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**THE DEVELOPMENT OF THE INLAND WATERWAY TRANSPORT SYSTEM
IN FLANDERS (BELGIUM): AN INSTITUTIONAL ANALYSIS**

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ABSTRACT

While the issue of governance and institutions in seaport systems has been addressed extensively in recent literature, few studies pay attention on this issue when it comes to inland waterway transport systems (IWT). In order to fill this gap, this paper aims at discussing the role of governance and institutions in the development of IWT in Belgium. We do so by first providing a literature review of existing port governance studies. Then, after a general discussion on IWT in the European Union, we discuss the case of the governance of IWT in Belgium (especially the Flemish area) with three essential factors: 1) functions of parties at different levels and their relationship; 2) financial governance regarding investments in IWT infrastructures and superstructures; 3) land use issues and concession issues of inland terminals. We conclude with a discussion on the role of institutions and governance in the development of IWT in Flanders, a region of Belgium, by analysing how governance and institutions play(ed) a role in the past and current development stage of the Belgian IWT system.

Key word: Inland waterway transport, Governance, Institution, Belgium, Flanders

1. INTRODUCTION

Inland waterway transport (IWT) is an integral part of the comprehensive transport system of a region and this transport mode has many advantages; it is environmentally friendly, reliable and cost-efficient. Having created many bridges between nations and regions, IWT has contributed to the development of mature economies over many centuries (INA, 2009). It is often considered as the most appropriate means of land transportation in the pursuit of a sustainable development strategy.

Academic literature actively contributes to current discussions about the development and role of IWT. In the case of the UK, the IWT is barely surviving because of government's ignorance (Burn, 1984) and a poor infrastructure condition with many older canals of limited navigability (Lowe, 2005). Barging network strategies in Belgium and the Netherlands are quite different from short sea or ocean structure of routine (Notteboom et al., 2004). Fremont et al. (2009) build up a model to show the interdependence between the setting up of combined waterway-road services, the competition between ports and the competition between shipping lines in France. As for the cases in Asia, although inland waterways play a very important role in the rural areas in some developing countries such as Bangladesh, India and Indonesia, IWT is still underdeveloped (ESCAP, 2003). The creation of a water-highway connecting countries or regions is considered as an opportunity for stimulating economic and environmental prosperity in South-East Asian Countries, although resistance exists from related authorities and countries (Kader et al., 2006). When discussing the similarities and dissimilarities between the spatial and the functional development of the container river service networks of the Yangtze River and the Rhine River, Notteboom (2007) showed that the Yangtze service network has the tendency to converge in more than one aspect. Veenstra et al. (2010) asserted that the Yangtze River system is going through a regionalization phase.

International Navigation Association (2009) underlined that "Sustainable water management requires the integrated use of waterways, thus benefiting a very large number of people because of the significant linear development that occurs alongside rivers. Because so many rivers cross national and regional boundaries it is important that the integrated use of waterways is taken forward on an intergovernmental, collaborative basis". From this point of view, governance and institutions play an essential role in the development of an IWT system.

In the past decade, "governance" and "institutions" have become a popular topic in port economic studies, since port reform has become a main trend in many seaports worldwide. Discussions among scholars reflect this trend against the background of globalization and regionalization with economic change and technological developments (Baltazar et al.,

2001; Wang et al., 2004; Brooks, 2004; Brooks et al., 2007; Debie et al., 2007; Ng et al., 2007; Notteboom, 2007; Brooks et al., 2008; Ng et al., 2010; Shou et al., 2010). Port Authorities in a number of countries have launched programs which aim to reform the administrative and ownership structure including a privatization process in order to solve problems of inefficient operation and management as well as to upgrade ports generation (Cullinane et al., 2001; Airriess, 2001; Brooks, 2004; Wang et al., 2004). Concession agreements are often used as tools for structuring the relations between public port authorities and private terminal operators (Notteboom, 2007). Processes of change in seaports are dynamic and the performance outcome of a reform process influences the next round of reforms (Brooks et al., 2008). Newly established seaport governance structures follow a path largely affected by local/ national institutional frameworks and the political traditions in place (Ng et al., 2010). In the course of reviewing literature about governance and institutional issues of port governance, most studies focus on sea ports while little is known about IWT system.

In order to fill this gap, we will develop this paper by bringing into focus the parties involved in IWT in Belgium and their relationships. Belgium is located at a strategic position in Europe – connecting the Netherlands, Germany and France. Therefore, the development of IWT in Belgium largely affects the development and utility of IWT in Europe. Under this circumstance, we are interested in the decision making process of IWT in Belgium since it is not only a domestic activity but also an important international issue at the European level. By exploring the institutional settings on IWT, including parties/agencies involved in IWT governance, interests and responsibilities of these parties, the procedures and implementation of decision making and the financial mechanism of investment on IWT, we will build up a framework describing the decision making process.

The paper is structured as follows. After a general discussion on IWT in the European Union, we discuss the case of the governance of IWT in Belgium (especially the Flemish area) looking at three essential dimensions: 1) functions of parties at different levels and their relationship; 2) financial governance regarding investments in IWT infrastructures and superstructures; 3) land use issues and concession issues of inland terminals. We conclude with a discussion on the role of institutions and governance in the development of IWT in Belgium by analysing how governance and institutions play(ed) a role in the past and current development stage of the Belgian IWT system.

2. BARGE FREIGHT TRANSPORT AND INLAND WATERWAYS IN THE EU

This section provides an overview of market demand and infrastructure provision in the European IWT system in order to offer the reader a good insight into some essential developments and current issues in IWT development in Europe.

2.1. Market demand and structure

Despite the fact that the European Union comprises no less than 27 Member States, practically the entire European barge freight transport activity takes place in just four countries. According to statistics released by the Eurostat of the European Commission (2011) barge freight transport registered 119.8 billion tonkm in the EU-27 in 2009. Germany, the Netherlands, France and Belgium accounted for nearly 90% of this volume (see Table 1). According to the observation from Seidenfus (1994), IWT in Germany is mainly structured into small-scale enterprises. Even today, close to 90% of the barge owners in the Northwest European barge fleet only own one vessel. These individual skippers typically provide their services to barge operators via time charter contracts (mainly in container barge shipping) or provide tramp services via voyage charters (mainly in bulk shipping).

