while works began in March 1981; the “newest” Port of Bar, equipped to handle around five million tons of cargo annually, was officially put into operation on July 13, 1983 [33]. The rehabilitation process involved significant investment costs. When compared with investments in other ports within the port system of the Socialist Federal Republic of Yugoslavia during that period, data show that the highest levels of investment were directed to the ports of Bar and Koper. Expressed as cumulative percentages of total investments across all ports, investments in Bar and Koper accounted for a total of 54% in 1980, 63.9% in 1981, 69.7% in 1982, and 64.4% in 1983 [37–40]. A key distinction, however, was that investments in the Port of Bar were aimed at repairing earthquake damage and restoring capacity, whereas investments in the Port of Koper were directed toward capacity expansion. Additionally, funding for the Port of Bar was largely secured through foreign loans and reconstruction funds, raising concerns about the sustainability of such investment levels due to the high degree of indebtedness [40].

In 1991, in line with the legal framework, the Working Organization (WO) “Port of Bar” was transferred from a municipal into a state-owned company, becoming the Public Enterprise (PE) “Port of Bar” [34].

In February 1998, PE “Port of Bar” was transformed into a joint-stock company (JSC), and on 1 October, 2009, the restructuring of “Port of Bar” JSC was completed. In line with the Restructuring Programme (adopted by the Government of Montenegro in 2008), “Container Terminal and General Cargo” JSC was spun off from “Port of Bar” JSC, along with three wholly owned subsidiaries: “Maritime Affairs” Ltd., “Information Technology” Ltd. and “Security” Ltd. “Maritime Affairs” Ltd. was privatized in 2010, while the other two subsidiaries subsequently ceased to exist and their employees were transferred back to “Port of Bar” JSC. The “Container Terminal and General Cargo” JSC was privatized in 2013, with the Turkish company “Global Ports Holding” becoming the majority owner. The company subsequently changed its name to “Port of Adria” JSC [34].

The development phases of the Port of Bar in the period 1906–2026, along with the key turning points of this historical stage, are presented in Table 3.

Table 3 – Development phases of the Port of Bar in the period 1906–2026
(source: authors)

Phase/Period	Description
(1)	(2)
1906 (27 June 1906)	The Contract on the Construction and Exploitation of the Port of Bar with an Additional Free Zone and the Railway from the Port to Lake Skadar, as well as the Navigation by Mechanical Means on Lake Skadar, was signed between the Government of the Principality of Montenegro and the Italian–Montenegrin company Bar Company <i>Compagnia di Antivari</i> . Bar Company - <i>Compagnia di Antivari</i> became the concessionaire and managed the port until 1926.
1906 – 1909	Construction works on the port.
1909 – 1912	Port operated under regular conditions, in accordance with the circumstances prevailing at the time.
1912 – 1918	The Balkan Wars; the First World War.
1919 – 1941	Port operated under regular conditions, in accordance with the circumstances prevailing at the time.
1941 – 1945	The Second World War.
1944	The port was mined and destroyed by the German army.
1945 – 1950	Preparations for the reconstruction of the port.
1950	Establishment of the Maritime construction enterprise in Bar (which carried out construction works until 1956).
1950 – 1965	First phase of construction following the Second World War.
1954	Establishment of the enterprise “Port of Bar Under Construction” for the processing, loading and unloading of goods.
1965	The enterprise “Port of Bar” was constituted and began independent commercial operations on January 1, 1966.
1965 – 1971	Port operated under regular conditions, in accordance with the circumstances prevailing at the time.
1971 – 1978	Second phase of post-Second World War construction.
1979	Catastrophic earthquake destroyed approximately 80% of the port infrastructure.
1980 – 1983	Rehabilitation of the port following the catastrophic earthquake.
1984 – 1992	Port operated under regular conditions, in accordance with the circumstances prevailing at the time.
1991	Port of Bar was constituted as a public enterprise and jurisdiction over it passed from the municipal to the state level.
1992 – 1995	Sanctions imposed by the United Nations Security Council against the Federal Republic (FR) of Yugoslavia.
1996 – 2009	Port operated under regular conditions, in accordance with the circumstances prevailing at the time.
1998	The Public Enterprise (PE) “Port of Bar” was transformed into a joint-stock company (JSC).
2000	Establishment of the Port of Bar Free Zone.
2000	Automation of the Port Information System.
2000	Certification of the Quality Management System in accordance with ISO 9001.
2004	Implementation of the ISPS Code in the field of port security.
2005	The Port of Bar Free Zone began operations.
2009	Restructuring of “Port of Bar” JSC.
2009 – 2025	Separate functioning of “Port of Bar” JSC and the “Container Terminal and General Cargo” JSC (later “Port of Adria” JSC).
2013	Privatization of “Port of Adria” JSC.

