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Network of ICD Port and Transportation in Vietnam

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Abstract
Vietnam seaport system is now divided into 6 groups with 45 ports with a total of 272 ports including: 2 grade seaports (international gateway ports); 12 Type I seaports (regional general port); 18 seaports of class II (local general ports) and 13 seaports of class III (offshore oil ports). Vietnam seaport owns about 92.2 km long wharf, with a total capacity of over 550 million tons / year. Compared to 2000 - the first year of implementing the plan, Vietnam's seaport system has increased by 4.4 times to the length of the port. Inland Waterways Department said that in 2017, only about 50% of the inland waterway transportation network in kilometers could be easily navigated. It means that only about half of the 19,000km of waterways are convenient to travel, so many shippers in Vietnam only choose to go to waterways if goods are large such as coal, construction materials, fertilizers and cement. . Referring to infrastructure, a recent report by the World Bank (WB) pointed out that most of the transport is done on 7,000km of nationally managed inland waterways. However, less than 30% of this network is suitable for barges with a tonnage of over 300 tons. This is a very modest rate compared to the successful commercial waterway transport network in the world. The size of boats in Vietnam is not large due to the shallow depth of the canal, the small size of the navigation channel and low bridge clearance. Many ports have outdated facilities and low mechanization or poor maintenance, poor domestic connectivity.

Keywords: ICD port, transportation network, development planning, orientation

1. Introduction
The waterway system in the area of Ho Chi Minh City has a total length of 975km, reachingan average density of 0.181km / 1,000 inhabitants. As a result, HCMC has a waterway density of 73% compared to the Mekong Delta, which has the highest waterway density in the country. The city has 92 local inland waterways with a length of 598.7km and 8 national inland waterways with a length of over 190km. For the inter-provincial route, from Ho Chi Minh City, there are many routes flowing to the Southwest and Southeast provinces, such as from Ho Chi Minh City to Ca Mau, Ha Tien will follow Te channel - Doi canal - Ong Lon canal - Cay Kho canal - Rach canal. Lao - Can Giuoc river - Nuoc Man canal - Vam Co river - Cho Gao canal, Ca Mau channel - Vap Vo and Sa Dec channels - Hau Giang River - Soi canal - Rach Gia canal, Ha Tien - Ba Hon canal - town of Kien The distance salary is about 320km long according to the level III river standard. In the East, from Ho Chi Minh City, it is possible to go to Bien Hoa or Binh Duong according to Saigon and Dong Nai rivers...
Inland waterways along the national inland waterways, maritime routes and hundreds of sea ports and ports in Ho Chi Minh City have been forming a waterway transport network connecting the key economic region. Therefore, the management, exploitation, operation and development of inland waterway network are pressing issues, because that will contribute significantly to the socio-economic development of the city. The investment in the right direction not only helps increase the capacity of water transport on the river routes but also contributes to lowering the cost of transporting goods in the region. In addition, developed waterways will reduce the pressure on the currently overloaded road, especially in the context of tightening the current vehicle load management on the road, which is the reason for the road traffic density to set and road transport costs increased.
In some ways, the superiority of water transportation compared to the road is also very significant. This can be verified through the transport capacity of a barge or a 300-ton ship,

inl equivalent to the transport capacity of 15 heavy trucks on the road. Thus, the potential of and waterway transport exploitation on the city's network of rivers and canals is not only very large and, if properly invested, will contribute to lowering transportation costs, creating competitiveness for domestic goods thanks to low cost. In addition, inland waterway transport activities also have many advantages such as transporting goods with large volumes, super-sized and super-weight goods and causing less environmental pollution. Being aware of these potential benefits, in the planning of waterway and port - port networks in Ho Chi Minh City in the period up to 2020, there are 5 water transport lines highly appreciated and selected by the HCMC government. These are the routes: Rach Dona - Doi canal - Phu Xuan River; Ong Lon 2 canal - Phuoc Kieng River - Rach Muong Chuoi; Shrimp canal - Muong Ban River; Doi - Kinh River - Dong Dien River and Dua canal - Giong river - Giong canal - Lo canal. These routes all have good hydrological conditions due to their wide river width and large depth, allowing the operation of medium-sized inland water transport means, even large-sized inland water transport means can safe circulation if invested in dredging and good treatment. According to experts, planning these waterway traffic projects shows far-sighted and insightful. Because all of the above 5 channels are important water transport routes, playing the role of connecting the national waterway axis is Ong Lon canal - Cay Kho canal - Can Giuoc river with the maritime route is Soai Rap navigation channel. From these connections, it leads to other positive consequences when directly releasing import and export goods at Hiep Phuoc seaport and Cat Lai river ports. According to the plan, all of the above five water transport routes are domestic level IV routes, designed for vessels with a capacity of 51-100 tons of traffic.

