

2.1 Maritime ports

On the Romanian shores of the Black Sea are located three seaports: Constanta, Mangalia, at about 22 miles to the south, and Midia, at about 10 miles to the north.

Constanta Port

The most important of those is Constanta Port, Fig.2, located at about 182 miles to the Bosphorus strait and about 85 miles to the main navigable Danube outlet into the sea, namely the Sulina arm. It spreads out over about 10 km of shoreline and advances about 5.5 km into the sea.

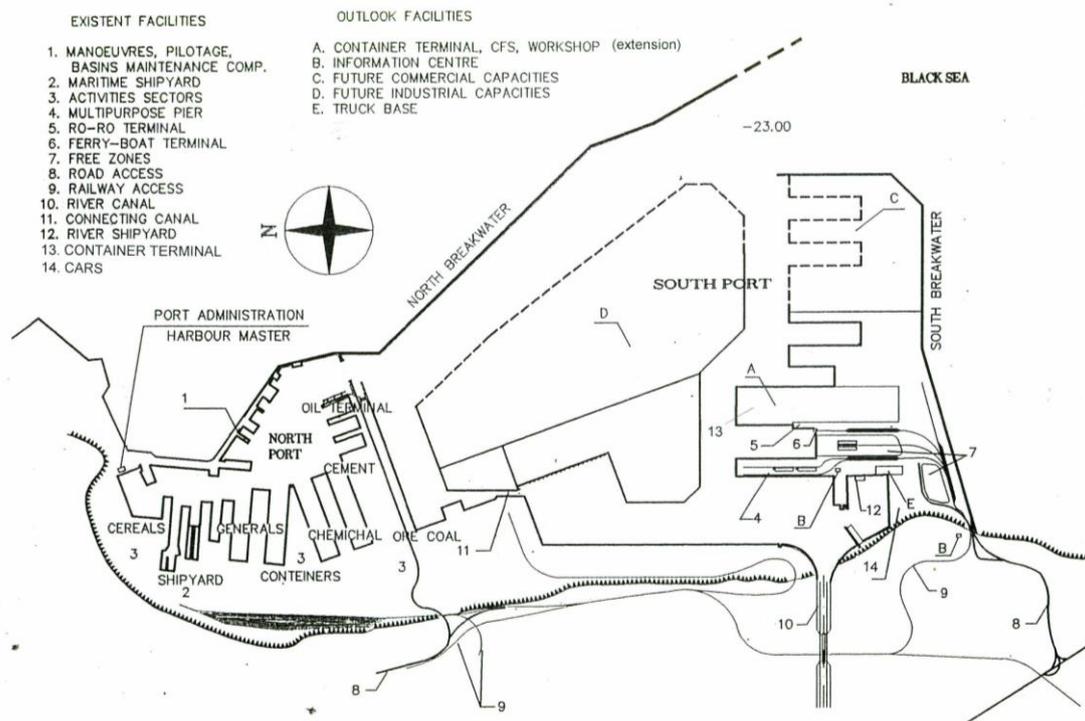


Figure 2: Constanta Port

The development of the Port of Constanta has been carried out in several phases.

The phase derives from the necessity of providing new port capacities to handle the constantly growing cargo traffic carried by high-capacity ships which for the time being have no access to the port. This large-scale development would be capable in the end to allow the berthing of ships up to 250,000 dwt.

The Danube – Black Sea Canal, which is connected to the Danube in Cernavoda, starts in the port area. The ships transporting goods on this channel to and from the Danube ports have also access to Constanta Port.

By its location and size, Constanta Port has real perspective for attracting new volumes of traffic and for developing economic activities, both in domestic trade and in international transit.

Constanta Port, being the largest trade port within the Black Sea area, has very high development capabilities in four possible directions:

- As a main transit port, between the Black Sea area and Western Europe.
- As a hub for traffic of goods to Europe.
- As an important terminal for navigation services to the countries of the Black Sea basin.
- As a loading and unloading center for large ships in relation to the goods trade among the surrounding markets.

