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Solutions for reduction of the pollution in the inland waterway transportation

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Abstract: Vietnam's road transport currently accounts for about 77% of the country's total freight volume. In terms of logistics costs, logistics services in Vietnam have seen remarkable improvements when increasing by 25 grades in the Logistics Competency Index (LPI). However, Vietnam's logistics costs are still at a high level, negatively affecting the competitiveness of export activities, increasing the cost of consumer goods. Specifically, logistics costs in Vietnam account for nearly 21% of total GDP, higher than most countries in the Association of Southeast Asian Nations (ASEAN). This has affected the export edge and increased costs for manufacturers and consumers. Vietnam needs to invest in infrastructure to reduce traffic congestion and promote the use of container transportation by barges to increase the use of inland waterway transport, further promote development of coastal transport on the North - South route. In addition, integration of integrated logistics centers and urban centers in domestic container port planning. As for the business side, it is necessary to modernize the fleet of trucks, promote driver training and driver licensing, especially improving fleet quality because transportation costs on each truck can be reduced by nearly 16% by upgrading truck fleet, improving utilization efficiency and reducing congestion and unofficial costs.
KEYWORDS*:* ship fleet, domestic transportation, transportation capacity.

I. INTRODUCTION

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 In particular, many ports have outdated facilities with low mechanization, poor maintenance or poor domestic connectivity.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. 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 by inland waterway. Agreeing with the above view, WB's Country Director in Vietnam, Ousmane Dione (WB), said that according to the WB's review, in the 2011-2015 period, the inland waterway sector accounted for 2-3% of the budget. Annual investment in the transport sector, however, in the period 2016-2020, this rate decreased to 1.2% of the budget estimate. This level of investment is not enough for the expansion of transportation capacity and maintenance. After decades of development, the length of inland water transport network receiving barge over 300 tons accounted for only 30% of the 7,000 km of the entire route. This rate is very low compared to the successful commercial inland waterway transport systems in the world. This fact shows that the need to continue investing and making significant investments in essential backbone infrastructure systems is also the main commercial corridors. These large-scale investment needs need to be met through a strategic allocation of limited public resources, while mobilizing the participation of the private sector in capital financing and service provision. The elimination of infrastructure restrictions to attract private investment into their fleet, and encourage international service providers with new technologies to cooperate with domestic businesses, will give increased authorization as well as improved standards for these critical services, with lower logistics costs and less emissions, "proposed Ousmane Dione. Therefore, the WB recommends that the transport sector should encourage investment from the private sector into the port system, while the state budget focuses on investing in the development of transport infrastructure. In addition, Vietnam may consider further development of a transport infrastructure development project (except for a port) that has the potential to implement a public-private partnership (PPP) model. For potential projects to focus on creating practical conditions and supporting successful deployment. In order to initiate the Inland Waterway Bureau of Vietnam, it is possible to consider expanding some small-scale contracts for short-term channel dredging (most

of which are yearly contracts) into conventional PPP contracts small tissue taken over several years. Waterway transportation is more efficient and environmentally friendly than other modes of transport. But alongside these advantages, the waterway rotation still has a major impact on the quality of the water environment.