In accordance with the Law on Ports, the current management model of the Port of Bar is the landlord model. The State of Montenegro is the owner of the land and port infrastructure, parts of which are granted, under long-term agreements, to port terminal operators - "Port of Bar" JSC (a joint-stock company in which the State of Montenegro holds a 78.55% ownership stake) and "Port of Adria" JSC (a joint-stock company in which the Turkish company "Global Ports Holding" holds 62% of shares). "Port of Bar" JSC operates the terminal for dry bulk, liquid bulk, and special cargo, the terminal for cargo storage and passenger traffic, and Ro-Ro, and general cargo terminal. "Port of Adria" JSC manages the container terminal, general cargo terminal, and timber and wood products terminal. Thus, "Port of Bar" JSC, as the legal successor to earlier organizational forms, functions as a joint-stock company primarily engaged in cargo handling and storage. The company is organized in accordance with the Law on Business Organizations of Montenegro and represents an integrated corporate, logistical, and technical-technological entity [34].

By a decision of the Government of Montenegro in 2000, approval was granted for the establishment of the Free Zone Port of Bar, which began operating in 2005 in accordance with a Decision of the Customs Administration of Montenegro. "Port of Bar" JSC acts as the operator of the entire Free Zone area [34].

4. Analysis of Cargo Throughput at the Port of Bar

Cargo throughput is an indicator of the efficiency of port operations and reflects the actual conditions in which a port functions. The factors influencing throughput at a port/terminal are numerous [41–43] and include: berth characteristics (length, water depth, etc.), available equipment at berths (port handling machinery), types of cargo handling operations, types of cargo handled [44], GDP growth in countries within the port's hinterland, total import–export flows in the port's gravitational area [43, 45], and others. An adequate approach to increasing throughput enables the optimal utilization of berth (terminal/port) capacities and the identification of development opportunities [46]. At the same time, throughput volumes significantly influence the key characteristics of a port [47].

Based on available sources [33, 37–40, 48–62], a data series on cargo throughput at the Port of Bar for the period 1906–2026 has been established. Table 4 presents selected values for representative years within the analyzed period.

Table 4 – Cargo throughput at the Port of Bar in the period 1906–2026
 (source: authors, based on [33, 37–40, 48–62])

Year	Cargo throughput (tons)	Description
(1)	(2)	(3)
...		
1939	5,000	The only available pre-Second World War year data on cargo throughput.
...		
1952	18,125	
1953	23,802	
1954	31,855	The year in which the enterprise “Port of Bar Under Construction” for the processing, loading, and unloading of goods was established.
...		
1965	223,000	The year in which Phase I of the construction of the Port of Bar was completed.
...		
1971	769,000	The year in which Phase II of the construction of the Port of Bar was initiated.
...		
1976	1,068,000	The year in which an annual cargo throughput of 1 million tons was reached for the first time (also the year in which the Bar–Belgrade railway was put into operation).
..		
1978	1,280,000	The year in which Phase II of the construction of the Port of Bar was completed.
1979	1,634,000	The year of the catastrophic earthquake that destroyed a large part of the operational quay.
...		
1983	1,731,000	The year in which the rehabilitation of the Port of Bar following the earthquake was completed.
1984	2,166,000	The year in which an annual cargo throughput of 2 million tons was reached for the first time.
...		
1989	2,744,000	The year in which the highest cargo throughput was achieved.
...		
1994	22,900	The year of the most significant decline in cargo throughput owing to the sanctions imposed by the United Nations Security Council against the SR of Yugoslavia.
...		
2005	2,162,000	The year in which, following the lifting of the United Nations Security Council sanctions against the SR of Yugoslavia, a throughput level of 2 million tons was once again reached for the first time.
...		
2009	1,355,600	The year in which the restructuring of “Port of Bar” JSC was implemented.
...		
2022	2,390,000	The year in which “Port of Bar” JSC achieved its highest cargo throughput since restructuring.

The first year in which containers appeared in the cargo handling structure was 1978, with a throughput of 194 TEU. The highest container throughput achieved prior to the restructuring of "Port of Bar" JSC was recorded in 2008, reaching 43,705 TEU [34]. After the privatization of "Port of Adria" JSC, container throughput reached approximately 64,000 TEU in 2025.

The capacity utilization rate of the Port of Bar in 1965-the year in which Phase I was completed-was 18.6% (with an achieved throughput of 223,000 tons compared to the installed capacity of 1,200,000 tons). This relatively low level of capacity utilization should be viewed in the context that the port was developed with a long-term perspective, based on the plan to integrate it among the major ports of Yugoslavia, with full realization of throughput potential expected only after the completion of the Bar-Belgrade railway.

As previously noted, it was expected that in the first year following the opening of the Bar-Belgrade railway, cargo throughput would reach 3,000,000 tons [35] - a level that was never actually reached. Analyses available in the literature point to the concerning fact that the commissioning of the railway was not followed by the anticipated sharp increase in throughput. This leads to the conclusion that the factors influencing port throughput are numerous and heterogeneous. In other words, it is evident that throughput (and thus the port's market position) does not depend on any single specific factor-not even on such a critical one as the port's infrastructural connectivity with its hinterland. In addition, an important insight emerging from the analysis is that service users (exporters/importers and logistics operators) do not rapidly alter established cargo flow patterns, particularly when existing routes function with the required level of reliability. Therefore, it was unrealistic to expect that users would redirect cargo flows from already established transport corridors "overnight".