Port of Midia

It has been developed in front of Lake Tasaul to receive vessels up to 10,000 dwt capacity. Infrastructures include berths for traffic of livestock, general cargo, liquid oil products, liquefied gases, ocean fishing activities and a shipyard.

The connection of the port with the Poarta Alba-Midia Navodari Canal ensures economic shipment of some goods, to the countries of Central Europe.

2.2 Inland Ports

Inland ports are located on the Danube River and on its inland waterways Fig.1.

Four river-maritime ports are situated on the Danube lower course also known as Maritime Danube, that allow access of ships with a capacity of about 7,500 dwt (the draught allowed on the Sulina branch of the Danube River).

River ports are developed along the entire Danube watercourse and on the navigable canal. Given the volumes of raw materials to be transported each port serves an area of the country and some industrial plants developed near the waterways.

3. DEVELOPMENT OF ROMANIAN TRANSPORTATION SYSTEMS AND THEIR CONNECTION WITH EUROPE

Due to its good access to major communication routes and strategic position Romania may become the easterly focus point for East-West trading.

The Romanian transportation system is connected to the transfer subsystems of transportation types, having basic monitoring position involving the development of transports and in particular of the intermodal ones.

3.1 Rail Transportation

An important percentage of cargo transportation through Romania is by rail. Romania also has widely dispersed of 40 inland terminals for the handling of containers.

The railway transportation subsystem is appointed with the enhancement of the main national railways in order to increase the travel speed up to 150-200 km/hour and even up to 250 km/hour with an improvement of the related equipment. The Romanian railway network will then integrate with the European one to ensure the conditions for the increase in exchange of goods.

3.2 Road Transportation

The road transport subsystem to which is appointed the enhancement of the whole national roads and an extra program to highways and express routes. All the previous enumerated works are mixing with the European transport system with its western capitals and major cities connections.

3.3 Inland Water Transport

Inland waterways in Romania are well developed. Constanta Port is linked by the Danube Canal and the Danube to an international hinterland including Ukraine, Moldova, Bulgaria, Serbia, Hungary, the Czech Republic, Slovakia, Germany and Austria.

Danube Fig.3 is navigable from Ulm to the Black Sea, measuring 2,588 km, out of which 1,075 km are in Romania. Along its course the Danube crosses the territory of 9 countries and 4 capitals and it represents an important historical waterway.

The Danube flows into the Black Sea, through 3 main branches. The main way of access is Sulina Chanel, 63 km long, which ensures, the navigation of 7.0 m draught maritime vessels up to Braila. Except the navigable sector of the Danube between Braila and Sulina, the minimum navigable depth kept by maintenance dredging is between 2.0 – 2.5 m.

With the opening of the Rhin – Main – Danube Canal in September 1992, there is a physical connection with the Rhine and the hinterland is potentially extended to Germany and to the Netherlands.

