

## THE CARGO EVOLUTION TRANSPORTATION ON ROMANIAN WATERWAYS CERNAVODĂ – AGIGEA AND POARTA ALBĂ – MIDIA NĂVODARI

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**Abstract:** The Danube – Black Sea Canal, third in the world after Suez Canal and Panama Canal, reduces with over 400 km the cargo route from the Black Sea to the center of the Europe and approximately 4000 km for the routes from Australia and Far East. The canal is part of the European project Rhine-Main-Danube and enable the interconnection of hundreds of inland harbor situated between the North Sea and Black Sea. The canal presents not only a great economic importance, being able to take about 80 million tons of cargo annually, but also a social meaning. It has a major contribution to the Romanian southeast farms, assure an expansion of irrigation, therefore implementation of the agricultural development program on modern principles, facilitate the supply of drinking water and industrial riverside villages.

**Keywords:** Danube canal, social meaning, expansion

### Introduction

The idea of building a waterway that shorten the way to the Black sea has existed since 1878 but the technical conditions of the time led to the postponement of the start of the project until 1949 when they started the first works. They were stopped in 1955, resumed in 1975 and were completed in 1984, the channel was inaugurated in May of the same year. For the construction of the canal were involved impressive resources, have been excavated about 300 million cubic meters (25 million more than the Suez Canal and 140 million more than the Panama Canal) and poured 3.6 million cubic meters of concrete requiring an investment of about 2 billion dollars.



Fig. 1. The Danube-Black Sea canal and Poarta Albă - Midia-Năvodari canal

The commissioning in 1992 of the Rhine-Main-Danube, Romania becomes the beneficiary of the whole system of waterways on the continent's liaises with 18 European countries and the possibility to the North Sea, Baltic Sea and English Channel. This achievement increases the importance of the river as the main transport artery that crosses the continent, allowing freight traffic thus northwest to southeast Europe and reducing by approximately two thirds route through the Mediterranean and the Atlantic, between the Black Sea and North Sea.

### The characteristics of the canal

The canal with the total length of 95.6 km, consists of a main branch of 64.4 km and a northern branch (known as White Gate Canal-Midia Năvodari), with a length of 31.2 km. Main line has a depth of 7 m, a base width of 70 m and 110-140 m surface. The canal has a maximum annual capacity of 75 million tons transport freight. Maximum draft is 5.5 m allowing access to the river ships and small sea. At each end are there two locks that allow traffic in both directions.

The White Gate Canal-Midia-Năvodari was built especially for the development of transport fuel in Ovidiu and transporting dolomite and limestone from the quarries Ovidiu to beneficiary and enlightened country, especially for Medgidia cement and binders. Throughout its length were built six bridges, three ports (Ovidiu, Midia, Luminița) and two locks.

Each canal lock factory service is equipped with facilities and mechanisms that provide automatic opening and closing

operation of airlocks. Lock Cernavodă has dual role: to not get water from the Danube when the level is greater than 7.5 m and stop water leaking into the Danube canal. Lock Agigea opens the canal to the open sea, making the transfer between the two categories of water. Each lock is constructed using waterfall energy. Each chamber lock has of plane gates upstream and downstream that works independently access of vessels being made simultaneously in both directions of traffic.

### Economic and social importance

Making the Danube – Black Sea channel, is the largest 100% Romanian investment objective of all time and the main advantages is the direct link to the port of Constanta, the largest sea port on the Black Sea and one of the largest in Europe. The transshipment cargo ships up to 5,000 dwt or river barges of 3,000 dwt, can provide efficient transportation to Central Europe.

This makes it an important target for Romania and Europe, especially if we take into account the water transport is the most affordable and that EU directives require reducing pollution from road transport.

Canal shortened by about 400 km from the Black Sea route goods to Central Europe and approximately 4,000 km route that make goods from Australia and the Far East for Central Europe.

The canal can take an annual traffic volume of over 75 million tones freight industry designed primarily Danube area. This reduces expenditure related to ensuring a direct and accessible price for the main beneficiaries within the country.