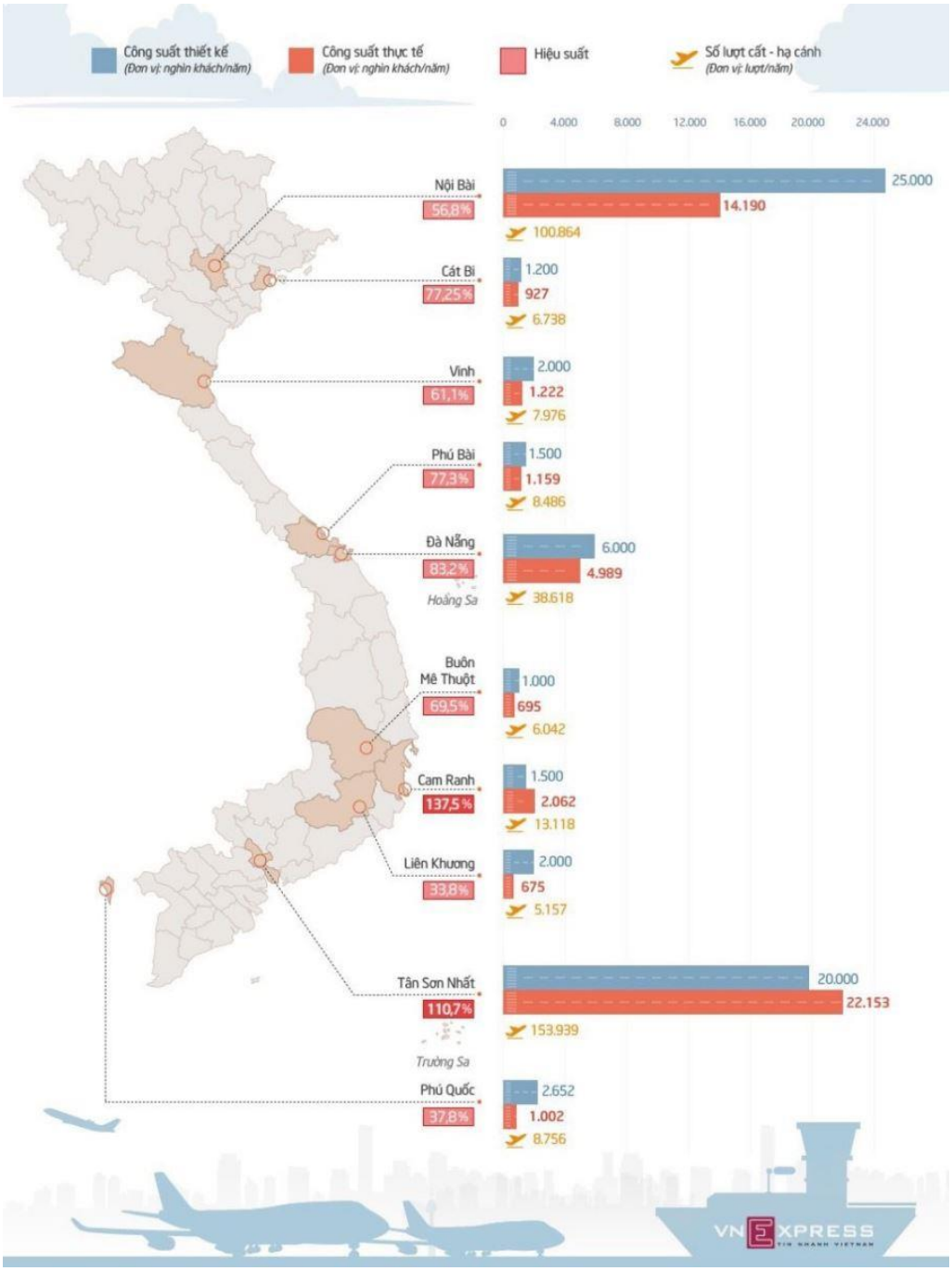

Fig. 1: Port planning in Vietnam

According to the Inland Waterway Management Area, under the HCMC Department of Transport, the roles and functions of these five waterway transport lines once invested in renovation are planned to meet three important criteria. That is to form a large-scale waterway transport business area from port to port, from shallow to deep and from the seaport to the city. Create the ability to directly link seaports to the Mekong Delta region and seaports with Ho Chi Minh City (a place of potential production and consumption of goods of the entire key economic region in the South). Finally, the 5 selected routes above will form a bridge system connecting the national transport axes with the seaport hub in the region; at the same time, it is a strong driving force for river-sea linkage and promoting inland waterway transport. According to the survey, the development of inland waterway transportation will be encouraged through a number of policy mechanisms: invest in infrastructure development; To encourage the development of inland port, waterway infrastructure; to Encourage the development of inland waterway vehicles; To encourage the development of inland waterway transport activities; Invest in logistics infrastructure and accelerate the socialization of logistics services. Specifically, will reduce corporate income tax of 30-50% in the first 5 years of exploitation for investors building the inland water port with the system of warehouses yards for logistic activities; Modern passenger port. At the same time, to support the land rent for the construction of inland waterway port infrastructure systems in service of loading and unloading cargoes and development of multi-modal transportation; To reserve a suitable land fund for investment projects on the construction of inland waterway ports and wharves, especially container handling ports. According to the draft, to encourage the development of inland waterway means will support 20-30% interest rate of bank for the transport business to build new means of transport with large