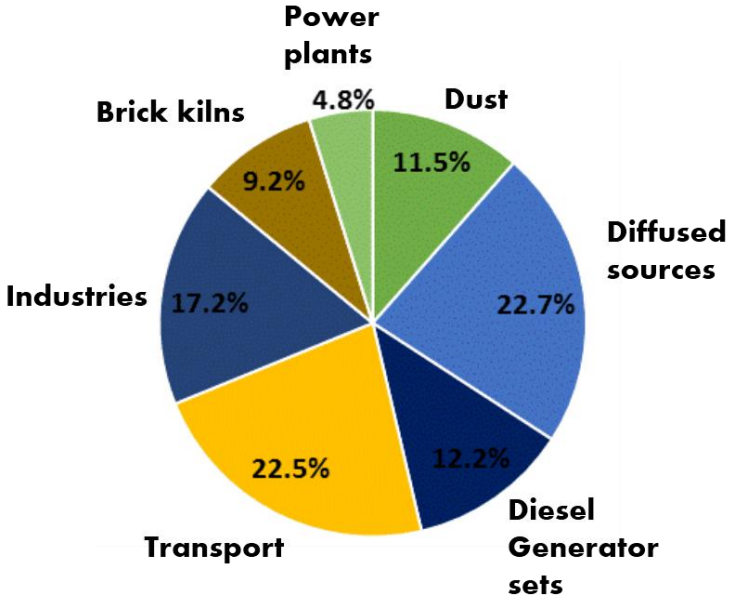

Fig. 1. Infrastructure transport in Vietnam

It needs to see a limitation to find a way to prevent widespread pollution. Waterway traffic control is closely linked to the protection of the water environment. Water pollution treatment systems in rivers and seas seem to be very rare, sewage sucking activities, sewerage ... will not be used. To operate the system of ships at sea, the river requires full supply of raw materials such as petrol, oil, grease. No one can guarantee these materials do not leaking out pollution. Incidents such as oil spills into the sea are not rare, and green seawater poisoned by too much oil will affect marine habitats. Submarine sewers are still maintained and operate when there is a waste incineration. In addition, the discharge of toilet water in the deck of the ship, discharge of lacquer solution directly into the sea also causes widespread pollution. The consequences of it leave no small, do not think the vast ocean, it is only too small things, you are wrong. Each day, each day it will accumulate into large black spots pollution. Then the source of water where the ships operate will be polluted, and the activities of the cruise will be affected.

The vast river and ocean environment, however, is vast, and our little actions also contribute to environmental pollution. It is necessary to further raise the awareness of everyone involved in boat trips on the protection of the marine environment when navigating. To support the development of inland waterway transport, the Ministry of Transport is encouraging all economic sectors to participate in transport business. SOEs only hold a market share of around 10-15% to ensure a leading role, focusing on major flows, some key commodities.

II. VARIOUS TYPES OF TRANSPORTATION

Climate change, sea level rise will increase the area of flooding, causing difficulties for drainage, increasing coastal erosion, affecting coastal construction works such as dykes, roads, The harbor. Hurricanes, floods, droughts, storm surges many road, sea, air, and air traffic systems are affected. According to the United Nations Development Program, climate change has a major impact on transport works. As the sea level rises, it will affect the foundations of coastal airports at the height of 5 m or less. According to the assessment, there will be six airports accounting for about 20% of Vietnam's airports affected with damage estimated at $ 0.52 billion. Climate change and sea level rise have caused subsidence and floods in many roads; Increased slippage, erosion of the surface, road infrastructure causing traffic, traffic jams, increased traffic accidents. Roads are cut off many sections, many local roads after the floods weekly floods are still flooded, congested, traffic difficult to travel. In the rainy season, many of the harbors were flooded, reducing the height of the canals affecting the mining ability of the building. The dry season drowns the flow of water that is affecting navigation. The phenomenon of salinity intrusion will increase, the trade travel in the difficult areas, the daily life of the local community is shrinking rapidly. Infrastructures, especially ports, will be hit hard, even if they have to be rebuilt,

renovated, upgraded or relocated. In aviation transportation, aviation activities have been and are having factors. Affects the atmosphere in the wrong direction and also reacts to climate change. Aviation industry has bad impact on the environment and is also heavily affected by climate change. According to the International Civil Aviation Organization (ICAO), nearly 20% of aviation accidents in the world are related to climate and weather and account for 8% of deaths. Weather phenomena such as rain, wind, hail, thunderstorms, thunderstorms, etc. are all challenges to flying safety.