The highest cargo throughput was recorded in 1989, reaching 2.744 million tons, which represents a 157% increase compared to the throughput recorded in 1976, when the Bar-Belgrade railway was put into operation (1,068,000 tons). In absolute terms, this corresponds to an increase of 1.676 million tons, implying an average (statistical) annual growth of 128,923 tons. Assuming that the growth trend observed in the period from 1976 to 1989 had continued, the "barrier" of 3 million tons of annual throughput would have been exceeded within two years-i.e., by 1991-when, statistically, throughput would have reached approximately 3.001 million tons. If the same trends from the aforementioned period had been projected over the subsequent 13-year period, from 1989 to 2002, the result would have been an annual throughput of approximately 4.42 million tons-approaching full

utilization of the capacity established through Phase II of the Port of Bar's development. However, instead of maintaining the growth trend and initiating a new investment cycle aimed at capacity expansion, "development" took a completely opposite-and highly unfavorable-direction for the port: the catastrophic earthquake, economic crisis, armed conflicts, the disintegration of the SR Yugoslavia, United Nations sanctions, and the collapse of industrial complexes that had previously generated cargo flows to and from the port.

In the context of analysis of the cargo throughput achieved, it is also necessary to highlight the low rate of utilization of the transit potential, which has consistently - through all phases of development - been regarded as one of the key directions for increasing throughput. For example, literature source [63], refers to an exceptionally broad (and very optimistically defined) potential area from which transit cargo flows could have been directed to and from the Port of Bar: the eastern parts of Bulgaria and Romania; the southern and south-eastern parts of the CSSR (today's Czechia and Slovakia); Poland; the possibility for Far Eastern countries (China, Japan) to use Bar in the exchange of goods on the Bar-Gdynia route; Hungary; and so on. Significant unrealized potential for increasing throughput was also linked to the re-export (transshipment) of goods, as well as to the establishment of cargo flows from Southern Italy through the Port of Bar.

The general conclusion is that the influencing factors mentioned above, associated with the low capacity-utilization rate during the 1970s, remain relevant today. In other words, increasing the utilization of transit potential and exploiting the potential of re-export (transshipment) continue to represent viable directions for increasing cargo throughput at the port.

As previously noted, the highest cargo throughput at the Port of Bar, according to official statistics, was achieved in 1989, amounting to 2.744 million tons, in line with the rising trend observed over the preceding years. At the moment when continued growth in cargo throughput was expected-accompanied by higher capacity utilization and the fulfillment of conditions for launching a new investment cycle aimed at expanding capacity-the opposite occurred. In the following years, throughput experienced a pronounced decline and, due to the economic sanctions imposed by the United Nations Security Council on the Federal Republic of Yugoslavia (introduced in 1992), it reached a minimum of only 22,900 tons in 1994. This represents yet another drastic example of the "wheel of history" being pushed backward-this time, in terms of throughput volume, the Port of Bar was effectively returned to the levels of around 1952-1953, marking a setback of more than 40 years. The magnitude of this disruption is difficult

to adequately illustrate; however, one detail suffices: a port system employing approximately 2,000 workers was reduced to operational performance levels which were characteristic of a period when the workforce was less than 5% of that number.

The above-mentioned developments, followed by the literal disintegration of the logistics system on which the role of the Port of Bar had been based-manifested through the reduction to a minimum or the complete shutdown of key industrial systems such as the Smederevo Steel Plant, the Mining and Smelting Complex in Bor, the Wagon Factory in Kraljevo, and others-led to the disruption of import/export flows on which the port depended. Consequently, following the lifting of the aforementioned sanctions (at the very end of 1995), the port was confronted with an extremely complex situation in its efforts to at least partially restore its market position.

Economic recovery in the port's hinterland, accompanied by the "revival" of operations of some of its former major users-through the privatization and intensification of import/export activities of the Smederevo Steel Plant, the automobile factory in Kragujevac, and the Mining and Smelting Complex in Bor-contributed to a gradual increase in cargo throughput. As a result, in 2022, "Port of Bar" JSC achieved a throughput of 2.39 million tons, the highest level recorded in more than 35 years. Although official data on throughput achieved by "Port of Adria" JSC in 2022 are not publicly available, likely that the combined throughput ("Port of Bar" JSC + "Port of Adria" JSC) may have even exceeded the figure of 2.744 million tons, which still officially stands as the historical record. It should be noted, however, that in that year certain "additional" cargo volumes were redirected to the Port of Bar due to disruptions in supply chains passing through Black Sea ports, caused by the effects of the war between Russia and Ukraine. In any case, it remains a highly concerning fact that annual throughput has not, over time, managed to surpass the level achieved in 1989-more than 35 years ago.

