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Truong Thanh Hai
Ho Chi Minh City University
of Transport, Ho Chi Minh
city, Vietnam

Phan Thi Thuy Hoa
Ho Chi Minh City University
of Transport, Ho Chi Minh
city, Vietnam

Correspondence:
Truong Thanh Hai
Ho Chi Minh City University
of Transport, Ho Chi Minh
city, Vietnam

Pollution issues for domestic waterway transportation in Vietnam

Truong Thanh Hai, Phan Thi Thuy Hoa

Abstract

Currently, the sources of marine pollution in marine, fisheries, tourism, oil and gas ... related to the use of marine resources are diverse and complex. These are sources of pollution caused by oil (from oil used as fuel, lubricant, hydraulic for ships, to cargo oil transported by ships); liquid chemicals on board; dangerous goods (explosives, radioactive substances, inflammables, poisons ...) transported by ship; trash; wastewater; antifouling paint used for hull; toxic materials used for shipbuilding (asbestos, heavy metals, chemicals); pollution due to the movement of aquatic species through ballast water; infectious diseases spread through maritime routes; demolition of old ships, oil exploration and exploitation at sea. The operation of ships (including fishing vessels and cargo ships) is one of the artificial sources that contribute significantly to air pollution. The quality of Vietnamese vessels is often not high, many vehicles are too old, outdated, fuel combustion efficiency is low and no exhaust gas treatment system has emitted many toxic gases such as SO₂, CO₂, CO, NO₂, CxHy. Currently, Vietnam has more than 1,700 transport ships, along with the number of fishing vessels of nearly 130 thousand ships, corresponding to the amount of fuel consumed about 4 million tons/year. It can be said that this is the source of pollution for the seas, coastal areas and many places, seriously affecting the marine ecosystem, destroying marine resources, endangering human health.

Keywords: waterway transportation, air pollution, domestic transport

1. Introduction

Inland waterway transport is one of 5 modes of transport in our country which plays a very important role. Inland waterway transport not only plays a role of transshipment of large quantities of goods and passengers but also creates millions of jobs, contributing to ensuring social security and protecting national defense and security. There are still many shortcomings in our water transport such as: There is still a situation where the water transport routes are not uniform; the phenomenon of exploiting natural resources in the river bed is not in accordance with the planning or technological process (mining sand and gravel ...) often occurs widely in almost all rivers and canals across the country; signaling system is not synchronized between the signal of inland waterway management unit and the signal of the owner; cargo handling and management of inland ports and wharves are still inadequate; The rapid development of the means of transport is uneven but only concentrated in some urban and industrial areas. With a trade / GDP ratio of about 200%, Vietnam's demand for efficient logistics systems is huge. As reported by the World Bank (World Bank), in the transport sector, freight transport by road and inland waterways are two areas that transport up to 90% of the total circulation of goods and services in Vietnam. However, road transport is proving to be overwhelming. Data on the fleet capacity in 2018 shows that inland waterway transport accounts for only about 17% of the national freight share, while the proportion of road transport is about 77% and the river river transport is 5%. 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. 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.

