

Inland water transport in the light of contemporary social and economic problems

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Abstract

Socio-economic development creates a lot of problems and challenges. At various levels, these problems are different, for example:

- globalisation, generating increased demand for transport, presents new challenges for transport, especially international;
- increasing disparities in regional development, as a source of social problems, make it necessary to look for more effective ways of eliminating these disparities;
- problems of towns and large cities, associated amongst other things with the growing needs of transport and insufficient infrastructure, reduce the standard of living and require an urgent solution.

Contemporary socio-economic problems have significant impact on transport, but on the other hand through changes in transport, many of them can be partly solved. This article aims to analyze the possibilities of developing inland waterways to solve today's social and economic problems.

Introduction

Socio-economic development does not always proceed harmoniously, creates a lot of problems and challenges. At various levels the problems are different, for example:

- **globalisation** which generates increased demand for transport, but also poses new challenges for transport, especially international;
- increasing **disparities in regional development**, which are a source of social problems, create the need to search for more effective ways of eliminating these disparities;
- **problems of towns and large cities**, connected among other things with the growing need for transport and insufficient infrastructure, which reduce the standard of living and require immediate solutions.

Some of these problems are increased in the conditions of prolonged **economic crisis** (disparities in regional development), while finding solution to others is obstructed for example by reduced investment. Additional difficulty is strong pressure

on **sustainable development** which calls for solutions not readily available amidst crisis.

Contemporary socio-economic problems affect transport to a considerable extent, but on the other hand they can be partially solved by at least a change in transport. This article aims at analysing the possibilities of how inland water transport may help extenuate or even solve contemporary socio-economic problems.

Inland water transport in view of the challenges of globalisation

Economic development and globalisation together with present development trends of goods exchange caused **the increase of transport needs** to be ahead of GDP for many years (such a situation lasted until the 2008 economic crisis when these trends collapsed, but as soon as 2010 they returned with greater intensity – even with falling GDP, the transport of goods and passengers began to rise dramatically, Fig. 1).

According to the latest estimates, the demand for goods transport between the years 2005 and

2020 will increase by 20% [2]. By 2030 the growth will be 40% and by 2050 – over 80% (Fig. 2) [3].

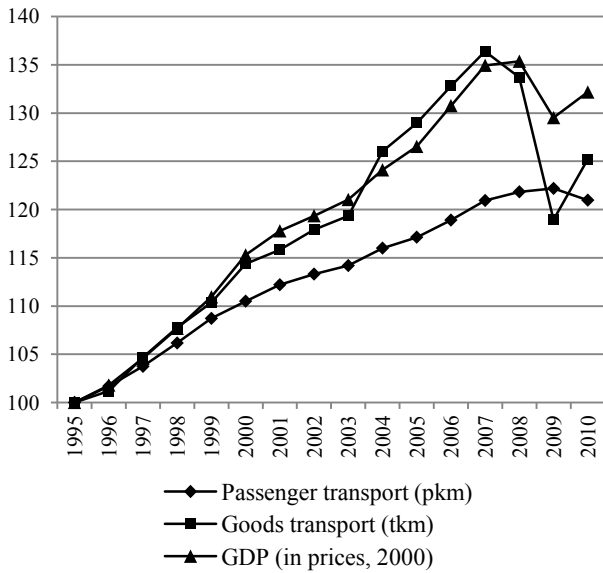


Fig. 1. The dynamics of economic development and transport performance in the transport of goods and passengers in EU-27 1995–2010 [1]

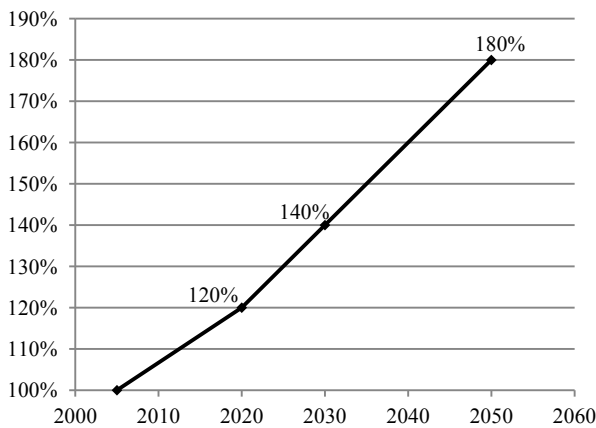


Fig. 2. The dynamics of the increase in goods transport demand in EU countries (2005 – 100%) (own study based on [2, 3])

Such a significant increase in face of troublesome and expensive congestion (ca. 1% GDP annually), carbon emissions, energy dependence on crude oil (96%), field restrictions to develop transport infrastructure, has mobilised EU states to take more effective actions to ensure sustainable development of transport.