A particularly telling indicator of the disruption of development trends at the Port of Bar (directly linked to instabilities and challenges in its market environment, and consequently to throughput levels and all derived performance indicators) is the length of time between the realization of investments in capacity-determining system components. For example, there have been no investments in the construction or extension of operational quays at cargo terminals since 1978 (a period of 48 years). Similarly, there was a prolonged gap between two major acquisitions of port cranes: from 1986, when portal cranes with a lifting capacity of 20 tons were procured (now operated by "Port of Adria" JSC), until 2011, when a Liebherr

LHM 550 mobile port crane was acquired by “Port of Bar” JSC-a span of 25 years. Furthermore, no new closed port storage facilities were constructed after 1978 until 2023, when a modular warehouse of 4,500 m² was built within “Port of Bar” JSC (after 45 years), etc.

In the initial stages of development after the Second World War, the Port of Bar had, from a logistical perspective, primarily local importance-serving the supply needs of the city of Bar and its surroundings, enabling the export of domestic products, and providing materials for companies engaged in the construction of the port, the development of the city, the completion of the Sozina tunnel, and the regulation tunnel for the Rikavac stream through Volujica Hill, which used to overflow in winter and cause flooding. During this period, the port was connected to its hinterland via the narrow-gauge Bar–Virpazar railway [53]. As previously noted, the integration of the Port of Bar into the system of major Yugoslav ports-in terms of throughput-was envisaged only after the completion of the Adriatic Highway and the Bar–Belgrade railway. Following the commissioning of the Bar–Belgrade railway in 1976, the role and importance of the Port of Bar evolved significantly. The port became a key hub intended to handle import and export flows from a broad hinterland, including the Socialist Republics of Montenegro, Serbia, and Macedonia (constituents of former Yugoslavia). If this direct gravitational zone is expanded to include the previously mentioned transit potential related to Central and Eastern European countries, it can be concluded that the still-relevant objective of positioning the Port of Bar as a port of wider regional importance had, in essence, already been established several decades ago.

The factors influencing the achievement of objectives related to the market positioning of the Port of Bar, as well as its role and importance within the logistics system to which it belongs, are numerous and characterized by highly complex interactions. Their detailed elaboration would require significantly more space than allowed within the scope of this paper; however, it is clear that one of the key groups of influencing factors relates to competing ports.

The Port of Bar faces very strong competition. Its main competitors include the ports of Rijeka and Ploče (Croatia), Constanța (Romania), Burgas (Bulgaria), Thessaloniki and Piraeus (Greece), Durrës (Albania), and Koper (Slovenia). The high level of investment in the development of these competing ports generates substantial risks for the market position of the Port of Bar. For instance, the Port of Koper has continuously invested in expanding its capacities and improving transport infrastructure connections with its hinterland; the ports of Rijeka and Ploče have also invested significantly in capacity expansion and connectivity; while the Port of Durrës

has launched a “mega-project” for the construction of a new cargo port-Porto Romano, alongside the development of transport infrastructure connecting the port to its hinterland, among other initiatives.

The fact that the maximum capacity utilization rate of the Port of Bar over the past 50 years (particularly with regard to the period following the commissioning of the Bar–Belgrade railway) has only slightly exceeded 50% deserves special attention. The devastating impact of the 1979 earthquake and the economic sanctions imposed by the United Nations Security Council on the SFR Yugoslavia had a clearly devastating impact on the port’s position and its capacity utilization. Furthermore, the dramatic shift in the Port of Bar’s position following the disintegration of the SFR Yugoslavia had a profoundly negative effect. From being envisioned as a key component of supply chains within a single state, the port suddenly became, for its main users, just one of several foreign ports-further burdened by infrastructure connections that deteriorated over time and gradually lost capacity. Various measures aimed at increasing cargo flows to and from the port have yielded limited tangible results. These included the promotion of the Budapest–Belgrade–Bar–Bari corridor, the establishment of a joint company owned by the port and railway enterprises to enhance rail cargo flows, the introduction of a unified port–rail tariff, the establishment of a free zone within the port area, the restructuring of the port, and the privatization of one of its terminal operators.

5. Development Directions of the Port of Bar

The fact that the highest average capacity utilization level achieved over the past 50 years has remained significantly below 50% (while the maximum recorded in the analyzed 120-year history was approximately 55%) directly points to a clear priority: intensifying efforts to increase the utilization of existing port capacities. At the same time, alongside measures aimed at improving current performance, it is evident that maximum efforts must be directed toward the development of new capacities-following market demands-in order to create the conditions for positioning the Port of Bar as a port of genuine regional significance.

Optimizing the level of utilization of existing port capacities and developing new ones depends on numerous internal and external factors, diverse in both nature and impact. Even under current conditions of infrastructure (rail and road) connecting the port with its hinterland, it is possible to increase cargo flows to and from the port, by implementing appropriate organizational measures and improving the level of coordination and cooperation between the port and logistics entities in the hinterland. However, it is evident that improvements are necessary in

several key areas directly linked to enhancing the Port of Bar's potential. These include: upgrading transport infrastructure connections with the hinterland (reconstruction of the Bar–Belgrade railway, construction of the Bar–Belgrade motorway, etc.), simplifying and accelerating procedures associated with cargo flows, and strengthening coordination among entities within the logistics system to which the port belongs. These are highly demanding projects from all perspectives, particularly in terms of investment costs and implementation timelines, and positive outcomes can only be expected through a systemic approach and coordinated, intensive action by all relevant actors. In parallel, it is essential to increase the level of investment both in the development of the port as a system and in the infrastructure that connects it with its hinterland.