The transport sector in Vietnam, an energy-intensive industry and greenhouse gas emissions, is increasing in the future as it implements activities to meet the needs of socio-economic development; What this means will increase the impact of climate change. The Ministry of Transport has set up the Environment Department to assist the ministry in environmental protection, economical and efficient use of energy, and response to climate change. The branch has environmental centers and project management boards having full-time or part-timers to carry out environmental protection activities for investment projects. Most of the units have the counseling, monitoring and implementation of environmental protection. However, at present, human resources and material facilities for environmental management of agriculture, especially for inspection and supervision, are still lacking, not often updated. bracelets. The application of new greenhouse gas emissions-friendly and environmentally-friendly technologies in transport requires a great amount of investment, while policy mechanisms to encourage research and application are not clear. The involvement of organizations and individuals is not encouraged. Hence, controlling and limiting the growth rate of greenhouse gas emissions requires industry to innovate and adopt low-waste technologies and clean technologies

III. SOLUTIONS FOR DEVELOPMENT

In order to alleviate the vulnerability of climate change, the sector needs to make adjustments in the development of energy and transport development plans, taking into account the elements of Climate Change. Upgrading and rehabilitation of transport facilities in areas often threatened by floods and sea level rise, ensuring the management of energy demand on the basis of high energy efficiency, Energy management; Developing a response strategy and adapting to abnormal weather conditions ... To build a complete system of sea dykes, when the whole country has 2,800 km of sea dykes in provinces and cities. The complete construction of the sea dike system in Vietnam not only protects the security of the country, but also protects the transport infrastructure in order to reduce the impacts of climate change, reduce storms, floods and water. The sea devastates the coastal provinces and cities and transport works. On the other hand, complete construction of sea dykes that prevent saltwater from entering the mainland, destroying transportation works. The transport sector should plan and redesign the transport infrastructure system on land, sea and coastal areas, ports, warehouses, canals, inland waterways, especially in Coastal and mountainous plains; Develop technical standards and norms appropriate to climate change. In the planning or construction of roads, especially rural transport, attention should be paid to the impacts of climate change, with emphasis on measures to strengthen sea dykes and drainage when flooding, especially in stormy season, Flood ... Implement the integration and protection of environmental resources in strategies, planning, plans and projects for development of transport; To concretize the implementation of the policy on solutions to cope with climate change and the protection of natural resources and environment; To popularize and thoroughly grasp the Party's and State's undertakings and policies on response to climate change and the protection of natural resources and the environment. The industry should focus on strengthening human resources, facilities and techniques for the state management, training, research on Flood and Storm Prevention and Fighting. To review, supplement and amend the land law system along the direction of prioritizing the use of land for development of transport infrastructure; To step by step develop transport towards less greenhouse gas emission, focusing on developing mass transit in Hanoi and Ho Chi Minh City. Ho Chi Minh (urban railway, fast bus) and increase the proportion of freight by rail, inland waterway and coastal. In addition, the transportation sector has also focused on developing and implementing incentive and incentive policies to motivate organizations and individuals to use vehicles that are less likely to emit greenhouse gases. Good environment; Use alternative fuels, renewable fuels. The sector has asked the agencies and units to coordinate with the concerned agencies to step up the inspection, propagation, dissemination and education to raise the awareness of environmental protection, the use of energy saving and Effectively, responding to climate change for cadres, civil servants, employees and laborers. Building and implementing plans, using energy economically and effectively, actively responding to climate change; Develop and implement a scientific plan to promote the research, development and application of climate change adaptation technologies.

Recently, the Ministry of Transport has issued Directive No.02/CT-BGTVT "On actively responding to climate change, thrifty and efficient use of resources, enhancing environmental protection in the industry. Transportation". Implement the Resolution No. 24-NQ/TW of the Party Central Committee; Resolution No. 08/NQ-CP of the Government promulgating the program of action for the implementation of Resolution No.24-

NQ/TW. The sector focuses on organizational and management solutions such as reviewing, supplementing and perfecting the system of legal normative documents, systems of standards and technical regulations in the sector in order to actively respond to Climate change, strengthening of natural resources management and environmental protection. Strengthening training, enhancing and developing human resources attach importance to the work of propagation, dissemination, education, raising awareness, formulating a sense of initiative in responding to climate change, enhancing the management of natural resources and environmental protection.