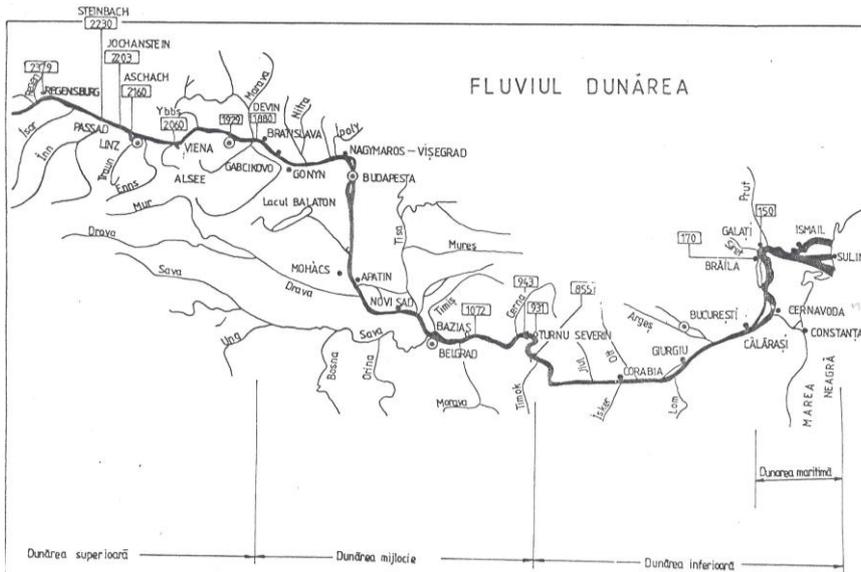


Figure 3: Danube River

The peripheral location of Danube induces a limited influence of its ports, restricted to the southern part of the country. Considering this, the strategy for the Territorial Arrangements Plan stipulates the turning into navigable waters of some Danube tributaries.

The same purpose has been considered in accomplishing navigable canals, such as:

- The Danube – Black Sea Canal, connecting Danube to Constanta port.
- The Poarta Alba – Midia, Navodari Canal, connecting the port Midia to Danube.
- The Bega Canal assisting the western part of the country.

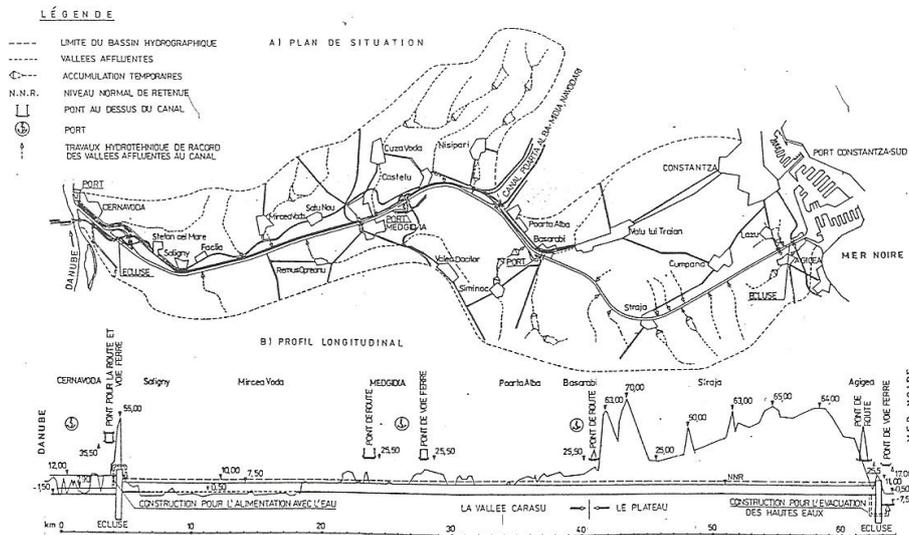


Figure 4: Danube – Black Sea Canal

The Danube – Black Sea Canal Fig.4: Its capacity is 75 million tones/year. The Danube – Black Sea Canal has complex functions, such as: navigation and water administration, irrigations, electric energy supply, drinking and industrial water supply, drainage of the adjacent lands, regularization of the water flow and their transit towards the sea. The navigable canal is 64.4 km long and 7.0 m water depth. The longitudinal profile, the hydro technical scheme of the canal, respectively, comprises a unique water race between the two hydro-technical systems of Cernavoda and Agigea Fig.5