tonnage, Self-propelled container ships Having a large capacity for transporting goods by inland waterway; Supporting 20-30% interest rate of banks in investing in modern high-speed passenger transport vehicles to operate on the inland waterways. At the same time, it supports the cost of fuel for this type of transportation, especially on the pressure reducing routes for road transport.

Besides, the organization will provide the best support services (signaling system, channel notification, anchoring position, entrance, exit, port, loading and unloading, warehousing, transport connection ...); Forecast, information about the source of goods for business; to create favorable conditions for transport business enterprises and individuals to access and enjoy preferences from the Government's support policy, such as tax, fee and credit policies.

2. The development of port in Vietnam

According to the representative of the Transport Strategy and Development Institute (Ministry of Transport), the Southern Region has 3,200km of waterway, which is inter-provincial and international, allowing ships from 500-5,000 tons of operation. Convenient operation and two horizontal axes connecting Ho Chi Minh City with other provinces in the region, meeting 300 ton vessels. In the Southwest and Southeast regions, Ho Chi Minh City seaport is a national general port, the focal point of Region I consists of major port areas such as the port area on the Saigon River and the Cat Lai port area on Dong Nai River and the port area above. Nha Be River, Hiep Phuoc port area on Soai Rap River. Despite the great advantages of sea and inland waterways, this mode of transport still has a small market share, not worthy of the existing potential of the region. The Southwest and Southeast regions have up to 2,500 ports of inland waterways, but only five ports are capable of loading and unloading containers due to the lack of specialized ports and weak infrastructure. Currently, 70% of goods in the Southwest region must be transported to Ho Chi Minh City seaports by road, causing transportation costs to increase by 10% - 60%.