Table 1: Barge freight transport in the EU-27 Member States, 1990-2009 – in billion tonkm

	1990	1995	2000	2005	2007	2008	2009	Growth 1990-2009
EU-27	118.3	122.1	133.9	138.7	144.9	143.2	119.8	1.3%
Belgium	5.39	5.73	7.22	8.57	9.01	8.75	7.09	31.5%
Germany	54.8	63.98	66.47	64.1	64.72	64.06	55.65	1.6%
France	7.58	6.63	9.11	8.91	9.21	8.9	8.71	14.9%
the Netherlands	35.66	35.46	41.27	42.23	46	45.3	35.66	0.0%
Other EU countries	14.87	10.3	9.83	14.89	15.96	16.19	12.69	-14.7%
<i>Share top 4 countries</i>	<i>87.4%</i>	<i>91.6%</i>	<i>92.7%</i>	<i>89.3%</i>	<i>89.0%</i>	<i>88.7%</i>	<i>89.4%</i>	

Source: own compilation based on Eurostat (2011)

2.2. IWT infrastructure in Europe

The total length of the navigable inland waterway network in the EU-27 (comprising classified rivers and canals) amounts roughly to 40,929 km (see Table 2). This is less than one fifth of the total railway network length (about 212,000 km in 2009) and less than one the total motorway network length (about 66,700 km – only motorways) in the EU-27. Top-three countries with respect to navigable inland waterways length also account for the lion's share of barge freight transport.

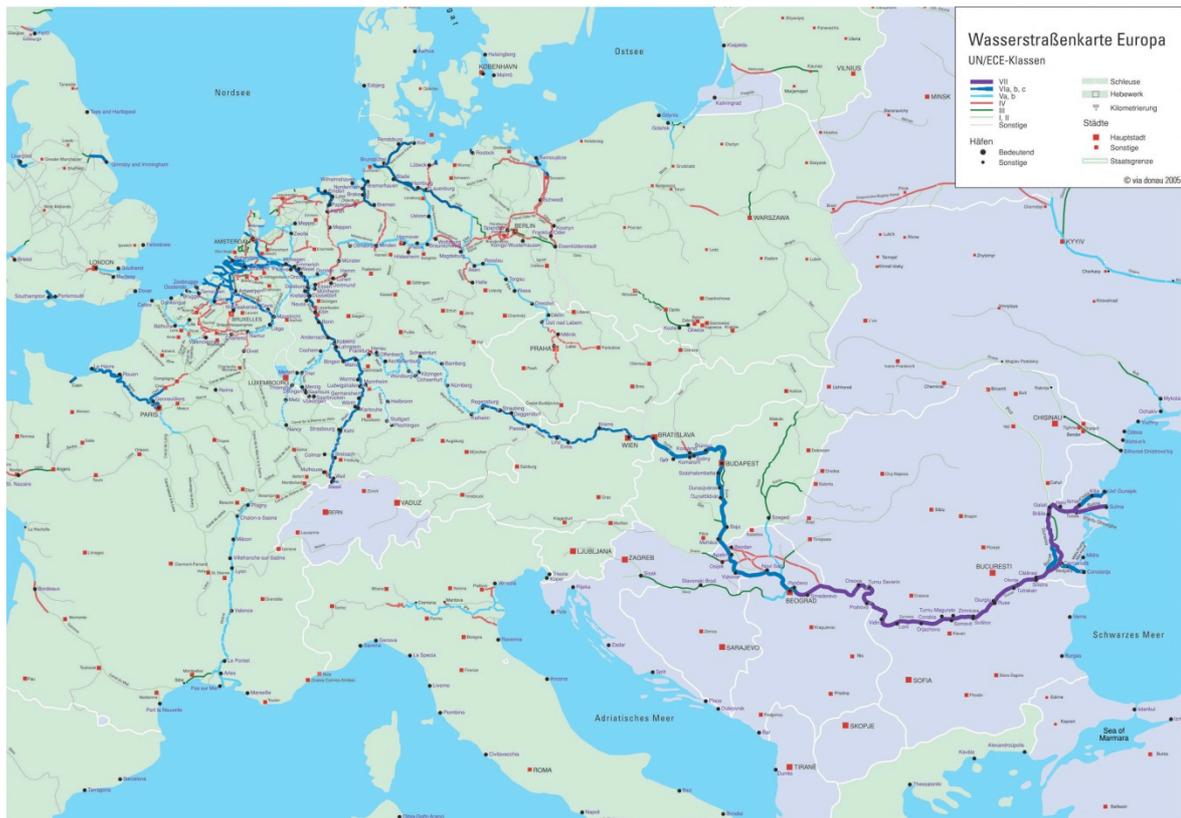
Table 2: Length in use of navigable inland waterways in the EU-27 Member States (classified rivers and canals) – in km

	1990	1995	2000	2005	2007	2008	Growth 1990-2008
EU-27	37155	38280	40693	41370	41196	40929	10.2%
Belgium	1515	1540	1534	1516	1516	1516	0.1%
Bulgaria	470	470	470	470	470	470	0.0%
Czech Republic	677	677	664	664	664	664	-1.9%
Germany	4350	6663	6754	7565	7565	7565	73.9%
France	6197	5962	5789	5788	5444	5200	-16.1%
Italy	1366	1466	1477	1562	1562	1562	14.3%
Hungary	1373	1373	1373	1440	1440	1440	4.9%
the Netherlands	5046	5046	6183	6082	6074	6102	20.9%
Poland	3997	3980	3813	3638	3660	3660	-8.4%
Romania	1782	1779	1779	1779	1779	1779	-0.2%
Other EU countries	10382	9324	10857	10866	11022	10971	5.7%

Source: own compilation based on Eurostat (2011)

A detailed overview of the inland waterway network of the EU-27 Member States, divided per CEMT-class, can be found in figure 1. Obviously, most of the European inland ports (including barge terminals in seaports) are concentrated in those countries which rank highest in tables 1 and 2.