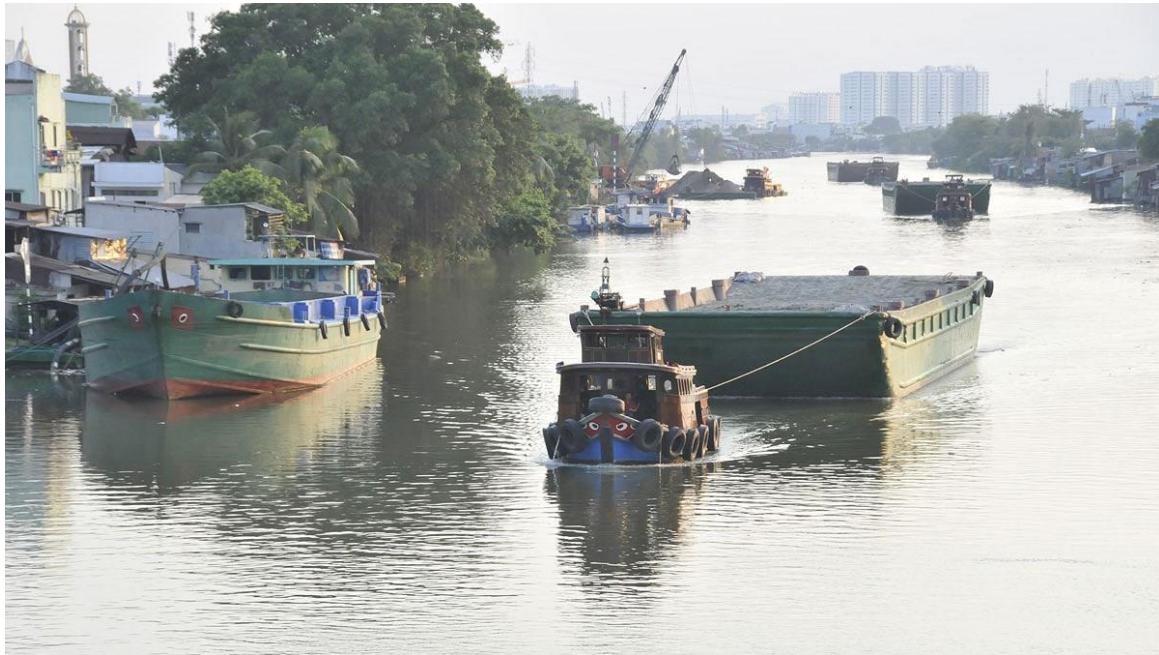


Fig. 1: Domestic waterway transportation

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. 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

2. Types of transportation

According to statistics of the Institute of Transportation Development and Strategy (Ministry of Transport), in the period of 2011 - 2016, transportation activities in our country consume a large amount of energy, accounting for 30% of the total national energy demand, 60 % of total fuel consumption and 10% increase each year. In particular, road transport is the largest energy consumer, accounting for about 68% of the industry's total fuel; 90% of fuel for transportation is gasoline and diesel (only 0.3% is clean fuel). With the consumption of large quantities of fuel, transport activities have emitted large amounts of GHG, increasing climate change. Currently, the average annual transport activity emits about 30 million tons of CO₂. In particular, road traffic emissions accounted for 86%, railways, waterways and airways accounted for 14%. The process of operation of vehicles transporting large amounts of substances such as dust, CO, NO_x, SO_x, gasoline vapor, lead dust, benzene ... causes air pollution. Specifically, the

concentration of dust in the air (quarter 2/2016) in cities such as Hanoi, Ho Chi Minh, Hai Phong, Da Nang ... at the intersections is 3-5 times higher than the permitted standard; The average CO, NO₂ concentration at some major intersections exceeds the permitted standard from 1.2 to 1.5 times. Statistics also show that the emissions of road motor vehicles depend heavily on the quality of vehicles. For cars and motorbikes that have been used for many years with low quality, low fuel efficiency, toxic substances, dust in high exhaust gas ... are the causes of serious environmental pollution. In particular, motorcycles are the main contributor to polluted gases, especially CO emissions. Trucks and passenger cars have a lot of NO₂ emissions. In addition, noise generated from traffic activities also plays a major role in causing environmental pollution. 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, 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. 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

3. Solutions

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. 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. American environmental experts say that marine vessels are a major source of environmental pollution, especially in port cities and coastal areas because they use poor quality asphalt fuel. Emissions are high, such as nitrous oxide (NO), sulfur dioxide (SO₂). Besides, these wastes also create acid rain and soot particles in the air. The US Environmental Protection Agency (EPA) has published the information, to prevent about 8,300 deaths each year in the US and Canada by inhaling smoke and harmful emissions from ships. According to US government statistics, ships are the culprits that cause two-thirds of SO₂ emissions in the

transport sector in 2002 and the lack of control measures will make this ratio possible. 98% by 2020. In addition, the US and Canada governments also set new standards for emissions of large-sized vessels, from 2015, new vessels will have to reduce 96% of SO₂. Compared to the present. Similarly, ships built after 2016 will have to cut 80% of NO emissions.