In addition, it is necessary to step up research and application of scientific and technological advances, diversify and combine resources, expand international cooperation on climate change, resource management and protection environment. Mekong River is a very valuable and potential resource for great navigation. For centuries, water transportation in the Mekong was the main mode of transportation between the coastal communities wave. With the advantage of low cost, it is possible to carry large quantities of cargo today. Along with the rapid economic development, the navigation system on the Mekong system has also rapidly developed with the rapid increase in the number of vessels, ports and infrastructure to meet the needs transportation of goods, passengers and tourism, etc. When the waterway transportation activities of economic sectors become bustling, it is also the inadequacies affecting traffic safety and environment. Schools such as the poor safety of vehicles, especially when transporting toxic goods, signal systems, signs asynchronous, waste from vehicles into the river, oil spills, etc. increased. With funding from the Kingdom of Belgium and the Australian Government, the NAP has achieved the following key results:

- Reports on navigational conditions for all routes (Houei Sai - Luang Prabang - Pakse, Kampong Cham - Phnom Penh - Vietnam - Cambodia border - to the sea). Report on waterway situation in downstream tributaries to contribute to the implementation of the Prior Informed Consent Procedure and Consultation.
- Beginning with the study of the Luangprabang waterway legal framework between Laos and Thailand. Signal buoys have been added and installed at the Houei Sai - Luangprabang - Vientiane lines; Kampong Cham - Phnom Penh; Phnom Penh - Siem Reap; Phnom Penh - Vietnam and Cambodia Borders; Bassac - Vam Nao (from July 2010).
- Cooperation with water-related organizations in the region and especially with the advanced countries has been strengthened. Technical assistance for the signing and implementation of the Vietnam-Cambodia Water Transport Agreement. Additional installation of 30 buoys on the Vam Nao canal near Vietnam - Cambodia border: In addition to enhancing the safety of vessels, the buoyancy, installation, operation and management of buoys are enhanced advanced technology for related units.
- Surveying waterway conditions and building electronic charts (ENC) from the Vietnam-Cambodia border to the estuary. Dinh An (Hau River estuary) and Cua Tu estuary (Tien estuary) provide up-to-date information on the water level (15 minutes). The Water Transport Program activities have contributed to strengthening the capacity of agencies through participation in workshops, consultations, forums, and field surveys. The program receives the support and participation of MOF's agencies including:
- Vietnam Inland Waterways Administration and Vietnam Maritime Administration, in which the Department's leaders are members of the Advisory Board (NAB) directly involved in directing the implementation of the program. Southern joins and supports the management and operation of Dinh An and Cua Tu tidal stations.
- The inland waterway management sections and major ports on the Tien and Hau Rivers support the provision of inland waterway transport information and participate in ensuring the operation of the signage buoy system. Enhance measures to ensure maritime safety and safety of inland waterway traffic.

The Ministry of Transport issued Directive No.11 on strengthening measures to ensure maritime safety and safety of inland waterway traffic. In recent times, there have been some particularly serious seagoing accidents causing significant loss of property to Vietnamese vessels operating inland and VR-SB vessels. The initial cause of the accidents indicates that the area of operation of the vehicle is not in line with the range of activity allowed or exceeds the allowable wind limits. Particularly, for VR-SB marine vessels when operating beyond the allowable sea limits and failing to comply with the regulations governing the licensing, cargo loading, safety equipment on board and The number of people on board does not match the actual declaration. In order to ensure the safety of navigation and safety of inland waterway traffic in the coming time, the Minister of Communications and Transport shall direct the schools' heads to perform the following tasks:

The Vietnam Maritime Administration, Vietnam Inland Waterways Administration shall direct port authorities to intensify the work of monitoring VR-SB ships and waterway vessels operating in the managed water area. Particularly, to attach importance to supervising the loading and unloading of goods, assuring that goods are loaded and tied up in strict accordance with regulations and with the right loads; Seafarers shall ensure that they have at least the safety margins and have adequate professional certificates; Crew members and passengers on the means of transport shall be in accordance with the declared quantity when carrying out the

procedures of travel and arrival and in accordance with the arrangement of the means of life saving of the means.

