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Key Findings

- A network of over 37,000 km of rivers connects thousands of cities and industrial areas across Europe.
- In 2014, the total volume of goods transported in the European inland waterways transport network reached 551 million tons and the total transport performed 151 billion ton-km, representing the largest mode of transport after road and railroad in the world.
- 21 Member States out of 28 have an inland waterways network and 13 of them are linked together.
- With 8,500 km, France is home to the EU's largest inland waterways network.
- Inland waterways transport is considered as an alternative to road and railroad transport in the EU.
- Although it has the potential in terms of inland waterways transport, Turkey is lagging far behind the EU in that respect.
- Inland waterways transport is very limited in Turkey with the majority of transportation being performed on the Van Lake or other lakes.
- Inland waterways transport has gained importance in Turkey with the launch of the Sakarya Inland Waterways Project in the 2000s.

Introduction

Inland waterways transport is a rather old mode of transportation. Indeed, from classical antiquity to nowadays, from the Mesopotamia Valley's Tigris and Euphrates rivers to Egypt's fertile Nile River and to the Rhine and Danube rivers of Europe, inland waterways transport has always existed. For instance, during the Roman period, boats would enter the Black Sea shores through the Danube River. Moreover, due to Rome's policy of assimilating non-Roman tribes, other peoples would also have unfettered access to the very same rivers without any obstruction. In addition, one should underline that the rivers have also served as borders for cities, agricultural and industrial areas among others. Currently, one can say that inland waterways transport is widely used in Europe and the Far East (especially in China and South-East Asian countries). Furthermore, thanks to the growing expansion of maritime transportation, rivers have gained prominence as well in that respect. Europe is surely one of the very continents where this can be clearly seen. The Rhine, Danube and Volga rivers are linking together many different countries and constitute as such privileged areas of transportation in Europe. In contrast, inland waterways transport has begun developing in Turkey only recently. One of the most important examples of this was the launch of the Sakarya River Transportation Project. One can assume that inland waterways transport will be further developed across in Turkey in the upcoming years.

The Making and Future of EU Inland Waterways Transport Policy

Inland waterways transport policy in the EU began to be shaped through a legislation which was enacted on 15 November 1985 and entitled "European Code for Inland Waterways[1]". This code of law had been prepared by the Economic Commission for Europe which represents the economic agency of the UN in Europe. The code's general provisions clarified the terminology pertaining to inland waterways transport. Furthermore, it also revealed detailed information regarding the vessels that are entitled to use the rivers such as the tonnage measurement of the vessels, inland waterways measures, and the standardisation of the personnel working on vessels, the possibility for the vessels to carry goods and unload goods along with provisions regarding the prevention of the pollution of rivers.

Taking into account the fact that Europe is home to a network of over 30,000 km of canals and rivers which link together many cities and regions, inland waterways transport is gaining more and more importance thanks to the expansion of the use of information technologies. In that context, the EU has set up "river information services" (RIS) which aim at informing the personnel on vessels regarding the rights of passage, latest developments on river traffic, traffic governance along with information regarding

[1] UN Economic Commission for Europe, "CEVNI: European Code for Inland Waterways", Working Group for Inland Water Transport, 2009. Retrieved from http://www.unece.org/fileadmin/DAM/trans/doc/2010/sc3wp3/ECE-TRANS-SC3-115r4e.pdf, 27 April 2016.

the passage and port costs[2]. In that context, it has become compulsory for EU Member States to enact EU and international legislation and to create river information services centres.

In terms of legislation, 11 directives have been revised in the 2006-2016 period. Another important directive of EU inland waterways transport legislation is one which relates to the standardisation of vessels taking part in inland waterways transport. The directive, which entered into force on 12 December 2006, effectively abolished a directive dating from 1982 which was related to the technical requirements for inland waterways vessels. With this directive, vessels operating in inland waterways, which are over or equal to 20 metres and with a volume of 100 cubic metres, can effectively use the inland waterways network. One should nonetheless note that ferryboats and military vessels are not included within the framework of this directive. Another important aspect of the directive is the fact that it brings an obligation of certification for all vessels using inland waterways. Whilst it is compulsory for all vessels to have an EU certificate; vessels entering the Rhine river region are also required to have a certificate from the Central Commission for Navigation on the Rhine.