The globalisation trends in economy caused, in connection with economic activity of the Far East markets, a significant increase in the needs for maritime transport using freight containers. In 2011, according to the American Association of Port Authorities (AAPA), 7 of the 15 maritime ports, which have the highest circulation of freight containers were Chinese, while the rest was constituted by Singapore, ports from South Korea,

Malaysia, the United Arab Emirates and only 3 European ports [4].

European ports greatly increased their circulation (in 2005 Antwerp, Hamburg and Rotterdam jointly handled 23.4 million TEU, in the critical 2009 – 23.6 and in 2011 – as much as 29.5 million TEU).

Table 1. Traffic of the busiest container terminals in 2011 (in TEU) [4]

No.	Name of the port	Country	Millions TEU
1	Shanghai	China	31.7
2	Singapore	Singapore	29.9
3	Hong Kong	China	24.4
4	Shenzhen	China	22.6
5	Busan	South Korea	16.2
6	Ningbo	China	14.7
7	Guangzhou (Canton)	China	14.3
8	Qingdao	China	13.0
9	Dubai	United Arab Emirates	12.6
10	Rotterdam	Holland	11.9
11	Tianjin	China	11.6
12	Kaohsiung	Taiwan	9.6
13	Port Kelang	Malaysia	9.4
14	Hamburg	Germany	9.0
15	Antwerp	Belgium	8.6

Crisis, which forced drawing greater attention to costs and competition, along with the increased traffic at seaports, which posed new challenges for hinterland transport, and last, but not least, the idea of sustainable development of transport (Fig. 3) have caused the inland water transport to become the hinterland transport for container terminals. It was determined by the following factors:

- lower transport costs;
- least harmful for the natural environment (among the branches of land transport);
- capacity reserves.

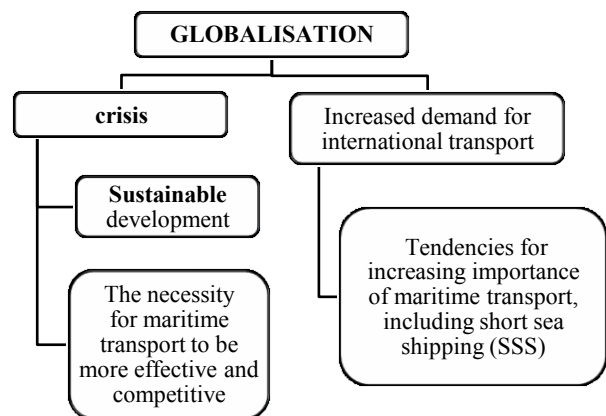


Fig. 3. The influence of globalisation and the idea of sustainable development on maritime transport [own study]

The role of shipping in the maritime ports' handling has been considerably strengthened with the increase in size of the ships the calling at maritime ports, which created the need for single transport of large amount of goods. The appearance of ships capable of carrying about dozen TEU at once, certainly made inland water transport seem more attractive, as it could offer to carry a few hundred of freight containers at once. The possibility to freight a whole batch of cargo using about a dozen pushed convoys, instead of a few thousand cars translates, not only to lower costs, but also shorter time of transshipment, not to mention saving external costs. In effect, a lot of European ports began to change branch structure of hinterland transport. Among the biggest European container terminals, Antwerp has undergone the biggest change. The share of inland water transport in the port handling rose from 33% in 2006 to 39% in 2010 (that is, as much as 6%); by 2020 it is planned, that the share will amount to 43%, and the target share is 45%. The biggest success in changing the branch structure of hinterland transport for the port of Antwerp is the increase of the share of inland water transport along the Albert Canal. During 12 years, the branch increased its share in container transport in this place by 46% (from 21% in 1998 to 67% in 2010), at the expense of road transport, whose share decreased from 79% to 33% [5] (Fig. 4). The similar changes can be observed in the hinterland transport in the port of Rotterdam (Fig. 5) [6].