Figure 1: The European IWT system and geographical location of (main) European inland terminals/ports



Source: Inland Navigation Europe (INE)

In the EU, the following principal waterway axes can be identified:

- The Rhine-axis connects the main seaports in the Netherlands (Amsterdam, Rotterdam, Flushing, Ijmuiden, Terneuzen) and Belgium (Antwerp, Ghent, Zeebrugge) to the industrial centers of Western and Southern Germany (Nordrhein-Westfalen and Rheinland-Pfalz), Eastern France (Alsace) and Northern Switzerland (city of Basel);
- The north-south axis (apart from the Rhine) links the Netherlands, Belgium and France. The most important rivers in this area are Scheldt and Meuse. Important links to be completed in this area are mainly aimed at improving the connections between Belgium and France through the Seine-Nord connection (under development);
- The east-west axis links Germany in the east to Poland and the Czech Border and in the west to Belgium and the Netherlands. Most projects in this area relate to the accessibility of the Elbe in Germany;
- The south-east axis is formed by the Danube. With the opening of the Rhine-Main-Danube canal in September 1992, inland barges with a reasonable draft can navigate from the North-Sea to the Black Sea. Nevertheless some improvements of navigation on the Main and Danube are considered as necessary.
- The secondary network which is not always linked to the main axes. Example of such a network is the Po delta in Italy. Although these waterways are not connected to the main axes, they can be of importance for combined transport.

As far as infrastructure is concerned, inland navigation can only realize its full potential if sufficient investments are made to solve current bottlenecks such as limited dimensions of

certain rivers/canals, limited air drafts, limited opening hours of locks/bridges and missing links in the network. Without those investments the capacity of vessels cannot be used optimally (i.e. potential economies of scale do not fully play), resulting in increased costs throughout the supply chain and a distortion of the competitive position vis-à-vis other transport modes.

3. INSTITUTIONAL STRUCTURE OF INLAND WATERWAY TRANSPORT IN BELGIUM

Belgium's relatively high share in European barge freight transport relative to the length of its IWT network (see tables 1 and 2) can be explained by the existence of two large industrial seaports (Antwerp and Ghent) with excellent barge connectivity and dense inter-port cargo exchanges with the port of Rotterdam and several major inland ports in Belgium (cf. Liège and Brussels) and abroad (the Rhine area, the Netherlands and Northern France), each generating a significant amount of inland waterway freight traffic.

The parties involved in developing IWT in Belgium are not only the Belgian governments but also supranational organizations. Due to historical factors, Belgium is divided into the Region of Flanders, the Brussels Region and the Region of Wallonia. In general, the transportation issues in each region, with the exception of rail transport, are managed by its own government. The different regions (Flanders, Wallonia and Brussels) are not only responsible for the navigable waterways, providing investment, maintenance and operation, but also deal with aids to the profession, although in a limited manner. On the other hand, the Federal Ministry of Transport is responsible for regulations with respect to vessels, crews, dangerous goods etc. In addition to the regionally responsible ministries, associations to promote inland waterway transport exist both in Flanders and Wallonia (e.g. Promotie Binnenvaart Vlaanderen in Flanders).

As the most of navigable waterways and all Belgian seaports, including the ports of Antwerp, Ghent, Zeebrugge and Ostend are located in Flanders (Figure 2), we will mainly focus on the institutions of IWT in Flanders.

