

EDUCATION AND TRAINING NEEDS IN THE FIELD OF LOGISTIC STRUCTURES AND SERVICES IN THE LOWER DANUBE REGION

Mihai Felea¹, Nicola Yankov², Irina Mărunțelu³ and Cristinel Vasiliu⁴

^{1), 3), 4)} *Academy of Economic Studies, Bucharest, Romania*

²⁾ *D.A. Tsenov Academy of Economics, Svishtov, Bulgaria*

Abstract

The approach of the subject concerning the training of specialists in the domain of logistic structures and services in the region of the inferior Danube is enlisted within a larger context, the Strategy of the Danube, but also in a more restrained one, the Program of Cross-Border Cooperation Romania – Bulgaria, 2007-2013.

The Strategy of the Danube represents a project initiated in the year 2008 by Germany, Austria and Romania to which subsequently there adhered the other states on the Danube and which became a program of the European Commission. It shall have allotted a budget of 50 milliards euro until the year 2013. It shall be preponderantly addressed to the population in the Danube Basin, which is estimated at 115 millions, following to be developed through cross-border projects. In December 2010 there is foreseen the approval of the Action Plan for the program the Strategy of the Danube by the European Commission.

The integration process needs premises and conditions for further development. One of them is the connectivity and it supporting system – the logistics. The problem of the connectivity is one of the pillars of the Danube strategy, which could play an important role in the Lower Danube Macro region's development. Those problems need different approaches, specialized research and training.

The situation of the two countries in the domain of fluvial logistics may be characterized as unsatisfactory in relation to their potential. At the present moment there is a single bridge which connects the two countries (Giurgiu – Ruse) and several travels with the passage boat. The harbour infrastructures are old and inefficient. There are no modern multi-modal platforms or a coherent vision in their design. The transportation on the Danube is insufficiently exploited. As well, the river is not capitalized in other domains, too: agriculture, pisciculture, energy, ecology, tourism, arrangement of the territory, etc.

Within a more restrained context, but correlated with the Strategy of the Danube, Romania and Bulgaria cooperate within the Cross-Border Program 2007-2013. Within it, the Academy of Economic Studies in Bucharest and thee Economic Academy Dimitar Apostolov Tsenov in Svishtov proposed themselves to collaborate in the domain "Cooperation concerning the development of human resources – the joint development of abilities and knowledge".

Keywords: Fluvial logistics, multi-modal platform, education, transportation, cross-border, Lower Danube Macro region, territorial connectivity.

JEL classification: I21, L99, M53, R41.

Romanian Situation*

In order to point out the necessities concerning training of specialists in a certain domain (in our case the logistic one) it is useful to be known its features, characteristics, particularities. When we approach the region of the inferior Danube we can discuss about various logistic services, but the accent must fall on the fluvial ones. The fluvial logistic cannot developed by itself, but in correlation with the logistic of other transportation means. Furthermore, any logistic service starts from the transportation activity on which it is based. Subsequently the transportation is correlated with other logistic activities, carried on as supplies of services, as well as storing, stocking, handling, customs clearance, etc.

The approach of the logistic services in the region of the inferior Danube must be framed within the more general problems of treating the river at the European level. There are concerns regarding the Danube at the level of the European Commission, of the European Conference of Transportation Ministers, of the Danube Commission (with the headquarters in Budapest), as well as at the level the various international and national organizations, including the political ones. As well, the Danube is approached from various perspectives, often contradictory ones: economic, ecologic, energetic, the arrangement of the territory, regional development, etc. These reasons entitle us to approach the problems envisaged by the study within a larger framework, European, which also circumscribe the specific zone of the inferior Danube.

Transportation requires special attention, because it represents an indispensable link in the logistic chains. In this sense, it has the function of tying different levels of the logistic system, from supply to distribution to the final client. The choice of a certain means of transport represents a logistic decision with direct and indirect consequences. Thus, the criteria based on which this choice is made are important, linked to the characteristics of each of the means of transport.

In a logistic chain, transportation can be in relation to: supply, transfer between plants (or warehouses) and delivery to the client. The supply with raw materials is done in large volumes and quantities. Thus, parcels are important, and the traffic is regular. Specific transportation can be: rail, fluvial or sea transportation. Transportation between plants for semi-finite or sub- assembled products (including warehouse supply) means regular shipment, with parcels ranging in average from 3 to 23 tons. These are appropriate for rail and road transportation. Shipments to plants or warehouses to clients are extremely heterogeneous. These are appropriate for road, rail and air transportation.

In the case of rail, air and sea transportation, the cost of transportation between and from terminals (from plant/ warehouse to the train station, airport or port and the in the other

* Mihai Felea, Irina Mărunțelu and Cristinel Vasiliu

direction) is added to the main transportation costs, in general road transportation, with the exception of companies located near the railway or ports.

The logistic platforms are generally spread over a road-road interface. Nevertheless, we notice the tendency for big platforms to be built in communication junctions that combine 2 or more means of communication, even others that road junctions, less used.

80% of the world trade exchange is done by sea transportation (using especially containers). In Europe, the exchange between the member states is dominated by road transportation, followed by rail transportation. Nevertheless, fluvial transportation starts to regain interest.

The road transportation network around a river platform for containers can reach 200 km, the maximum distance corresponding to a return transport in one day.

A multimodal logistic platform fulfils 2 complementary functions:

- service logistics: storage and management of stocks, orders' preparation, assembly, fitting, conditioning, common information management, etc;
- flow logistics: just-in-time supply system, distribution, transport organizing, etc.

1. The methodology of the study on the training of the specialists in the domain of logistics

In the projection of the study we started from the premise that the training of the specialists is related to the educational system in the domain of logistics, with an accent on the higher education. As well, the problems concerning the training of the specialists in the domain of logistics must be correlated with the preoccupations at the European level.

Thus, at the European level, with a view to fulfilling the objectives of the Agenda of Lisbon in the domain of transportations there was elaborated a White Book in the year 2001, by the European Commission, which comprises a series of stages until the year 2010. This programme was updated in the mid-term review of 2006. The White Paper had identified as main challenges: the imbalance in the different transport modes' development, congestion in cities and on major routes, as well as in airspace, and transport's impact on the environment. It proposed policies aimed at adjusting the balance between the modes, stressed the need to do away with bottlenecks in trans-European transport networks and to reduce the number of road accidents, together with calling for an effective policy on infrastructure charging.

Transport policy as outlined in the mid-term review builds upon the White Paper. It notably promotes sustainable mobility in the EU while offering a more flexible toolbox for tackling problems and for addressing new challenges arising from the different context of a larger European Union, rising fuel prices and Kyoto commitments.

The key policy objectives of the mid-term review rest upon four main pillars:

- Mobility (EU must offer the necessary level of mobility to people);
- Protection (protect businesses, protect the environment, ensure energy security, promote minimum labour standards, protect the passenger and the citizen);

- Innovation (increase the efficiency and sustainability of a growing transport sector, develop and bring to the market new innovative solutions);
- International dimension (EU must be a united, leading player on the international transport stage).

Next to actions foreseen in the 2001 White Paper, such as boosting rail and maritime connections for long-distance goods transport, additional instruments to achieve these objectives are foreseen. Indeed, in a spirit of 'co-modality', each mode should be used in accordance with its own merits, alone and in combination with others. Measures include a freight logistics action plan to create better synergies between road, rail, river and sea transport, and to achieve the transport modes' integration into logistics chains. This will give industry a competitive edge but also diminish the environmental impact per unit of freight. Other tools include intelligent transport systems to make mobility more efficient, safer and cleaner; a debate on how to improve the mobility of citizens in urban areas; an action plan to boost Inland waterways; an ambitious programme for more environmentally friendly power for cars and lorries.

Transport was seen as a crucial element in the establishment of the Common Market, whose rules, especially those governing international transport, made possible the free trade of goods and the free movement of persons. This is why Transport forms an integral part of the Treaty establishing the European Community. Elements such as Transport Safety and the Trans-European Transport Networks (TEN-T) were, for example, added with the Treaty of Maastricht (1992).

The TEN-T play an important role in securing the free movement of passengers and goods in the European Union. They form a key element of the Lisbon strategy for competitiveness and employment in Europe. Including major infrastructural projects, the TEN-T aims to ensure a free flow on major transport routes as well as the sustainability of transport.

The goal of the European Transportation Policy is to establish a sustainable transport system that meets society's economic, social and environmental needs and is conducive to an inclusive society and a fully integrated and competitive Europe. The ongoing trends and future challenges highlighted in the previous paragraphs, point to the need for satisfying a rising demand for 'accessibility' in a context of growing sustainability concerns. The most immediate priorities appear to be the better integration of the different modes of transport as a way to improve the overall efficiency of the system and the acceleration of the development and deployment of innovative technologies. This is within an approach that always keeps the transport users and workers, with their needs and rights, at the centre of policy making.