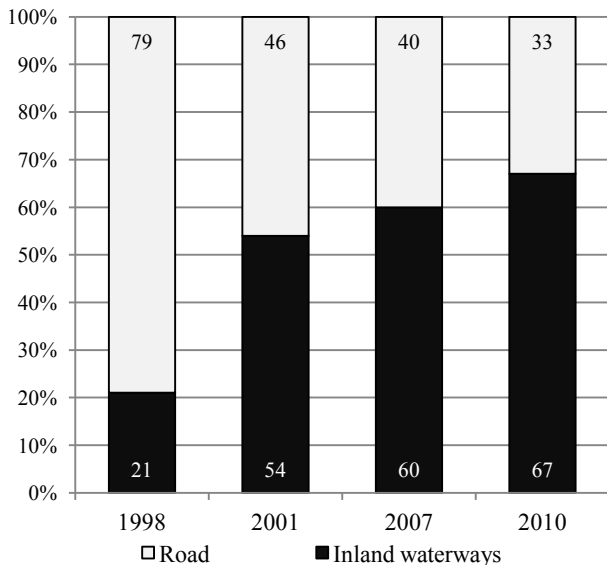


Fig. 4. Changes in the branch structure of the container transport along the Albert Canal (own study based on [5])

Other European container terminals which have a significant share of inland water transport in their hinterland transport are Le Havre (9%) and Amsterdam (45%) [7].

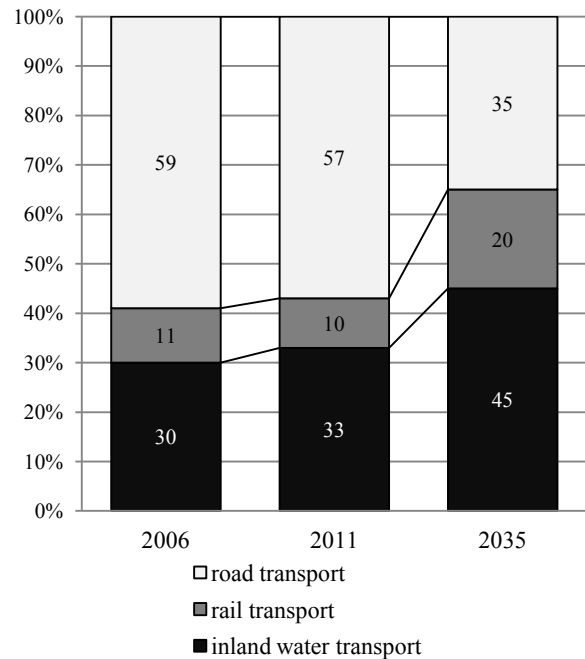


Fig. 5. The share of inland water transport in handling the container transport in the port of Rotterdam [6]

Regional development

One of the most important goals of the EU is the elimination of disparities in regional development.

EU regional policy aims at eliminating unemployment by creating new jobs, taking action in order to increase the competitiveness, economic growth, improvement of the living standards, as well as by sustainable development. The investment in those fields is to contribute to the achievement of the targets of Europe 2020 strategy. Central and Eastern European countries, including Poland (but excluding Masovian Voivodship), constitute the region with the lowest GDP in EU (Fig. 6). However, the GDP in a large part of France, Spain, a section of Great Britain, eastern part of Germany and Masovian Voivodship is also lower than the EU average. This means that the problems of regional development affect numerous countries.

The 68 regions in total have an average GDP more than 25% lower than the average for EU-27. Twenty of those regions belong to six member states of EU-15: Italy (5 southern regions), France (4 overseas regions), Greece, Portugal (4 regions each), Great Britain (2 regions) and Spain (Extremadura region). The 48 remaining regions can be found in those countries which joined the EU either in 2004 or 2007; each of these 12 states, excluding Cyprus and Malta, has at least one region with a GDP below this level. The average GDP per capita was lower than the half of the average GDP in EU-27 in 22 of these regions. These regions are situated in Bulgaria, Hungary, Poland, Romania