It is clear that the future development of the Port of Bar should, to the greatest extent possible, align with current global trends in the development of modern seaports. These trends primarily relate to sustainable development (including its environmental, economic, and social components, along with their various manifestations such as decarbonization, clean energy, circular economy, and waste management) and digitalization. At the same time, there is a continuous need to further improve the overall port governance model, optimize the level of intermodal activities, fully utilize the potential of the Free Zone of the Port of Bar, and enhance systems related to occupational health and safety, security, emergency response, risk management, etc.

It is necessary to emphasize that the integration of environmental principles into port operations could contribute not only to the reduction of negative environmental impacts, but also to the generation of financial benefits through increased competitiveness and efficiency. The economic dimension of sustainable development implies resource optimization, improved profits, and sustainable investment in infrastructure, while the social dimension includes raising awareness among the local community, employees, and other entities interested in the importance of green practices and responsible port management. Putting the aforementioned into practical terms, it is important to, in addition to planned expansion of the Port of Bar capacities, introduce measures aimed at reducing air emissions, improving energy efficiency and optimizing resource use, while simultaneously developing intermodal connections and improving awareness of sustainability principles. Such an approach can contribute to achieving the goal of transforming the Port of Bar into an economically sustainable, environmentally responsible, and socially inclusive port, capable of meeting future development challenges and integrating into European green standards.

In this context, it should be noted that spatial planning documentation for the Port of Bar area envisages the development of port capacities up to 12 million tons per year. In other words, current spatial plans reserve sufficient space for increasing the existing capacity by approximately 140% (from the current 5 million tons per year to the planned 12 million tons per year).

Throughout this process, it is important to bear in mind that the Port of Bar is a relatively small port, which generally implies various types of constraints, including those related to human resources and investment capacity. When creating business (development) strategies, it is essential to take into account the specific characteristics associated with small ports. For example, on a global scale, total port throughput in 2022 was very close to the levels recorded in 2019 (Figure 4).

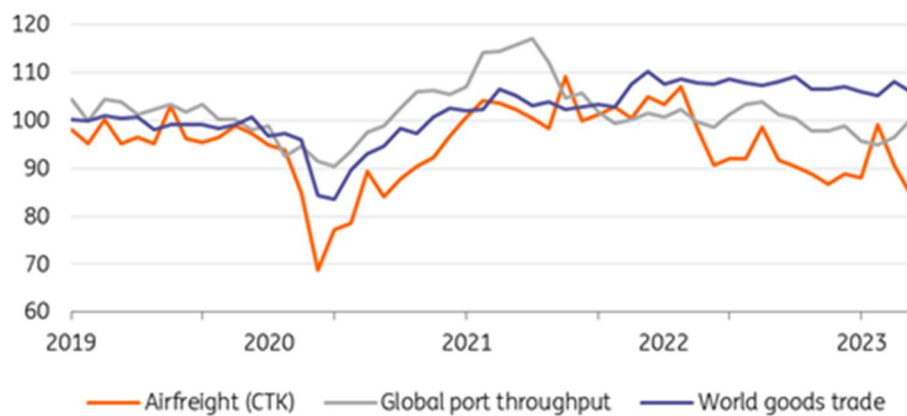


Fig. 4 – Cargo throughput at ports (source: [64])

However, the situation at “Port of Bar” JSC was noticeably different: in 2019, throughput reached 1.45 million tons, while in 2022 it reached 2.39 million tons, representing a ratio of $2022/2019 = 1.65$.

6. Conclusion

Analysis presented in this paper implies there is one constant – the resilience and continuity of the Port of Bar as an entity. There is no doubt this trend will continue. In its more recent 120-year history, numerous details confirm this assertion. Despite the many wartime periods it has endured, the destruction it suffered during the Second World War, the earthquake that nearly completely devastated it, the total blockade caused

by economic sanctions imposed by the United Nations Security Council, and the many state systems it has outlived, the Port of Bar continues to mark significant anniversaries of its remarkable existence.

Although conceptually well-positioned and despite attempts to apply various (theoretically and practically recognized) mechanisms aimed at increasing capacity utilization over time in terms of performance indicators, the Port of Bar has never surpassed the “threshold” of 3 million tons of cargo throughput per year. This is an issue that calls for comprehensive analysis.

This paper highlights some of the key obstacles to the development of the Port of Bar over the analyzed period, some of which have set the “wheel of history” back by several decades. Unfortunately, there are many examples in which certain operational models and business practices-identified as having significant potential more than a century ago or somewhat later-have remained unused or have been used only to a very limited extent, even though the passage of time has done little to diminish their relevance (although some have, naturally, undergone modifications in form).