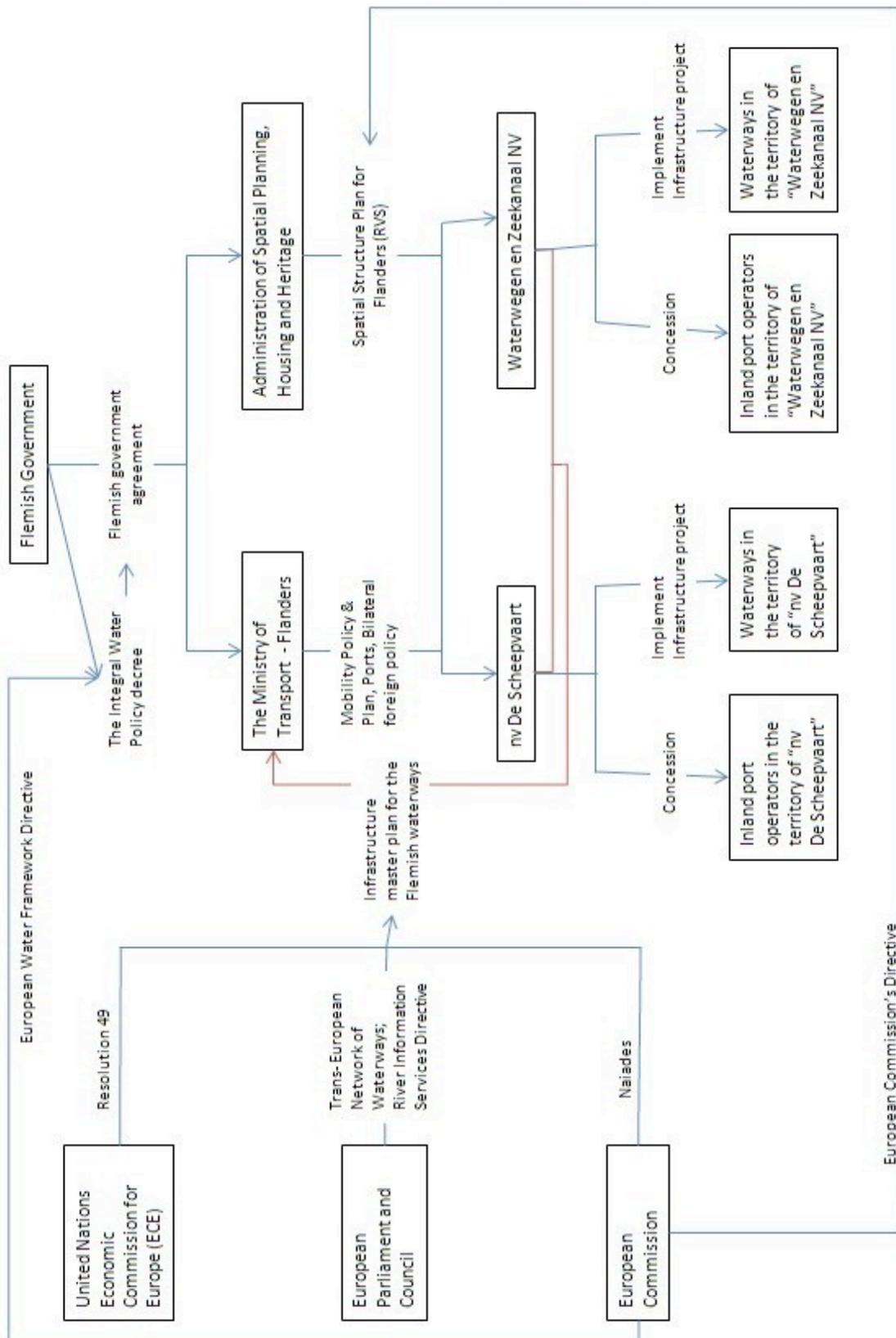
Figure 2. Inland waterways in Belgium



Source: Promotion Office for Inland Navigation in Flanders

Three levels' administrative agencies - European level, Regional level (Flanders and Wallonia) and Waterway level – actively influence the development of IWT in Belgium. Most of the time the power structure is not vertical from the European level to the waterway level. It is dependent on the allocation of responsibilities. Figure 3 shows the relationships among all parties involved in the IWT management in Flanders.

Figure 3 Institutional structure of IWT in Flanders



Source: Own Compilation by authors

3.1. Functions of agencies

3.1.1. European level

The **European Union** plays the most important role for IWT development at the European scale. The inland waterway system, particularly in Germany and the Benelux, has benefited from a European liberalization which unfolded in the late 1990s following European policy guidelines. This policy was aimed at two pillars: tackling vessel overcapacity and market liberalization.

The European Commission addressed the issue of *vessel overcapacity* by joint scrapping actions and by curbing investments in new vessels. Two instruments were used in order to achieve these objectives. The breaking-up premiums were to make the industry competitive for the long term by improving its structure and productivity, at the same time allowing many owner operators to bow out with an acceptable level of financial compensation. Under the ‘old-for-new’ rule, vessel operators who increased their capacity by acquiring a new vessel must either scrap a given proportion of their old tonnage or pay a financial penalty for the tonnage in question. This rule was introduced by a 1989 Regulation. Both instruments are no longer in use.

The *liberalization of the barge industry* was aimed at outlawing price fixing and cargo sharing arrangements (the so called ‘tour-de-rôle’ system), which were operational in certain segments of the EU-waterway market. The ‘tour de rôle’ system was a sort of alternate chartering system. The main part of the international waterway market, in particular the Rhine market, was already subject to a free regime. The Commission opted for a gradual liberalisation of the other sub-markets. The inland waterway transport market is completely free since 1 January 2000 (Council Directive 96/75 of 19 November 1996), when the ‘tour de rôle’ system was abolished. Since then, prices can be freely negotiated between shippers and carriers. Some countries abolished the ‘tour-de-rôle’ system before 2000. For instance, the Belgian governments anticipated the directive by fully deregulating their market as of 28 November 1998.

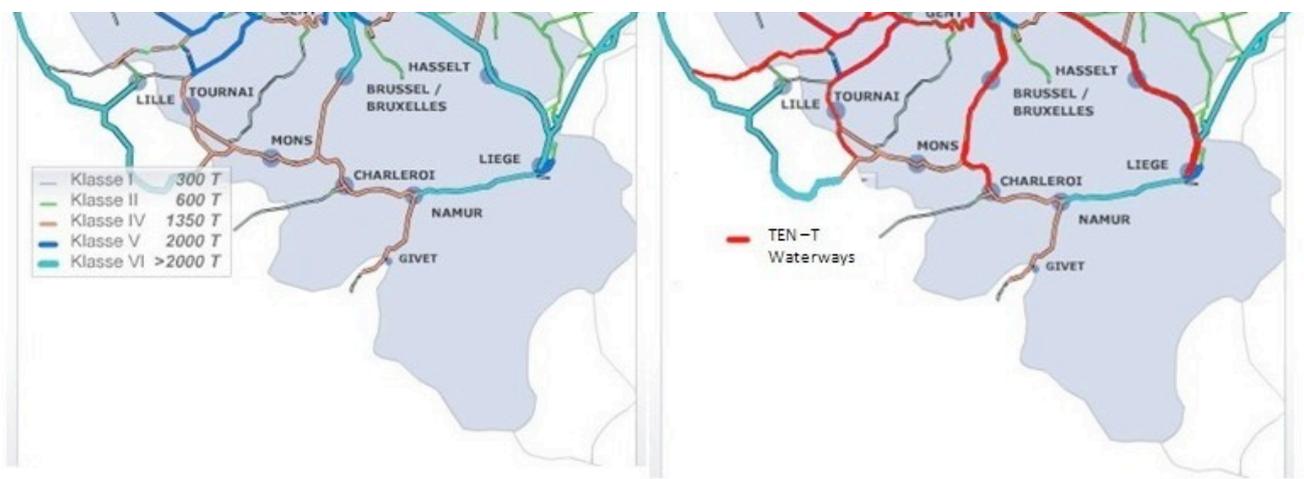
At the infrastructural level, the **European Parliament and the Council** set up a project “Trans-Europe Transport Networks (TEN-T)” including waterways and established IWT related requirements for this network. In 1990 the European Council adopted an initial outline plan for high-speed railway lines, which was proposed by the Commission. Subsequently, in 1994, in order to provide crucial political incentives, a list of 14 priority projects was adopted by the Essen Council and the European Parliament. In 1996, the European Parliament and the Council adopted Decision No. 1692/96/EC on guidelines for the development of the Trans-European transport network (TEN-T) by 2010. Since then,

the Parliament and the Council amended the outline plans several times to incorporate seaports, inland ports and terminals (initiated by Decision No. 1346/2001/EC).