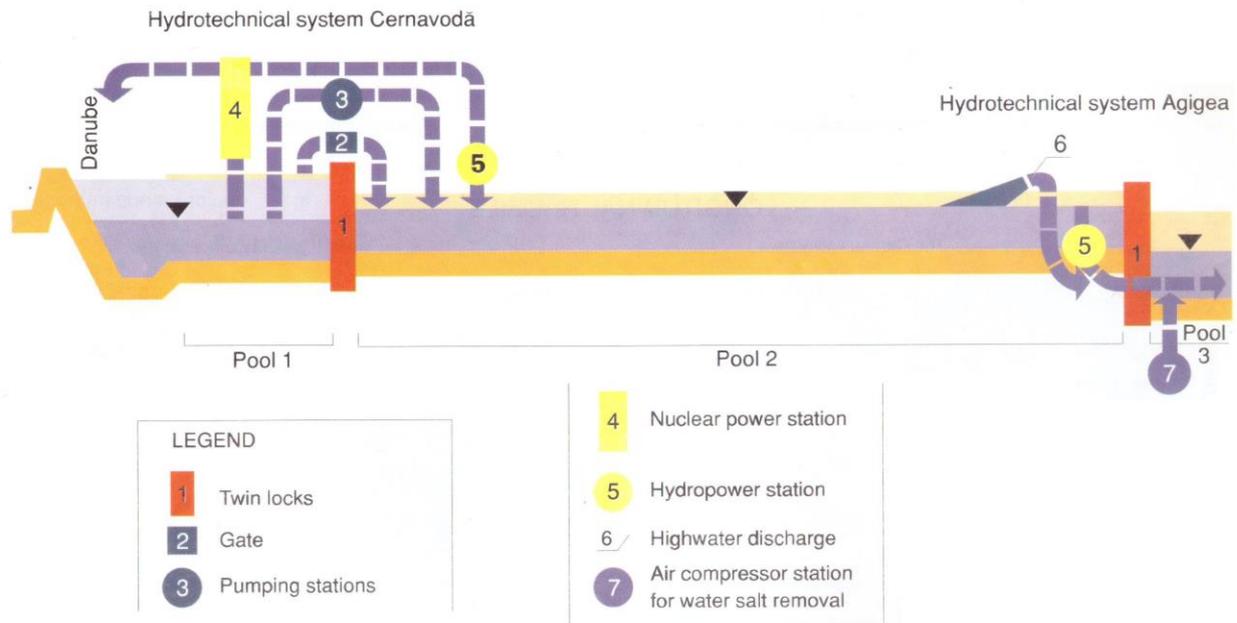


Figure 5: Danube Black Sea Canal. Hydrotechnical diagram.

The calculation convoy is made up of 6 barges and a pusher of 2,400 – 3,200 HP. The access of river – maritime vessels of 5,000 – 6,000 dwt of this waterway is also possible.

The twin locks have chambers of 310 m length, 25 m wide and a minimum depth of 7.5 m Fig.6.

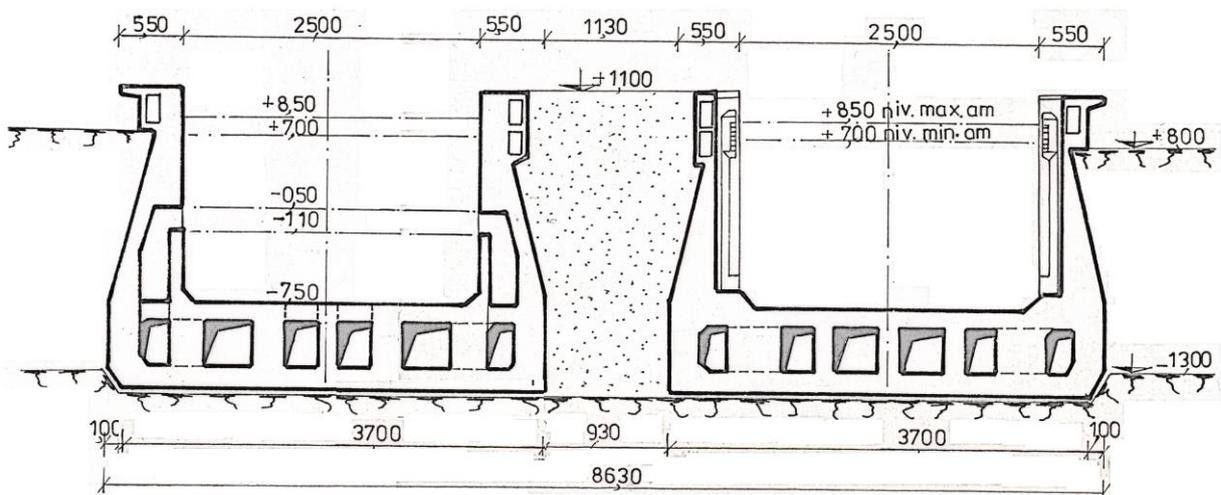


Figure 6: Twin locks

To prevent penetration salted water in the lock have been provided two solutions:

1. Fill the lock above the salty water level only from the freshwater canal through a drain located above the port basin (salted water).
2. at the downstream end of the lock is provided a compressed air curtain which prevents entering water from the port basin. This curtain is created before barge entrance and stops after the lock has been partially included.

Poarta Alba – Midia, Navodari Canal: This is the northern embracement of the navigation system in Dobrogea, the navigable waterway detaches itself from the main Danube – Black Sea Canal on km 36 and flows into Midia maritime port and Tasaul Lake

The technical characteristics adopted for this navigable waterway allow the usage of 3,000 tones type barges, used on the Danube – Black Sea Canal, the convoy consisting of only one barge and a pusher, based on the reduced traffic.

The twin lock chambers has a useful length of 145 m, 12.5 m width and minimum water level at the apron 6.0 m.

4. METHODS FOR DEVELOPING PORT ACTIVITIES

Currently the exploited port capacity is 60% and the revenues from cargo handling have decreased. Therefore as described below a number of actions are to be taken that will lead to an increased efficiency of the facilities and aim to increase volume of handled goods. Some of these measures have been applied but necessary adjustments have to be constantly undertaken.

4.1 Extension of the hinterland of a port

In order to achieve this, easy connections to distant areas must be created. Therefore European transport corridors are considered Fig.7.

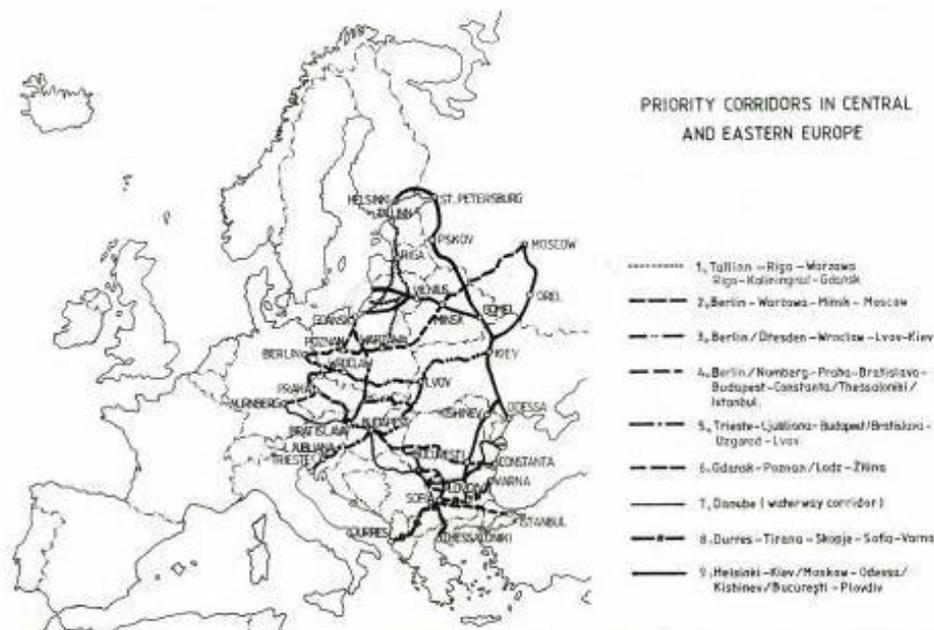


Figure 7: European transport corridors

A series of aspects concerning the need of a new infrastructure in Eastern Europe, the Black Sea Region and the Balkans included alongside with the possibilities or realizing the transport corridors for road and rail corridors, which are to meet the transport and multi-modal transport needs on local, regional or national level, as well as on pan-European level.