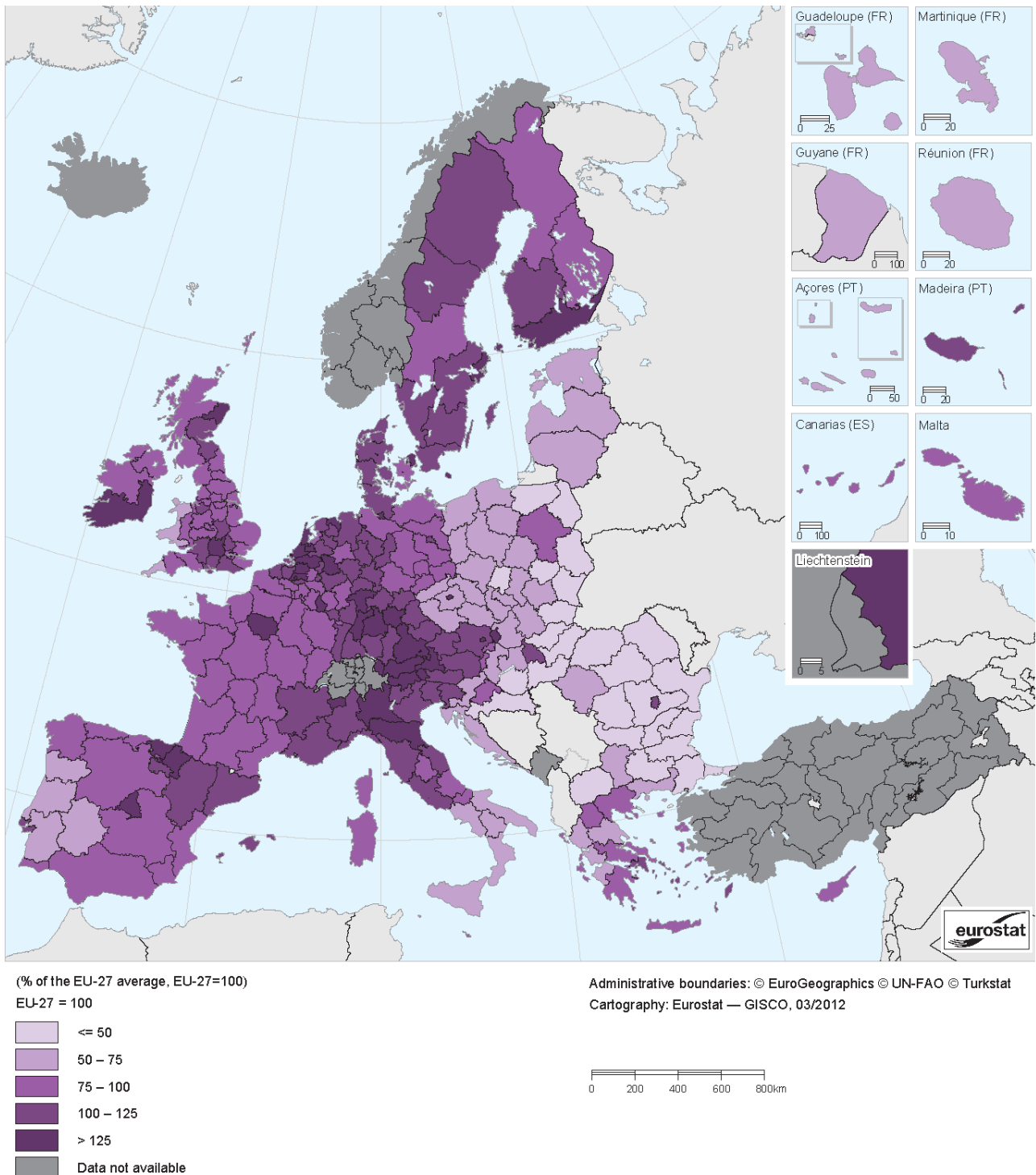


Fig. 6. Gross domestic product (GDP) per inhabitant, in purchasing power standard (PPS), by NUTS 2 regions, 2009 (% of the EU-27 average, EU-27 – 100) [8]

and Slovakia. The population of these 22 regions, in which GDP expressed in PPS did not exceed 50% of the EU-27 average, is about 38.5 million, which constituted 7.7% of the EU population [8].

One of the reason of disparities in regional development is the limited transport availability. Inland water transport is not the branch that would increase this availability. One, can find routes on

which this branch would provide attractive connections; these are, however, exceptions.