In 2013, the European Commission approved the NAIADES II package. Within that scheme is included a series of regulations regarding the development of Europe's inland waterways network in the 2014-2020 period. In this context, the emphasis is especially put upon the following points:

- **Infrastructure** – planned actions for inland navigation under the existing programmes and under the forthcoming instruments of the next multiannual financial framework for the period 2014-2020 (financial and technical assistance);
- **Market** – assistance for integrating inland waterways into the multimodal logistic chains and financial incentives for inland navigation;
- **Fleet** - measures to reduce emissions (for example standards);
- **Jobs and skills** – actions aimed at increasing harmonisation of standards for professional training and certification;
- **Information exchange and sharing** – review of the River Information Services policy[3].

Furthermore, a regulation promoting inland waterways navigation, which was enacted in 1999, was revised on 9 February 2016[4]. With this regulation, the path was cleared towards a more competitive and sustainable inland waterways network. The regulation includes rules related to the improvement of working conditions on the vessels, granting

[2] EU Council and European Parliament, "2006/87/EC Directive of the European Parliament and of the Council of 12 December 2006 laying down technical requirements for inland waterway vessels and repealing Council Directive 82/714/EEC", 2006/87/EC, 12.12.2006. Retrieved from http://eur-lex.europa.eu/eli/dir/2006/87/oj, 27 April 2016.
[3] European Commission, "NAIADES II", 05.01.2016. Retrieved from http://ec.europa.eu/transport/modes/inland/promotion/naiades2_en.htm, 27 April 2016.
[4] EU Council, "Rules for promoting inland waterway transport in the EU", EC No 718/1999, 29.03.2016. Retrieved from http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31999R0718&from=FR, 27 April 2016.

support to vessel workers in terms of retirement, organising vocational training or retraining schemes for workers leaving the industry, improving operators' skills in order to safeguard the development and future of the trade[5].

Another important issue in inland waterways navigation is the transportation of dangerous goods. In that context, a directive was enacted in 2008 entitled "Inland transport of dangerous goods[6]". The directive aims at implementing international provisions regarding the transportation of dangerous goods in inland waterways at the European level. The 2008 directive was revised in April 2016 through a directive which further elaborated the technical specifications required of the vessels using inland waterways networks in Europe. Thus, there are new rules as such on the certification of vessels and it is stipulated that the vessels need to get certifications from the Central Commission for Navigation on the Rhine.

Geographically speaking, one can say that inland waterways transport has an important potential in Europe by the sheer size of the rivers in many EU Member States.

Table 1: Main Inland Waterways Networks in the EU

Country	Length of network (in km)
France	**8,500**
Germany	**7,500**
Netherlands	**6,000**
UK	**3,200**
Romania	**1,780**
Belgium	**1,500**
Austria	**350**

Source: Voies Navigables de France

Currently, 21 out of the 28 EU Member States have inland waterways transport. Altogether, the EU has a 37,000 km long network of rivers suitable for transportation. Moreover, in 12 of these countries, the rivers are linked to one another. Indeed, rivers such as the Danube, Rhine, Loire and Rhône include some of the largest economic centres in Europe. Furthermore, when one takes a closer look at the map, one can see that these inland waterways networks are mostly located in the EU's more developed countries such as Belgium, the Netherlands, Luxembourg, Germany and Austria. Undoubtedly, the Rhine and Danube rivers compose some of the most important rivers in Europe and thanks to them; there is a link from the North Sea to the Black Sea with the Danube delta at the Romanian-Ukrainian border. In 2013, inland waterways