It is evident that one of the fundamental objectives for the future development of the Port of Bar should be the definition and implementation of a management model that ensures the optimal utilization of existing capacities and the development of new ones. At the same time, maximum efforts at all relevant levels are required to ensure that, instead of facing setbacks that push the “wheel of history” backward, the system is continuously improved, progressing step by step toward the realization of its clearly significant potential.

References

- [1] Andrijašević, Ž., Cvetinović, A., Lekić, S., Milović, Ž., Ostojić, M., Pavlović, N., Popović, M., Šušter, M., Vujović, M., Zagarčanin, M. (2006), “Pristan – grad kojeg nema”, Publikum, Belgrade, ISBN: 86-908753-0-1.
- [2] <https://dacg.me/issar/icg-da-2-bar-ao-bar/luka-bar-lb-bar/>
- [3] Popović, M. (1985), “Barska luka u dva vijeka”, Pobjeda, Podgorica.
- [4] ESPO, ESPO Green Guide, A Manual for European Ports Towards a Green Future, 2021. <https://www.espo.be/media/ESPO%20Green%20Guide%202021%20-%20FINAL.pdf> [Accessed 15 Feb. 2025].
- [5] European Commission, Europe's Seaports 2030: Challenges Ahead, Brussels, 2013. <https://europe.eu>.
- [6] Verschuur, J., Koks, E.E., Hall, J.W. (2022), “Ports' criticality in international trade and global supply-chains”, *Nature Communications*, no. 13, <https://www.nature.com/articles/s41467-022-32070-0> [Accessed 12 Feb. 2025].
- [7] Jouili, T. (2016), “The Role of Seaports in the Process of Economic Growth”, *Developing Country Studies*, vol. 6(2), pp. 64–69. Available at: <https://core.ac.uk/download/pdf/234682718.pdf> [Accessed 10 Feb. 2025].

- [8] Wahyni, S. (2019), "Innovation in Port Development. The Quad Helix Model", in: *Infrastructure Investment in Indonesia: A Focus on Ports*, Cambridge: Open Book Publishers.
- [9] Jugović, A., Jardas Antonić, J., Aksentijević, D. (2023), "An Overview of Criteria and Scenarios Relevant for Development of Seaports of County and Local Importance in the Republic of Croatia", *Transactions on Maritime Science*, vol. 12.
- [10] Bulletin Fall (2016), <https://repositorio.cepal.org/server/api/core/bitstreams/1e9d475e-70e5-41a2-a1c9-7d8b7351db4d/content> [Accessed 22 Feb. 2025].
- [11] Taneja, P., Walker, W.E., Ligteringen, H., van Schuylenburg, M., van der Plas, R. (2009), "Future scenarios: Implications for port planning", *Proceedings of the WCTRS Conference*, Antwerp. <https://www.researchgate.net/publication/284150234> [Accessed 28 Feb. 2025].
- [12] Vilke, S., Ukić Boljat, H., Grubišić, N., Maglić, L. (2021), "Application of multi-criteria analysis for the introduction of green port management practices: an evaluation of energy efficient mobility in nautical ports", *Scientific Journals of the Maritime University of Szczecin*, 65: 72–83.
- [13] International Chamber of Shipping (ICS) — *Maritime Barometer Report 2022–2023*. <https://www.ics-shipping.org/resource/ics-maritime-barometer-report-2022-2023/> [Accessed 26 Feb. 2025].
- [14] UNCTAD, *Review of Maritime Transport*, United Nations, Geneva (2021), <https://unctad.org> [Accessed 11 Feb. 2025].
- [15] American Bureau of Shipping, *Revolutionary Maritime Technology Trends* (2022), <https://ww2.eagle.org/en/innovation-and-technology/technology-advancements/abs-tech-trends.html> [Accessed 12 Feb. 2025].
- [16] European Commission, COM (2026) 112 final, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions — EU Ports Strategy {SWD(2026) 81 final}*, Brussels (2026). https://transport.ec.europa.eu/transport-modes/maritime/eu-ports-and-industrial-maritime-strategies_en [Accessed 24 Mar. 2025].
- [17] ESPO, *Environmental Report — EcoPortsinSights 2025* (2025). <https://www.espo.be/publications/espo-environmental-report-2025> [Accessed 10 Mar. 2025].
- [18] Indriastiw, F., Hadiwardoyo, S.P., Nahry (2021), "Port Connectivity Model in the Perspective of Multimodal Transport: A Conceptual Framework", *IOP Conference Series: Materials Science and Engineering*, vol. 1052. The 5th International Conference on Marine Technology (SENTA 2020), 8 December 2020, Surabaya, Indonesia. <https://iopscience.iop.org/article/10.1088/1757-899X/1052/1/012008> [Accessed 27 Feb. 2025].
- [19] Pham, T.Y. (2023), "A smart port development: Systematic literature and bibliometric analysis", *The Asian Journal of Shipping and Logistics*, vol. 39, pp. 57–62.
- [20] Ravetz, J. (2013), "New Futures for Older Ports: Synergistic Development in a Global Urban System", *Sustainability*, vol. 5(12): 5100–5118.
- [21] Pardali, A., Stathopoulou, C. (2006), "The Post-War Port Industry Development Models: The Effects on the Economic Development of the Ports' Hinterland", 46th Congress of the European Regional Science Association: "Enlargement, Southern Europe and the Mediterranean", 30 August – 3 September, Volos, Greece, pp. 1–16.
- [22] Liu, L., Ping, H. (2020), "Study of the Influencing Factors on Development of Ports in Guangdong, Hong Kong, and Macao from the Perspective of Spatial Economics",