The European Commission estimates that cargo transportation must be considered a key component of an integrated logistic system, in which the choices made will have a big impact on the efficiency and exploitation costs of a lasting and fully integrated company. As a result, the European Commission encourages the implementation of a modern conception and suggests a progressive evolution towards a future model of an intermodal European transportation. The logistic quality of intermodal transportation will be guaranteed by paying special attention to abilities, preparation, durability, reliability, efficiency and profitability. Obtaining the quality of logistic services in intermodal transportation requires an appropriate preparation. This will be included in the educational plans of certain

institutions for higher education in Europe and will be at the basis of a platform of European preparation. As such, Europe is aware of the low level of training of specialists in logistics river. In conclusion, the European inland waterway transportation policy is focused on areas: market, fleet, jobs and skills, image and infrastructure.

The objective of our study is represented by the identification of the preoccupations of the institutions of higher education in the counties neighbour to Bulgaria in the domain of logistics, through the development of certain specific educational programs. We must make the remark concerning the existence at Giurgiu of a subsidiary of the Academy of Economic Studies, which allows the latter to connect to the cross-border problems.

Having in view the objective of the study, in order to obtain the envisaged results there was used the descriptive research. In the achievement of the study there was taken into account the nature of the information which it was wished to be obtained and the necessity of usage of certain specific instruments for the collection of the relevant data.

The collection of the data was performed through the method of investigation of the secondary sources:

- the legislative basis concerning the education in the domain of logistics in Romania;
- secondary data resulted following the on line research of the sites of the universities of the counties neighbour to Bulgaria.

Following the finalization of the analysis there was performed the interpretation of the data. As result of the study concerning the analysis of the system of education in the domain of logistics in the 7 counties neighbour to Bulgaria there were identified the problems and the opportunities existent at the level of the domain, as well as the main directions of intervention.

Thus, the legislative framework for the organization of the higher education is large, but we consider that, relevant for our intercession are the regulations which allow the accreditation or the temporary authorization of the license studies and of the master programs. In that respect, we took as basis of analysis the Decision of Romania's Government no.749 of 2009, for the approval of the Schedule of Denomination of the Domains, of the structures of the institutions of higher education and of the specializations/programs of university studies of license accredited or authorized to temporarily function organized by them and the Order of the Minister of Education, Research and Youth no.4666 of 2009, concerning the approval of the programs of university studies of master evaluated by the Romanian Agency of Quality Assurance in the Higher Education. According to them, we stated that mainly, the logistic is approached within the Economic Sciences, the license domain Business Administration, with the specializations: Business Administration; The economy of trade, tourism and services; The economy of trade, tourism, services and quality management and Business administration in trade, tourism, services, commodities and quality management. Besides them, logistics also appears in the technical domain, especially as industrial logistics, as well as in the Naval Academy "Mircea cel Batran" of Constanta, the Faculty of Civil Marine (the discipline Naval and harbour logistics), but the approach is one strictly limited to the specific license domains. As well, logistics also often appears within the discipline "The logistics and the distribution of merchandises" and more seldom in that of the discipline "The logistics of merchandises".

As regards the studies of master there are only 3 programs of master at the national level regarding the logistics respectively “Logistics” – at the Academy of Economic Studies the Faculty of Trade; “Acquisitions, distribution, logistics” – the University “Alexandru Ioan Cuza” in Iasi, the Faculty of Economy and Business Administration and “Industrial logistics” – the University “Lucian Blaga” in Sibiu, the Faculty of Industrial Engineering.

In the 7 counties neighbour to Bulgaria, with the exception of Constanta there are no independent universities but only subsidiaries of certain state or private universities. The domain of license Business administration can be found at Drobeta Turnu Severin (where there functions the University Centre Drobeta Turnu Severin as subsidiary of the University in Craiova), Alexandria (where there functions a subsidiary of the University “Valahia” in Targoviste) and Constanta. At Constanta the domain Business administration is present in several universities: the University “Ovidius”, the Christian University “Dimitrie Cantemir”, the University “Tomis”. In none of the universities in the 7 counties there is any master program in the domain of logistics.

In conclusion, the fluvial logistic is not studied within any of the universities neighbour to Bulgaria or within the license studies, or in those of the master degree. This thing proves a lack of adaptation of the educational programs in these universities to the specific of the zones in which they carry on their activity. The problems of the Danube are very little studied and most often without the correlation of the domains in which they may occur. There is preferred the variant of taking over, many times even by simply copying the education plans from the great universities, especially from those in Bucharest. Furthermore, we notice the lack of transparency of these universities, justified by the insufficient information and often irrelevant from their own Internet sites, finding no analytical program of the disciplines which study the logistics. Nevertheless, there appears the opportunity of introducing a master program in the domain of fluvial logistics by creating a university hub, in which there should also enter the Academy of Economic Studies and the Economic Academy D.A. Tsenov. At the same time it must be connected to the European platform envisaged to be established through the support of the European Commission. Within such a master program there may be included disciplines such as: fluvial transportations within the context of the sustainable development, multi-modal logistic systems, the control of logistic management, instruments of international trade, the logistics of storing and conditioning on multi-modal platforms, the management of the stocks and the supply through multi-modal platforms, the management of the production and the management of quality, introduction into River Information Services (RIS), etc.

On the basis of the obtained information we achieved a SWOT analysis of the system of training in the domain of logistics at the national level, also relevant for the 7 counties, presented in Table no.1.

Table no. 1: SWOT analysis of the system of training in the domain of logistics at the national level

Strong points	Weak points
The adoption of the Bologna system in the higher education 3+2+3 (with accent on competences) The existence in the education plans of a discipline dedicated to logistics.	The failure to involve the business environment and the university one in the adoption of policies regarding the transportation, environment, tourism, etc. The lack of transparency of the

<p>The constitution of partnerships between the universities and the business environment (represented by associative structures, such as the Romanian Logistics Association)</p> <p>The development of certain projects in the domain of logistics, accomplished both on the national, and on the European plan.</p>	<p>universities concerning the content of analytic programs.</p> <p>The incoherence in the elaboration of the policies in certain domains, through the failure of correlation with the related sectors.</p> <p>The elaboration of certain university disciplines which are not adapted to the specific of the zones where the universities carry on their activity.</p>
<p>Opportunities</p>	<p>Threats</p>
<p>To be aware in the business environment of the importance of training in the domain of logistics.</p> <p>The policy of the European Union in the domain of education and vocational training.</p> <p>Projects with external financing for the training in the domain of transportation.</p> <p>The presence of certain great companies of logistics in Romania which need qualified personnel.</p> <p>The Strategy of the Danube</p> <p>The Danube Rectors' Conference (organization which follows up the approach of the business environment)</p>	<p>Frequent changes in the education plans as regards the contained subjects and the volume of time allotted to them.</p> <p>Frequent changes of the legislation specific to the domain of education.</p>

Additional reasons which sustain our steps for the development of the training in the domain of fluvial logistics in the zone of the inferior Danube are related to the development of the European programs, such as NAIADES, Marco Polo II, the Strategy of the Danube (which shall become operational in 2010), etc. For the implementation of the Strategy of the Danube in Romania, the establishment of an Academy of the Danube offering training and advice for the business environment and governmental and non-governmental organizations is foreseen in 2010 in Bucharest. As well, there may be attracted European funds through specific programs, including the cross-border ones. Within this context we must also point out the activity of a European organization – Danube Rectors' Conference, appeared in 1983. The general purpose of the Conference is of improving the didactic and research activity in the higher education, through the establishment of bilateral and multilateral contacts between the member universities. As well, the Conference acts in the capacity of consultant, presenting its points of view or making recommendations on problems in which the universities are competent towards governs, national or international organizations, the business environment, etc.

In conclusion, from the above mentioned aspects we can recommend the development of a master program in the domain of fluvial logistics, carried on in partnerships among several Romanian and Bulgarian universities, on the purpose of correspondingly exploiting the opportunities offered by the Danube as economic potential. In order to better understand the problems with which the fluvial transportation on the Danube confronts itself we further

present several aspects which we consider relevant and which constitute the actual state of facts from which we start.

2. Characteristics and features of fluvial transportation

Fluvial transportation is less and less used since 1970, due to certain factors, which include:

- decline of traditional heavy industries;
- decrease in the number of inflammable transports;
- increased importance of the speed criterion of deliveries;
- old network of transportation;
- lack of network maintenance;
- difficulties in exploitation;
- the specific legislation;

Traditionally, it is considered that fluvial transportation is appropriate for construction materials, agricultural products, petroleum products, solid mineral fuels, minerals, waste for the metallurgical industry, etc. Nowadays, there are changes regarding the nature of the freight transported by water – clothing, textiles – footwear, electronic devices, hygiene products and cosmetics, etc. The use of fluvial transportation is determined in relation to its advantages and disadvantages.