At the same time, waterway transport means have not been invested in the quantity and infrastructures of inland waterways being damaged, thus changing the train flow; the improvement of the channel has not been properly invested, and many channels have been deposited, so the boats and ships are sparse. At the same time, waterway traffic congestion is happening more and more like on Cho Gao canal (Tien Giang) when there are 1,300 times a day. From the above reality, to improve the ability of waterway transport in the Southwest and Southeast regions, the Director of Vietnam Maritime Administration (Ministry of Transport) Nguyen Xuan Sang said: Vietnam Maritime Administration cooperated with Sai Gon New Port Corporation to implement a solution to suspend the output of goods to Cat Lai port, not to increase the ship load; At the same time, he worked with goods owners to allocate goods to dry ports in Ho Chi Minh City and to Cai Mep - Thi Vai port (Ba Ria - Vung Tau) in order not to increase costs and reduce pressure on Cat Lai port. According to the Master Planning for Inland Waterway Transport to 2020 (Decision No.16/2000/QD-TTg on 2.2.2000) with the orientation of exploiting the natural advantages of waterways in bulk shipping at a lower cost and less impact on the environment. In particular, the plan also aims to achieve vertical integration in the inland waterway transport sector by synchronizing the development of roads, ports, loading facilities, Capable of managing the ship and meeting the need for passenger cargo with higher quality and safety. At the same time, develop an air transport infrastructure to form an interconnected system with other modes of transport and in collaboration with the irrigation and hydropower sectors. As well as upgrading the fleet to a more efficient and upgrading the fleet to a more efficient configuration, Safe and reasonable, suitable for canals and rivers. It is necessary to expand the financial foundation of the sector, in which the public sector is focused on river transport and in cooperation with the private sector in port development.

In addition, the planning also targeted with large fleet: capacity up to 12 million tons; in traffic flow, the increase in length. International experience shows that the modernization of the fleet is a necessary development objective to increase the proportion of inland waterway transport in total freight relative to the current situation; Paralleling is the improvement of transport cost effectiveness for fuel consumption and maintenance of equipment, while reducing greenhouse gas emissions per tonne per kilometer. Apply modern technology to existing ships and their operations such as improving propulsion with significantly lower emissions; Install the propeller head to improve thrust; Installation of articulated barge

systems, ... Planning and conducting construction with state-of-the-art technology to support fleet improvement and new or more effective. Attractive financial regimes will also provide incentives for new investment or upgrading of existing fleets

Vietnam has developed its fleet size over the past few years, but its average shipment capacity is still relatively low. So, the potential to expand the size of Vietnam's VG fleet is still great. Luis C.Blancas and M.Baher El-Hifnawi, authors of the book "Promoting Trade through Transport with Low Competitiveness and Low Emissions", argue that scale expansion will bring economic benefits. Depending on the load of the ship, each time, the load of the ship increased by 1%, transport costs decreased by more than 1%. Not only reducing fixed costs such as labor, capital, and insurance on DWT, large vessels can save more fuel, resulting in reduced fuel costs and CO_2 emissions. The authors also commented that the expansion of the fleet size in Vietnam has not been influenced by clear public policy interventions. This is proof that the transportation industry is flexible enough to meet the growing transport volumes while modernizing and expanding. But it is predicted that Vietnam will have difficulty using large size vessels, especially network infrastructure bottlenecks that limit the development of inland waterways or the use of ship river-sea ferries. In Western Europe in general and the Netherlands in particular, rapid expansion is supported by government tax incentives and other financial measures.

In order for the inland waterway industry to develop, it is imperative that we take action in the areas of waterways, wharves, fleets, logistics, and infrastructure. When considering the financial budget of Vietnam, it is necessary to focus investment in waterways and ports of the main transport network. Ensure regular maintenance of priority waterways to facilitate better circulation of this market. Incorporating inland water transport and shipping has become a major option for transport companies, and supports the development of multimodal logistics warehousing. So, the main waterway traffic in Vietnam is the Red River Delta (18 provinces), the Mekong Delta (in 15 provinces). At general cargo traffic of these provinces, the proportion of inland waterway traffic and inland waterway traffic predominates. Inland waterways have the first online trading platform under developed logistics "drags down" the competitiveness of the business. According to statistics, 13 provinces and cities in the Mekong River Delta do not have any formal logistics or seaport center of the sector or economic zone. More than 70% of goods from the Mekong Delta have to move to HCM City or CAI Mep - Thi Vai port at Vung Tau to be exported abroad, not directly from the Mekong Delta. The Mekong Delta now accounts for over 50% of the country's total agricultural exports. However, the lack of an air cargo logistics center, a seaport officially becomes a bottleneck of the export of goods in this area.