[5] Ibid.
[6] European Parliament, "Inland transport of dangerous goods", 2008/68/EC, 20.10.2008. Retrieved from http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1440156857059&uri=URISERV:tr0006, 27 April 2016.

transport represented 6.9% of the freight transported in the EU[7]. Moreover, in 2014, the total volume of goods transported on the European inland waterways network rose to 551 million tons whereas the total transport performed had reached 151 billion ton-km[8]. Across the EU, there are almost 11,500 vessels involved in inland waterways transport with a total freight capacity of over 11 million tons. Furthermore, the inland waterways transport sector is rapidly developing. In 2012, there were 9,430 enterprises which ensured employment to 41,100 people[9]. In 2013, the total turnover of the inland shipping industry in the EU rose to 5.5 billion euros[10].

Map 1: Inland Waterways Networks of EU Member States

Source: European Commission

The European Commission promotes the development of inland waterways transport and actively supports the integration of inland waterways with other means of transportation[11]. Due to issues pertaining to pollution, traffic, security, as well as

[7] Eurostat, "Freight transport statistics", January 2016. Retrieved from http://ec.europa.eu/eurostat/statistics-explained/index.php/Freight_transport_statistics, 27 April 2016.
[8] Eurostat, "Inland waterway transport statistics", October 2016. Retrieved from http://ec.europa.eu/eurostat/statistics-explained/index.php/Inland_waterway_transport_statistics, 27 April 2016.
[9] European Commission, "EU transport in figures: Statistical Pocketbook 2015", 2015. Retrieved from http://ec.europa.eu/transport/facts-fundings/statistics/doc/2015/pocketbook2015.pdf, 27 April 2016.
[10] Netherlands Maritime Technology, "Mapping the European Maritime Cluster", November 2015. Retrieved from http://maritimetechnology.nl/media/Mapping-the-European-maritime-cluster.pdf, 27 April 2016.
[11] European Commission, "Inland waterways", 18.03.2016. Retrieved from https://ec.europa.eu/transport/modes/inland/index_en.htm, 27 April 2016.

emission and capacity constraints, the Commission highlights the advantages of inland waterways transport as a more reliable and efficient mode of transport. As such, one should underline the key importance of the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways prepared by the UN Economic Commission for Europe and the Central Commission for Navigation on the Rhine which was signed in 2000 and entered into force in 2008[12].

One should also underline the fact that inland waterways transport holds strategic importance from the perspective of the principle of intermodality in the context of the TEN-T programme. Indeed, among the 30 projects included within the framework of TEN-T, two of them are directly related to inland waterways transport[13]. The Danube River which links numerous European countries from Germany to Romania holds a key role in that respect. Furthermore, one should also remind that it is linked to the Rhine River through a canal located in Germany.

Thus, one can clearly see that inland waterways transport holds significant potential for the EU economy. With its 2050 Transport Strategy, the Commission aims at integrating all of its core airports with railway networks as well as, if possible with the inland waterways systems[14].

Turkish Inland Waterways Transport Policy: A New Dimension in the Transport Sector

Currently, it is impossible to say that Turkey has experienced noteworthy progress in terms of expanding its inland waterways network and allow it to reach its full potential. In the past, there had been attempts at using the Sakarya River for means of transportation but this has not yet really materialised. In the Ottoman period, the lower side of the Sakarya River had been opened to transportation seven times. In 1976, there had been a project to open the river to transportation but because of insufficient freight it was not completed. Nowadays, the provinces of Sakarya, Kocaeli, Bolu, Bilecik and Eskişehir, through which runs the Sakarya River, have considerably developed in the last 20 years. Indeed, thanks to the industrial expansion in the region, the trade and services sectors have also seen tremendous progress in that respect. Furthermore, according to a report published by the East Marmara Development Agency, the GDP per capita of these provinces is above Turkey's average[15].