Thus, we can estimate that the advantages of fluvial transportation include:

- reliability – the transport on water is slow, but it is not subject to the traffic jams that affect the road transportation. From this point of view, we can appreciate that fluvial transportation is adapted to the requirements of just-in-time deliveries and programmed transport;
- safety – the cost of accidents is 12 times lower than on railways and 110 times lower than on roads, while the percentage of hazardous products transported on water is higher than the other 2 means of transport;
- low costs and high loading capacity. Along with mass transport, the fluvial transportation of containers allows pre and post-transport costs lower than for other means of transport. It is one of the explanations for the change of traffic from Rouen or Le Havre (France) to Anvers (Belgium);
- transportation on water is adapted for heavy loads – with the exception of some technical characteristics that allow it (especially free height under bridges), the fluvial way is the best solution of the transportation of heavy parcels; unlike the roadway, companies are not forced to obtain special authorizations and there is zero negative impact on the population;
- fluvial transportation is more economical regarding energy consumption and it is better adapted to the environmental requirements;

- the fluvial channel has multiple uses: transportation, tourism, water resource, ecological resource, energy resource, etc.

Concerning the disadvantages, fluvial transportation is confronted with a series of inconveniences, which include:

- it is slow – a very low speed. This becomes a problem, especially because nowadays speed is considered a prime criterion by companies when it comes to delivery. However, in many situations, it is unjustified, thus leading to a decrease in the number of days cargo is stock (low speed of circulation that leads to higher storage costs);

- the network is not linked – there are no connections between fluvial channels and their placement on European territory is inconsistent;

- natural constraints: decrease in water levels in dry seasons or sudden rises in flood seasons;

- the length of the distance covered – water streams do not represent the shorter distance between 2 points, thus, due to the course of the water bed, the distances covered are longer than those on road;

- the need to combine it with another means of transportation – a solution could be applying the roll-on/roll-off solutions, which do not demand the transshipment of the cargo from one means of transport to the other. But these solutions call for investments that become profitable only for large quantities of cargo;

- the rate of use of the capacity is lower than for other means of transport – it is difficult to find cargo in both directions.

Despite this kind of problems, there are several opportunities for fluvial transportation, such as: extending palletized transportation; penalizing road transportation (the strong rise in the price of petroleum, traffic restrictions, taxes, traffic jams); the nature of the products transported.

As a consequence, the evolution of fluvial transportation will be influenced by a series of key variables, such as:

- globalization and the place Europe has in international specialization (deindustrialization, followed by the agricultural policy);

- organization and localization of European production and the associated logistics;

- the rate of economic growth;

- energetic problems: the availability and price of petroleum, the nuclear energy, etc;

- the technological evolution of transport (smart roads);

- problems of the system of transport (complementarity and conflicts between transport of passengers and of cargo, the quality of the services, costs and prices, traffic jams, etc);

- public policies in the field of environment, transport (free markets, financing and price policy, taxation, social regulations, safety, greenhouse effect, etc), territorial development.

Transportation, a key component of the logistic chain is more and more often placed between efficiency constraints of distribution and durability. River ports become potential logistic centres due to the necessary interconnections with other means of transport. Thus, there can appear accessibility problems of infrastructures and function competition.

Fluvial transportation could represent an alternative to the negative impact of road transportation. It seems to be the means of transport with the lowest external cost. In fact, it allows a lower traffic in urban areas, reducing pollution and environmental problems. Very economical, it takes up a low quantity of energy and it can sustain great loads. A fluvial convoy can transport up to 5000 tons, compared to the 1600 tons sustained by a train and 38 tons for a semi-tow. Regarding costs, fluvial transportation is very competitive (0.2 cents/t*km), compared to rail transportation (0.6 cents/t*km) and road transportation (2.6 cents/t*km).

At a European level, attention is paid to the improvement of fluvial traffic and the increase of its safety, put into practice through the implementation of a particular information system. The system of fluvial information (River Information System) uses recent communication technologies. It combines private and public information and its objective is to contribute to the performance of the internal European navigation, allowing:

- improvement in safety (support for management, following hazardous materials, support for rescue services, etc);
- efficiency of fluvial transportation (traffic fluidity. Information on the state of the network, improving the logistic chain, etc);
- protection of the environment (optimizing routes, decreasing the energy consumption, etc).

According to the European Directive 2005/44/EC from 7 September 2005, RIS is valid for IVth class and higher waterways, which link 2 member states and it will be introduced progressively.

3. Particular problems of transportation on the Danube

Commercial transportation on the Danube is decreasing for more than 10 years, due to the bad navigation conditions, the change in products in the economic environment after the fall of the iron curtain, as well as the blocks appeared after the bombing of the bridges at Novi Sad (Serbia) in 1999.

On the Danube, considered as important part of the whole European transport system, embedded in the European inland waterway network along its entire route, these problems become even more critical than in the Rhine area, given that only a few industrial sites are situated along the waterway, many of the large economic centres on the Danube are not located on the main stem, e.g. Bucharest and Sofia, and goods carried by ship inter-modal transports are thus rather the exception than the rule. The result is a considerable competitive disadvantage as against truck and rail, offering substantially better covering of

space. Moreover, on the Danube in Eastern European countries, the structural change of economy, liberalisation of the transport market and the political crisis in the Balkan area have caused a dramatic fall of transported goods to less than one third of the volume carried in the '80s. Today, "only 10 percent of what can be transported on the Danube is now being shipped that way, this is nothing compared to the Rhine" said Ehrard Busek, chairman of the Institute for Danube Region and Central Europe in Vienna during a conference on the European Union Danube strategy in Mamaia, Romania, 2010. According to the latest figures available, 50 million tons of goods were transported on the Danube in 2007; by ways of comparison, more than 300 million tons of goods are shipped on the Rhine every year. Shipping goods on the Danube is very limited when the potential is enormous. In this context the question arises on the perspectives of European inland waterway transport in general and on the future of transport on the Danube in particular. This is why container shipping, roll-on/roll-off transport and the use of flexible multi-purpose vessels have to be extended. Technical adaptation and increase of capacity of port terminals, as well as coherent logistic chains are also prerequisite. As for infrastructure, the overhead clearance under bridges is of great importance whereas a maximisation of the navigation channel depth is no priority task. The improvements of waterway transport systems, faster updates as well as better and more precise forecasts of water levels have about the same effect as an increase in the channel depth of about 10 %. The main bottlenecks are not the draughts of the vessels but the overhead clearances of bridges. Today, new ship-building technologies as well as new information and communication systems offer the possibility of increasing both productivity and interest of inland waterway transport without extending massive interventions in the riverine landscape. The emphasis is put on types of vessels showing the following characteristics: multipurpose use, high specialisation, integration in an information and communication network of the waterway, fleet's logistics management. A re-orientation to other groups of goods also changes the requirements for inland waterway transport, i.e. more flexible, regular and frequent offers. The Austrian Danube already provides good conditions for the traditional transport of bulk goods. Bulk goods with a specific weight of less than 0.8t/m³ (solid fuels, cereals and foodstuff / animal feed, forestry products, benzine / benzol and chemical products) (table no. 2) may be carried on all important types of vessels in operation on the Austrian Danube on about 300 days/year, at a capacity utilisation of 100 %. As they can be stored, heavier goods (ores, metal products, minerals, building materials, fertilisers, heavy oils) may be transported in periods with favourable water levels, thus limiting productivity losses.

It is possible to improve inland navigation on the Danube while maintaining and enhancing ecological and socio-economic values the river provides?. The answer is "Yes", but several issues related to navigation are misunderstood or falsely communicated, as follows:

- "inland navigation is more environmentally friendly in terms of pollution than other modes of transport". It is true that inland navigation emits less climate-relevant emissions per tonne-km transported than road transport and in some cases possibly rail transport, but often nitrogen oxide and sulphur oxide emissions are higher for ships. Also, transport of goods by ship may travel longer routes due to the natural courses of the river systems, although cargos usually require rail or road transport when considers door-to-door service. Total trips and their corresponding emissions should be considered carefully. There is potential to cut air pollutant emissions and improve fuel efficiency of vessels substantially, but no matter how well navigation performs regarding gas emissions, its share of the modal-split (only 6% EU-wide) is just not large enough to be of crucial importance for

bringing total transport-related emissions down because transport emissions have gone out of control due to massive growth of road transport;

- “efficient transport of goods requires a minimum and constant water depth along the entire river for most of the year”. Because rivers are highly dynamic systems, reliable and accurate prognoses of parameters are difficult. Climate change potentially increases uncertainty of water level parameters. “Minimum” levels in this case are often misunderstood as referring to a guaranteed bottom-line that cannot be crossed, whereas in fact it means the highest point of the river bed in a given cross-section of the fairway. Dredging sediment from the riverbed in order to maintain a certain water depth exacerbates the problem of the already existing manmade sediment deficit, has negative impacts on the river system, and is no permanent solution. “Fit the ships to the river, not the river to the ships”.