- Mathematical Problems in Engineering, vol. 2020, Article ID 2343860. <https://doi.org/10.1155/2020/2343860>.
- [23] Pettit, S.J., Beresford, A.K.C. (2009), "Port development: from gateways to logistics hubs", *Maritime Policy & Management*, vol. 36, pp. 253–267.
 - [24] Krivokapić, R. (2022), "Perspectives for the Development of Small Seaports, with Reference to the Adriatic Seaports", *Transformations in Business & Economics*, vol. 21, pp. 21–33.
 - [25] European Commission, COM/2020/789 final — Sustainable and Smart Mobility Strategy, Brussels (2020). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0789> [Accessed 31 Jan. 2025].
 - [26] European Commission, COM/2019/640 final — European Green Deal, Brussels (2019). https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/transport-and-green-deal_en [Accessed 13 Feb. 2025].
 - [27] <https://sdgs.un.org/goals> [Accessed 24 Feb. 2025].
 - [28] <https://www.undp.org> [Accessed 24 Feb. 2025].
 - [29] Lind, M., Lehmacher, W., Netz, A., Watson, R.T. (2023), "System Demonstrators: Swedish Ports as a Case Study for Innovation".
 - [30] European Environment Agency, Transport and Environment Report (2022) — Digitalisation in the Mobility System: Challenges and Opportunities, Luxembourg: Publications Office of the European Union. <https://www.eea.europa.eu/publications/transport-and-environment-report-2022/transport-and-environment-report/view> [Accessed 12 Feb. 2025].
 - [31] Beresford, A.K.C., Gardner, B.M., Pettit, S.J., Naniopoulos, A., Wooldridge, C.F. (2005), "The UNCTAD and WORKPORT models of port development: evolution or revolution?", *Maritime Policy & Management*, vol. 31(2), pp. 93–107. DOI: 10.1080/0308883042000205061.
 - [32] Ducruet, C., Polo Martin, B. (2025), "Port-city evolution in the long run (1880–2020): Global and regional trends", 2025-25 Working Paper, Université Paris Nanterre. https://economix.fr/pdf/dt/2025/WP_EcoX_2025-25.pdf [Accessed 22 Mar. 2025].
 - [33] Perović, M. (1988), "Bar i Ulcinj — Savremene privredno-geografske funkcije", Nikšić.
 - [34] "Luka Bar" AD (2026), Archived documentation, Bar.
 - [35] Ljumović, D. (2001), "Uz izgradnju Luke Bar", Stručna knjiga, Belgrade.
 - [36] Dokić, M. (2004), "Željeznička mreža Srbije (1884.–2004.)", Institute of Economic Sciences, Belgrade.
 - [37] Opće udruženje saobraćaja SFRJ, Grupacija morskih luka SFRJ (1981), "Analiza poslovanja i ekonomskog položaja lučkih radnih organizacija u 1980.", Rijeka.
 - [38] Opće udruženje saobraćaja SFRJ, Grupacija morskih luka SFRJ (1982), "Analiza poslovanja i ekonomskog položaja lučkih radnih organizacija u 1981.", Rijeka.
 - [39] Opće udruženje saobraćaja SFRJ, Grupacija morskih luka SFRJ (1983), "Analiza poslovanja i ekonomskog položaja lučkih radnih organizacija u 1982.", Rijeka.
 - [40] Opće udruženje saobraćaja SFRJ, Grupacija morskih luka SFRJ (1984), "Analiza poslovanja i ekonomskog položaja lučkih radnih organizacija u 1983.", Rijeka.
 - [41] Chen, Z., Chen, Y., Li, T. (2016), "Port Cargo Throughput Forecasting Based on Combination Model", *Proceedings of the 2016 Joint International Information Technology, Mechanical and Electronic Engineering Conference*. DOI: 10.2991/jimec-16.2016.25.
 - [42] Eskafi, M., Kowsari, M., Dastgheib, A., Taneja, P., Thorarinsdottir, R.I. (2021), "Mutual information analysis of the factors influencing port throughput", *Maritime Business Review*, vol. 6(2), pp. 129–146. DOI: 10.1108/MABR-05-2020-0030.