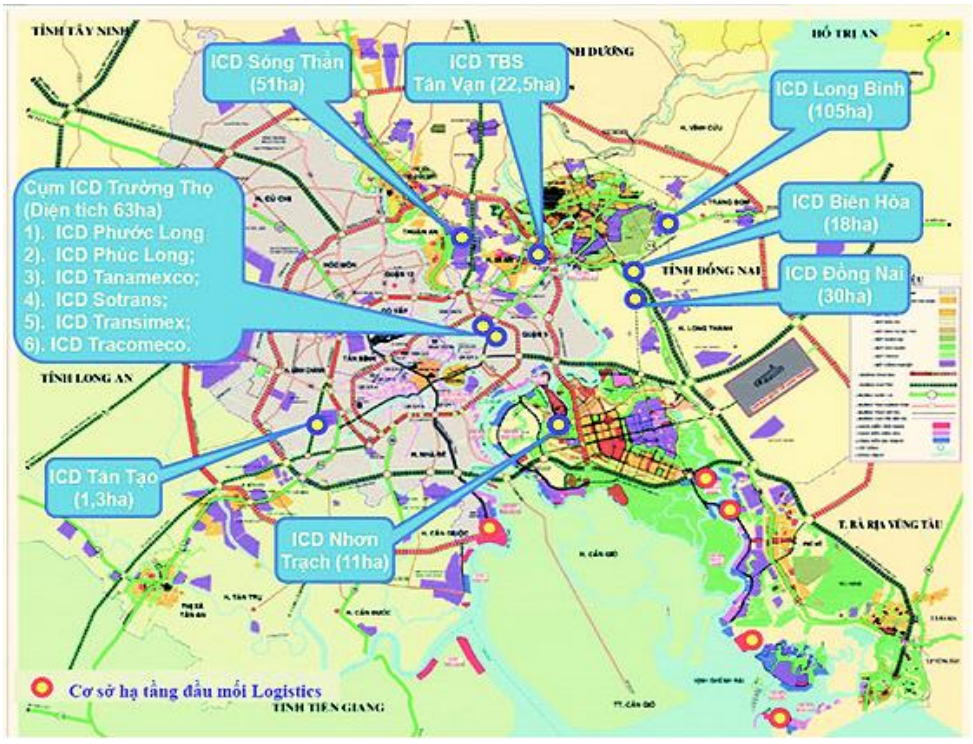

Fig. 2: ICD port network

Inland waterway transport plays an important role in transporting goods, meeting the needs of people. In the South Vietnam in general and in the Mekong River Delta in particular, river density is among the highest in the world. However, the investment to bring into full play the strengths as well as the management of inland waterway transport is still limited, not taking advantage of the inherent strengths and exploiting the economic conditions and the sustainability of the mode of this transport.

The inland waterway network in the south and the Mekong Delta has more than 100 routes, totaling nearly 3,200 km in length, which are inter-provincial and international in nature. Of these, six lines originate from the border toward the East Sea, allowing ships of 500 to 5,000 tonnes to operate smoothly and two routes across Ho Chi Minh City to provinces capable of accommodating ships of 300 tonnes. Specifically, the Sai Gon - Kien Luong route (Through the 10 tower, 227 km long), Sai Gon - Kien