According to the European Union's report on the impact of marine emissions on ships, the amount of toxic emissions from ships is killing about 39,000 people a year in Europe, of which Britain suffered the most damage. The head of the research team, Janusz Cofala of the Austrian Institute of Applied Systems Analysis, said the acceleration of international trade and the number of ships that are mostly from China are increasingly making ships more polluted school. He was most affected because of the long sea and also the busiest trading place, bustling ships and boats. The study also found that the average life expectancy of Westerners in the UK will be reduced by 20-30 months from 2020.

Currently, the EU is planning to set up the first low emissions waters, reducing the level of pollution from thousands of cargo ships moving across the seas every year. The EU requires governments to support maritime companies to meet SO₂ standards closely. In support of EU solutions, the International Maritime Organization (IMO) agreed to limit SO₂ content in marine fuel sources to vessels passing emissions control areas (effective in 2015), meanwhile, shipping companies will face the possibility of meeting low SO₂ emissions and cleaner fuel costs, resulting in higher sea freight rates. The EU has accepted IMO's proposal to reduce sulfur content in marine fuels, with the sulfur limit for all vessels cutting to 0.5% in 2020 (currently at 3, 5%), and limits for all Baltic and North Sea vessels (called "controlled regional emissions") will be cut to 0.1% from 0.5% by 2015. Instead of using sulfur-containing fuels, shipping operators can also use alternative treatment technologies to clean up the emissions of boats to reduce pollution. In order to control well emissions from ships in maritime activities to the extent permitted, Vietnam needs to have policies, legal documents, regulations and state regulations for fishing vessels and transport vessels. Emission reduction - especially greenhouse gas emissions, ship science and technology, ship machinery, exhaust gas collection furnace.

For transports, Vietnam should consider to fully join Appendix VI - "Regulations on air pollution prevention by ships" of the MARPOL Convention 73/78 IMO. At the same time, building indicators according to IMO standards for energy efficiency design (EEDI) is an index that can be verified by calculating ship design parameters. This index is a means to help ship owners compare the effectiveness of designs of the same type of ship of different shipyards. In addition, human resource training and awareness raising should be organized to reduce emissions from ships and climate change for objects related to maritime, fisheries and marine economy; Renovating shipbuilding technology according to green maritime standards, reducing engine emissions - ship and incinerator machines; Issuing policies on taxation and collection of ship emissions; Cooperating and exchanging experiences with international maritime-environmental organizations in the field of marine emissions; Researching, constructing and establishing a number of "emission control" or "special" areas of ships in

ports near the sea area with special values on ecological environment in Vietnam's seas. Accordingly, all large vessels with pollutant emissions exceeding the permitted standard will limit access to the port or special pilot mode. This "emission control zone" can be set up in 2 coastal areas of Quang Ninh - Hai Phong and Vung Tau - TP. Ho Chi Minh.

4. Conclusion

Inland waterway means and sea-going vessels operating on inland waterways must comply with regulations on environmental protection, in particular: Inland waterway means must comply with the current law on technical regulations. technique of pollution prevention by inland waterway vehicles; The ship must comply with the current law on national technical regulations on marine pollution prevention systems; inland waterway means and sea-going vessels operating on inland waterways must have equipment to shield and not let goods fall and disperse dust causing environmental pollution; do not dump wastes into inland waterways; inland waterway vessels and seagoing vessels must have plans for rescue of oil pollution and chemical pollution according to the law provisions on operation; Inland waterway vessels and sea-going ships causing oil spill incidents, means owners and ship owners must respond to oil spills according to current law provisions. Across the country today there are nearly 300 inland water ports divided into 3 types: focal ports and areas managed by the central and local authorities; Specialized ports and wharves managed by factories and enterprises; Free ports and wharves are managed by communes, districts, cooperatives and private enterprises. Emissions from transportation vehicles, construction machinery operating on ports and under rivers can pollute the air environment, increase greenhouse gas emissions ... causing climate change. The wharves and yards are usually not covered by roofs, or materials to shield them, goods are kept outside the yard, usually bulk goods, construction materials such as sand, stone, coal, ore, wood, fertilizer ... not shielded when there is wind to sweep sand dust, stone dust, coal, ores far away, affecting the health of people living in the surrounding area (causing respiratory diseases: pneumonia and bronchitis chronic). When it rains, rainwater will wash these goods down the water causing pollution of the water environment.

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