Also, the new waterway is accessible to all foreign-flagged vessels concerned in accordance with Romanian law.

For our country, the Danube - Black Sea presents a special significance not only economic but also social. Designed as a new navigation route between Cernavodă and Agigea canal is part of a vast assembly with multiple functionalities. He has a major contribution to good management of inland waters in this part of the country, the expansion of irrigation and therefore agricultural development on modern principles allowing the water supply to coastal communities and industry.

Using the Danube - Black Sea canal and commissioning of the free zone Constanta Sud - Agigea created favorable conditions that have increased the interest of navigation continental countries of central Europe in investing in Romania for the development of trade with the Near and Middle East, ensuring -it also the economic development of the Romanian seaside premises.

Being an axis of communication is done via Canal traffic and exchange of goods beneficial in the development of urban and rural settlements bordering. Some urban settlement in the region have developed industrial function due to Danube – Black Sea Canal: Cernavodă – energy function, industrial function Medgidia (building materials cement) and Năvodari – chemical function. Rural settlements were not affected by the construction of the canal, with one exception, which Straja city was moved in 1980.

### Cargo traffic in the period 1991-2014

After 1990, transit through Danube-Black Sea Canal has

increased substantially. Total traffic has increased from 9.4 million tons in 1991 to over 20 million tons since 1996. The best year in history was 2005, over 30 million tons of freight traffic. In 2008 there was a traffic of 24 million tons capacity with 7823 sluicing. 16808 river vessels transiting the canal or barge convoys. The goods were transported coal, coke, petroleum products, fertilizers and iron ore. In 2011 there was a total of 11.6 million tons of freight transported both river vessels and river-sea vessels. Domestic traffic accounted for 58.1% of total traffic and international traffic was 41.9%. (figure 2 and figure 3).

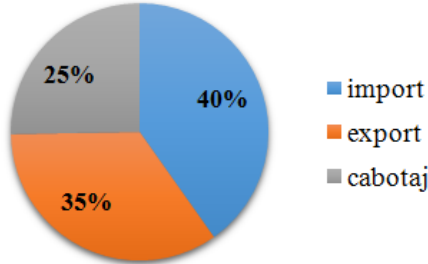


Figure 2. Internal trafficking of goods in 2011

Cabotage, which represents the traffic between ports or places of Romanian extraction and Danube ports or waterways, was represented by open pit and quarry products and slag required for the construction of the Bucharest – Constanta highway.

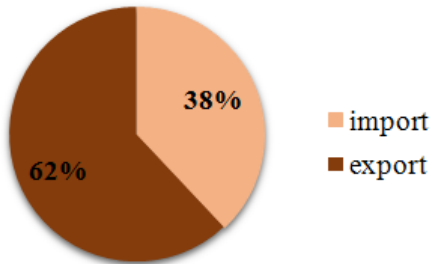


Figure 3. External trafficking of goods in 2011

The main countries with a majority in the carriage of goods by inland waterways in 2011 are shown in figure 4. Notably, in 2011, 76.7% is that freight traffic was conducted with Romanian flag vessels and given the low level of the Danube occupancy capacity of ships decreased from 47.14% in 2010 to 40.08% (figure 4).

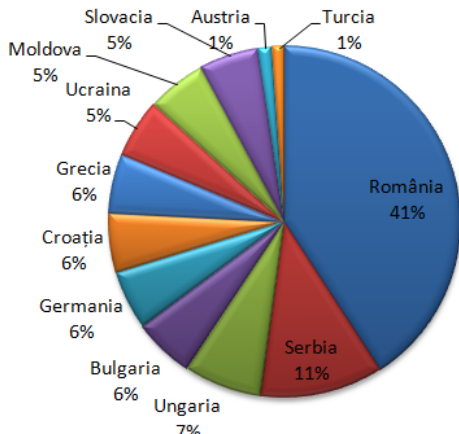


Figure 4. Distribution of goods traffic in 2011

The low level of the Danube was not the only obstacle to achieving a higher volume of traffic but also during unfavorable navigation.