Luong (Through Lac Lap canal, 313 km long) and Sai Gon - Ca Mau route Xa No, 386 km long), ... Many river ports and ports have direct access to the road system, which connects directly to the important seaports, creating favorable links between modes of transport. . In Ho Chi Minh City, the inland waterway transport network has been assessed and developed with a total length of 1,000 km. From this point of view, the international seaport of Ho Chi Minh City becomes a national general port and is the first class center of the region, including major ports such as Sai Gon port, Cat Lai port. Dong Nai, Nha Be port area, Hiep Phuoc port on the Soai Rap river, ... Currently, Ho Chi Minh City has 40 cargo ports under exploitation with the length of over 17,000 m. The city also has three river ports as cargo port, including Phu Dinh port (District 8), capacity of two million tons per year, capable of receiving ships of 1,700 tons; The port of Long Binh (District 9), capacity of 1.7 million tons per year, received ships of 5,000 tons, ... According to the Department of Transport (Transport) of the city, the total output of goods through the port The sea in 2016 is nearly 100 million tons (up 7% over 2015) and the goods through ports and ports more than 25 million tons (increase 8% over 2015). Particularly Mekong Delta region - the granary, seafood and fruits largest in the country, the system of rivers, channels, canals extremely rich, nearly 28,000 km long. Transport capacity, the region has about 160 thousand vehicles with engine capacity more than 5.5 million CV, a total load of about 5 million tons of goods; freight traffic reached 51.5 million tons / year. All of the major rivers and tributaries and canals in the Mekong River Delta flow seamlessly through all industrial parks, residential areas, resource areas,... have a connection, exchanges are very convenient. Binh Duong has two large rivers, the Saigon River and the Dong Nai River, which go to deep water seaports in the Soai Rap and Thi Vai rivers. But on these two rivers, there are many bridges crossing with static apertures. The boat is very low, so large ships and boats carrying imported and exported goods cannot go back and forth to trade goods. Means of waterway transportation have not been invested in quantity and size; Infrastructure infiltration has been on the rise, such as the loss of a signaling system, illegal exploitation of resources, change of navigation channels, construction of riverine buildings, port works, etc. Renovation of the channel is not properly invested, many sections of the river are meandering flow, small curved radius, very dangerous for ships operating on the river, especially the flood season. Being in the planning of seaport group No. 5 (port cluster in Ho Chi Minh City, Dong Nai, Ba Ria - Vung Tau), the inland waterway system of Dong Nai province has potential for economic development. However, the inland waterway system still remains at a potential level. According to Dong Nai Department of Transport, the inland waterway system in the province is over 2,600 km long. Of which, about 200 km of waterway of 14 routes is being exploited well; The four ports of Dong Nai, Nha Be, Long Tau and Thi Vai are also planned to have port docks, a total of 44 ports, but currently only 15 are invested. Specifically, the port of Go Dau - Phuoc A port is planned eight ports, so far five ports come into operation. Specifically, the port of Go Dau - Phuoc A port is planned eight ports, so far five ports come into operation. In the Nhon Trach district, only seven terminals were planned and 26 remaining were not built. Dong Nai ports serve more than 11 million tons of cargo each year, accounting for more than 15% of the plan (reaching over 80 million tons of cargo traffic by 2030).

3. Conclusion

Assessing the status of Vietnam's inland waterway industry, the World Bank said that restrictions on infrastructure conditions, especially inland waterway corridors, hindered Vietnam's inland waterway industry. develope. Specifically, only 29% of the national waterways (about 2,033 km) are capable of operating barges of at least 300 DWT due to the shallow depth of the canal, small vessel sizes and low bridge clearance. In particular, many ports have outdated facilities with low mechanization, poor maintenance or poor domestic connectivity. Meanwhile, all inland waterway transport networks of China, Europe and the United States have been developed appropriately for vessels with a tonnage of over 1,000 tons to operate, normally the tonnage of the vessels. This facility is even bigger. According to the WB, the challenge for Vietnam in the coming time is to ensure the mobilization of capital for operation and maintenance of inland waterway transport infrastructure after 2020. At the same time, also must ensure sufficient capital to invest in upgrading infrastructure and improving the capacity of inland waterway transport on technical and market facilities. Notably, if reducing the proportion of investment in road infrastructure 2-3% will not cause much impact on transport efficiency. But if the investment for water transport is 2-3%, it will bring huge economic benefits to the country, because the average cost / ton-km of road transport is 5 times higher than transport download by inland waterway

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