Most of the European rivers are improved for navigation. In addition, a network of artificial navigable canals linking the major rivers and the rivers in the area has been developed for covering as much territory as possible.

As far as the waterborne transport is concerned, development of inland waterway networks efficient form the energy consumption point of view, having a less impact on the environment. The inland waterway network must be integrated into the intermodal traffic systems. The actions for the further development of the waterborne transport on short sea shipping must be also put into force.

These new routes enlarge, considerably, the Danube hinterland. Also, all the corridors have a port as extreme point, such as Constanta in Romania, Varna and Burgas in Bulgaria, Istanbul in Turkey and Odessa in Ukraine.

The maritime Port of Constanta is linked by the Black Sea – Danube Canal and the Danube itself to an international hinterland including 10 European countries Fig.8.



Figure 8: Constanta – Rotterdam corridor

4.2 Promoting small distances navigation in the Black Sea

The Black Sea has an area of 411,540km² and together with the Azov Sea, the area amounts to 461,540km². The maximum distance between coasts is 1,125km on the East-West direction and 600km on the North-South direction.

Navigation is possible all the year round, except the Northern part of the Azov Sea, where, during some winters, icebreakers are needed for about two months. Three important navigable rivers flow into the Black Sea, Danube, Niper, Don Thus extending considerably, the hinterland of the sea Fig.9.



Figure 9: Black Sea hinterland

There are more than 35 ports on The Black Sea and Azov Sea coast. The Volga – Don Canal allows the navigation of ships up to the Caspian Sea and then, on the inland waterways in Russia, up to the White Sea, passing by the Moscow area and St. Petersburg, the latter being one of the biggest ports on Baltic Sea.

By creating the logistic zone of the Black Sea, the efficient connection of the European flows with the Asian flows can be realized. International companies consider the Black Sea region a significant business area. The new political, economic and commercial conditions have generated an attractive and favorable context for business.

The Black Sea is connected to the Mediterranean Sea through the Bosphorus and Dardanelles and then, to the Atlantic basin through Gibraltar, while the navigation to the Asia – Pacific region is realized Suez Canal.

5. INTERNATIONAL COLLABORATION REGARDING THE DANUBE RIVER

5.1 European Community Collaboration

Extension of the hinterland of a port requires connection to distant areas and European Transport Corridors are considered. The Corridor VII represents, in fact, a waterway of the Danube. Nevertheless, it is mentioned that other corridors cross the Danube: Corridor V, Corridor IX.

These routes enlarge considerably the Danube hinterland. In addition, all the corridors end to a port, such as Constanta Port in Romania.

5.2 The International Convention (I.C.) regarding the protection of the Danube

This convention was adopted in 1994 in Sofia. Its purpose is to increase the collaboration regarding prevention and control of transboundary pollution, sustainable management of the Danube and the rivers along its hydrographic basin, as well as, rational exploitation and conservation of water resources. This will contribute to the protection of the Black Sea and assist the efforts of the United Nations Economic Commission for Europe (UNECE) and European Community.

5.3 The Danube Commission (D.C.)

The Danube attracted the attention of many economic, political and military authorities of different countries. Following a series of discussions, the “Convention regarding the rules governing the navigation on the Danube” was signed in Belgrade in 1954 by the countries having direct access to the Danube.

Danube Commission’s (D.C.) purpose is to standardize the regulation for navigation; for example, establishing the manner for performing the maintenance works, signalling, and so on.

D.C. cooperates with CEE, with the International Committee regarding the protection of the Danube convention and Rhine Commission in order to be in line with the regulations, due to the fact that the navigation takes place both on the Danube and Rhine Fig.10.