Thus navigation channel was stopped for a period of over 25 days either because of strong wind or due to fog. The month March was the largest recorded during the interruption of navigation over 5 days. However, in 2011 the waterways have crossed a number of naval units 20,775 individually or in convoys whose number was 4455.

In 2013 there was a total of over 13.9 million tons cargo traffic transported by river vessels whose capacity was 30,291 tons capacity and river ships - maritime net register tonnage of 263,000 tons.

Traffic by vessels flying the flag Romanian was 14.3 million tons, representing 47.4% of total traffic and the traffic of foreign-flagged vessels was nearly 16 million tons which is 52.6%.

Cabotage in 2013 was 869 thousand tons being represented by open pit and quarry products.

Share outbound freight was 61.81% of total traffic (figure 5): 5.3 million tons cargo of grain (38% of total traffic), metal 5.7 million tons of goods (41% of total traffic), coal 0.9 million tons of goods (7% of total traffic) and basic metals 0.9 million tons of goods (6% of total traffic).

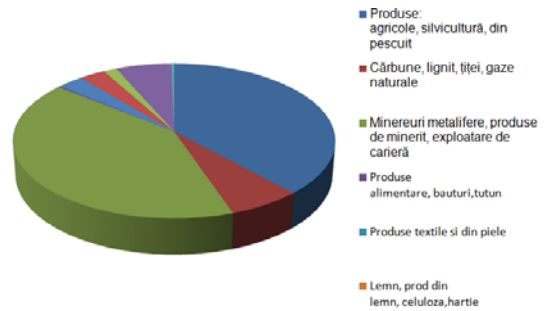


Figure 5. Balance products

Due to the transport system under full/empty use of transport capacity in 2013 was 46%. In the year 2013, the number of sluicing performed were 10,245, the total number of ships transiting was 22,105 of which 15,586 foreign-flagged vessels and convoys total transit was 4,639.

The main countries with a majority in the carriage of goods by inland waterways are shown in Figure 6.

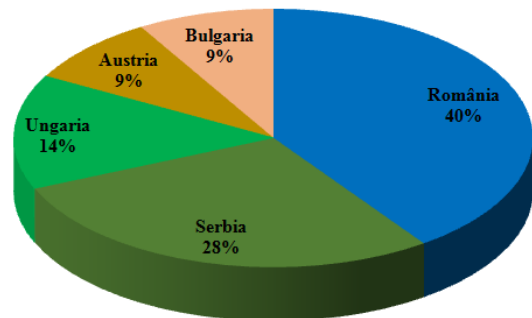
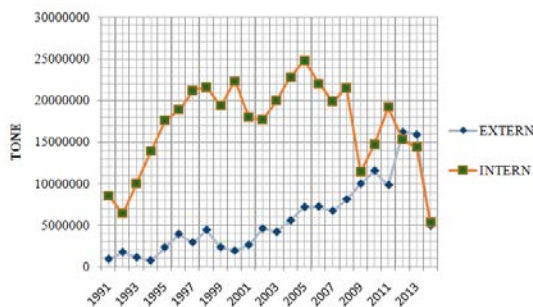


Figure 6. Distribution traffic goods in 2013

Since the beginning of 2014 until now joined waterways total traffic of 4.6 million tons of goods (2.1 million tons of freight traffic, and 2.5 million tons. Tons cargo international traffic), transported by ship river whose capacity was 10,206 tons capacity.

**Conclusion**

In recent years there has been an increase in traffic compared to the internal external. Thus in 2012, for the first time exceeded the external traffic internally with more than 15 million tons capacity (Figure 7). This emphasizes understanding, internationally, the potential that is the waterways and canal contributing to the overall development of river traffic.



*Fig. 7. Capacity of goods transported*

From early 2012 until the end of November there was a total volume of 29.4 million tons capacity, exceeding the forecast by 3.3 to plan.



*Fig. 8. Goods transported*

In 2012 (Figure 8) total traffic exceeded both the traffic recorded in 2011, one in 2010 and one in 2009, registering over 4.4 million tons of grain, ranked first among the goods transported by inland waterway.

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