Inland water transport can, however, significantly improve the socio-economic situation in those regions, where there are inland waterways, by offering water tourism. Numerous regions with low GDP are poorly industrialised but in exchange have great natural values. The use of these values is

a chance to develop various forms of water tourism, which requires:

- tourist development of the region;
- development of accommodation and gastronomic infrastructure;
- developments of inland waterways in order to provide predictable navigational conditions (these parameters need not be very high, but the minimum depth should be guaranteed);
- constructing harbours and marinas which allow not only for providing services at an appropriate level, but also preventing uncontrolled environment degradation by tourists.

The effects of water tourism development for the region's socio-economic development, after the abovementioned conditions have been met, can be significant and may include:

- decrease in unemployment, especially in the group of people who find it hardest to find employment – middle-aged women;
- economic effects – according to EU studies a tourist coming via waterways leaves in the region on average € 32, which given a million tourists, translates into € 32 million, which are spent on accommodation services, gastronomic souvenirs, etc.

Water tourism is a response to today's needs of the inhabitants who increasingly often prefer active forms of recreation, connected with sightseeing and in the moderate climate zone. Therefore, there are real chances to mitigate the problems of economic development of numerous European regions through the development of water tourism. The demand for such services is growing even today very dynamically.

Inland water transport in solving transport problems of towns and cities

An another domain, where the transport-related problems are accumulated, are towns and cities. The implementation of rules of sustainable development of transport in urban logistics is essential to improve the living standard of citizens. Here, as well inland water transport may be widely used and often without the great investment. Towns and cities situated near waterways can, as is the case in many EU countries, implement both passengers and goods transport, thereby decreasing congestion and facilitating the access to areas closed for transport.

Commuting may be an important field of using inland water transport in the areas of maritime ports and shipyards. Shipping often ensures the most

favourable connections in these regions, and using passenger ships for such transport would considerably decrease rush hour traffic and its inconveniences. Such transport is relatively easy to plan, as the demand for it is predictable and can be accomplished in cooperation with economic entities it concerns.

Inland water transport may play a significant role as a part of **public communication**. The premises for this type of transport are as follows:

- location of the most of big cities near waterways;
- low requirements of passenger ships for waterways (there is a strong possibility to adapt fleet to local conditions);
- relatively low requirements as regards passenger harbours;
- parking problems in the city centres;
- high parking costs;
- low road safety;
- closure of many city centres for passenger traffic.

Waterways, as mentioned above, run through the most populated parts of towns and cities – their centres, which creates possibilities to use them for public transport on selected routes. The success of this solution depends, however, on treating inland water transport the same way as other branches of transport, both when it comes to prices and coordinating timetables with the transport needs. Such transport is usually not large-scale, but it may play an important role during the rush hours.

In the **urban agglomerations**, inland water transport may reduce road congestion by handling everyday goods transport from inland ports to city centres. Another new area of using inland water transport in cities is waste transport. The European Union generates 2.3 billion tonnes of waste annually, 60% of which is currently transported by road. Considering a far-sighted solution to this problem, cities such as Brussels, Lille, Liege, London, Paris, Hague and others are trying to increase the transport of this load by waterways, hence reducing congestion in cities, costs and carbon emissions. In Holland, in the region of Amsterdam, the transport of 140,000 tonnes of waste to the landfill in Alkmaar by water allows 5,500 lorries to be removed from roads annually. In Great Britain barges carrying waste are able to replace 100,000 lorries annually [9]. Yet another niche, which can be – and in some countries already is – filled by inland water transport, is transporting paper to the cities and waste paper back, for recycling.

Conclusions

All of the presented socio-economic problems, the solving of which inland water transport may facilitate, also occur in Poland. The container turnover of maritime ports rises very rapidly and hinterland transport does not keep up with this growth. By 2016, after the currently in-planning DCT 2 terminal has been built, container reloading capacity in the port of Gdańsk will have risen fourfold, to 4,000,000 TEU. Unfortunately, although it is a port situated at the Vistula estuary, there are as of right now no plans to use this waterway for container hinterland transport.

The development of water tourism is relatively the best. The point of infrastructure and the tourist facilities are being built and a local governments are truly engaged in promoting their regions. Unfortunately, what safe shipping requires, is to provide stable navigation conditions and this is a problem.

Similarly, in towns and cities – local governments engage themselves in the development of water transport, but urban water logistics is highly dependent on investment beyond the control of the local governments. What is necessary then, is a comprehensive and cohesive idea which will allow to implement environmentally friendly and advantageous solutions in Poland.

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