Promote the dissemination of maritime laws and inland waterways to enterprises, shipowners and crew members to raise awareness of maritime safety and inland waterways. Strengthen the inspection of Vietnamese vessels operating on domestic routes, VR-SB-class vessels carrying out safety equipment, and training crews to respond to emergency situations; Resolutely resolutely handle violations, not allowing means to leave the port when there are serious defects affecting the safety has not been overcome.

The Vietnamese Register has instructed the registry offices to pay more attention to improving the quality of ship registration, VR-SB vessels and other waterway facilities to limit technical incident meetings. Strengthen the inspection of the performance of duties of the registrars in the work of registration, to strictly handle the violations. To study the amendments and supplements of technical regulations to ships and waterway vessels in the direction of raising safety standards for crewmembers and passengers and step by step approaching the minimum requirements of the International Convention that Vietnam Nam is a member of maritime safety, maritime security and prevention of environmental pollution. Strengthening the guidance of enterprises and ship owners on the regulations related to maritime safety, maritime security and prevention of pollution of the sea environment.

Ship owners, companies managing and operating sea-going ships and waterway means shall strictly observe the law provisions on maritime safety, maritime security and prevention of environmental pollution; Instruct the ship's captain to uphold the responsibility, perform his duties seriously ...Port enterprises shall only be allowed to load cargo on board the ships and vessels permitted to carry them; Goods are loaded onto the right vessels and vessels as prescribed; The goods are lashed and tied in accordance with the regulations, guidelines on packing and tying goods before the ship leaves the port. The provincial/municipal Communications and Transport Services shall intensify the inspection and raising of the quality of training and testing activities and the professional certificates of crew members and riders; approve and strictly manage the business of passenger transport by fixed routes, passenger transportation under contract and transportation of tourists. The Legal Department reviews and synthesizes new behaviors and violations of VR-SB inland waterway vessels and port owners to supplement the draft decree on sanctioning administrative violations in the field Maritime and inland waterways. The Traffic Safety Department shall assume the prime responsibility for, and coordinate with the Inspectorate, the Legal Department and concerned units in, organizing periodical or extraordinary inspections of agencies and units on the implementation of this Directive. The task of ensuring maritime safety and safety of inland waterways is one of the key tasks of the Ministry of Transport and Communications, the Minister requests the Heads of agencies and units to seriously implement perform./.

IV. CONCLUSION

According to the Ministry of Transport, inland water transport is one of the five modes of transport in our country play a very important role. Inland waterway transport not only plays a major role in transporting large volumes of goods and passengers, but also creates millions of jobs, contributing to ensuring social security and national defense and security. However, there are still many inadequacies in waterway transportation such as unequal waterway traffic; The phenomenon of exploitation of river resources as planned or Process technology is not as planned (exploitation of sand, gravel, etc.) are common in most rivers and canals in the country. The signaling system is not synchronized between the signal of the inland waterway management unit and the signal of the owner; The handling of domestic goods transportation and inland port management is inadequate; The force of the means of development is fast, uneven but concentrated in some urban areas and industrial parks. Therefore, the Ministry of Transport has proposed a scheme to facilitate the development of a synchronized inland waterway infrastructure linking with other modes of transport; To improve the capacity of the crew and the inland waterway transport crews. To create favorable conditions for inland waterway transportation business with reasonable transportation costs; Improve the quality of water transport services; Ensure safety and environmental friendliness; Make a distinct advantage over other modes of transport. Specifically, will develop, promulgate mechanisms, The policy is to facilitate the development of inland waterway infrastructure; Build and promulgate mechanism, The policy of supporting the development of the fleet has a reasonable structure with a fleet of about 30%, self-propelled ships accounting for about 70% of the total number of inland waterway vessels; To prioritize the development of the container fleet; Inland waterway transportation and training , retraining of human resources for inland waterway transportation.

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