As far as the TEN-T inland waterway network is concerned, the European Commission fully understands that, in order to play an essential part in the multimodal transport system, inland navigation requires an efficient infrastructure. The national waterway networks of the different Member States are however not always optimally interconnected. The aim of the European Commission is to stimulate the creation of a coherent trans-European network of continuous waterways of reasonable gauge (if possible class Va/Vb dimensions of the ECMT waterway classification, i.e. draft of 2.8 m and an air draft of 7 m) through the modernization of existing canals and rivers (deepening, widening or creating the necessary lock capacity) and, where necessary, the creation of new links. The share of inland waterways of class IV or lower in the total EU network length is expected to halve from about 33% in 1996 to about 17% in 2015. IWT interest groups have always criticized the limited amounts of funds attributed to IWT development? For example, between 1996 and 2010 a total amount of 436 billion euro was to invested in the TEN-T network in the former EU-15 Member States. About three quarters of these investments went to rail transport (50.5%) and road transport (26.0%), while inland waterway transport only got a very small share (1.9%). In this respect, it is important to underline that the political decision-making process on the allocation of funds and the general outline of the TEN-T network might have been influenced by the fact that there are only six Member States with river systems which are interconnected (Austria, Belgium, France, Germany, Luxemburg and the Netherlands), while rail and road infrastructure is of interest to all Member States.

The European Commission also adopted a Directive on harmonized River Information Services (RIS) on inland waterways in the Community. Important Flemish waterways inevitably form a part of TEN-T waterways (figure 3) and RIS because “the Flemish network of navigable waterways is no island in itself but forms part of the larger European network within which it plays a central role that will further increase significantly when connected to the Seine network. As part of this larger entity, the Flemish network is also concerned with standards and conditions that are partly obligatory and partly recommended” (W&Z et al., 2009). Figure 4 shows that location of waterway networks that are included in the TEN-T waterways in Flanders and the classification of these waterways. According to the requirements of TEN-T, in Flanders, “the waterways of the TEN waterway network must, as regards navigability, at least meet the specifications of the CEMT Class IV, and with its modernizing must upgrade to class Va/Vb”, therefore in favor of contributing a greater economic and social cohesion in terms of optimizing the utilization of waterways in Flanders (W&Z et al., 2009).

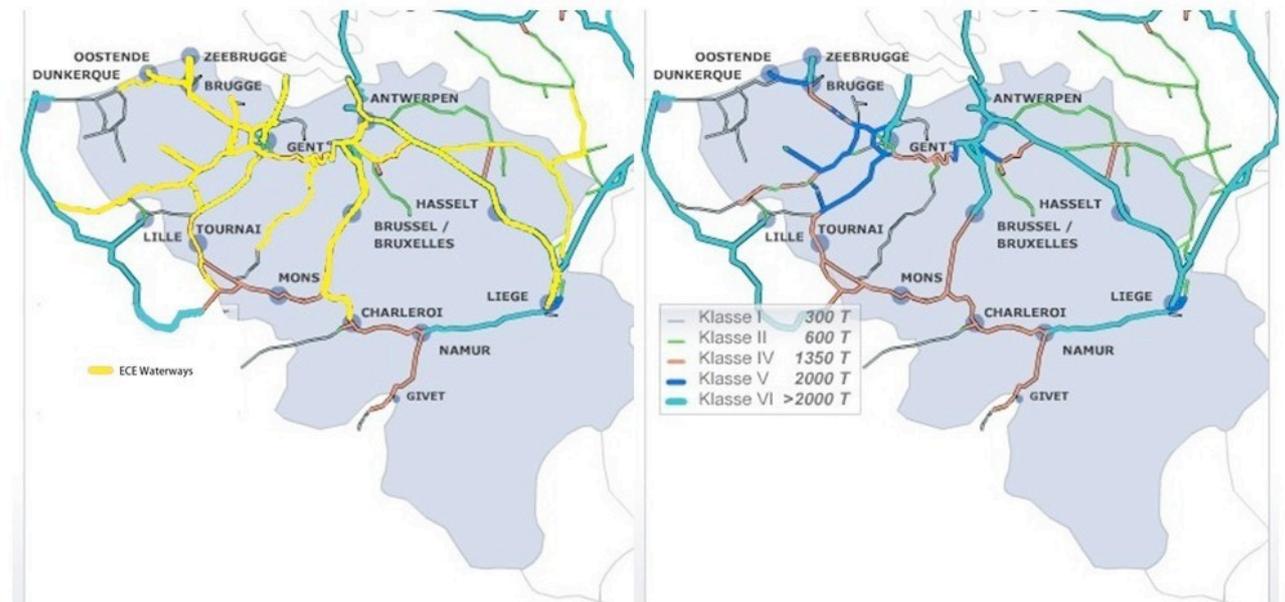
Figure 4 TEN-T waterways in Flanders and their classification



Source: Promotion Office for Inland Navigation in Flanders and own Compilation by authors

Next to the European Union agencies, the **United Nations Economic Commission for Europe (ECE)** developed a classification of waterways and conditions for signs along the waterways in order to build up a homogeneous European network of waterways. Therefore, ECE proposed three important documents: the European Agreement on main inland waterways of international importance (AGN), the Code Européen des Voies de la Navigation Intérieure (CEVNI) and Resolution 49 – to achieve its objectives (W&Z et al., 2009). Figure 5 shows the location of waterway networks that are included in the ECE waterways in Flanders and the classification of these waterways. The ECE network of waterways is more intricate than the TEN-T network of navigable waterways. The former includes not only the TEN-T waterways but also other Flemish waterways considered of international significance (W&Z et al., 2009). In addition, the bottlenecks and missing links of Flemish waterways in ECE waterways networks are listed in ECE Resolution 49.

Figure 5 ECE waterways in Flanders and their classification



Source: Promotion Office for Inland Navigation in Flanders and own Compilation by authors

The **European Commission (EC)** pays more attention on various practical issues of IWT when compared with the Parliament and ECE. The Naiades action plan launched by the EC covers five strategic areas to promote the development of IWT: markets, fleet, jobs and skills, image and infrastructure. Actions are carried out by the EC, the Member states and other parties involved (between 2006 and 2013), based on the recommendations in Naiades.