[12] UN Economic Commission for Europe, "European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)", ECE/TRANS/220 (Vol. 1), 2011. Retrieved from https://www.unece.org/fileadmin/DAM/trans/danger/publi/adn/adn2011/English/ADN_2011_Vol_I_E_protected.pdf, 27 April 2016.
[13] European Commission, "30 Priority Projects", 2016 Retrieved from https://ec.europa.eu/inea/ten-t/ten-t-projects/projects-by-priority-project, 27 April 2016.
[14] European Commission, "Transport 2050: Commission outlines ambitious plan to increase mobility and reduce emissions", 28.03.2011. Retrieved from https://europa.eu/rapid/press-release_IP-11-372_en.htm, 27 April 2016.
[15] East Marmara Development Agency, "Sakarya Nehri'nin Ulaşım ve Taşıma Amaçlı Kullanılabilirliği Raporu", September 2010. Retrieved from

Map 2: Map of Rivers and Lakes of Turkey

Source: DereTepe.Net

With such positive developments, one can also add that external trade in the region has increased and there has been renewed interest *vis-à-vis* the region and Turkey's potential in terms of inland waterways as a whole. Nonetheless, inland waterways transport is still at most residual in Turkey. Indeed, taking a closer look at the figures regarding domestic freight transport by different means of transport, one can see the following: 84.5% of all domestic goods are transported by road, 6.8% by railroad, 6.5% by sea and 2.2% by pipelines[16]. As a result of geographical conditions, inland waterways transport is very limited in Turkey and the majority of operations are being performed on the Van Lake along with other lakes. Taking into account Turkey's rivers, one can see that most of the rivers that have a potential for inland waterways transport are close to the Black Sea region. As such, the Kızılırmak River, which constitutes Turkey's longest river, may be of certain importance. Furthermore, one can also recollect the Bartın River on which vessels of approximately 500 tons can navigate and transportation is performed in a rather limited manner[17]. In total, there is a 1,200 km long inland waterways network across Turkey[18]. Another point that needs to be highlighted is the fact that inland waterways transport effectively would cost less than other means of transportation: for example, in Europe, 100 tons of freight that is transported for a distance of 1 km would cost less by inland waterways. Indeed, as such, whilst 100 tons of freight that is transported at a distance of 1 km would cost 2.81 dollars by road, 0.65 dollars by railroad, it would cost only 0.20 dollars by inland waterways[19].

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http://www.dogumarmarabolgeplani.gov.tr/pdfs/6_ulasim_49_SakaryaNehrindeTasimacilik.pdf, 27 April 2016.

[16] "Sokullu'nun 'Çılgın Proje'si 500 yıldır gerçekleştirilmeyi bekliyor", *Hürriyet*, 22.02.2012. Retrieved from http://www.hurriyet.com.tr/sokullunun-cilgin-projesi-500-yildir-gerceklestirilmeyi-bekliyor-19972671, 27 April 2016.

[17] Bartın Culture and Tourism Directorate, "Bartın Irmağı". Retrieved from http://www.bartinkulturturizm.gov.tr/TR,69016/bartin-irmagi.html, 27 April 2016.

[18] Central Intelligence Agency (CIA), "The World Factbook: Turkey", 2016. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/tu.html, 27 April 2016.

[19] "Sakarya Nehrinde Yapılan HES'ler Sakarya'nın Geleceğini bitirir", Sakarya54.net, 09.07.2015, Retrieved from http://www.sakarya54.net/sakarya-nehrinde-yapilan-hesler-sakaryanin-gelecegini-bitirir, 27 April 2016.

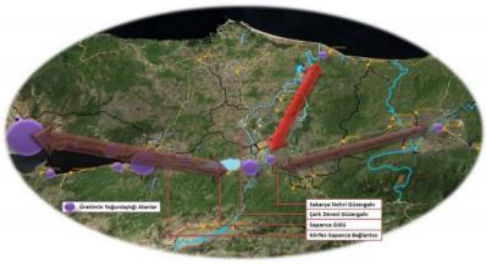
Sakarya River Transportation Project

The idea of linking the Sakarya River through the Sapanca Lake to the Izmit Gulf goes back to Antiquity. Indeed, a bridge dating back to that period close to Adapazarı is testimony to it. According to researchers, the architectural structure of the bridge shows that it was not solely aimed at crossing the Sakarya River but also at trying to divert the river's path towards the Sapanca Lake[20]. The project was envisaged during the Ottoman period but never effectively materialised. Following the proclamation of the Republic, there were various assessments made by geological experts which confirmed that because of the lack of freight, the project was not of particular importance.