- “there is a great potential to improve and increase transport of goods on the Danube”. The Danube river basin navigation situation is not as ideal as that of e.g. the Rhine with its large number and high density of harboured industrial sites. Furthermore, the current primate of mobility is risking long-term sustainability. Hence, how many goods are to be transported across Europe irrespective of transport modes (ships, trains, trucks) has to be reviewed critically;

- “promoting inland navigation will move the transport of goods from road to river”. Plans to improve conditions for inland navigation will most likely affect the transportation of bulk goods, while container goods in the Danube region are mainly being transported by road or rail. This means better conditions for inland navigation on the Danube are unlikely to reduce traffic and thereby emissions from road transportation. It might, however, reduce transportation by rail, which has equal or better environmental performance as transport on rivers;

- “river engineering is worth the infrastructure investment and will bring economic boom to the region”. Even if a maximum of fairway depth and reliability of water levels is provided, this is no guarantee for high handling of goods in the harbours and for the prosperity of a region. This has been the lesson learnt from the Main River. The statistics for harbours along the (completely impounded and regulated) Main River show that the mass of handled goods nearly halved in value between 1990 and 2007. Furthermore, cost-benefit analysis for navigation projects do not yet take environmental costs into the equation such as lower revenues from ecosystem services or higher risk of flooding as a consequence of navigation-related river regulation measures;

- “development of the waterway is needed to improve transport between the North and Black Seas”. The transport of goods on the seaway is much faster and therefore cheaper than transports between North and Black Sea via inland waterways. Data especially for the Rhine show, that rivers primarily provide transports from the seaports to the hinterland. Prediction of transport volumes may be fuzzy especially considering the recent and deep economic crisis likely to bring a significant reduction in transport of goods, including containers;

- “bottlenecks need to be removed”. Plans to improve navigability of the Danube currently focus on the removal of so-called bottlenecks, while at a closer look some of them are less of a hindrance than claimed. For example, the Austrian section east of Vienna is

listed as one of the “bottlenecks” despite the fact that the EUDET study performed in 1999 specifies this section as the one with the highest transport capacity between Kelheim (DE) and Budapest (HU). This section is navigable throughout most of the year, has shown good performance under extreme conditions (the extreme dry year 2003 brought the second highest annual transport rate that had ever happened on the Austrian Danube until then) and ships transport goods under low water conditions.

The ALSO Danube Project (Advanced logistic solutions for the Danube waterway) introduced by the Austrian organization Via Donau used the instruments based on the technology of information with the purpose of contributing to changing this trend and to integrating river navigation in the intermodal transportation chains. These instruments combine traffic and transport management in the internal navigation and offer full, punctual and precise information for the entire logistic chain. Thus, the operators can plan loading and transport programs, can track loads at any time and can change ongoing plans. ALSO Danube has also contributed to the development of fluvial information services harmonized in Europe, with a particular focus on the components related to transport management. (Table no. 2)

Table no. 2: Countries crossed by river traffic

Fleet Composition				Main Traffic					
Country	Main harbour		% European Fleet	Metal Mineral	Building materials	Petroleum Products	Agricultural Products	Metallurgical Products	Others*
Germany	Regensburg	209	19	15	21	16	10	-	-
Austria	Linz	358	1	30	10	18	10	-	-
Slovakia	Bratislava	169	1	20	-	37	15	10	-
Hungary	Budapest	419	1	18	-	12	24	16	-
Croatia	Vukovar	138	1	51	-	18	7	-	10
Serbia	Belgrade	587	2	18	-	-	24	16	-
Bulgaria	Ruse	471	1	-	39	-	-	14	24
Moldavia	Giurgiulești	0,55	0,05	-	100	-	-	-	-
Ukraine	Reni	170	3	-	31	-	-	26	28
Romania	Constanța	1167	10	37	31	-	11	-	-

Source: Adapted after Commission du Danube, 2007. *Des données statistiques sur l'état de la navigation danubienne*. [online] Budapest: Commission du Danube. Available at: <http://www.danubecommission.org/uploads/doc/STATISTIC/Nav_statistics_fr.pdf> [Accessed 6 August 2010].

* Croatia is transporting chemicals, Bulgaria is transporting mineral fuels and Ukraine is transporting cars.

4. Aspects specific to the fluvial transportation on the Danube in Romania

Although in Romania the authorities appreciate that the fluvial transportation is cheaper and safer, it has a more important energetic efficaciousness and thus, a more reduced impact

over the environment and it is adequate for the transportation of dangerous merchandises, its development is extremely reduced. Even in the government programs the problems of the fluvial transportation are present, but the transposition into facts is almost null.

In Romania, the transportation on the inferior waters is quite little developed from causes such as:

- the navigable transportation is almost entirely limited to the Danube, and the circulation in the 7 counties represents a significant weight;
- there are lacking specific infrastructures, necessary for the fluency of the traffic: harbours, harbour equipments, flood gates, connections among harbours and other routes of transportation, etc.;
- the circulation channels are badly maintained – non-dragging, badly signalized, navigable mid-channels which are modified.

In Romania, the Danube- Black Sea Channel allows an economy of 400 km between Cernavoda and Constanta, for convoys of 18000 tones and vessels of 5000 tones. Due to the channel Main- Danube (1992), the system Rin - Main- Danube connects the Northern Sea to the Black Sea, with the overall dimensions superior to class V – CEMT (Conférence Européenne des Ministres des Transports). Nevertheless, this corridor is little used and consequently, its potential is under exploited.

In 2005 the traffic of merchandise on the channel Danube – Black Sea reached high quotas, the external transit reaching record quotas. The most transited categories were, in order, the cereals, the ore, the coal, the rolled products, the containers and the traffic of passengers. The causes were the revival of the economic activities within the country and in the Central and Eastern Europe and the putting into operation of the terminal RO-RO in Constanta Harbour. Furthermore, the Administration of the Navigable Channels (A.C.N.) supported the more advantageous transportations in convoys (several coupled barges and pushing vessels). In the same year, the internal traffic had the value of 24784420 tones capacity. As well, the year 2005 had an important traffic of vessels of passengers, and with a view of sustaining the tourism C.N., A.C.N. S.A. took treating measures with the priority of the vessels of passengers and with the reduction of their cruise speed. There must be mentioned the fact that although there took place powerful floods in Romania this year, this thing did not negatively influence the traffic on the internal navigable routes, the depths of the navigable mid-channel being ensured for vessels of high tonnage. (Table no. 3)

Table no. 3: The evolution of the traffic on the navigable channels 2005-2010

Years	External (t)	Internal (t)	Total (t)
2005	7180683	24784420	31965103
2006	7239125	22030078	29269203
2007	6711956	19876035	26587991
2008	8106825	21519196	29626021
2009	9978620	11411972	21390592
2010 (first 6 months)	5037989	5508296	10546285

Source: The Administration of the Navigable Channels, 2010. *The evolution of the traffic*. [online] Constanța: The Administration of the Navigable Channels. Available at: <www.acn.ro/index.php?id=5/> [Accessed 25 July 2010].

The external traffic was in growth in 2006, the main external destinations were Serbia, Hungary, Bulgaria, Austria and Ukraine. The external traffic reached these quotas due to the growth of the weight of certain mass merchandise which may further bring favourable evolutions. From among them we mention: iron ore (with the destination Austria, Hungary, Serbia), coal, charred coal, but also agricultural-alimentary products (towards Serbia, Bulgaria, Hungary). The internal traffic decreased by 11.11% as against the previous year. The cruise traffic decreased as against 2005 due to the reorientation of the Tour operators towards other destinations, because of the unfavourable weather forecasting.

In the year 2007 there was registered a total traffic of 26,587,991 tones capacity, a traffic relatively low on the background of the warnings of small waters on the Danube and of the drought which influenced especially the production and the traffic of cereals. In the conditions of a lower level of water on the Danube there decreased the traffic of iron ore towards Serbia and Hungary and the export of rolled products both the internal and the transit ones were considerably reduced. In fact the reduction of the exports was the main cause of diminishing of the traffic on the navigable channels. The traffic was also diminished in the first half of the year due to the fact that 2007 represented a disastrous agricultural year.

In the year 2008 the level of the Danube came back to normal, the total traffic on the channels reached the total value of 29626021 tones capacity. Nevertheless the internal traffic was influenced by the reduction of the activity of the Integrated Iron and Steel Work Sidex Galati, for a period of 3 months and by the fact that cement factory in Medgidia did not use at all the navigable channels for the export of cement, as it proceeded in the latest years.

The external traffic knew an important increase also having in view the integration of Romania into the European Union on January 1st, 2007, which led to the increase of the interest for the usage of the internal navigable channels in Romania. As well, the international traffic on average displacement distances increased also as result of the normalization of the traffic conditions on Serbia's territory.

The year 2009 represents the beginning of the financial crisis, but the total traffic was much diminished due to the substantial decrease of the traffic of ores on the Romanian channels towards the Integrated Iron and Steel Work Sidex Galati. Nevertheless, the external traffic increased as against the previous year, mainly due to the increase of the traffic of cereals.

In the first quarter of the year 2010, for the first time in history the external traffic of merchandises exceeded the internal one, being registered 2,376,000 tones capacity for the external traffic and 2,207,000 tones capacity for the internal one. The decline of the internal traffic is owed to the fact that MITTAL STEEL Galati (Sidex) did no longer transport raw materials on the channel.