- [43] Jansen, M. (2014), "Forecasting container cargo throughput in ports", Master's thesis, Erasmus University Rotterdam, Erasmus School of Economics — Urban, Port and Transport Economics. <https://thesis.eur.nl> [Accessed 1 Mar. 2025].
- [44] Sun, L., Tan, D-R. (2008), "Research on probability distribution of port cargo throughput", *Journal of Marine Science and Application*, vol. 7(1), pp. 65-68, DOI:10.1007/s11804-008-7014-7.
- [45] Zhang, H. (2014), "Analysis of influencing factors of coastal port cargo throughput in China from economic aspect", Digital Repository of the World Maritime University World Maritime University Dissertations. https://commons.wmu.se/cgi/viewcontent.cgi?article=2861&context=all_dissertations. [Accessed Feb. 28, 2025].
- [46] Makoa, P., Dávid A., Oleic, A.B. (2021), "Possibilities of increasing the throughput of ports", 14th International scientific conference on sustainable, modern and safe transport, *Transportation Research Procedia*, vol. 55, pp. 426-433, <https://pdf.sciencedirectassets.com/308315/1-...> [Accessed 25 Feb. 2025].
- [47] Obasi, C.C. (2022), "Assessment of the Impact of Cargo Throughput on Port Productivity in Warri Seaport, Delta State, Nigeria", *Annals of Review and Research*, vol. 7(3), DOI: 10.19080/ARR.2022.07.555714.
- [48] Ministarstvo pomorstva FNRJ, (1953), *Pomorski godišnjak za godinu 1952.*, Beograd.
- [49] Uprava pomorstva i rečnog saobraćaja FNR Jugoslavije, (1954), *Godišnjak pomorstva i rečnog saobraćaja za godinu 1953.*, Split.
- [50] Uprava pomorstva i rečnog saobraćaja FNR Jugoslavije, (1955), *Godišnjak pomorstva i rečnog saobraćaja – godina 1954.*
- [51] Uprava pomorstva i rečnog saobraćaja FNR Jugoslavije, (1957), *Godišnjak pomorstva za godinu 1956.*, Split.
- [52] Uprava pomorstva i rečnog saobraćaja FNR Jugoslavije, (1958), *Godišnjak pomorstva za godinu 1957.*, Beograd.
- [53] Uprava pomorstva i rečnog saobraćaja FNR Jugoslavije, (1959), *Godišnjak pomorstva za godinu 1958.*, Beograd.
- [54] Stručni odbor za pomorske luke Savjeta za saobraćaj SPK, Zajednica lučkih poduzeća, (1964), *Izveštaj o radu jugoslovenskih pomorskih luka za 1963.* Beograd, Rijeka.
- [55] Savjet za saobraćaj SPK, Grupacija pomorskih luka, (1967), *Analiza poslovanja i ekonomskog položaja lučkih preduzeća u 1966.*
- [56] Savjet za saobraćaj SPK, Grupacija pomorskih luka, (1969), *Analiza poslovanja i ekonomskog položaja lučkih poduzeća u 1968.*, Kopar.
- [57] Savjet za saobraćaj SPK, Grupacija pomorskih luka, (1970), *Analiza poslovanja i ekonomskog položaja lučkih poduzeća u 1969.*, Rijeka.
- [58] Savjet za saobraćaj SPK, Grupacija pomorskih luka, (1972), *Analiza poslovanja i ekonomskog položaja lučkih poduzeća u 1971.*, Split.
- [59] Grupacija pomorskih luka Privredne komore Jugoslavije, (1977), *Analiza poslovanja i ekonomskog položaja lučkih organizacija udruženog rada u 1976.*, Bar.
- [60] Grupacija morskih luka Jugoslavije, (1978), *Analiza poslovanja i ekonomskog položaja lučkih radnih organizacija u 1977.*, Dubrovnik.
- [61] Opće udruženje saobraćaja SFRJ, Grupacija morskih luka SFRJ, (1985), *Analiza poslovanja i ekonomskog položaja lučkih radnih organizacija u 1984.*, Rijeka.
- [62] Privredna komora Jugoslavije, Udrženje saobraćaja, Grupacija morskih luka, (1987), *Analiza poslovanja i ekonomskog položaja lučkih radnih organizacija u 1986.*, Dubrovnik.
- [63] Dokić, M. (1986), *Dosadašnje korišćenje pruge Beograd – Bar i Luke Bar, tekući problemi i perspektive*, Institut ekonomskih nauka, Beograd.
- [64] <https://www.ing.com/>

Submitted:	31/03/2026	Deda Đelović
Accepted:	23/04/2026	Luka Bar AD, Obala 13. Jul 2, Bar, Montenegro Email: deda.djelovic@lukabar.me
		Milutin Lakićević Luka Bar AD, Obala 13. Jul 2, Bar, Montenegro Email: milutin.lakicevic@lukabar.me
		Vesna Mihaljević Luka Bar AD, Obala 13. Jul 2, Bar, Montenegro Email: vesna.mihaljevic@lukabar.me
		Dragan Šćekić Luka Bar AD, Obala 13. Jul 2, Bar, Montenegro Email: dragan.scekic@lukabar.me
		Dejan Novović Luka Bar AD, Obala 13. Jul 2, Bar, Montenegro Email: dejan.novovic@lukabar.me