In its last 20 years, there have been tremendous developments in the region which rapidly industrialised. This also resulted in greater pollution in and across the Sapanca Lake, leading to a lack of interest for the Sakarya River Transportation Project. Furthermore, the project was overshadowed by the announcement of the rather ambitious "Canal Istanbul" project. The first step of the project is of critical importance: it consists in linking the Karasu-Adapazarı section to the sea. Whilst the TINA and the VIKING projects are at the forefront, the Sakarya River Transportation Project maintains its strategic importance in terms of developing Turkey's inland waterways transport potential.

The following steps of the project include the construction of an artificial canal which would link the Sakarya River with the Marmara Sea through the Sapanca Lake. If completed, it is reported that the project would significantly lower the cost for the transportation sector and could lead to a decrease in maritime traffic on the Bosphorus. Furthermore, it is also claimed that the project would be rather cheap and with a potential of increasing tax revenues in the region. In the long run, it is expected that the project would have an overall impact on the whole region including Sakarya, Kocaeli, Bolu, Bilecik and Eskişehir provinces[21].

Map 3: Sakarya River Transportation Project's Planned Route



Source: East Marmara Development Agency

[20] Şahin Sencer, "Adapazarı/Beşköprü Mevkiindeki Antik Köprü ve Çevre Tarihi Coğrafyasında Yarattığı Sorunlu Durum", 1985, Retrieved from http://www.envanter.gov.tr/files/belge/A3ASR_0069.pdf, 27 April 2016.

[21] East Marmara Development Agency, "Sakarya Nehri'nin Ulaşım ve Taşıma Amaçlı Kullanılabilirliği Raporu", September 2010, Retrieved from http://www.dogumarmarabolgeplani.gov.tr/pdfs/6_ulasim_49_SakaryaNehrindeTasimacilik.pdf, 27 April 2016.

The State Planning Organisation was pushing forward for the realisation of the feasibility reports regarding the project and they have been as such prepared by the Sakarya Province authorities along with Sakarya University and been transmitted to the Ministry of Transport, Maritime Affairs and Communication. Interest among the general public for the project, especially the populations living in the region, has increased thanks to media coverage. The fact that the region has a suitable geography also makes the project more attractive[22]. Furthermore, it is claimed that once the project is completed, it would create a total profit of 52.808 million dollars in terms of further energy production[23].

Conclusion

The rivers have linked together important economic, cultural and political centres in many parts of the world for centuries. The EU, with its large and integrated inland waterways system, has a significant advantage in that respect. Thanks to a substantial increase in investments to the sector in the EU, one can expect traffic to rise in Europe's main rivers. As for Turkey, with its Sakarya River Transportation Project, it is expected that the interest for this means of transportation will grow in the upcoming period. Whilst the EU already has a comprehensive legislation which covers inland waterways transport, Turkey still lags behind and it will need to revise and expand its domestic legislation in that respect. One can add that inland waterways transport can expand in Turkey with feasibility reports but also through greater publicity and interest for it. In that respect, the Sakarya River Transportation Project holds a key importance and could lead the East Marmara region to become a leading logistics centre for Turkey and beyond.

[22] Ibid.
[23] "Sokullu'nun 'Çılgın Proje'si 500 yıldır gerçekleştirilmeyi bekliyor", *Hürriyet*, 22.02.2012. Retrieved from http://www.hurriyet.com.tr/sokullunun-cilgin-projesi-500-yildir-gerceklestirilmeyi-bekliyor-19972671, 27 April 2016.