3.1.2. The Regional Level –Flanders

At the infrastructural level, the **Flemish Government** draws up the Flemish governmental agreement, which includes the principle to develop transport in Flanders. It is the aim of the Flemish Government to continue to invest in smooth mobility so economic gateways such as ports have better access (W&Z et al., 2009). The Flemish government pursues an infrastructural policy aimed at expanding and upgrading the network of waterways with a reasonable gauge. It is no coincidence that the three busiest waterways in Belgium are no natural waterways but canals – notably the Scheldt-Rhine Canal, the Albert Canal and the Ghent-Terneuzen canal. The last couple of years, infrastructural efforts have mainly been focusing on the bottlenecks near seaports (e.g. the link of the port of Antwerp to the Albert Canal), the upgrading/renovation of lock capacity, the adaptation of bridges (air draft) to allow 4-layer container barge transport and on stimulating the development of inland cargo handling facilities alongside the main waterways. In general, the **Ministry of**

Transport-Flanders is responsible for making the mobility policy and plan and to develop bilateral foreign policy related to transportation according to the Flemish government agreement. On other hand, the **Administration of Spatial Planning, Housing and Heritage** is responsible for making the Spatial Structure Plan for Flanders (RVS) according to the Flemish government agreement as well. The RVS develops plans for inland waterways, related quay wall and land usage of port operators.

In the past decades, next to infrastructure development, three initiatives have been taken in order to stimulate freight transport on Flemish inland waterways. Firstly, the Belgian inland navigation sector was fully deregulated as from the end of 1998. With this deregulation Belgium anticipated to the earlier indicated European liberalization which stated that chartering and pricing in the national and international transport market by inland waterways in the Community had to be completely liberalised by 1 January 2000. Following this deregulation, the system of chartering by rotation ('tour-de-rôle') was abolished and prices could be freely negotiated between shippers and carriers. This resulted in a substantial decrease in freight rates, which obviously had a positive impact on the volumes shipped.

Also in 1998, a Public-Private Partnership (PPP) program concerning the construction of quay walls along the Flemish inland waterways was initiated. Under this program, the Flemish Government intervenes in the costs of building infrastructure (loading and unloading quays) for companies that want to make use of inland navigation to transport their goods flows. Ever since its inception this program has been very successful within the local industry. In the period between 1998 and 2004 no less than 100 requests for the construction of quay walls had been submitted, all of which obtained formal approval. The lion's share of the requests concern the transport of dry bulk goods (51), waste products (17) and containers (13). The European Commission took an important decision in this respect and formally approved the prolongation of the PPP-program till 2010. This clearly illustrates the importance the European Commission attaches to initiatives aimed at stimulating inland navigation.

A third important stimulus for inland navigation was the decision by the Flemish Government to drastically reduce the navigation rights on the Flemish inland waterways as from 1 January 2000. The navigation rights were reduced by as much as 90% to a symbolical 0.00025 euro per ton km.

The Flemish government takes actions according to the European Naiades program to promote its IWT performance, for example, launching fiscal support for the modernization of the Belgian fleet and promoting the supply chain/innovation/minor waterways and

connection of sea ports and inland waterways of IWT in Flanders. In addition, the European Commission's Directive drawn up by the EC also constraints the scope of the Spatial Structure Plan for Flanders and furthermore influences the spatial plan for the Flemish inland waterways.

3.1.3. The Waterway Level – the Waterway Managers

Two agencies – nv De Scheepvaart and Waterwegen en Zeekanaal NV - are responsible for the management of IWT in Flanders. Figure 6 shows that their respective responsibilities in terms of waterway management.

Figure 6 Waterways are managed by the Flemish Waterway Mangers



Source: Promotion Office for Inland Navigation in Flanders

Normally, the IWT in the east of Flanders is under the control of nv De Scheepvaart; meanwhile Waterwegen en Zeekanaal NV takes charge of waterways in the middle and the west of Flanders. Agencies who manage inland waterways and IWT (such as nv De Scheepvaart and Waterwegen en Zeekanaal NV) are called “Waterway Managers”. Actually, they are autonomous organizations controlled by the Flemish government in a way that the government sends its own officers to work as members of the board of directors of Waterway Managers. Normally Waterway Managers are mainly responsible for maintenance, construction, dredging, planning and draining of inland waterways according to the policies of the Flemish government. In addition, they build up “Public-Private Partnership” (PPP) with private inland port operators in terms of concession agreement (see earlier section). Furthermore, all Waterway Managers make the general “Infrastructure Master Plan for the Flemish Waterways” (therefore Master Plan) together every certain period, and each of them makes the detailed plan for its own jurisdiction according to the Master Plan.

3.2. Relationship of Departments/Agencies

3.2.1. Planning

In Flanders, the Waterway Managers Waterwegen en Zeekanaal NV and nv De Scheepvaart – prepare the Master Plan together. During the planning process, each level – from the general management team to the implementation team – of the two Waterway Managers communicate with each other to make a plan for Flemish waterways as a whole based on a common objective that is linked to the strengthening of economic development, especially the development of IWT, in Flanders.

Although Waterway Managers make the general plan and related detailed plans for developing IWT in Flanders, plans are constrained by policies, regulations and projects from both the European level's organizations and the Flemish government. As for the general plan, such as the Master Plan, on the one hand, it embodies plans for European unified Navigable inland waterway networks (TEN-T waterways, ECE network of waterways) and related European technological guidelines and specifications (RIS); on the other hand, it concerns the mobility policy and plan set out by the Flemish government: *“The Flemish Government uses the policy guidelines in the Flanders Mobility Plan as the starting point for its mobility policy. As a priority the Flemish Government wants to work on combating traffic congestion and stimulating accessibility to support the logistical function of Flanders in Flanders. This must take place by the elimination of missing links where necessary, ... and the efficient use of the capacity of the existing infrastructure”* (W&Z et al., 2009). Meanwhile, the infrastructure plan has to be adapted “within the context of the review of the Spatial Structure Plan for Flanders (RVS)” (W&Z et al., 2009), which has to follow the European Commission's Directive. As for the detailed plans, the mission statements of the Waterway Managers are always arranged according to Flemish government policy and forecasts about IWT performance to make sure that the inland waterway capacity is available for IWT vessels.