For the internal navigable routes, the role of Constanta Harbour and of the steel factory in Galati proves to be crucial. Constanta Harbour attracts 70% of the international and transit traffic from the internal navigable routes.

Conclusions

The treated aspects allowed us to point out the stage of the development of the fluvial transportation at the European level and, particularly, on the Danube, as well as of certain associated logistic services. In the conditions of the elaboration of certain joint programs for training between Romania and Bulgaria for specialists in the logistic domain in the region of the inferior Danube there must be had in view aspects such as those treated in the work. All of them may be constituted in descriptors of the analytic program afferent to such a discipline or in freestanding disciplines within a program of master degree, or of another program of post-university training. It should prove to be of great actuality, even at the level of the European Commission there was realized the necessity of the introduction, in the university environment, of certain studies in the domain of the fluvial logistics. Furthermore, the Commission has in view even the building of a European platform for education in the domain of fluvial transportations. Of course, each aspect treated in the work may be also constituted in a freestanding discipline, fathoming the problems of the fluvial logistics.

Our opinion is that only a treatment at the European level represents the solution for the development of the transportation on the Danube and implicitly, of the associated logistic services. Only in this way the potential of the transportation on the Danube might be correspondingly exploited, really becoming an alternative to other modalities of transportation (especially the road one). At the same time, the positive examples in Europe – especially Germany and Holland – may constitute situations of good practices for other countries. Furthermore, the treatment of the fluvial logistics on the Danube must be correlated with other domains – agriculture, energetic resources, tourism, environment, territorial development, etc. for the real creation of a synergetic effect of economic-social development in the basin of the river.

Bulgarian Situation**

The EU is issuing specific documents for every planning period. Beside this there are also new challenges when the Union is entering in every new decade. Such documents are the *Europe 2020* vision and the *European strategy for Danube River*. The effective efforts for the realization of the documents mention above force the higher education to react properly, to prepare human resources and specialists who will participate in the Pan European integration process, in the single market transactions.

The ideas and visions about the development of the European Union have to reach all the citizens and the future specialists. And respectively the higher educational and training systems have to react to that challenge stressing to the principle “thinking globally and afterwards acting locally”.

The problem of an integrated European Single market has different dimensions. In one direction it is connected with development of strategic macro regions. From the other side it needs to stimulate Trans European and multi directional mobility.

In this context the Logistics system (LS) of the EU is it not an isolated problem. It serves the process of normal single market functioning and development. The mobility through

** Nicola Yankov

connectivity requires necessary preconditions; one of them is the development of EU's logistic system as a whole. The mobility itself requires prerequisites as connectivity and connectivity superstructure, structures and infrastructure. The single market regarded as networks of macro regional markets needs Trans and inter-market connections and well functioning logistics and awareness about its importance and its development problems.

In this regard there are missing links and bottlenecks among the networks which are facilitating the transactions – *connectivity*.

Being aware about the problems which the EU is facing nowadays, the Academy of Economic Studies in Bucharest (Romania - ASE) and the D Tsenov Academy of Economics in Svishtov (Bulgaria) started to work in the area of human potential developments and to find ways how to offer joint training programmes. Their collaboration started in 2008 and since then it is developing in diverse forms of activity. As joining their efforts, the two academies initiated actions to determine the training and education needs in the different fields of local and regional development in the Lower Danube Region. One of the fields is logistics with its structures, processes, services and the supporting super structure and infrastructure.

1. Methodology

1.1. The object

The objects of the research in this article are the problems and different aspects of the Lower Danube macro regional development. The methodology is determined by the thesis that a well developed regional entity needs prepared specialists with adequate training. It is valid for concrete regional subsystems one of which is the Logistics system.

The ASE and Tsenov academies could fulfil adequately the need for specialized training regarding the challenges of the EU if they take appropriate joint actions to evaluate the need of training and offer quality and adequate training products.

1.2. Hypotheses

In this article the intention is the following working hypotheses to be checked:

- One of the strategic sub systems of the LDMR is the logistics.
- The higher education in the ASE and D Tsenov academies of economics understands the need for joint initiatives regarding the training and creating awareness in strategic areas and systems which are vital for the normal development of the LDMR.
- The ASE and Tsenov academies could fulfil adequately the need for specialized training regarding the challenges of the EU if they find out good joint moves to evaluate the need of training and could offer quality and adequate training products.

1.3. Scope and tasks

The training has to offer different products which affect different target groups. The scope to find ways for paying attention to the specific problems of the Lower Danube Macro Region (LDMR); to create awareness regarding those problems; to find out how specific skills which originate not only from the perspective of the respective countries – Bulgaria and Romania, but also from the requirements of the super system (in the case of the present article - the European Union).

In this context the attachment to the scope, stated above, requires to meet the following tasks:

- Understanding the intentions of the EU for the period 2011 – 2020.
- Understanding the range and the role of the LDMR Logistics system and to answer to the question how it has to be develop properly so to support and to facilitate the functioning of the macro regional market as an integral part of the European single market.
- Analyzing the dyad and also the problem “European mobility – European connectivity” from the Danube river and Lower Danube Macro Region perspective.

This article has as object the administrative regions along the Danube River and in the LDMR. This region is eligible for concrete European operational programme Romania-Bulgaria, 2007 – 2013.

2. Results and comments

Overview of the development problems of the logistics/infrastructure system in the LDMR

The first thing to begin with, is the understanding that the LDMR needs qualified human resources which have to be trained in more and more goal oriented way. They have to be aware about its development problems and with the existing bottlenecks.

The strategists of the Danube river basin potential utilisation and protection started a process of transformation following the trajectory: *FROM* "river of transport and commerce" *TO* "blue river". Working from this global perspective the member states of the EU have to tackle jointly issues of common interest including business ones such as provision of global access to both the territory of the macro-region and other EU regions (for instance, the Baltic Sea – Black Sea transport connections), EU – Near East (Asia) etc. In this regard an important issues the great water basins to be interconnected.

The global view of the connecting waterways of Europe, respectively the basins of the rivers Main, Rhine and Danube is a starting point in the process of understanding the place of the European Logistics system. It is shown as follows in figure no. 1.

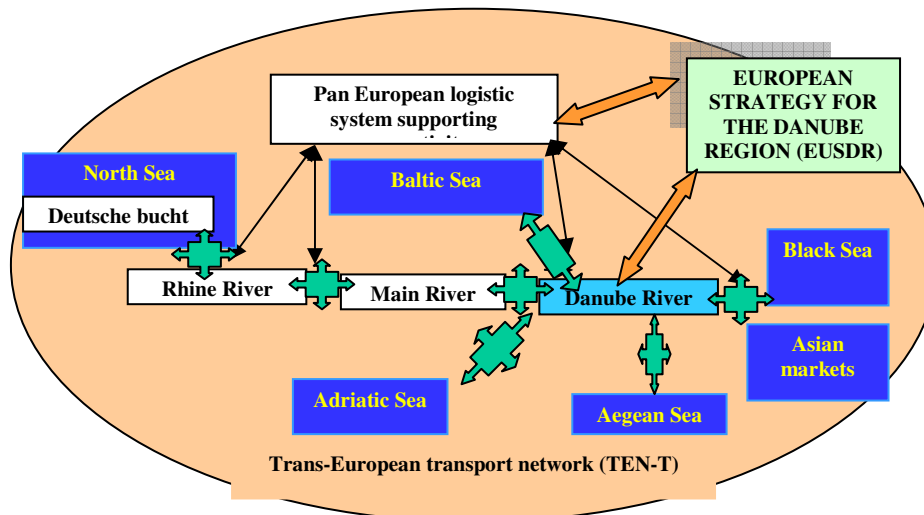


Figure no. 1: The big picture of the Pan European logistics system coverage

In the Single market the logistics is serving the problem of the connectivity. In this regard it is facilitating the different flows in and outside the Single European market. Here the problem is the access to both the territory of the LDMR and other EU regions (for instance, the Baltic Sea – Black Sea transport connections), EU – Near East (Asia).

In the problematic chain “Trans European mobility – connectivity – logistics – transportation” we will stress on the question how this chain could become an academic training product. Or in that direction one problem is the understanding the chain: Connectivity \rightleftarrows Logistics \rightleftarrows Transportation \rightleftarrows Navigation \rightleftarrows Ports \rightleftarrows port superstructure, structures and infrastructure \rightleftarrows Roads etc. The relations between the topics which needed to be is an object of research and respectively training have the following outlines, illustrated in figure no. 2.