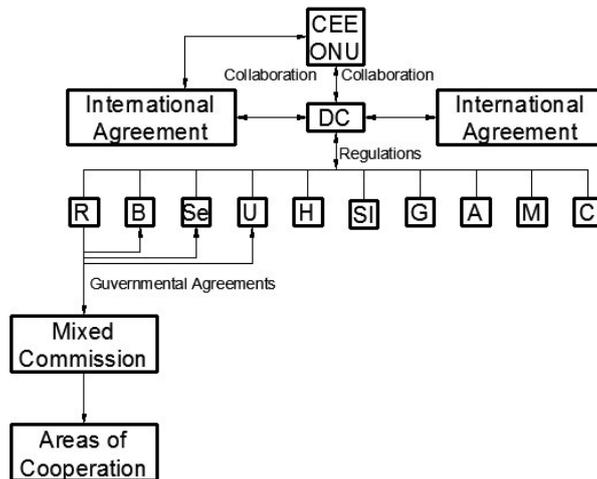


Figure 10: International collaboration regarding Danube River exploitation

5.5 Cooperation between countries

Government agreements that took into consideration the D.C. regulations enacted between Romania and its neighbours Conventions. As a result, Mixed Committees were found Fig.11.

The members of these committees meet periodically to discuss all issues at stake along the common sections of the Danube.

In order to address any navigation issues all Danube riparian countries adopt the C.D. regulations, which issues fundamental Provisions. Some aspects are developed by the governmental Mixed Commissions.

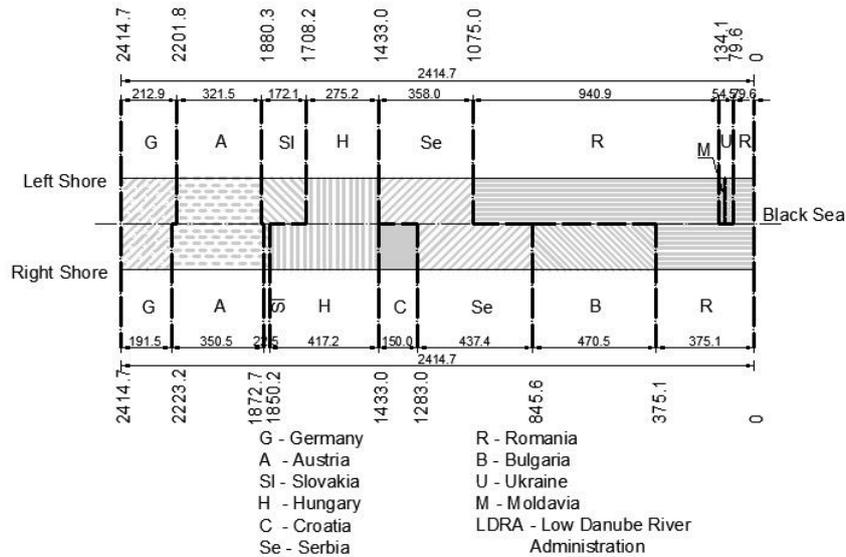


Figure 11: Sections of the Danube

5.6. Studies on the Danube Waterway

A number of studies have been conducted to improve the navigation conditions along the Danube River.

Consequently, Danube as a traditional European waterway corridor for passengers and cargo alike, has a major impact on the development of its adjacent countries. However, the transport patterns in the River are in decline compared to other modes of transport such as road, rail, and air.

Increased Danube Transportation will support further European Integration, social stability and economic growth by means of reduced costs and reduced environmental damage at an attractive investment cost.

6. CONCLUSIONS

In order to improve the performance of a port should be considered the development of its activities in three directions: cargo manipulation, industrial activities and services.

Is required an integrated transportation system for an area as big as possible in order to have reduced shipping costs. The transportation networks must lead to the port hinterland expansion.

To increase efficiency, the watercourse infrastructure must fulfill several functions: flow regularization, irrigations, water supply, drainage, power generation, etc.

Implementation of the zone of logistic activity concept (ZLA) will develop and will increase the efficiency of the port activities.

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