At the Flemish level, the Flemish Government Agreement (made by the Flemish Government) which influences the Mobility Policy & Plan and the RVS, is constrained by The Integral Water Policy Decree. The Integral Water Policy Decree of 18 July 2003 establishes the framework within which the development of the waterways can and must take place. This decree that implements the European Water Framework Directive on water establishes the organizational conditions under which an adaption of the principles of the integral into its environment can take place (W&Z et al., 2009).

3.2.2. Approval

Before completing the Infrastructure Master Plan for the Flemish Waterways, the Waterway Managers have to submit it to the Flemish Ministry of Transport (MOW). Once approved by the Ministry of Transport, the Master Plan can be implemented by the

Waterway Managers. The Ministry not only approves the Master Plan but also decides on the order of implementing every project included in the Master Plan. In general, the order and priority of projects are decided based on the common objective for developing the Flemish economy and related comprehensive transportation, and the annual budgets of the Ministry of Transport (Flemish government).

3.2.3. Implementation

After the funding of a project is earmarked by the Ministry of Transport, the Waterway Managers start to implement the project, such as maintaining and dredging waterways as well as building quay walls. Sometimes some construction projects are outsourced to qualified companies and experts. Normally, the extent of implementation is depending on the amount of funding the Waterway Managers received. Therefore, the total duration of implementation of the whole master plan might be extended because of the lack of funding from the Flemish government.

3.2.4. Concession with private inland operators

The Waterway Managers build up Public-Private-Partnership (PPP) with inland port operators in terms of concession agreement in Flanders. The type of their concession is called Rehabilitate-Operator-Transfer (ROT): the Waterway Managers grant a concession to a private inland port operator to finance and rehabilitate or modernize a specific terminal or an entire port. This operator is entitled to operate and obtain revenue from the rehabilitated port for a specific period. The private operator takes all commercial risks, and at the end of the concession period, the government retakes ownership of the improved assets (Notteboom, 2007).

A discussion on the concession policy of nv De Scheepvaart provides more insight into the details of Water Manager's concession policy in Flanders. Under normal conditions, nv De Scheepvaart owns the land along its responsible waterways and can lease them to private port operators. Important arrangements regarding the concessions include:

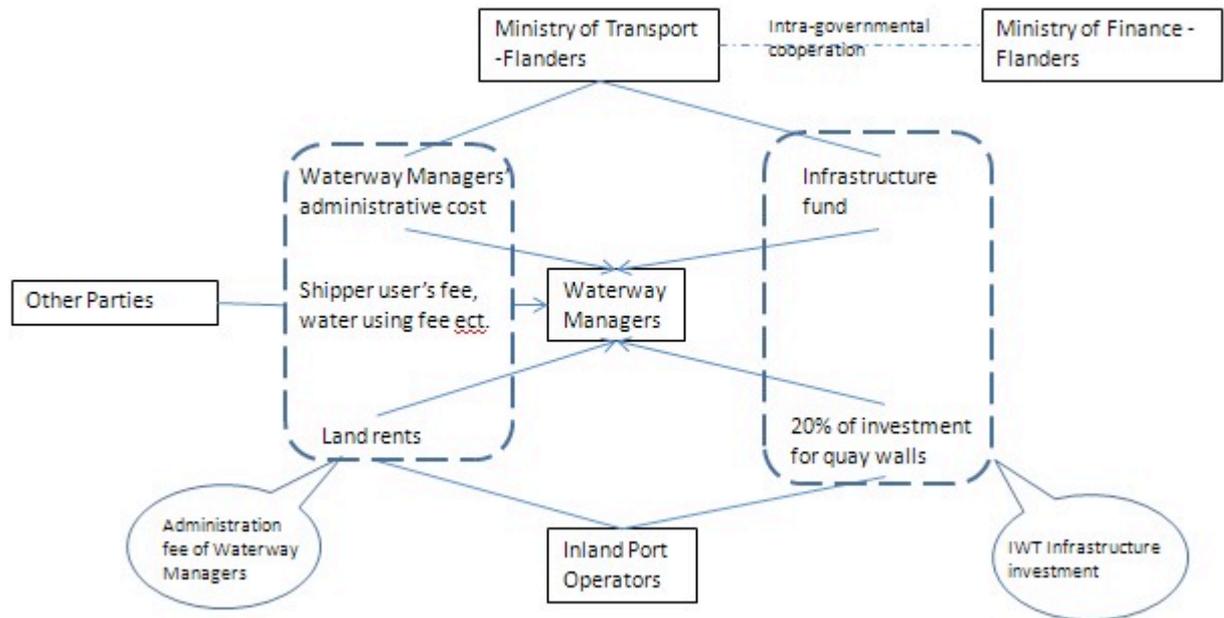
- 1) The investment for building or maintaining the quay wall is funded by both nv De Scheepvaart and the operator, at a rate of 80% - 20% (the 20% funded by the operator is only allowed to be used for the construction of the quay wall);
- 2) The normal concession period is 25 years, which could be extended based on an agreement between the waterway manager and the operator;

- 3) The operator needs to pay rents to the waterway manager every year. The amount of rents is calculated by size of the land leased to the operator;
- 4) The operator obtains the revenue from its operations;
- 5) The nv De Scheepvaart sets up a target annual transport volume for each inland port operator according to its estimation of the general economic environment. If the operator achieves this throughput objective, the waterway manager will give a bonus to the operator in terms of a discount on the payable rents. If the operator failed to achieve the throughput target, it needs to pay a fine to the waterway manager;
- 6) The nv De Scheepvaart is responsible for building the infrastructure (such as quaywalls, locks) while the operator is responsible for establishing superstructures (such as cranes, warehouses and yard equipment). The operator can remove all superstructures when the concession agreement with the waterway manager ends.