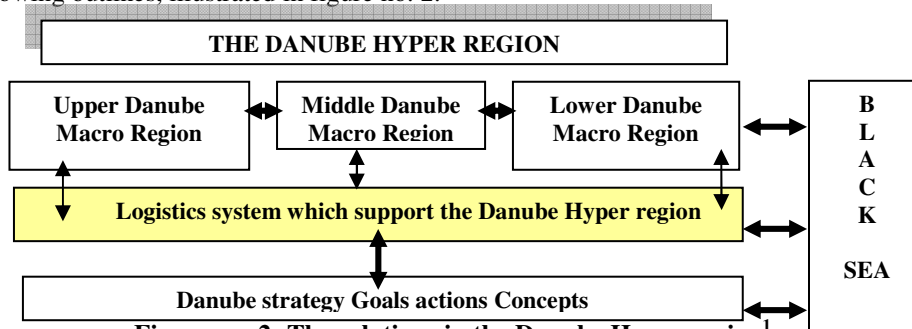


Figure no. 2: The relations in the Danube Hyper region¹

Discussing the problems of the logistics we mean that this system includes not only the „logistics chain“² but also logistics process and logistics infrastructure. (Figure no. 3)

¹ The whole Danube basin is called *Danube Hyper Region*. It includes three macro regions as follows: 1. Upper (Superior) Danube river: from Km 2411 to 1790 (Kehlheim-Gonyo – 621 km); 2. Middle Danube river: from Km 1790-930 (Gonyo – Vaskapu - 860 km). 3. Lower Danube river: from Km 930 to the Danube Delta (930 km).

The logistics process itself has to be conceptualised with various activities such as analysing, modelling, strategizing and planning.

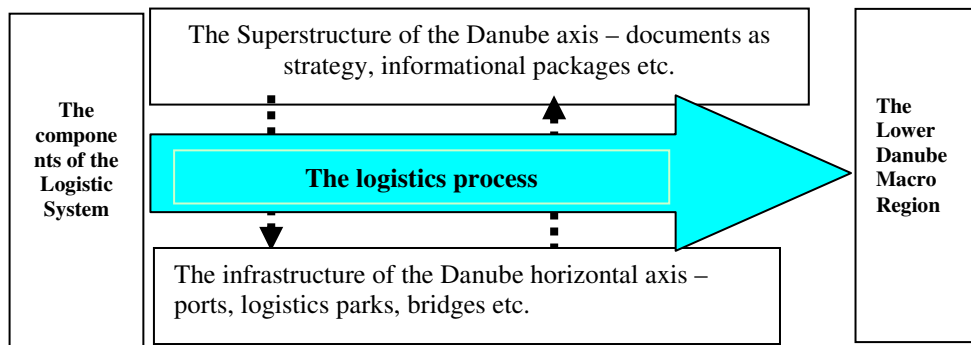


Figure no. 3: The vertical structure of the logistics process

The training includes a study of the flows of physical resources through the European macro regions and inside them. Afterwards the needs of training in the problems of the Logistics System (LS) development on the territory of the LD MR have to be discussed. In this aspect the first step is to determine the outlines of the LS in this macro region. We believe that the system has the following components. (Figure no.4)

There are two types of flows on the territory of the LD MR which are or crossing it, or using the Danube River transportation. The problem is that there has to be ensured quality and easy-to-access transport and improvement of internal regional connections. The problem envisages mainly rehabilitation and modernization of the road infrastructure of regional importance, including II and III-class roads.

The holistic approach applied to the connectivity means that there have to be a balance between: *the internal connectivity* (between the territorial entities included in the LD MR) and the *external connectivity* (among the Danube River and other hyper and macro regions).

One of the key priorities of the EU Danube strategy is undoubtedly the improvement of the internal connectivity within the LD MR and its connections with other macro regions.

² According to a study, the logistics chain includes processes and flow of natural resources. They continue downstream until the commercial realization. Logistics includes the stages of buying goods, transport, customs clearance, control, reception, storage, preparation for delivery - (re)packaging, marking, labelling, training commands, preparing shipping documents, delivery orders, return packaging and, where appropriate, goods rejected, withdrawn, etc. here also could be added different minor processes such as circulation of documents, information and support resources: material resources, human resources and financial resources involved etc. (Dordea and Nicodim, 2008)

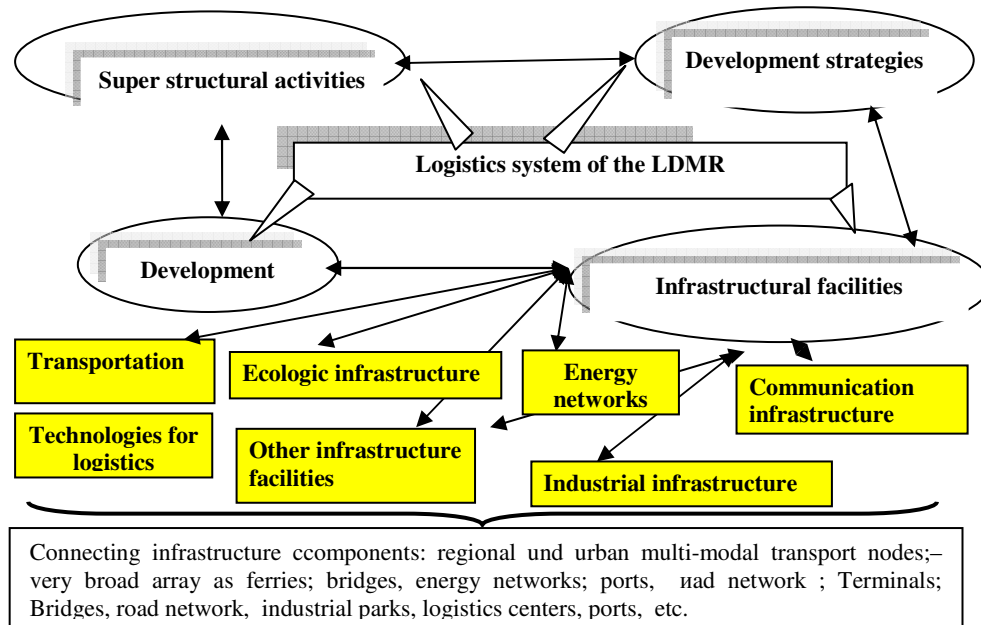


Figure no. 4: The structure of the Logistics system of the LDMR

The holistic model of the joint and inter-state development of the LDMR, could be based on a package of aspects’ models which as a whole is systematised in the chain “Regional problems of the logistics/infrastructure and actions taken to they to be resolved”. (Figure no. 5)

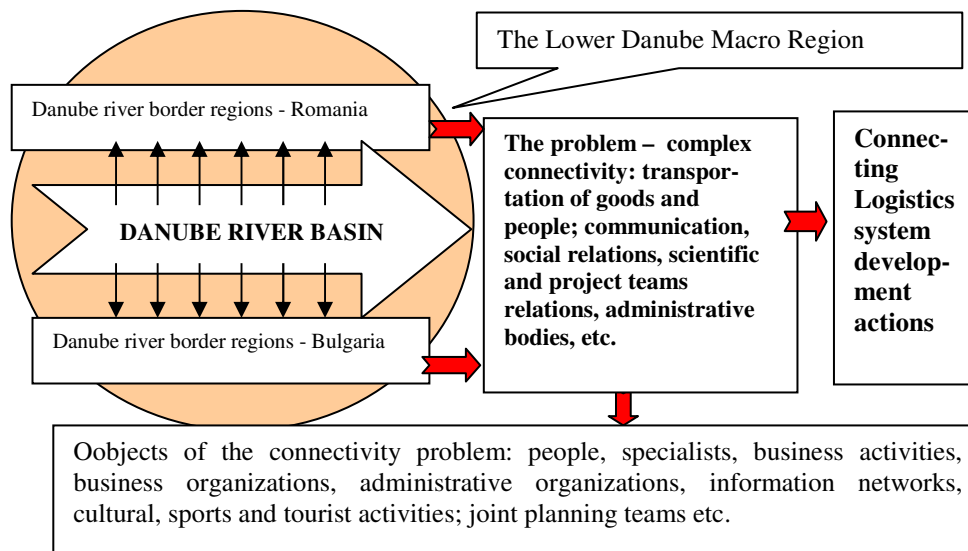


Figure no. 5: The chain “Region - problems of the logistics/infrastructure – actions”

The Danube strategy should not focus only on the improvement of the navigability of the Danube River and its key tributaries, but also on the modernisation of transport links along other transport corridors of European importance, such as trans-European Corridors V and X, and the increase in their connectivity within the PAN European network (TEN-T) of inter-modal transport routes and logistic hubs.

From the connectivity point of view the LDMR's Logistics system has two major problems – to serve as a component of the TEN-T (respectively corridor 7) and in the case of Bulgaria and Romania to facilitate the Trans border relations.

Concerning the transport accessibility it is low in many parts of the region. In this regard the connectivity concept includes also a complex of measures relating to the development and modernization of the railway, road and port infrastructure, bridges and ferryboat connections of the Danube, waterways and navigation systems.

The transport infrastructure as an important component of the logistics and it is fundamental for the mobility of the persons and goods and for the territorial cohesion of the whole European Union. The multiple transport infrastructure of the Danube Region (waterways, ports, terminals, road, rail, bridges, pipelines) have to be have environmental compatibility and turn the important ports into multimodal logistic centres.