3.3. Financial mechanism of IWT in Flanders

In Flanders, the details of construction projects of IWT infrastructure and the required investment amounts to complete each project are included in the Master Plan made and submitted by Waterway Managers. Having reviewed the Master Plan, the Ministry of Transport – Flanders needs to decide on the priority of each project and discusses the budget allocation with other departments (especially the financial department) of the Flemish Government. At the end of this process, the Ministry of Transport earmarks the investment to the Waterway Manager on a yearly basis according to its budget and priority of different projects in its agenda. As for projects related to building/maintaining quay walls, the Waterway Managers receive 20% of the investment from the private operators who use the quay wall. In addition, the Waterway Manager's revenues obtained from other sources, such as land rents/concession fees and ship user's fees, are only used for the administration of the Waterway Managers (Figure 7).

Figure 7 Financial mechanism of IWT in Flanders



Source: Own Compilation by authors

3.4. Land use issue

In most cases, the land along the waterways is owned by its responsible Waterway Manager. According to the plan of land use made by the Flemish government in the late 1970s, some land owned by the Waterway Managers is destined for the IWT industry while other land plots are assigned to nature preserve or build-up area (e.g. housing, commercial zone). In addition, although the Waterway Managers or private inland port operators are allowed to make spatial plans for their managed land, the scope of these spatial plans are restricted by regulations/policies/plans established by governmental departments in the EU, Belgium and Flanders. For example, due to environmental regulations, it is not allowed to build up high polluted factories in some areas even though these factories could promote the development of IWT. Therefore, Waterway Managers do not have complete freedom when developing the land, even though they are the owners of these lands.

4. CONCLUSIONS

This paper detailed the institutional structures of inland waterway transport in Flanders (Belgium), based on three levels: the European level, the regional level and the waterway management level. IWT related policies and regulations from each level were described and the interaction among these levels was analyzed. On one hand, due to the strategic geographical location of Flanders, plans for developing IWT in Flanders are affected by transport plans and spatial plans both from the European level and the Flemish level. Therefore, this involvement of other agencies encourages the development of IWT in Flanders while also limits the freedom of Flemish waterway managers to develop IWT on a more independent basis. On the other hand, financial support for IWT development in Flanders is only coming from the Flemish level: the Waterway Managers make the Master Plan according to their evaluation of the local IWT situation and apply for funds to improve IWT infrastructure. The Flemish government decides the real implementation duration of the Master Plan and earmarks the fund according to the Flemish economic environment as a whole. Meanwhile, the establishment of PPP between Waterway Managers and private inland port operators contributes in part to the required investments for IWT infrastructure. In essence, the development of IWT in Belgium is a combination of a bottom-up process and a top-down process: parties at every level are considered as active contributors to the improvement and development of IWT infrastructure and operations.

REFERENCES

Airriess C A (2001), The regionalization of Hutchison port holdings in mainland China, *Journal of Transport Geography* 9: 267-278

Baltazar R, Brooks M R (2001), The Governance of port devolution: a tale of two countries. Paper presented at the *World Conference on Transport Research (WCTR)*, Seoul, July.

Burn S A (1984), Water freight transport – survival or revival?, *Land Use Policy* 1(2): 134-146.

Brooks M R (2004), The Governance Structure of Ports, *Review of Network Economics* 3(2): 168-183

Brooks M R, Cullinane K (eds) (2007), *Devolution, Port Governance and Port Performance*, Elsevier, Oxford

Brooks M R, Pallis A A (2008), "Accessing Port Governance Models: Process and Performance Components" *Maritime Policy and Management* 35: 411-432

Cullinane K, Song D W (2001), The administrative and ownership structure of Asian container ports, *International Journal of Maritime Economist* 5: 175-197

Debrie J, Gouvernal E, Slack B (2007), Port devolution revisited: the case of regional ports and the role of lower tier governments, *Journal of Transport Geography* 15(6): 455-464

ESCAP (2003), *Transport and Tourism Division, Review of Developments in Transport in the ESCAP Region 2003 - Asia and the Pacific*, United Nations, New York

Eurostat (2011), *EU Transport in Figures: Statistical pocketbook*, European Commission, Brussels

Frémont A, Franc P, Slack Brian (2009), Inland barge services and container transport: the case of the ports of Le Havre and Marseille in the European context, at <http://cybergeog.revues.org/21743?lang=en#resume> accessing on 14th Oct 2011

International Navigation Association (2009), *Inland Waterborne Transport: Connecting Countries*, The United Nations Educational, Scientific and Cultural Organization, Paris

Kader A, Saman A, Ahmad M (2006), *Utilisation of Inland Water Transport System in South East Asian Region - An Overview of the Prospect*, University Technology Malaysia. [WWW] <URL: <http://eprints.utm.my>>

Lowe D (2005), Inland Waterway, Short-Sea, and Coastal Shipping. In *Intermodal Freight Transport*. Elsevier Butterworth-Heinemann, Oxford: 92-108.

Ng K Y A, Pallis A A (2007), "Reforming port governance: the role of political culture", in *Proceedings of IAME 2007 International Association of Maritime Economists*, <http://www.iame.info>

Ng K Y A, Pallis A A (2010), Port governance reforms in diversified institutional frameworks: Generic solutions, implementation asymmetries. *Environment and Planning A*, 42(9): 2147-2167

Notteboom T E, Konings R 2004, Network dynamics in container transport by barge. *Belgian, Journal of Geography* 5 (4): 461–477

Notteboom T E (2007), Concession agreement as port governance tools. *Research in Transportation Economics* 17: 449-467

Seidenfus H S (1994), Inland waterway transport in the federal Republic of Germany: Situation and problems, *Transportation Research Part A: Policy and Practice*, 28(6): 511-515

Shou C, Ng K Y A, Pallis A A (2010), Transport node governance in a changing world: the institutional reform of Tianjin port in China. *Current Issues in Shipping, Ports and Logistics*: 467-481

Veenstra A, Notteboom T E (2010), The development of the Yangtze River Container port system. *Journal of Transport Geography*: Article in press

Wang J J, Ng A K Y, Olivier D (2004), Port Governance in China: a review of policies in an era of internationalizing port management practices, *Transport Policy* 11: 237-250

Waterwegen en Zeekanaal NV, nv De Scheepvaart (2009), Infrastructure Master Plan for the Flemish Waterways Horizon 2014