In creating awareness about the Danube river problems we are aware about the fact that the whole territory of Bulgaria is under its influence as a transport, water and energy potential. This influence is specifically highlighted with respect to the implementation of major infrastructural projects relating to the European transport corridors 4, 7, 9 and 10.

Considering the geographic location the logistic/infrastructural development of the Bulgarian part of the LDMR includes also and connecting mega projects for:

- Development of the transport infrastructure along to corridor 4 (road and railway). And also from the Vidin bridge through Sofia to Thessaloniki as part of the destination from Central Europe to Aegean Sea. In this aspect a specific requirement to Bulgaria is the Danube Bridge 2 to be in line with the adequate development of roads, railways, internal water ways, port logistical and servicing infrastructure in Bulgaria and Romania.
- Transport infrastructure which provides combined freight, including transits from the Black Sea region, Near East and Asia to Central and Northern Europe.
- Participation in schemes for combined transportation of freight entering or leaving the Danube Macro Region in special and EU in general.
- Organization of public transport of passengers along Danube River and between Bulgarian and Romanian localities along its coast.
- Projecting a road along the Bulgarian shore of the Danube River which could have a very positive effect on the direct connection of many Bulgarian towns and which could attract internal and external tourist flows. It will connect the economic and administrative centres along Danube River and also will secure also the more free flows of European citizens and the functioning of internal markets of the regions.

The opportunities for better transport communications provide increased flexibility of the labour market in the region and attract the number of mixed-capital small and medium-sized enterprises.

Achieving of a multi-modality of transport, regional and urban multi-modal transport nodes will have as effects sustainable mobility management through quality connectivity.

The ports themselves and their infrastructure has to be developed at least in two directions – to serve to the Trans border regional integration and the Danube transport corridor as a whole. From the other hand it is expected they to play the role of distributors regarding the adjacent territories and the localities they serve. One particularity is, that between Bulgaria and Romania there the lack of many transport connections across the Danube River with the exception

Important projects for Bulgaria are to become one of the “Eastern Doors” of the Danube Macro Region and respectively EU. It could be achieved by the modernization of port terminals and the establishment of modern inter-modal terminals and logistics centres.

Improved interconnection and increased competitiveness cannot be imagined without good ICT connections. Joint projects and transfer of know-how and experience in this domain are an urgent prerequisite for the future development of any macro-region.

Therefore, it is of utmost importance for Bulgaria to implement projects that will have direct impact on the improvement of business environment such as the establishment of business, logistic and information centres at regional level. They could support the activities and to be involved in developments dialogue.

The intentions overviewed above imply the application of specific models. It could be used for analysis and strategizing of the TBR development as a whole.

The integral connectivity lead to the *concept of Trans border axes and corridors*. Regarding the LDMR development there could be outlined a couple of meridian axis, which could act as supporting points for future integration efforts. The problem is that within the both countries the parallel connection are functioning normally, but the meridian Trans border links are not so well developed although the efforts done in the past years.

The meridian integration axis if created, could be the backbone for a higher degree of a multi vector integration – business, social, ecological, etc. The actions following that axes aim to build-up relations between people, specialists, business activities, business organisations, administrative organisations, information networks, cultural, sports and tourist activities; joint planning etc³. As the axial and corridor oriented Trans border entrepreneurship continue to mature, the importance of marketing agility and manoeuvrability will grow — both as a defence and offence against any anti European integration efforts.

The Trans Danube river border axes if conceptualised and entrepreneurially developed could as an integrator of the Trans border regional development will support this process.

³ One of the examples outside the Bucharest/Rouse meridian axis is the axis Veliko Tarnovo (Veliko Tarnovo district – Bulgaria) ⇔ Alexandria (Teleorman district, Romania) ⇔ Svishtov (Veliko Tarnovo district – Bulgaria). The idea, launched by Nikola Yankov in Borba newspaper (2005) was developed couple of years ago by the Centre for Regional Integration and development - Svishtov. Afterwards it has been discussed on different levels in the both countries.

3. Accents on training needs concerning the development of the LDMR’ logistics/infrastructure system

The needs of training could, inter alia, cover the complex of topics, questions and problems. Some of them are connected with the awareness’ creating questions. The training of qualified and skilled specialists and experts’ preparation first of all has to give answers to the “what” questions as follows:

- *What* kind of significant methods for the macro-region internal and international transport connections need improvement?
- *What* kind of mechanisms have to be applied for public-private partnerships for the development of new transport ways along Danube River between Bulgaria and Romania, such as new ferryboat connections, third bridge, etc.
- *What* subjects need to be studied? Also, their *content* should refer not only to specific problems, but also to their specific solving methods.
- *What* kind of workshops, traineeships, etc. should be developed? And how would these be organised?
- *What* kind of methods and techniques would be used in this process? Also, we can refer to creativity training in order to proper elaborate the problems regarding the LDR development and to solve them in a more original way. The main aim would be the presentation and discussion of the identified solutions in order to develop new project ideas.

The students training regarding the problems of the LDMR development also has to focus on the development alternatives, using holistic and network approach in logistics. Regarding the analytical skill, the training has to overview the development of the LS and on that base to get ideas about future projects preparation and implementation (if approved); to analyze of the degree of connectivity problems. In this aspect has to be included analyses of projects oriented towards development in LDMR infrastructure as an object of training? An example in this regard could be the systematization presented in table no. 4.

Table no. 4: Overview of different types of project affecting the Logistics/infrastructure system

Levels	Past and present	Future necessary projects	Exotic projects existing in the public space)	Modern technologies
Some examples:				
Macro level – LDMC as a whole Medium level trans border regions NUTS I NUTS II NUTS III	Vidin – Calafat bridge	Tourist transport; Danube bicycle path; Panoramic road Vidin Silistra – Tulcea (or Cernavoda – Constanta)	Canal Ruse Varna; Hydro energy dams – Nikopol – Turnu Magurele and Silistra - Calarasi NPP Belene Tunnel under the Danube etc.	Catamarans transportation for TIRs – Ruse-Varna
Lower levels				

It is needed a type of training that could answer to questions, as: *how the Danube River could play the role of an integrator for cluster initiatives*. Which of them in the case Bulgaria-Romania, have to have Trans border character. Other question is what kind of clusters has to be established for increasing the efficiency of the Logistics system of the LDNR?

The networks problems (how to do) for Trans border cluster projects' development will make the trainees to think in perspective and in Trans border integration context.

Regarding the need the specialists to be trained in connectivity awareness the trainees have to get skills in planning of initiatives for improvement of accessibility, evaluating the development of the transport connections and communications and efficient use of energy resources. One other aspect of the training is the analysis of the degree of connectivity - transport, pipe lines, energy lines etc.

The "how" type questions are:

- How to conduct a joint policy with regard to the inter-modal cargo⁴ and development of environmentally friendly forms of transportation and how the implementations of modern logistical solutions for inter-modal transport cargo along Danube River have to be implemented?
- How and in which ways the development and establishment of infrastructure for alternative public transportation and recreational transport has to be done (such as bicycle alleys) etc.

Table no. 5 and no. 6 present some of the tools, which could offer a series of information and facts for a more detailed analysis. They have the following parameters:

Table no. 5: Screening the problems of the Logistics- infrastructure system

Overview of the existing trans border infra-structure	Locations, or perimeter of operation, or structures and units	Overview of the projects dealing with the trans border infra-structure	Problem formulation	Relevance to the EUSDR
Bridges	Ruse-Giurgiu			
Ferry boats	Vidin – Calafat; Siliistra – Calarasi; Oriahovo – Beket; Svishtov-Zimnicea etc.			
Canals	Cerna Voda - Black Sea	Danube – Black Sea (Ruse Devnia)		
Others				

⁴ For example, the analyze of the regional und urban multi-modal transport nodes will show that, at the moment, around the Danube River, Bulgaria has only two modern logistic spaces – in Vidin and Ruse).

Table no. 6: Model for analyst of the connections between Bulgarian and Romanian ports

Bulgarian and Romanian ports in the LDMR	Types of relations and connection nowadays and new possible relations under the umbrella of the LDMR development strategy			
	Romanian port A	Romanian port B	Romanian port C	Romanian port D
Bulgarian port 1				
Bulgarian port 2				
Bulgarian port 3				
Bulgarian port				
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> Analysis of the existing connections and relations and evaluating the necessities and possibilities for new ones </div>				
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> Project ideas, proposals and initiatives </div>				

The training has also to include and presentation skills in reporting problems of different projects concerning the connectivity. Last, but not least have to be the understanding the *pro* connectivity (respectively logistics) projects and actions (with concrete examples) and the motives of the *contra* connectivity (logistics) projects and actions. We mean that the Lower Danube has to be developed without mega projects, many of which are hazardous, environmentally dangerous and non effective)⁵.

The short overview of the content of the training matters regarding creating awareness and preparing regional managers and entrepreneurs in the area of logistics/ Infrastructure could be ended with a synthesis. It is presented in table no. 7.

The problems are the connections and synchronization between the different types of transport - river with railroads and automobile roads. This corresponds with the directions of the “Europe 2020” and as a whole increase the transport sustainability efficiency and connectivity.

Table no. 7: General connectivity overview matrix – for analyses and realization

⁵ For projects as Canals like Danube River – Black Sea or Belene nuclear power plant, are needed updated studies. These, are also necessary for the establishment of hydro-technical and hydropower facilities in Bulgarian-Romanian section. In this regard, it has to be taken into consideration the complexity of the environmental issues of the river, the river banks and river and their tributary basins.

Types of connections	<i>Components of the Logistics system in the Lower Danube Macro Region</i>	Types of connectivity infrastructure	Evaluation of the quality of the Logistics system components	Projects for the development of the logistics system in the LDMR	Projects management problems
Business systems; Institutions; Municipalities; Non government organisations; Universities; Tour operator organizations etc.		(Transport Electricity Gas Rail roads Ferry boats Other components)			

Conclusion

The level of Trans border interactions (administrative; non-governmental organizations; business initiatives etc. is insufficient) for Trans border integration. Bulgaria lacks good infrastructure which could to attract in higher degree transit commodities' flow for redistribution. To become logistic centre every region has to have railroads and road network, working ports with potential for redistribution of cargo with attractive prices.

For LS better management it has to be improved. The first step in this regard is the conceptualising of the Logistics system of the LDMR, and the second – to project links between different administrative, citizen organizations' and other types of networks. The third important action is the formulating strategies for development of interconnecting infrastructure – communication, port, transport, energy etc., to be formulated. As a whole they make the logistics process to run smoothly and in its turn to attract more commodities' flows, investments, tourists etc. A very important tool in this regard is the marketing activity. Its goal is to attract financial and other types of support and from third – to convince the population to “buy” the ideas for the infrastructure projects developments.

It is also necessary a network for cooperation between universities in the macro region aiming at the development of innovations and streamline the research in key areas which will eventually ensure better competitiveness and prosperity of the regional economy to be establish.

In the beginning of the decade 2010-2020 the ideas and problems confronting the EU in the field of the Logistics system has to be resolved in positive and profitable for the whole EU ways.

Final remark

In our opinion, the two universities can collaborate in the following areas:

- Conducting a joint master's program or other forms of post-graduate training, whose content we presented in the article; the Chair of Commerce from Academy of Economic Studies has a master's program, "Logistics", which is ARACIS accredited and the work can be transferred at the branch at Giurgiu; this is part of the European Commission concern which aims to develop at universities disciplines related to inland logistics and to create European education platforms, with emphasis on the role of multi-modal transport;
- Within the partnership between our universities, we suggest the establishment of a Romanian-Bulgarian observatory of the intermodal transportation. This could show in a better way the situation of combined transports, while disseminating information would contribute to influencing authorities, transport companies, but also of other categories of public interested in the importance of intermodal transportation.

References

Ballis, A. and Golias, J., 2004. Towards the improvement of a combined transport chain performance. *European Journal of Operational Research*, 125(2), pp. 420-436.

Bouffioux, C., Beuthe, M. and Pauwels, T., 2006. La qualité des services de transport de marchandises: une analyse agrégée des ordres de préférence declares. *Les Cahiers Scientifiques des transports*, 21(50), pp. 135-158.

Bureau d'information sur la navigation fluvial, 2009. *Le fluvial, un mode de transport à forte valeur ajoutée l'avenir du transport de marchandises et de la navigation fluviale en europe 2010 – 2011*. [online] Rotterdam: Bureau Voorlichting Binnenvaart. Available through: <www.bureauvoorlichtingbinnenvaart.nl> at: <<http://www.raadhuis.eu/bvb/pageflip/fr/>> [Accessed 27 July 2010].

Chandra, C. and Grabis, J., 2007. *Supply Chain Configuration – Concepts, Solutions and Applications*. New York: Springer Science +Business Media.

Commission du Danube, 2007. *Des données statistiques sur l'état de la navigation danubienne*. [online] Budapest: Commission du Danube. Available at: <http://www.danubecommission.org/uploads/doc/STATISTIC/Nav_statistics_fr.pdf> [Accessed 6 August 2010].

Commission Européenne, Direction générale de l' énergie et des transports, 2006. *Le transport du fret en Europe – des solutions logistiques modernes dans une optique de compétitivité et de durabilité*. Luxembourg: Office des publications officielles des Communautés européenne.

Danube Rectors' Conference, year. *History of the Danube Rectors' Conference*. [online] Vienna: Danube Rectors' Conference. Available through: <<http://www.d-r-c.org/Main.asp?Opt=about&tab=H>> at: <<http://www.d-r-c.org/Main.asp?Opt=about&tab=H>>

- c.org/documents/HISTORY_OF_THE_DANUBE_RECTORS.doc> [Accessed 23 July 2010].
- Directorate-General Energy and Transport, 2009. *A sustainable future for transport: Towards an integrated, technology-led and user-friendly system [COM(2009) 279 (final)]*. [online] Brussels: Commission of the European Communities. Available at: <<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0279:FIN:EN:PDF>> [Accessed 6 September 2010].
- Dordea, S. and Nicodim, L., 2008. Actualities in logistics and transport. *Amfiteatru Economic*, X(24), pp. 157-165.
- European Commission, 2006. *Keep Europe Moving - Sustainable mobility for our continent, 2006 White Paper Mid Term Review [COM(2006)314]*. [online] Brussels: Commission of the European Communities. Available at: <http://ec.europa.eu/transport/transport_policy_review/doc/2006_transport_policy_review_en.pdf> [Accessed 6 September 2010].
- European Commission, 2003. *Developing the trans-European transport network: Innovative funding solutions [COM(2003) 132]*. [online] Brussels: Commission of the European Communities. Available at: <http://www.unece.org/trans/main/tem/temdocs/com_2003_0132_en.pdf> [Accessed 6 September 2010].
- European Commission, 2001. *European transport policy for 2010 - time to decide, White Paper [COM(2001) 370]*. [online] Brussels: Commission of the European Communities. Available at: <http://ec.europa.eu/transport/strategies/doc/2001_white_paper/lb_com_2001_0370_en.pdf> [Accessed 6 September 2010].
- Felea, M., 2008. The role of inventory in supply chain. *Amfiteatru Economic*, X(24), pp. 109-121.
- Fotache, D. and Hurbean, L., 2007. Supply chain management: from linear interactions to networked processes. *Informatica Economica*, 40(4), pp. 73-76.
- Jourquin, B. and Limbourg, S., 2006. Equilibrium Traffic Assignment on Large Virtual Networks, Implementation issues and limits for multi-modal freight Transport. *European Journal of Transport and Infrastructure Research*, 6(3), pp. 205-228.
- Lièvre, P., 2007. *La logistique*. Paris: Ed. La Découverte, Coll. Gestion et management.
- Mărunțelu (Albăstroiu), I., 2008. The particularities of logistics related to e-commerce. *Amfiteatru Economic*, X(24), pp. 177-191.
- Romanian Government, 2009. The Government Decision 749/24.06.2009 for the approval of the Schedule of Denomination of the Domains, of the structures of the institutions of higher education and of the specializations/programs of university studies of license accredited or authorized to temporarily function organized by them, *The Official Gazette* no.465, Bucharest, pp. 7-90.
- Nae, T.R., 2008. The growth of freight transport role – implication to logistical framework, *Amfiteatru Economic*, X(24), pp. 210-223.

- The Administration of the Navigable Channels, 2010. *The evolution of the traffic*. [online]. Constanța: The Administration of the Navigable Channels. Available at: <www.acn.ro/index.php?id=5//> [Accessed 25 July 2010].
- The Order of the Minister of Education, Research and Innovation no.4666 (2009), concerning the approval of the programs of university studies of master degree evaluated by the Romanian Agency of Quality Assurance in the higher education. [online] Available at: <<http://www.edu.ro/index.php/articles/c172/>> [Accessed 24 July 2010].
- Vasiliu, C., 2008. Warehousing – activity which contribute to supply chain performance. *Amfiteatru Economic*, X(24), pp. 94-108.
- World Wildlife Fund, 2009. *Save the Danube as a lifeline! – steps towards sustainable navigation, Common NGO position on navigation in the Danube basin*. [online] Gland: World Wildlife Fund. Available at: <http://www.wwf.de/fileadmin/fm-wwf/pdf_neu/Save_the_Danube_as_a_lifeline.pdf> [Accessed 9 August 2010].
- World Wildlife Fund, 2002. *Danube Carpathian Programme - Waterway Transport on Europe's Lifeline, the Danube Impacts, Threats and Opportunities*. [online] Gland: World Wildlife Fund. Available at: <http://www.wwf.hu/media/file/1180873628_danubereport_4.pdf> [Accessed 9 August 2010].
- Yankov, N., 2009. The necessity for a different paradigm for economic development. *Amfiteatru Economic*, XI(25), pp. 189-200.
- Yankov, N., 2007. Multilevel marketing integration process management. *Amfiteatru Economic*, IX(21), pp. 9-19.